



**JACOBS LEVY EQUITY
MANAGEMENT CENTER**
for Quantitative Financial Research

The Promises and Pitfalls of Factor Timing

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Outline

- Factor Timing = The Holy Grail?
- The Literature on Factor Timing
- Which Signals Might Predict Factor Returns?
- The Empirical Evidence
- The Perils and Pitfalls of Factor Timing
- Overcoming the Challenges

The material contained in this presentation is current as of the presentation date, unless otherwise indicated.

Factor Timing = Holy Grail?

Factor Returns

Full-Sample Performance for Fama-French factor returns (July 1963 to June 2017)

	Mkt-RF	Size	Value	Profitability	Investment	Momentum
Annualized Return	5.2%	12.1%	13.6%	11.5%	12.6%	14.1%
Annualized Volatility	15%	21%	17%	15%	15%	17%
Excess Return	0.0%	7.0%	8.4%	6.3%	7.4%	9.0%
Risk Adjusted Return	0.34	0.57	0.81	0.76	0.83	0.84

Past performance does not guarantee future results.

Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

But Factors are Cyclical...

Excess Returns of Factors by Decade

(Excess returns annualized relative to the Fama-French market factor)

	Size	Value	Profitability	Investment	Momentum
July 1963 to 1969	15.2%	9.4%	7.1%	3.7%	13.1%
1970 to 1979	7.2%	13.8%	5.5%	8.7%	10.0%
1980 to 1989	14.2%	13.4%	10.8%	14.5%	16.1%
1990 to 1999	1.4%	6.4%	8.2%	7.8%	9.4%
2000 to 2009	9.9%	8.7%	4.3%	7.3%	7.9%
2010 to June 2017	-0.6%	-1.6%	2.9%	1.0%	1.5%

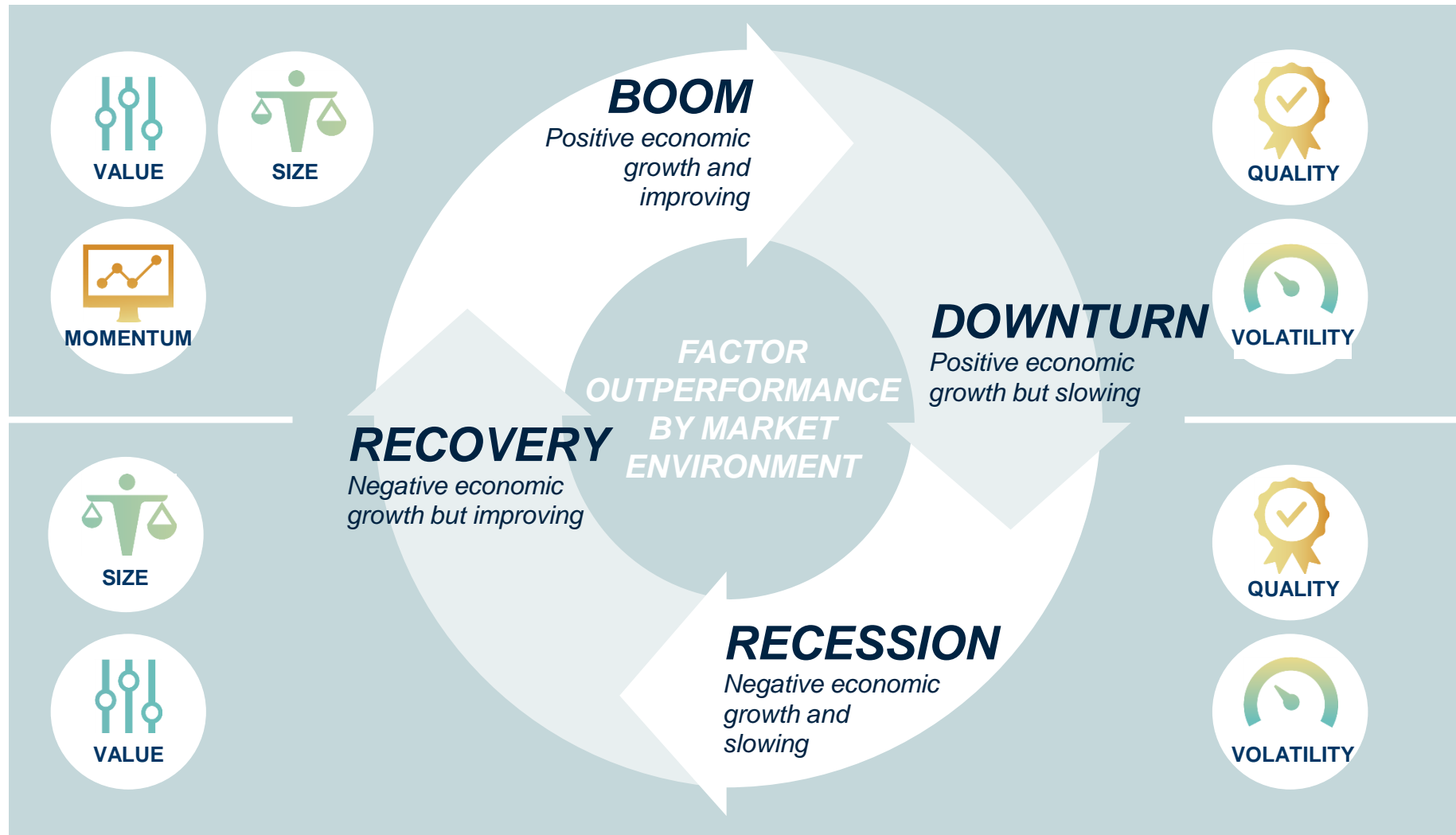
Darker green: strong positive premium

Darker red: strong negative premium

Past performance does not guarantee future results.

Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

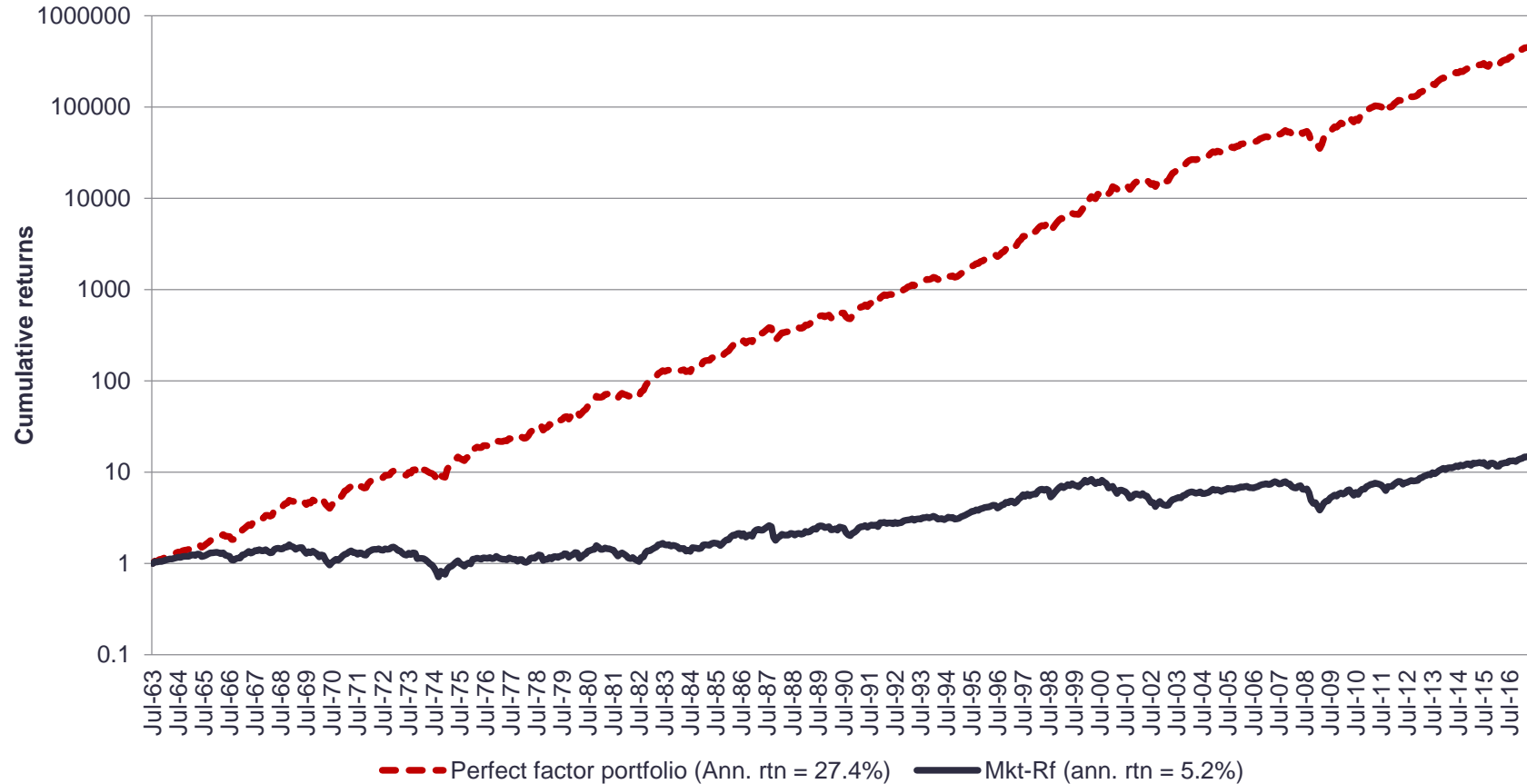
But Factors are Cyclical...



Source: SSGA

... And With Foresight, the Opportunity for Alpha is Astounding

A Long-Only Portfolio Rebalanced Monthly Holding Positive Historical Return Factors

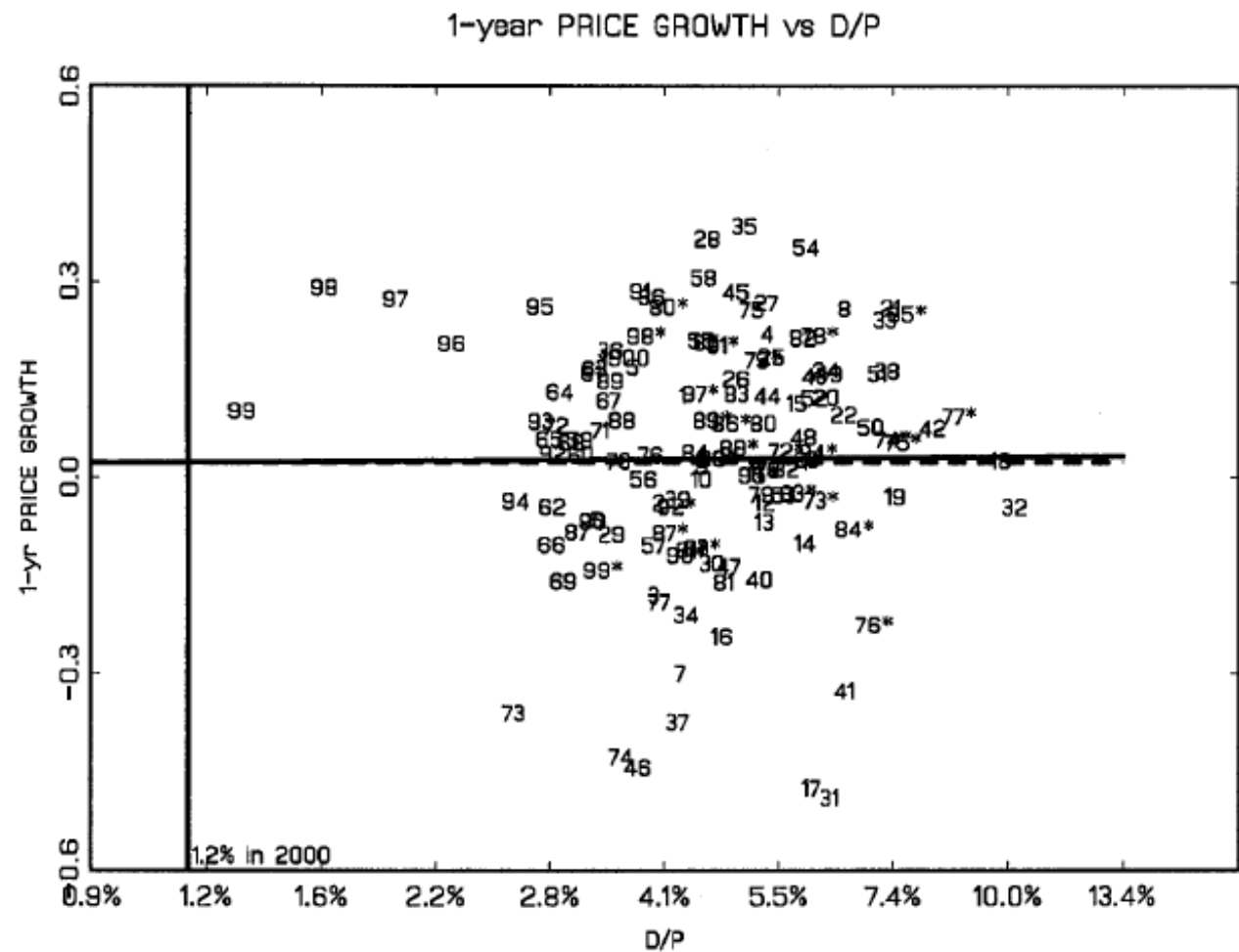


Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

Source: SSGA, Kenneth French.

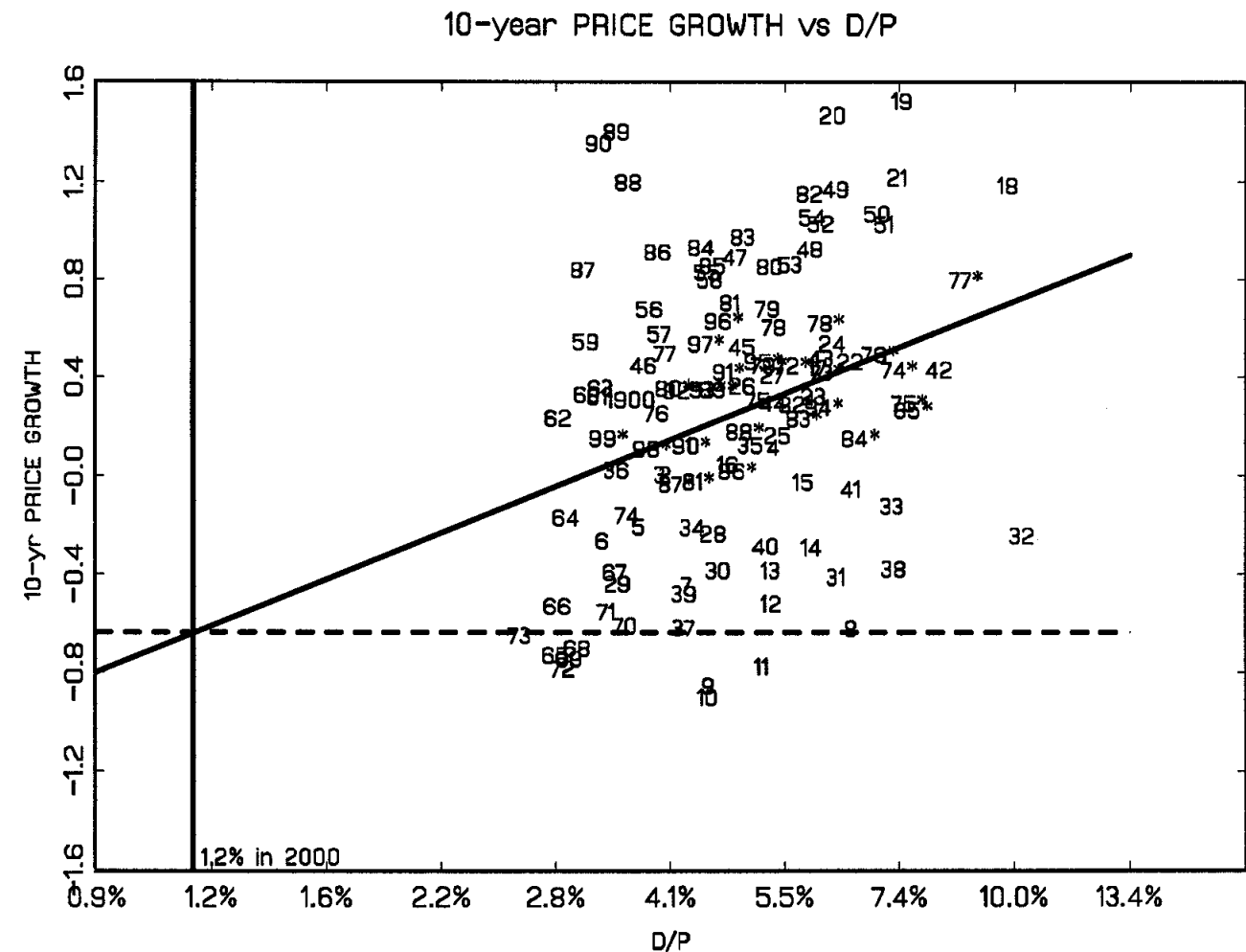
The Literature

Campbell and Shiller (1998) on the Relationship between Dividend Yield and Future Market Returns



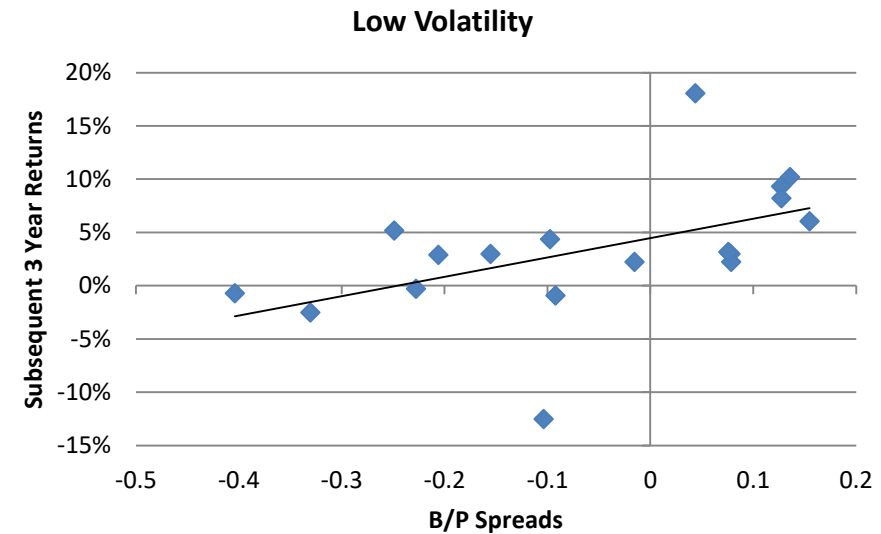
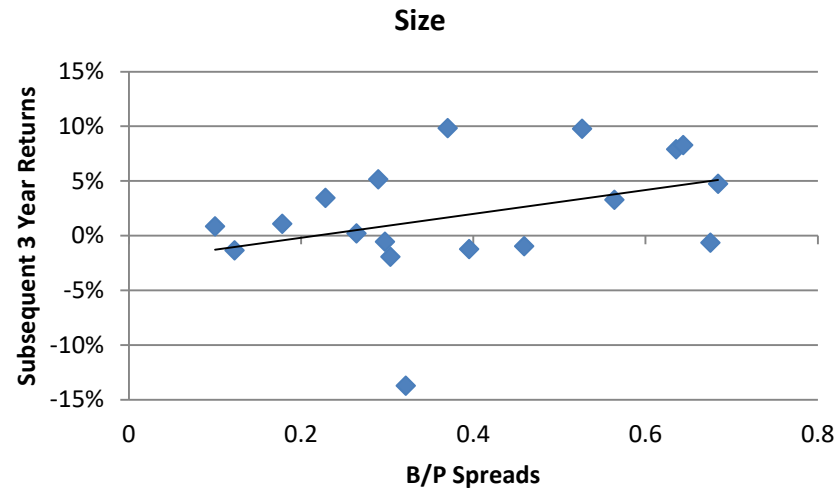
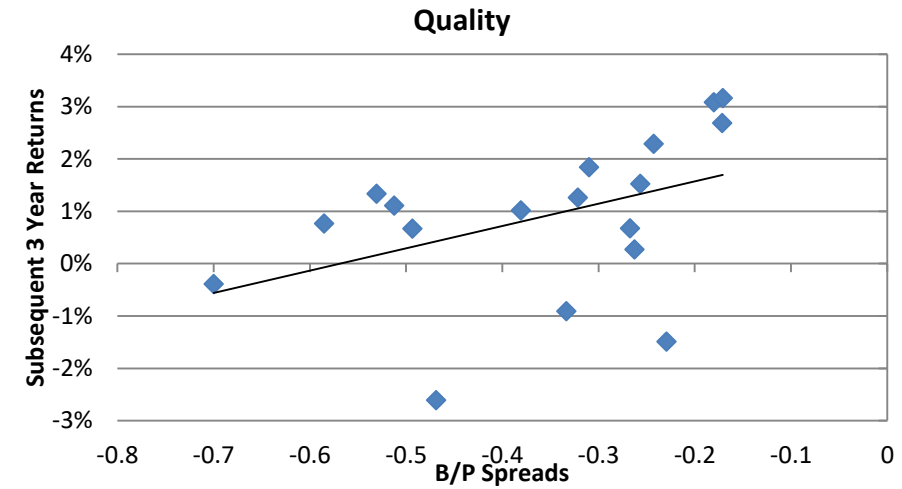
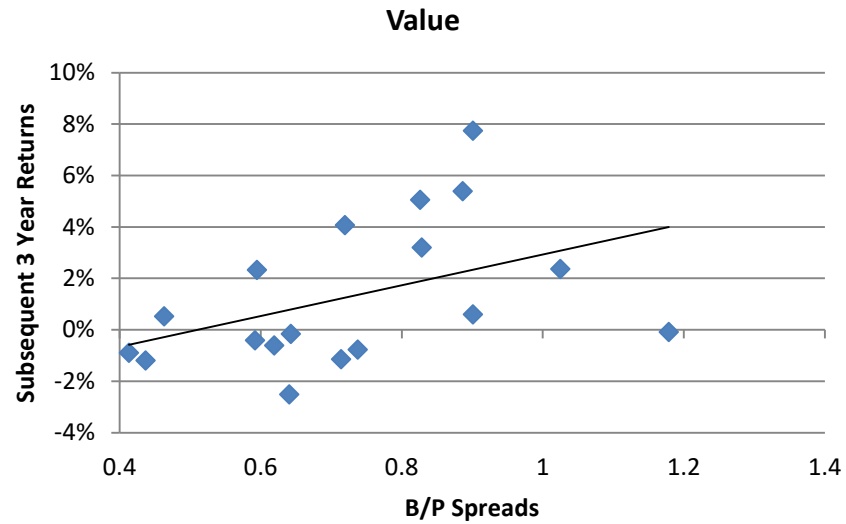
Source: "Valuation Ratios and the Long-Run Stock Market Outlook: An Update" - John Y. Campbell and Robert J. Shiller. Data updated through 2000.

Campbell and Shiller (1998) on the Relationship between Dividend Yield and Future Market Returns

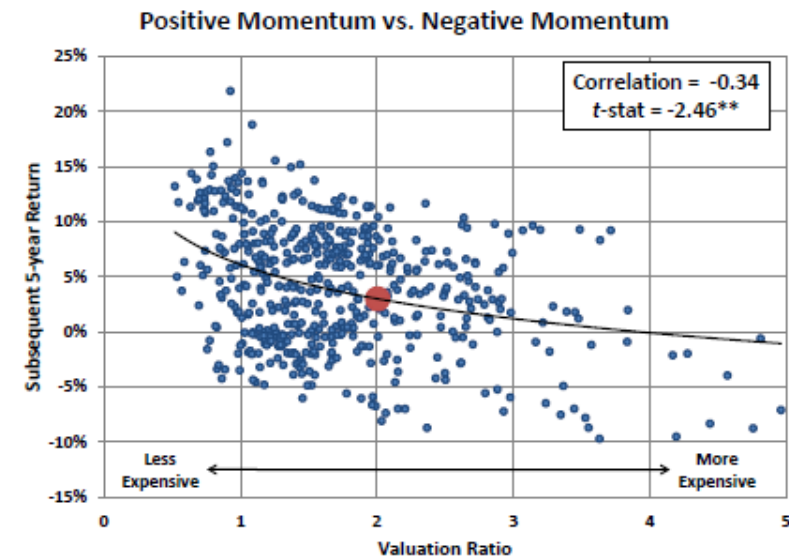
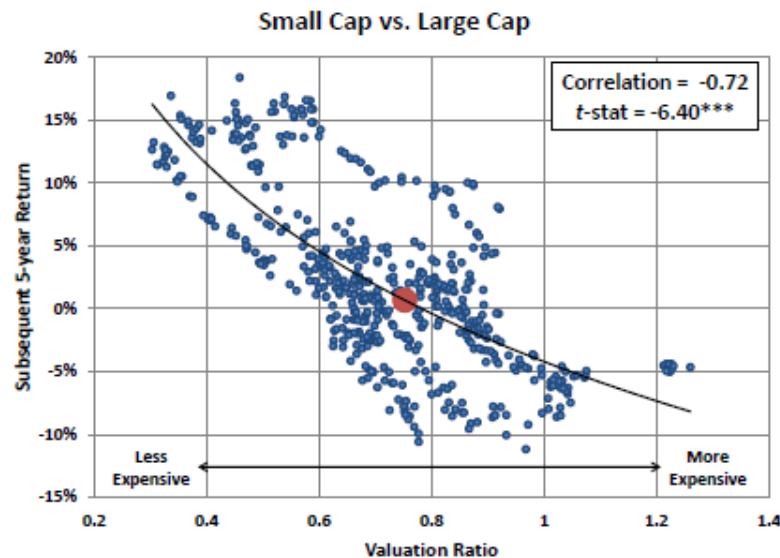
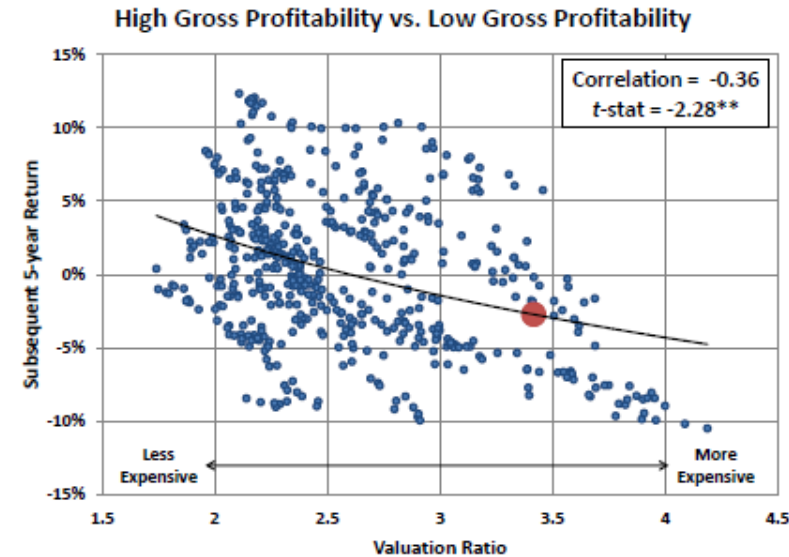
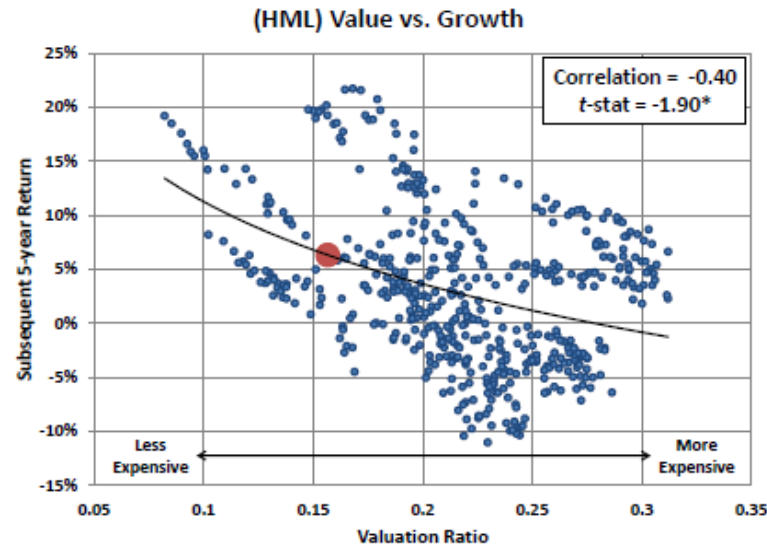


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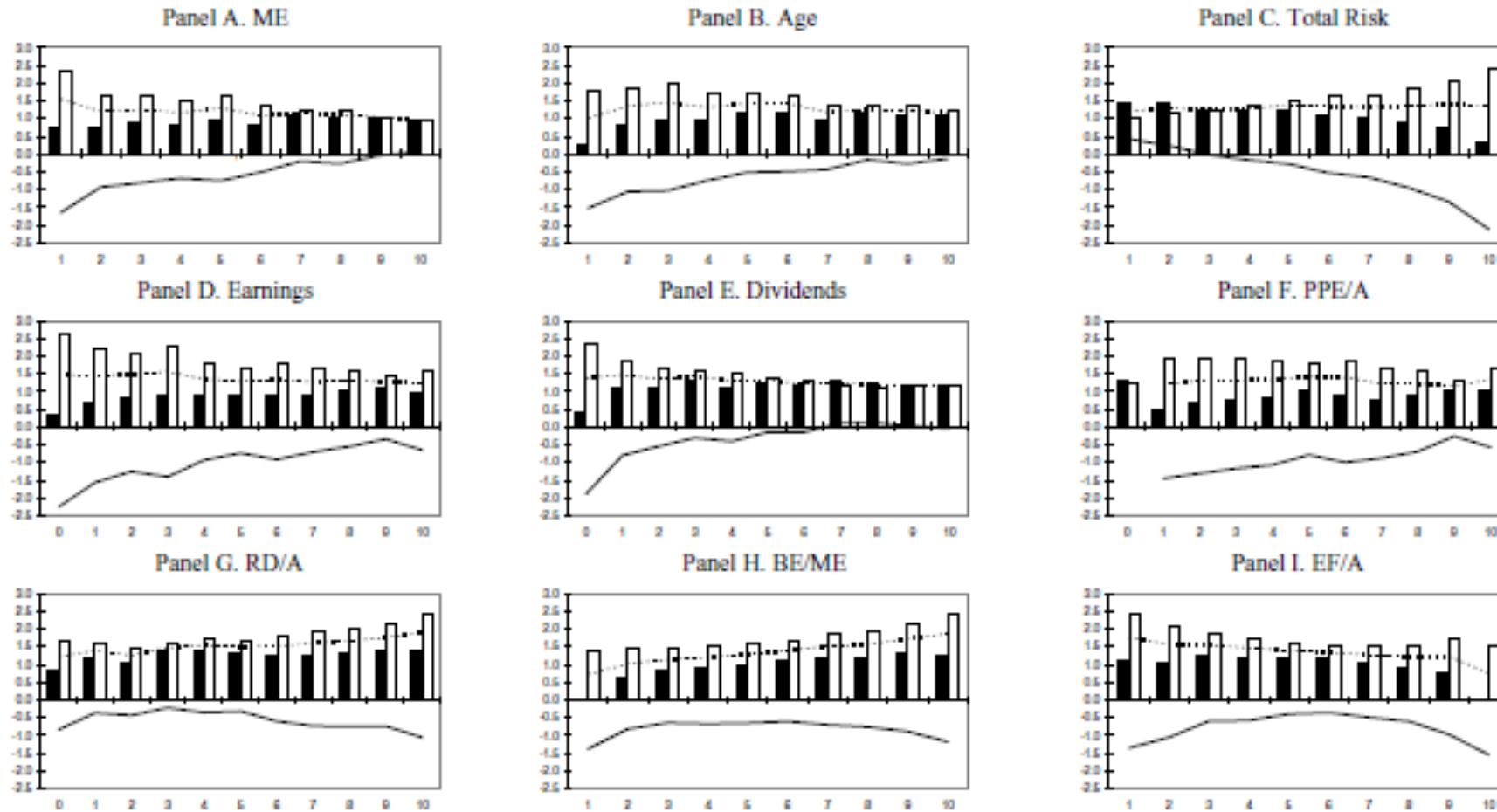
Extending Campbell and Shiller to Factors: Thomas and Shapiro (2014)



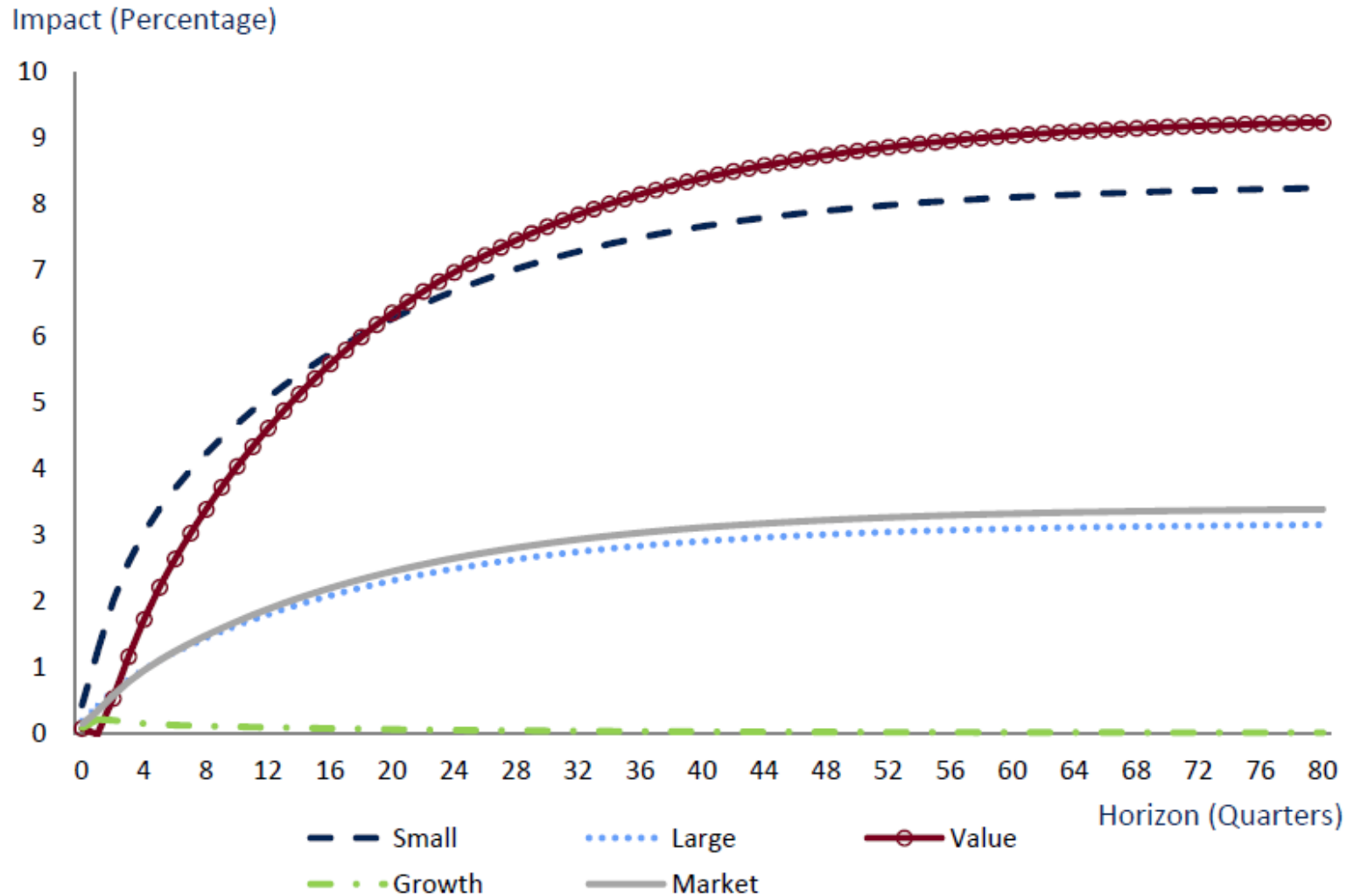
Extending Campbell and Shiller to Factors: Arnott, Beck, and Kalesnik (2016)



Baker and Wurgler (2006) on Sentiment



Winkelmann, Suryanarayanan, Hentschel, and Varga (2013) on Macroeconomic Shocks



Source: "Macro-Sensitive Portfolio Strategies: Macroeconomic Risk and Asset Cash Flows" – Winkelmann, Suryanarayanan, Hentschel, and Varga, MSCI, March 2013

The Literature

- **Historical real earnings:** Campbell and Shiller (1988)
- **Dividend yield:** Fama and French (1988)
- **Cross-sectional beta premium:** Polk et al. (2006)
- **Investment to capital ratio:** Cochrane (1991)
- **Stock market volatility:** Merton (1980) and French, Schwert and Stambaugh (1987)
- **Spread between yields on low-grade corporate bonds and one-month Treasury Bills:** Keim and Stambaugh (1986)
- **Term spread:** Campbell (1987) and Fama and French (1989)
- **Inflation:** Campbell and Vuolteenaho (2003)
- **The share of equity issues in total new equity and debt issues:** Baker and Wurgler (2000)
- **Aggregate market's implied cost of capital:** Li, Ng, and Swaminathan (2013)
- **Sentiment indicators:** Huang et al. (2014)

The Literature

- **Valuation and Momentum**

- Garcia-Feijoo, Kochard, Sullivan, Wang (2015): used to predict **Low Volatility**
- Arnott, Beck, Kalesnik (2016, 2017): used to predict **Value, Momentum, Low Beta, Gross Profitability, Investment, Size**

- **Sentiment**

- Baker and Wurgler (2006): used to predict **Size, Volatility, Dividend yield, Growth, Profitability**

- **Macroeconomic Cycles**

- Jacobs and Levy (1989): used to predict **Size**
- Muijsson, Fishwick, Satchell (2014): used to predict **Beta**
- Winkelmann, Suryanarayanan, Hentschel, and Varga (2013): used to predict **Size and Value**

Which Signals Might Predict Factor Returns? And Why?

Candidate Predictors

Category	Examples of Individual Metrics
Financial Conditions	Corporate credit spread, TED spread, Money Supply Growth
Economic Conditions/Macroeconomic Cycle	GDP growth, Capacity Ratio, Consumer Confidence Index
Sentiment/Risk Sentiment	VIX, ISM PMI
Valuation	CAPE, Dividend Yield, Earnings Yield, Book-to-Price
Trend/Momentum/Persistence	Past performance (1 mth, 3 mths, 6 mths, 1 year, 3 years, 5 years)

Some Priors

	Size (Small Cap)	Quality (Profitability/Investment)	Low Volatility	Value	Momentum
Factor Valuation	-	-	-	-	-
Factor Momentum	+	+	+	+	+
Sentiment ("propensity to speculate")	-	+	+	-	n/a
Measures of Risk (Corporate credit spreads, TED spread)	+/-	+/-	+/-	+/-	+/-
Measures of Economic outlook (TERM spread, Change in Capacity Ratio, Inflation, ISM PMI)	+	-	-	+/-	+/-

The Empirical Evidence

Factor Data

- History: July 1963 – July 2015
- Factor Portfolios: Fama-French long-only portfolios

- Size: low 30%
- Value: high 30%
- Profitability: high 30%
- Investment: low 30%
- Momentum: top 3 deciles
- Market: all NYSE, AMEX, and NASDAQ securities

Factor	Fama-French Definitions
Size	Market equity
Value	Book to Market ratio
Profitability	ROE
Investment	YoY growth rate of total assets
momentum	Prior 2-12 return
Market	All NYSE, AMEX, and NASDAQ securities

- All portfolios are Cap-weighted, and annually reconstituted (except that Momentum is reconstituted monthly).
- Annual one-way turnover of 30% (monthly of 10% for Momentum) is assumed in order to take out the transaction cost before compounding to long-horizon returns.

Candidate Predictors

RHS Variables , Definition, Data Sources, Availability

Financial Conditions	Definition	sources	From	Till
corporate credit spread	Yield Spread between Moody's BAA and AAA Corporate Bond	Bloomberg	196001	201507
TED spread 1	3-month InterBank Rate - 3-month T-Bill rate	Datastream	197201	201507
TED spread 2	3-month InterBank Rate - 3-month T-Bill rate	FactSet	198601	201507
Term spread	Treasury Yield 20-year - 3-month T-Bill rate	Datastream	197201	201507
M base	YoY growth of monetary base adjusted after inflation	Datastream	196001	201507
M1	YoY growth of money supply M1 adjusted after inflation	Datastream	196001	201507
M2	YoY growth of money supply M2 adjusted after inflation	Datastream	196001	201507
DJIA	YoY growth of Dow Jones Industrial Average Index	Datastream	196001	201507
bank loan	YoY growth of commercial bank assets - loans and leases in bank credit	Datastream	196001	201507
Economic Conditions	Definition	sources	From	Till
gdp	YoY growth of US gdp (constant price)	Datastream	196002	201507
personal consumption	YoY growth of personal consumption (constant price)	Datastream	196002	201507
private fixed inv	YoY growth of domestic private fixed investment (constant price)	Datastream	196002	201507
Current Account	YoY growth of current account adjusted after inflation	Datastream	196102	201507
Unit output	YoY growth of output per hour (nonfarm business) adjusted after inflation	Datastream	196002	201507
Corporate profit	YoY growth of corporate profits adjusted after inflation	Datastream	196002	201507
bankruptcy	YoY growth of bankruptcy filings	Datastream	198111	201507
capacity ratio	YoY growth of capacity utilization rate all industry	Datastream	196801	201507
tot treasury out	YoY growth of total treasury securities outstanding adjusted after inflation	Datastream	196001	201507
tot cons credit	YoY growth of consumer credit outstanding adjusted after inflation	Datastream	196001	201507
savings rate	personal savings as % of disposable personal income	Datastream	195901	201507
Consumer Conf Index	YoY growth of consumer confidence index	Datastream	196802	201507
personal income	YoY growth of personal income adjusted after inflation	Datastream	196001	201507
CPI	CPI- ALL URBAN SAMPLE: ALL ITEMS - ANNUAL INFLATION RATE			
	NADJ	Datastream	195901	201507
PPI	US PPI - FINISHED GOODS SADJ	Datastream	196001	201507
Change in CPI	YoY change of CPI	Datastream	196001	201507
change in PPI	YoY change of PPI	Datastream	196101	201507
unemployment rate	unemployment rate	Datastream	195901	201507
Unemploy initial claims 4-wk avg	YoY growth of smoothed 4-week average of unemployment initial claims	Datastream	196801	201507

Source: SSGA

Candidate Predictors

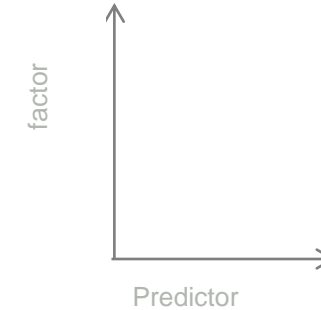
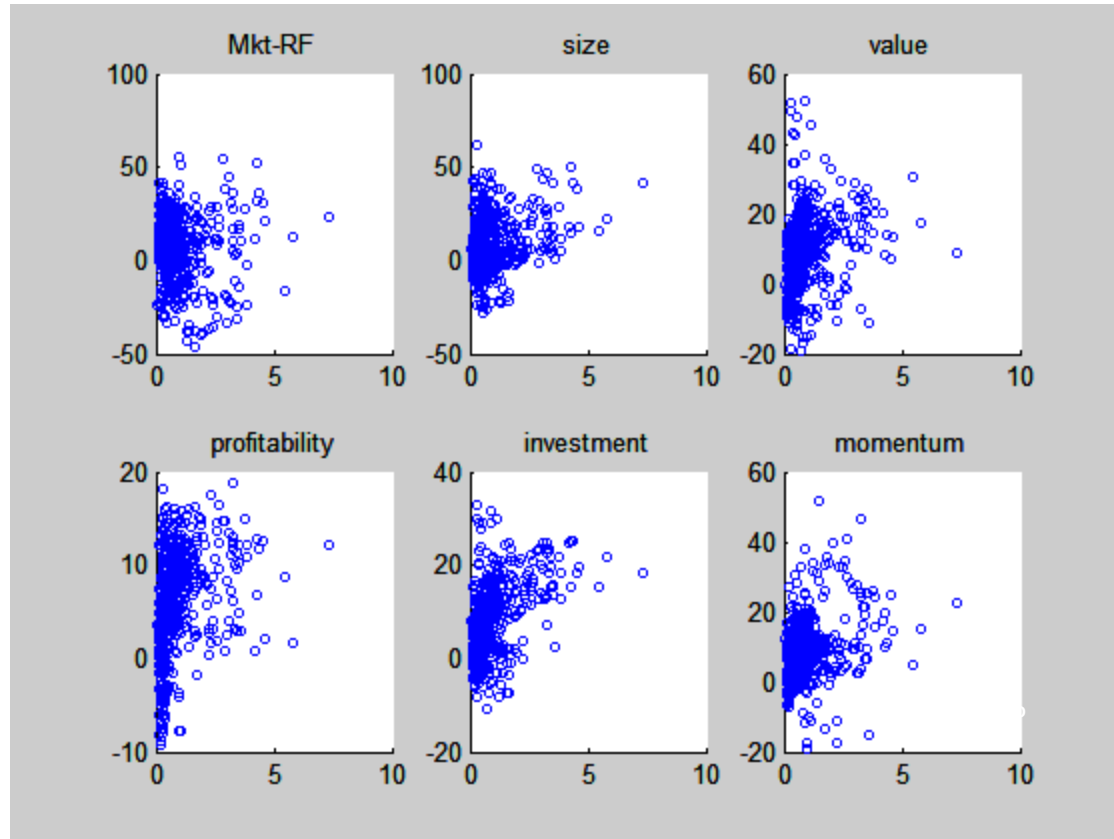
RHS Variables , Definition, Data Sources, Availability

Housing Market	Definition	sources	From	Till
sales of new homes	YoY growth of sales of new one family houses adjusted after inflation	Datastream	196901	201507
sales of existing homes	YoY growth of existing home sales: single-family and condo adjusted after inflation	Datastream	198601	201507
home builder	YoY growth of national association of home builders index adjusted after inflation	Datastream	196001	201507
Unit housing started	YoY growth of new private housing units started	Datastream		
Sentiment	Definition	sources	From	Till
VIX average	monthly average of high and low VIX	FactSet	199001	201507
SENT^	linear combination of first principal component of six sentiment proxies, where each has first been orthogonalized with respect to a set of macroeconomic conditions	Baker and Wurgler	196507	201012
SENT	linear combination of first principal component of six sentiment proxies	Baker and Wurgler	196507	201012
DSENT^	change of SENT^	Baker and Wurgler	196508	201012
DSENT	change of SENT	Baker and Wurgler	196508	201012
Leading indicator	YoY growth of US the conference board leading economic indicators index	Datastream	196001	201507
ISM PMI	YoY growth of ISM purchasing manager index	Datastream	196001	201507
Shiller's Indicators	Definition	sources	From	Till
CAPE	Cyclically adjusted price to earnings ratio (P/E10)	Shiller	195901	201507
Div Yield	real dividend / real price	Shiller	195901	201506
Earn yield	real earnings/ real price	Shiller	195901	201412
Factor Momentum	Definition	sources	From	Till
Past 1-month performance	excess factor returns in the past 1 month	French's data library	196308	201507
Past 3-month performance	excess factor returns in the past 3 months	French's data library	196310	201507
Past 6-month performance	excess factor returns in the past 6 months	French's data library	196401	201507
Past 1-year performance	excess factor returns in the past 1 year	French's data library	196407	201507
Past 2-year performance	excess factor returns in the past 2 years	French's data library	196507	201507
Past 3-year performance	excess factor returns in the past 3 years	French's data library	196607	201507
Past 5-year performance	excess factor returns in the past 5 years	French's data library	196807	201507

Source: SSGA

TED Spread

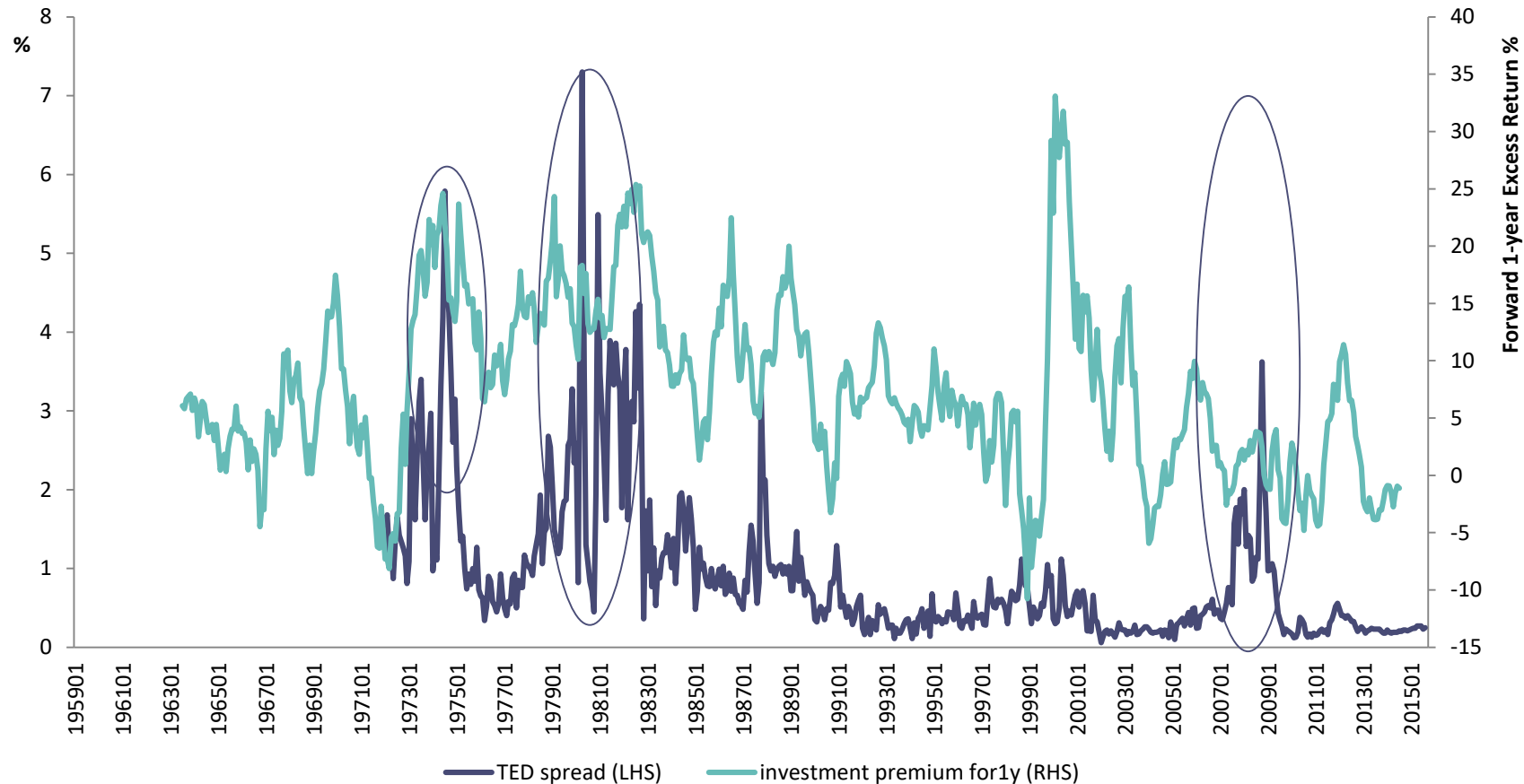
TED Spread vs Forward 1-Year Factor Premia (July 1963 – July 2015)



Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

TED Spread

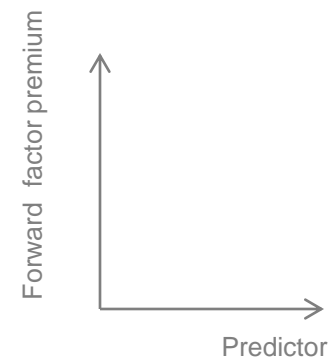
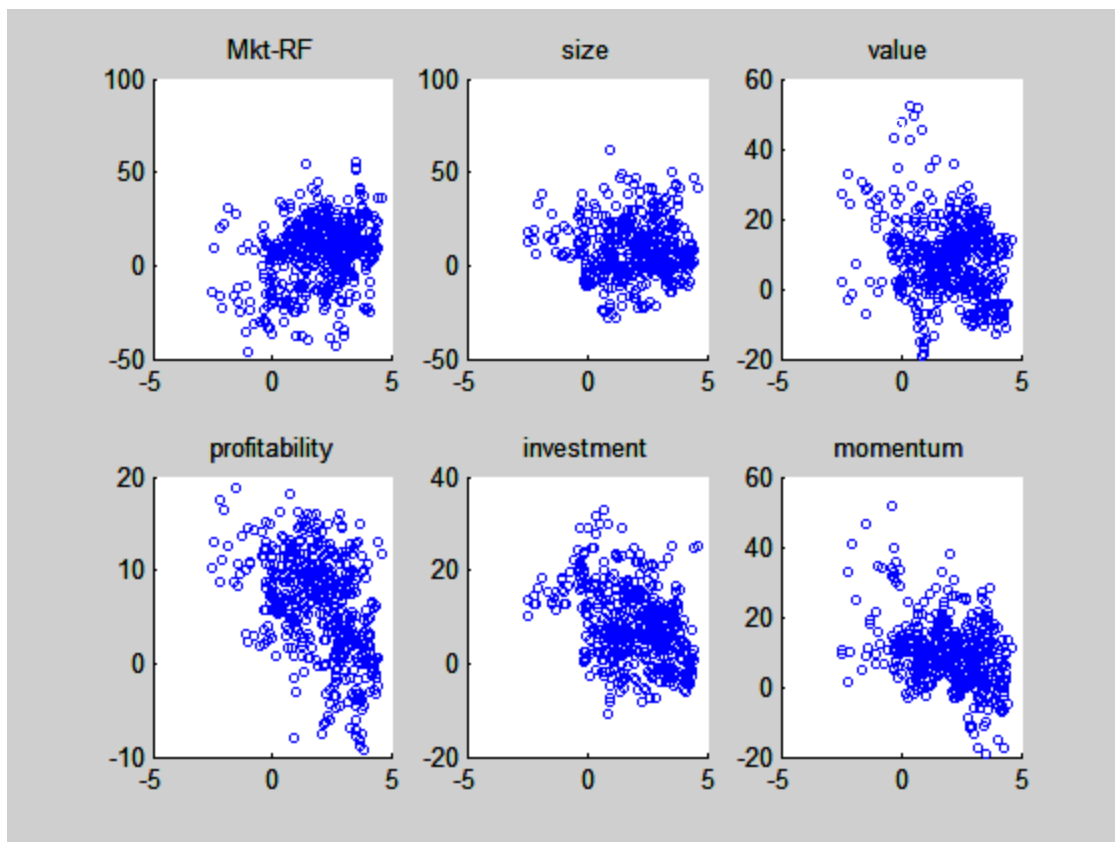
TED Spread vs 1 Year Forward Investment Factor



Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

TERM Spread

TERM Spread vs. Forward 1- Year Factor Premia (July 1963 – July 2015)

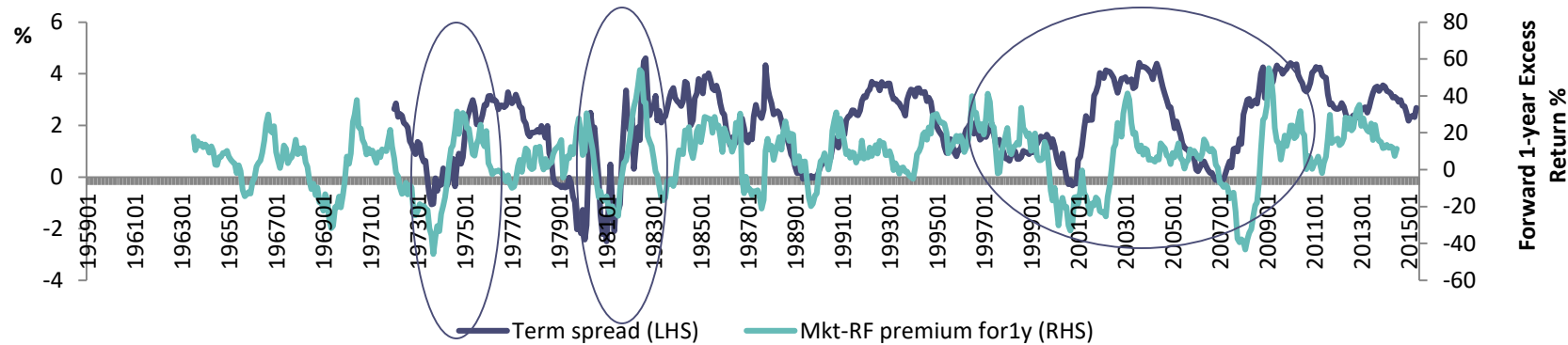


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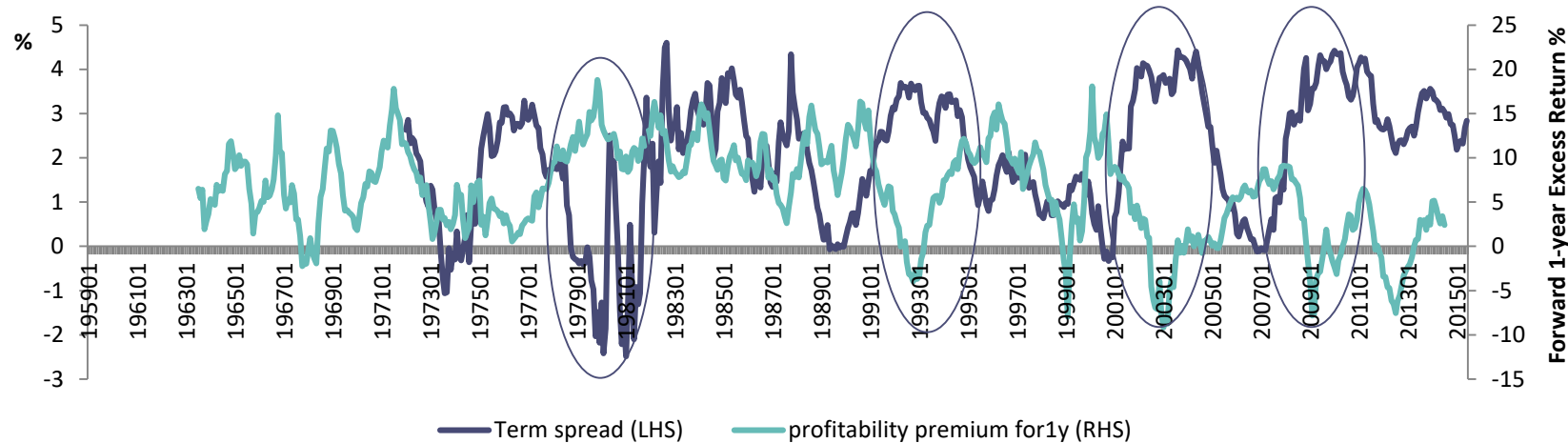
TERM Spread

TERM Spread vs. Forward 1- Year Factor Premia (July 1963 – July 2015)

Market Premium and TERM Spread



Profitability Premium and TERM Spread

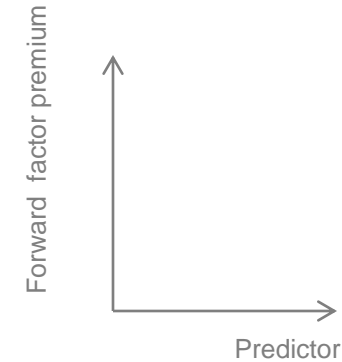
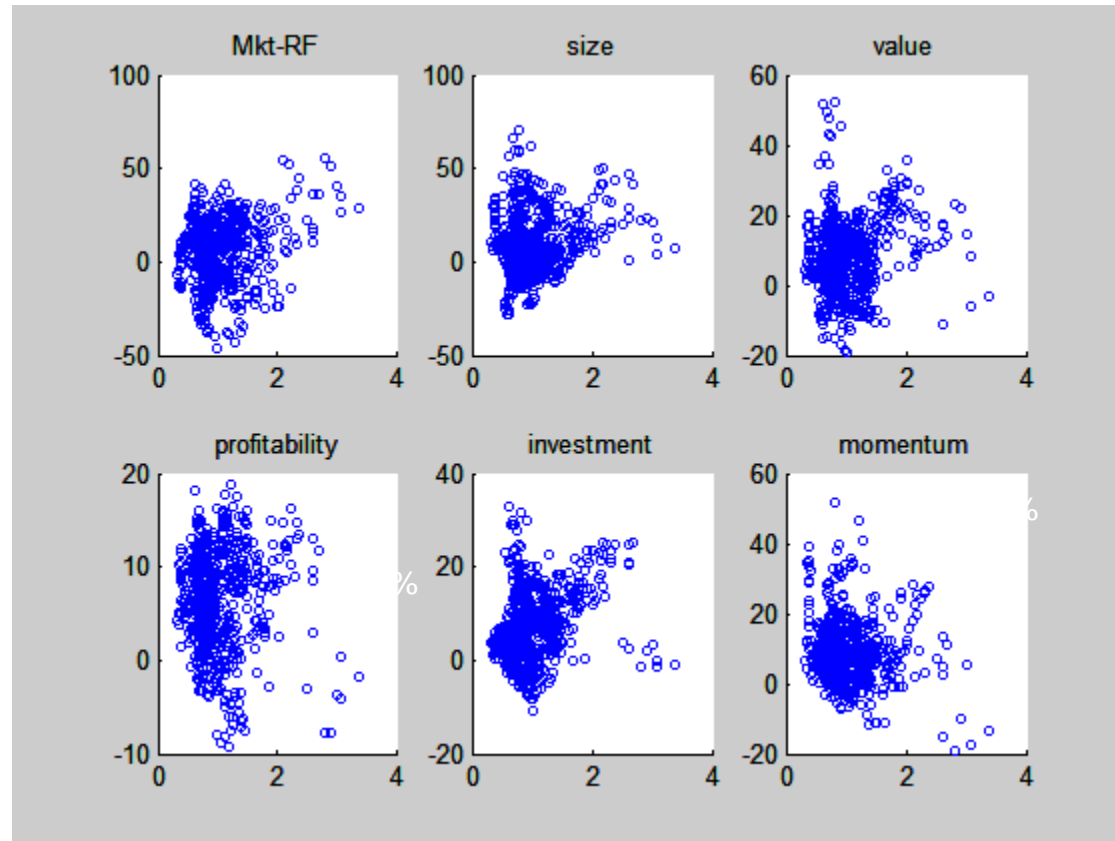


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Corporate Credit Spread

Corporate Credit Spread vs Forward 1-Year Factor Premia (July 1963 – July 2015)

Corporate Credit Spread vs Forward 1-Year Factor Premium

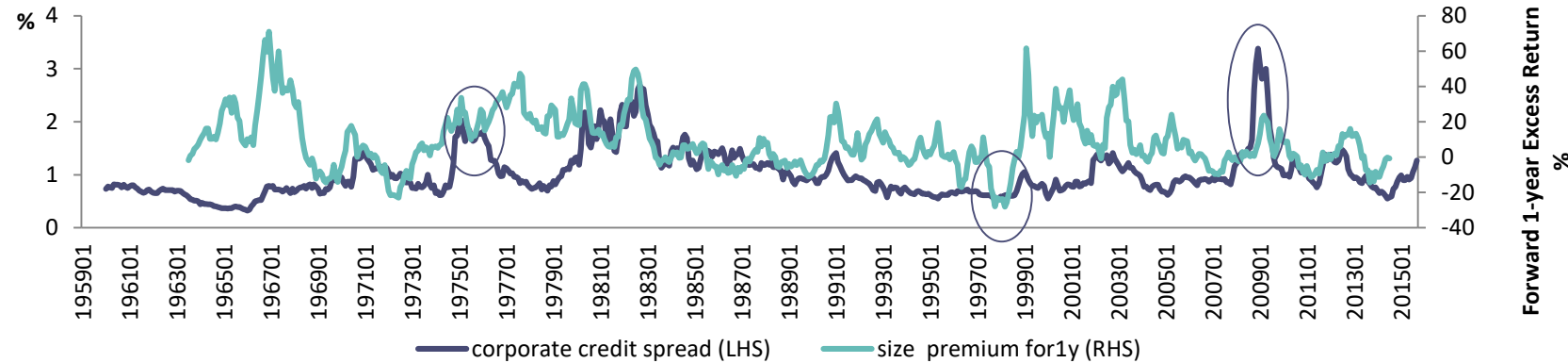


Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

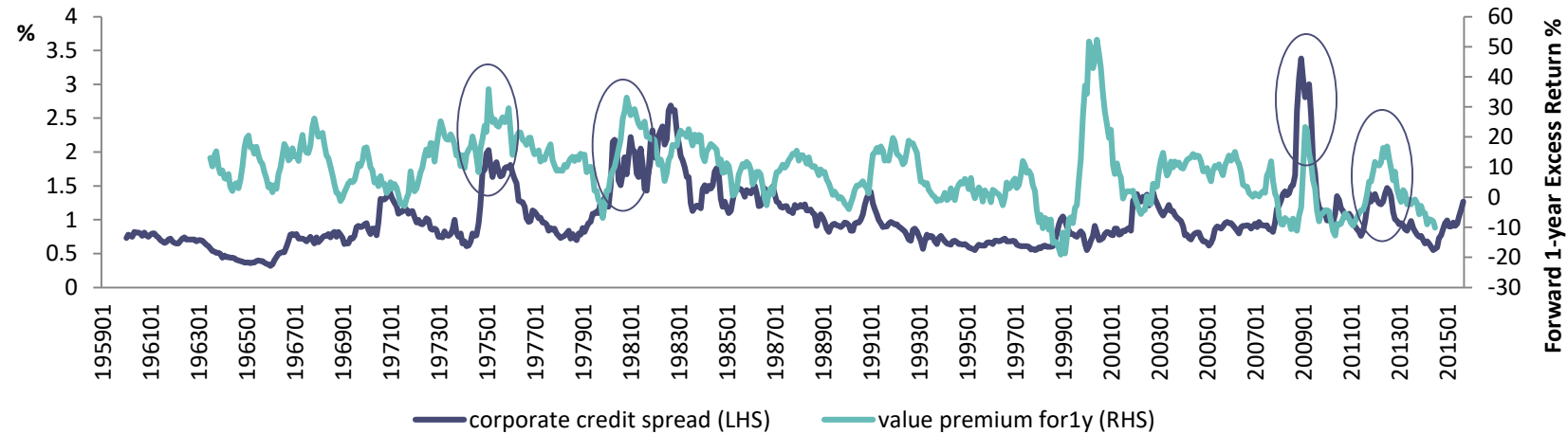
Corporate Credit Spread

Corporate Credit Spread vs Forward 1-Year Factor Premia (July 1963 – July 2015)

Size Premium and Corporate Credit Spread



Value Premium and Corporate Credit Spread



Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Market returns use the Fama-French market portfolio minus the risk-free rate and assume no transaction costs or rebalancing costs. Performance of the factor and market portfolios is not indicative of the performance of any product managed by SSGA.

Corporate Credit Spread (Yield Spread between BAA and AAA Corporate Bond)

Financial Predictors vs. Forward Factor Performance

		Corporate credit spread (Yield Spread between Moody's BAA and AAA Corporate Bond)	TED spread (3-month InterBank Rate - 3-month T-Bill rate)	TED spread 2	Term spread (Treasury Yield 20-year - 3-month T-Bill rate)	YoY growth of monetary base adjusted after inflation	YoY growth of money supply M1 adjusted after inflation	YoY growth of money supply M2 adjusted after inflation	YoY growth of commercial bank assets - Loans and leases in bank credit
Forward 1 Month return	size	7%	6%	-10%	2%	-4%	-6%	-2%	-5%
	value	0%	14%	-8%	-12%	-13%	-9%	-5%	3%
	profitability	4%	11%	25%	-19%	-12%	-18%	-5%	6%
	investment	9%	20%	1%	-18%	-13%	-12%	-12%	-4%
	momentum	-6%	9%	3%	-13%	-17%	-14%	-9%	1%
Forward 3 Month return	size	12%	11%	-7%	1%	-6%	-11%	-5%	-9%
	value	4%	16%	-8%	-21%	-15%	-12%	-5%	6%
	profitability	3%	18%	31%	-28%	-21%	-27%	-10%	9%
	investment	14%	30%	6%	-28%	-20%	-17%	-18%	-4%
	momentum	-9%	19%	5%	-21%	-27%	-24%	-14%	4%
Forward 6 Month return	size	15%	17%	-7%	0%	-7%	-15%	-7%	-11%
	value	8%	21%	4%	-24%	-15%	-13%	-5%	6%
	profitability	3%	27%	34%	-37%	-29%	-36%	-14%	13%
	investment	19%	35%	14%	-36%	-24%	-21%	-22%	-4%
	momentum	-14%	24%	0%	-28%	-32%	-29%	-15%	6%
Forward 1 Year return	size	15%	27%	-7%	-2%	-9%	-19%	-8%	-12%
	value	16%	28%	9%	-20%	-21%	-16%	-8%	1%
	profitability	0%	32%	37%	-46%	-33%	-44%	-21%	17%
	investment	25%	47%	24%	-37%	-28%	-27%	-31%	-6%
	momentum	-16%	30%	0%	-37%	-28%	-31%	-15%	9%

Darker green: strong positive correlation

Darker red: strong negative correlation

Source: SSGA, Kenneth French. As of 8/31/2017. Analysis over period data is available – see Slides 22 and 23

Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Economic Predictors vs. Forward Factor Performance

		GDP growth	Personal Consumption growth	Private Domestic Fixed investment growth	Current account growth	Unit output growth	Corporate profit growth	Change in Bankruptcy filings	Change in capacity ratio	Change in treasury securities	Change in Consumer Credit	Personal Savings Rate	Change in Confidence Index	Change in personal income	CPI	PPI	Change in CPI	Change in PPI	Unemployment rate
Forward 1 Month return	size	-6%	-5%	-6%	-1%	-5%	2%	4%	-10%	-5%	-6%	7%	-4%	-6%	7%	6%	-1%	0%	3%
	value	6%	7%	4%	-3%	-6%	3%	4%	-3%	-5%	-2%	14%	9%	8%	13%	10%	-2%	-3%	0%
	profitability	3%	2%	0%	2%	-15%	-13%	6%	-1%	-10%	6%	10%	-6%	6%	15%	9%	4%	1%	-7%
	investment	-5%	-4%	-7%	-2%	-19%	-11%	0%	-10%	-7%	-5%	12%	-3%	-4%	21%	16%	2%	0%	4%
	momentum	5%	5%	3%	4%	-14%	-5%	-7%	1%	-15%	0%	10%	1%	2%	16%	12%	9%	8%	-7%
Forward 3 Month return	size	-9%	-9%	-11%	-5%	-10%	-2%	6%	-18%	-10%	-11%	12%	-13%	-13%	13%	11%	0%	0%	3%
	value	10%	9%	6%	-6%	-8%	5%	5%	0%	-7%	-4%	23%	10%	12%	18%	14%	-6%	-9%	0%
	profitability	6%	5%	0%	3%	-23%	-18%	5%	-2%	-15%	9%	15%	-8%	9%	24%	15%	7%	4%	-11%
	investment	-6%	-6%	-9%	-7%	-28%	-15%	3%	-15%	-12%	-8%	19%	-6%	-5%	32%	24%	4%	-1%	6%
	momentum	8%	7%	7%	0%	-22%	-7%	-12%	1%	-23%	1%	17%	-2%	3%	25%	19%	12%	12%	-10%
Forward 6 Month return	size	-13%	-12%	-14%	-7%	-17%	-7%	10%	-23%	-14%	-15%	16%	-24%	-18%	20%	16%	4%	2%	4%
	value	10%	8%	6%	-5%	-11%	3%	6%	-2%	-7%	-9%	28%	8%	13%	23%	18%	-9%	-12%	0%
	profitability	11%	11%	2%	-1%	-29%	-20%	1%	-1%	-19%	14%	20%	-6%	13%	31%	19%	6%	3%	-14%
	investment	-7%	-8%	-10%	-6%	-37%	-21%	4%	-19%	-16%	-10%	25%	-14%	-7%	42%	32%	6%	2%	8%
	momentum	12%	9%	10%	-6%	-29%	-8%	-17%	2%	-28%	3%	23%	-5%	3%	32%	22%	16%	13%	-12%
Forward 1 Year return	size	-10%	-10%	-14%	3%	-21%	-11%	8%	-25%	-22%	-17%	23%	-23%	-16%	26%	21%	6%	-1%	2%
	value	9%	11%	3%	2%	-22%	-1%	-2%	-2%	-11%	-16%	36%	8%	11%	34%	28%	-8%	-10%	3%
	profitability	17%	16%	8%	-2%	-34%	-17%	-9%	1%	-20%	19%	22%	-3%	16%	35%	19%	7%	5%	-14%
	investment	-7%	-7%	-10%	2%	-50%	-24%	2%	-16%	-22%	-10%	30%	-15%	-10%	55%	43%	12%	7%	11%
	momentum	22%	15%	19%	1%	-32%	-2%	-27%	5%	-29%	8%	32%	0%	10%	38%	21%	12%	2%	-13%
Forward 2 Year return	size	5%	2%	-2%	1%	-20%	-7%	3%	-20%	-30%	-12%	29%	-16%	-6%	29%	26%	4%	-7%	-5%
	value	3%	5%	-1%	2%	-40%	-10%	-19%	-8%	-23%	-22%	48%	-4%	-3%	53%	46%	4%	2%	8%
	profitability	24%	20%	19%	-4%	-37%	-8%	-20%	5%	-16%	23%	24%	8%	15%	37%	17%	9%	11%	-8%
	investment	2%	0%	1%	-4%	-59%	-21%	-15%	-4%	-23%	-6%	35%	-6%	-8%	64%	49%	13%	8%	13%
	momentum	37%	24%	34%	-5%	-32%	8%	-21%	11%	-26%	15%	42%	8%	22%	42%	24%	10%	-2%	-12%
Forward 3 Year return	size	8%	7%	2%	4%	-24%	-8%	-9%	-20%	-36%	-10%	32%	-14%	-4%	35%	37%	8%	3%	-3%
	value	5%	8%	1%	1%	-46%	-15%	-29%	-11%	-28%	-20%	60%	-5%	-4%	62%	52%	4%	5%	12%
	profitability	21%	17%	23%	-4%	-40%	-7%	-23%	7%	-7%	23%	26%	17%	15%	34%	10%	-1%	-1%	4%
	investment	7%	4%	8%	-3%	-58%	-18%	-23%	1%	-17%	-6%	44%	3%	-4%	67%	50%	7%	6%	23%
	momentum	30%	21%	32%	0%	-37%	7%	-28%	11%	-23%	14%	43%	9%	14%	45%	30%	13%	5%	-1%
Forward 5 Year return	size	5%	0%	6%	3%	-29%	-6%	-9%	-15%	-37%	-7%	35%	-7%	-5%	40%	44%	11%	1%	3%
	value	4%	0%	8%	-3%	-57%	-15%	-13%	-7%	-33%	-15%	67%	-8%	-3%	70%	57%	8%	3%	22%
	profitability	10%	3%	18%	-2%	-47%	2%	-30%	14%	8%	3%	30%	19%	1%	42%	18%	-8%	-10%	39%
	investment	0%	-5%	8%	-2%	-65%	-16%	-13%	-4%	-11%	-11%	51%	0%	-10%	71%	53%	1%	-4%	42%
	momentum	16%	9%	23%	3%	-44%	11%	-33%	8%	-10%	4%	51%	15%	5%	49%	37%	1%	-7%	27%

Darker green: strong positive correlation. Darker red: strong negative correlation

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Housing/Sentiment/Valuation vs. Forward Factor Performance

		Housing Market				Sentiment							Shiller Valuation		
		Sales of new homes	Sales of existing homes	Home builder	Unit housing started	VIX average	SENT^	SENT	DSENT^	DSENT	Leading indicator	ISM PMI	CAPE	Div Yield	Earn yield
Forward 1 Month return	size	6%	-1%	1%	3%	-3%	-9%	-10%	4%	6%	-7%	-3%	-4%	9%	8%
	value	4%	1%	4%	1%	-18%	2%	0%	6%	-4%	1%	4%	-8%	11%	11%
	profitability	-8%	-11%	-20%	-5%	5%	13%	13%	-4%	-1%	-6%	-5%	-8%	15%	13%
	investment	-1%	-5%	0%	-3%	-4%	7%	3%	6%	-2%	-11%	-5%	-14%	18%	18%
	momentum	0%	-8%	2%	-1%	-17%	-4%	-5%	5%	5%	1%	-6%	-6%	13%	17%
Forward 3 Month return	size	3%	-6%	-3%	2%	5%	-14%	-17%	2%	4%	-14%	-11%	-7%	16%	14%
	value	6%	1%	4%	2%	-19%	1%	-2%	8%	-1%	1%	5%	-13%	18%	16%
	profitability	-12%	-17%	-31%	-9%	-1%	20%	19%	-7%	-3%	-6%	-8%	-13%	24%	23%
	investment	-4%	-9%	0%	-5%	-8%	10%	4%	5%	3%	-17%	-9%	-20%	28%	28%
	momentum	-3%	-14%	3%	-4%	-24%	-6%	-6%	1%	5%	2%	-11%	-10%	23%	29%
Forward 6 Month return	size	-2%	-10%	-7%	-2%	15%	-21%	-23%	0%	0%	-19%	-18%	-12%	24%	20%
	value	5%	-1%	-3%	2%	-10%	0%	-5%	6%	0%	1%	5%	-17%	24%	20%
	profitability	-16%	-20%	-38%	-10%	-12%	26%	24%	-7%	-7%	-5%	-9%	-17%	32%	33%
	investment	-5%	-13%	-4%	-6%	-5%	13%	6%	6%	6%	-21%	-14%	-27%	37%	37%
	momentum	-8%	-16%	1%	-7%	-32%	-10%	-9%	0%	-3%	3%	-16%	-15%	31%	39%
Forward 1 Year return	size	-8%	-19%	0%	-9%	25%	-26%	-29%	6%	7%	-21%	-21%	-13%	30%	26%
	value	7%	-3%	-4%	4%	-10%	-4%	-10%	7%	7%	1%	8%	-22%	33%	29%
	profitability	-17%	-23%	-44%	-12%	-21%	26%	25%	-4%	-3%	-1%	-10%	-22%	41%	43%
	investment	-8%	-21%	-10%	-9%	0%	14%	6%	5%	6%	-21%	-16%	-34%	49%	51%
	momentum	-9%	-16%	0%	-9%	-30%	-15%	-13%	3%	-2%	6%	-15%	-22%	42%	49%
Forward 2 Year return	size	-18%	-16%	-6%	-17%	38%	-44%	-46%	5%	9%	-16%	-13%	-11%	30%	28%
	value	-5%	-14%	-6%	-3%	-10%	-18%	-26%	8%	10%	-7%	0%	-32%	48%	46%
	profitability	-4%	-17%	-33%	1%	-38%	24%	24%	1%	-1%	10%	-6%	-32%	52%	53%
	investment	-19%	-28%	-16%	-14%	-8%	6%	0%	3%	2%	-16%	-11%	-42%	60%	64%
	momentum	-2%	-2%	-2%	-2%	-29%	-31%	-30%	2%	3%	15%	-3%	-33%	53%	55%
Forward 3 Year return	size	-12%	-14%	-8%	-13%	36%	-52%	-57%	6%	10%	-11%	-10%	-10%	29%	32%
	value	-1%	-11%	7%	2%	-3%	-20%	-29%	7%	7%	-5%	-2%	-42%	59%	59%
	profitability	1%	-11%	-11%	6%	-47%	23%	23%	-1%	-1%	13%	-9%	-41%	59%	57%
	investment	-9%	-17%	8%	0%	-11%	-3%	-9%	3%	3%	-7%	-7%	-49%	67%	72%
	momentum	6%	3%	7%	5%	-33%	-39%	-39%	4%	4%	16%	-6%	-40%	57%	60%
Forward 5 Year return	size	-10%	-7%	-2%	-10%	46%	-56%	-61%	5%	6%	-13%	-7%	-13%	27%	36%
	value	-4%	-15%	17%	2%	14%	-14%	-23%	4%	4%	-10%	-5%	-51%	68%	70%
	profitability	4%	-13%	14%	12%	-56%	6%	7%	4%	5%	16%	-3%	-57%	69%	68%
	investment	-4%	-15%	27%	1%	-7%	-11%	-18%	4%	5%	-11%	-9%	-61%	78%	82%
	momentum	7%	3%	17%	8%	-37%	-46%	-47%	4%	4%	11%	-3%	-54%	63%	66%

Darker green: strong positive correlation. Darker red: strong negative correlation

Source: SSGA, Kenneth French. As of 8/31/2017. Analysis over period data is available – see Slides 22 and 23. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Past Factor Returns (1M, 3M, 6M, 12M) vs. Forward Factor Performance

		1 month					3 months					6 months					12 months				
		size	value	profitability	investment	momentum	size	value	profitability	investment	momentum	size	value	profitability	investment	momentum	size	value	profitability	investment	momentum
Forward 1 Month return	size	10%	3%	-2%	-2%	2%	4%	2%	1%	0%	4%	7%	6%	0%	7%	1%	12%	10%	-1%	9%	5%
	value	2%	13%	2%	7%	-2%	8%	14%	1%	11%	3%	8%	13%	5%	11%	5%	16%	17%	6%	10%	3%
	profitability	8%	3%	19%	6%	4%	10%	10%	16%	11%	2%	5%	13%	17%	13%	6%	4%	9%	19%	15%	11%
	investment	5%	7%	6%	13%	2%	10%	16%	1%	19%	8%	10%	12%	12%	19%	13%	15%	19%	12%	19%	13%
	momentum	8%	1%	6%	0%	6%	12%	5%	4%	4%	6%	11%	7%	8%	1%	10%	8%	11%	9%	4%	7%
Forward 3 Month return	size	4%	1%	0%	-1%	3%	1%	4%	2%	4%	1%	8%	6%	0%	10%	1%	14%	12%	-1%	12%	7%
	value	9%	14%	1%	10%	3%	11%	18%	4%	14%	5%	10%	15%	9%	14%	6%	24%	20%	10%	13%	5%
	profitability	9%	9%	16%	10%	1%	10%	14%	15%	14%	6%	2%	20%	21%	19%	10%	5%	14%	25%	21%	18%
	investment	11%	15%	1%	18%	8%	11%	17%	10%	20%	14%	13%	17%	20%	25%	19%	20%	26%	18%	26%	20%
	momentum	12%	5%	4%	4%	5%	16%	12%	8%	7%	10%	12%	15%	13%	3%	12%	9%	20%	15%	8%	9%
Forward 6 Month return	size	6%	4%	-1%	5%	0%	8%	5%	0%	10%	1%	12%	10%	-2%	18%	4%	20%	14%	-1%	17%	12%
	value	8%	12%	5%	10%	4%	9%	15%	9%	14%	5%	11%	14%	14%	14%	5%	28%	16%	13%	12%	9%
	profitability	3%	12%	16%	12%	5%	0%	19%	21%	18%	10%	-2%	20%	29%	24%	15%	5%	16%	33%	25%	24%
	investment	11%	12%	11%	18%	11%	12%	17%	19%	25%	19%	16%	20%	27%	30%	23%	21%	27%	24%	30%	27%
	momentum	10%	9%	7%	2%	9%	12%	16%	12%	3%	12%	10%	20%	17%	5%	13%	10%	27%	17%	13%	10%
Forward 1 Year return	size	11%	7%	-2%	7%	3%	14%	10%	0%	13%	6%	19%	13%	0%	19%	12%	24%	18%	-1%	17%	19%
	value	15%	13%	5%	8%	2%	21%	16%	9%	11%	4%	26%	14%	13%	12%	8%	34%	12%	12%	14%	16%
	profitability	2%	7%	19%	14%	9%	3%	12%	25%	20%	16%	4%	14%	32%	24%	22%	8%	15%	35%	28%	30%
	investment	13%	15%	13%	17%	11%	16%	22%	20%	26%	19%	18%	24%	25%	30%	27%	21%	29%	23%	31%	32%
	momentum	8%	11%	10%	5%	8%	9%	19%	16%	10%	10%	10%	25%	19%	14%	10%	15%	33%	21%	22%	10%
Forward 2 Year return	size	9%	7%	0%	5%	5%	12%	10%	1%	10%	9%	19%	13%	-1%	14%	16%	26%	18%	-2%	16%	26%
	value	11%	6%	6%	8%	7%	16%	6%	10%	12%	14%	20%	4%	13%	15%	20%	23%	8%	14%	21%	31%
	profitability	1%	6%	16%	12%	10%	1%	8%	22%	19%	17%	2%	11%	28%	27%	24%	6%	15%	33%	33%	32%
	investment	9%	12%	13%	16%	14%	11%	16%	20%	23%	23%	14%	19%	26%	27%	31%	16%	27%	27%	30%	38%
	momentum	9%	13%	11%	8%	5%	12%	19%	16%	14%	7%	17%	24%	20%	19%	12%	25%	29%	23%	27%	23%
Forward 3 Year return	size	10%	8%	0%	9%	11%	15%	13%	1%	16%	19%	19%	17%	0%	21%	25%	24%	24%	-3%	25%	33%
	value	7%	9%	7%	13%	13%	10%	13%	12%	20%	21%	16%	17%	15%	27%	30%	20%	24%	17%	35%	39%
	profitability	0%	6%	12%	13%	8%	-1%	9%	18%	20%	14%	0%	12%	23%	27%	20%	5%	19%	26%	35%	29%
	investment	8%	14%	13%	17%	17%	11%	21%	21%	26%	27%	15%	27%	26%	33%	35%	18%	35%	28%	39%	42%
	momentum	9%	11%	7%	10%	11%	13%	16%	11%	17%	17%	15%	20%	15%	22%	22%	19%	28%	16%	32%	28%
Forward 5 Year return	size	5%	7%	0%	11%	6%	6%	10%	1%	18%	11%	9%	15%	0%	23%	15%	10%	20%	-1%	25%	19%
	value	7%	9%	10%	15%	12%	9%	12%	17%	24%	21%	13%	15%	24%	31%	29%	18%	21%	29%	38%	40%
	profitability	3%	7%	7%	13%	9%	4%	11%	11%	22%	16%	8%	15%	15%	30%	24%	16%	22%	19%	38%	32%
	investment	5%	10%	12%	17%	14%	6%	15%	20%	27%	23%	9%	19%	28%	36%	32%	11%	29%	32%	43%	39%
	momentum	7%	11%	3%	14%	6%	9%	17%	5%	23%	10%	13%	24%	7%	31%	15%	16%	32%	7%	38%	18%

Darker green: strong positive correlation. Darker red: strong negative correlation

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Past Factor Returns (3 Yr, 4 Yr, 5 Yr) vs. Forward Factor Performance

	3 years						4 years					5 years						
	size	value	profitability	investment	momentum		size	value	profitability	investment	momentum		size	value	profitability	investment	momentum	
Forward 1 Month return	size	11%	9%	-2%	6%	6%	11%	8%	-1%	7%	11%		4%	4%	1%	5%	7%	
	value	14%	10%	7%	9%	10%	10%	10%	6%	8%	13%		8%	9%	6%	8%	12%	
	profitability	5%	10%	17%	16%	17%	5%	12%	15%	16%	16%		15%	21%	14%	19%	22%	
	investment	12%	15%	11%	15%	17%	12%	17%	11%	14%	19%		12%	16%	14%	16%	21%	
	momentum	11%	14%	9%	8%	7%	12%	13%	7%	10%	13%		13%	17%	7%	13%	12%	
Forward 3 Month return	size	14%	12%	-3%	9%	9%	16%	11%	-2%	10%	17%		3%	5%	-1%	7%	9%	
	value	20%	11%	10%	11%	17%	14%	14%	9%	12%	21%		12%	11%	8%	11%	18%	
	profitability	7%	15%	23%	23%	24%	8%	19%	20%	24%	24%		22%	31%	20%	29%	34%	
	investment	16%	21%	16%	21%	26%	17%	25%	16%	20%	29%		16%	23%	20%	23%	32%	
	momentum	15%	24%	15%	14%	10%	20%	22%	12%	17%	22%		17%	28%	11%	22%	18%	
Forward 6 Month return	size	19%	15%	-5%	12%	16%	21%	16%	-5%	14%	25%		3%	6%	-2%	9%	12%	
	value	21%	9%	12%	12%	22%	18%	16%	10%	15%	29%		13%	12%	11%	14%	23%	
	profitability	8%	19%	30%	32%	33%	10%	24%	25%	31%	32%		30%	40%	25%	38%	44%	
	investment	18%	24%	20%	24%	32%	22%	31%	20%	25%	37%		18%	28%	25%	28%	39%	
	momentum	19%	30%	18%	19%	16%	23%	29%	16%	23%	29%		19%	36%	11%	28%	22%	
Forward 1 Year return	size	25%	19%	-4%	14%	27%	24%	19%	-6%	16%	32%		1%	7%	-2%	10%	14%	
	value	21%	9%	12%	16%	32%	20%	18%	11%	20%	37%		15%	14%	15%	19%	32%	
	profitability	12%	20%	35%	37%	40%	15%	31%	28%	39%	41%		38%	49%	30%	47%	54%	
	investment	17%	28%	22%	26%	39%	23%	35%	22%	31%	45%		19%	34%	27%	33%	46%	
	momentum	27%	34%	24%	28%	28%	26%	34%	20%	34%	36%		23%	42%	12%	35%	25%	
Forward 2 Year return	size	27%	23%	-6%	19%	36%	20%	21%	-8%	19%	30%		0%	6%	-7%	7%	12%	
	value	17%	18%	14%	29%	47%	17%	23%	18%	31%	46%		22%	21%	22%	29%	41%	
	profitability	11%	25%	31%	42%	41%	22%	41%	28%	48%	48%		39%	55%	32%	56%	58%	
	investment	19%	35%	27%	34%	49%	24%	39%	33%	42%	55%		24%	42%	32%	41%	50%	
	momentum	30%	33%	22%	38%	40%	32%	44%	18%	48%	39%		21%	45%	8%	41%	25%	
Forward 3 Year return	size	21%	27%	-5%	26%	34%	13%	24%	-5%	25%	28%		-7%	4%	-9%	4%	5%	
	value	17%	28%	24%	41%	50%	18%	32%	26%	43%	51%		26%	28%	20%	35%	42%	
	profitability	16%	33%	27%	45%	41%	29%	49%	25%	54%	51%		42%	60%	30%	58%	60%	
	investment	20%	39%	36%	46%	53%	22%	46%	40%	54%	60%		25%	49%	34%	50%	52%	
	momentum	27%	40%	16%	47%	35%	28%	49%	10%	53%	34%		13%	47%	4%	40%	22%	
Forward 5 Year return	size	5%	18%	-6%	21%	19%	-5%	10%	-9%	11%	8%		-22%	-7%	-15%	-11%	-13%	
	value	19%	26%	33%	44%	49%	21%	29%	28%	44%	49%		27%	31%	11%	31%	41%	
	profitability	26%	37%	21%	52%	45%	33%	53%	22%	60%	54%		37%	60%	23%	62%	56%	
	investment	14%	37%	34%	51%	46%	18%	45%	34%	56%	50%		23%	48%	20%	47%	45%	
	momentum	18%	40%	2%	47%	22%	14%	48%	1%	47%	20%		-4%	36%	-1%	26%	7%	

Source: SSGA, Kenneth French. As of 8/31/2017. Analysis over period data is available – see Slides 22 and 23. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Darker green: strong positive correlation. Darker red: strong negative correlation

Empirical Observations

Highlights

- Correlations between TERM Spread and Profitability are negative as expected across all horizons (and they become increasingly negative as we extend the horizon)
- Both TED Spread and TERM Spread are reasonably strong predictors for horizons greater than 6 months, particularly for Value, Profitability, Investment, and Momentum.
- Four Economic signals – Unit Output growth, Personal Savings rate, CPI, and PPI have reasonably strong correlations with Value and Investment factors at horizons of one year and higher.
- The VIX and Sentiment metrics have strong predictive relationships at 1 year horizons and up but the impact is not uniform across all factors.
- Valuation metrics have strong relationship with future factor performance, particularly at longer horizons.
- Past factor performance is a significant predictor for some factors as early as 3 months out (strongest for Size, Value, Profitability, and Investment), but at 1 year+ horizons, the impact is strongest across all factors, though at 3 and 5 year horizons, some evidence of mean reversion starts to appear.

Linear vs. Regime-Type Indicators

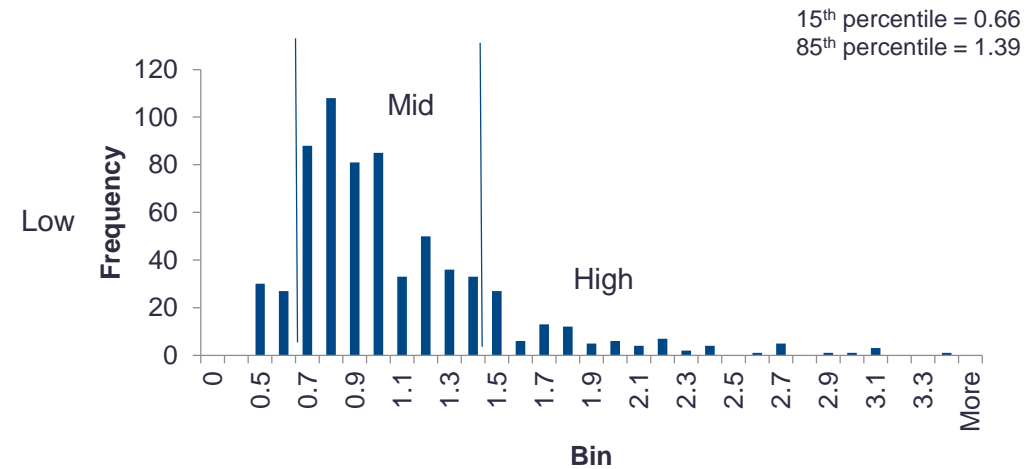
Categorize candidate predictors into three states

= Low, if the predictor value is less than the 15th percentile

States of Predictors = Mid, if the predictor value is in between of the 15th percentile and 85th percentile

= High, if the predictor value is greater than the 85th percentile

Histogram of Corporate Credit Spread and Low, Mid, High States as of 2015/07



Average Returns Using Three States

	Mkt-RF	Size	Value	Profitability	Investment	Momentum
Corporate credit spread						
Low	11.3	1.8	4.2	8.1	4.6	11.3
Middle	4.8	8.3	8.0	5.6	7.4	9.3
High	8.1	13.2	12.7	7.5	9.9	8.6
TED spread						
Low	8.5	5.4	4.9	4.2	5.2	6.7
Middle	8.1	7.9	8.4	7.7	9.1	10.1
High	2.4	17.3	11.3	10.2	13.2	14.2
Term spread						
Low	-2.0	13.9	14.1	10.7	13.4	18.1
Middle	7.7	5.5	6.4	7.3	7.8	8.6
High	11.9	9.3	6.3	2.9	5.6	6.5
M2						
Low	7.3	14.8	10.6	7.2	11.7	13.8
Middle	6.5	8.0	8.1	6.3	7.2	8.6
High	2.9	3.3	8.1	4.6	4.0	6.4
Unit output						
Low	3.6	16.7	12.5	8.4	13.2	14.7
Middle	6.3	7.0	8.7	6.4	7.1	8.5
High	9.2	6.4	1.5	1.5	2.6	5.8

- Green: highest factor return
- Red: lowest factor return

Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

High Minus Low Returns

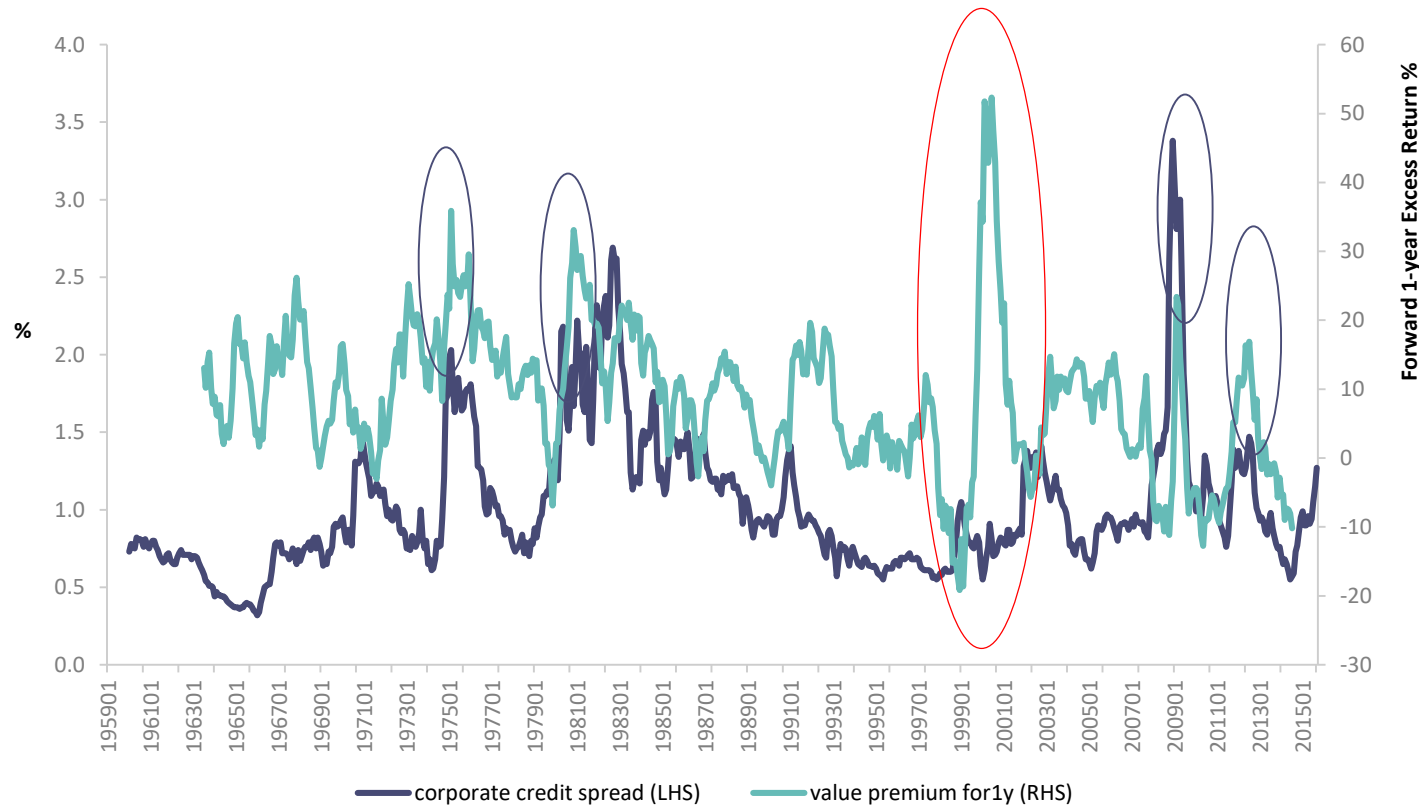
	Mkt-RF	Size	Value	Profitability	Investment	Momentum
Corporate credit spread	-3.2	11.4	8.6	-0.6	5.3	-2.7
TED spread	-6.2	11.9	6.5	5.9	8.0	7.6
TERM Spread	13.9	-4.6	-7.8	-7.8	-7.7	-11.6
M2	-4.4	-11.5	-2.5	-2.5	-7.7	-7.5
Unit Output	5.6	-10.3	-11.0	-6.9	-10.6	-8.9
Capacity Ratio	-7.2	-15.3	-2.6	0.8	-6.6	-2.1
CPI	-10.6	15.7	13.8	5.9	10.6	11.1
SENT^	-9.2	-4.8	-3.6	7.6	1.5	2.6
ISM PMI	-14.4	-14.9	2.6	-3.7	-5.3	-5.9
Div Yield	6.8	17.4	6.7	3.2	9.0	9.2
Momentum (past return)	-3.1	6.1	5.8	5.2	7.4	6.6

- Green cells = Differences are statistically different from zero

Perils and Pitfalls

Pitfall #1: Time-Varying Relationships

US Corporate Credit Spread and the Fama-French Value Long Factor Portfolio (July 1963 to July 2015)



Source: SSGA, Datastream. Kenneth French. The information contained above is for illustrative purposes only. Hypothetical returns are based upon estimates and reflect subjective judgments and assumptions. These results were achieved by means of a mathematical formula and do not reflect the effect of unforeseen economic and market factors on decision-making. The hypothetical returns are not necessarily indicative of future performance, which could differ substantially.

Pitfall #1: Time-Varying Relationships

**Beta of Fama-French Long Value Portfolio Factor to Market (Rolling 3-year windows)
(July 1963 to July 2015)**



Source: SSGA, Datastream. Kenneth French. The information contained above is for illustrative purposes only.

Hypothetical returns are based upon estimates and reflect subjective judgments and assumptions. These results were achieved by means of a mathematical formula and do not reflect the effect of unforeseen economic and market factors on decision-making. The hypothetical returns are not necessarily indicative of future performance, which could differ substantially.

Pitfall #2: Seeking Indicators Based on Hindsight

An Example

	Mkt-RF	Size	Value	Profitability	Investment	Momentum
3-Month Horizon						
Number of predictors statistically significant in 1972 – 1989	5	18	3	2	10	9
Number of predictors are confirmed statistically significant in the same direction in 1990 - 2010	0	1	0	2	0	1
6-Month Horizon						
Number of predictors statistically significant in 1972 – 1989	1	17	3	3	6	14
Number of predictors are confirmed statistically significant in the same direction in 1990 - 2010	0	1	0	2	0	0
12-Month Horizon						
Number of predictors statistically significant in 1972 - 1989	3	14	5	4	14	13
Number of predictors are confirmed statistically significant in the same direction in 1990 - 2010	1	1	0	2	1	1

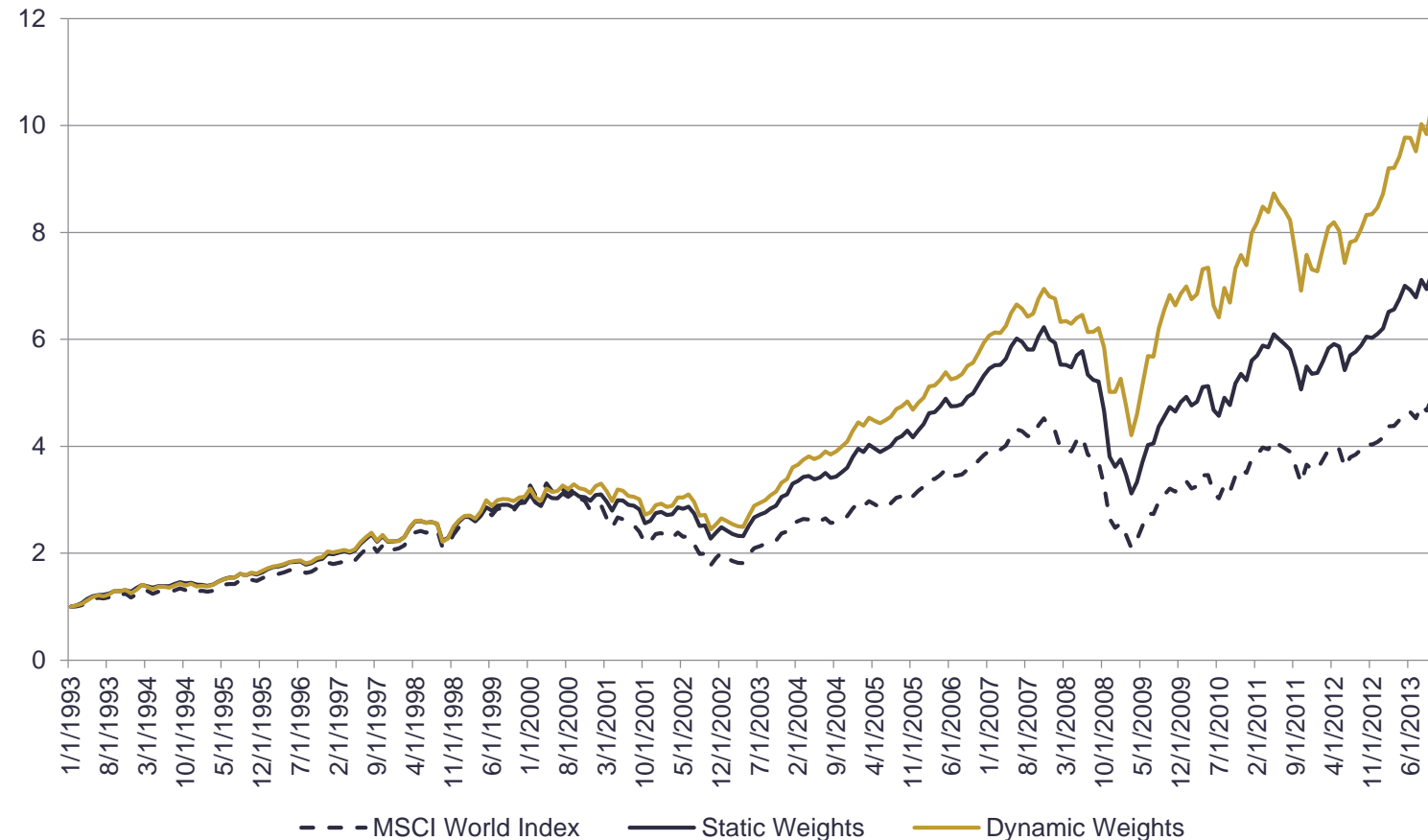
Overcoming the Challenges: Building a Factor Timing Model

Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Dates for the two portfolios illustrated on slides 45 and 46 do not match given that they were produced as two independent research projects. The two projects were conducted by the Investment Solutions Group and Active Quantitative Group respectively.

Illustration #1: A Linear Timing Strategy with Factor Valuation

Cumulative Portfolio Returns (January 1993 to May 2014, USD Gross Returns)



Static Portfolio:

- Annualized Excess Returns = 1.78%
- Tracking Error = 3.42%
- IR = 0.52

Dynamic Portfolio:

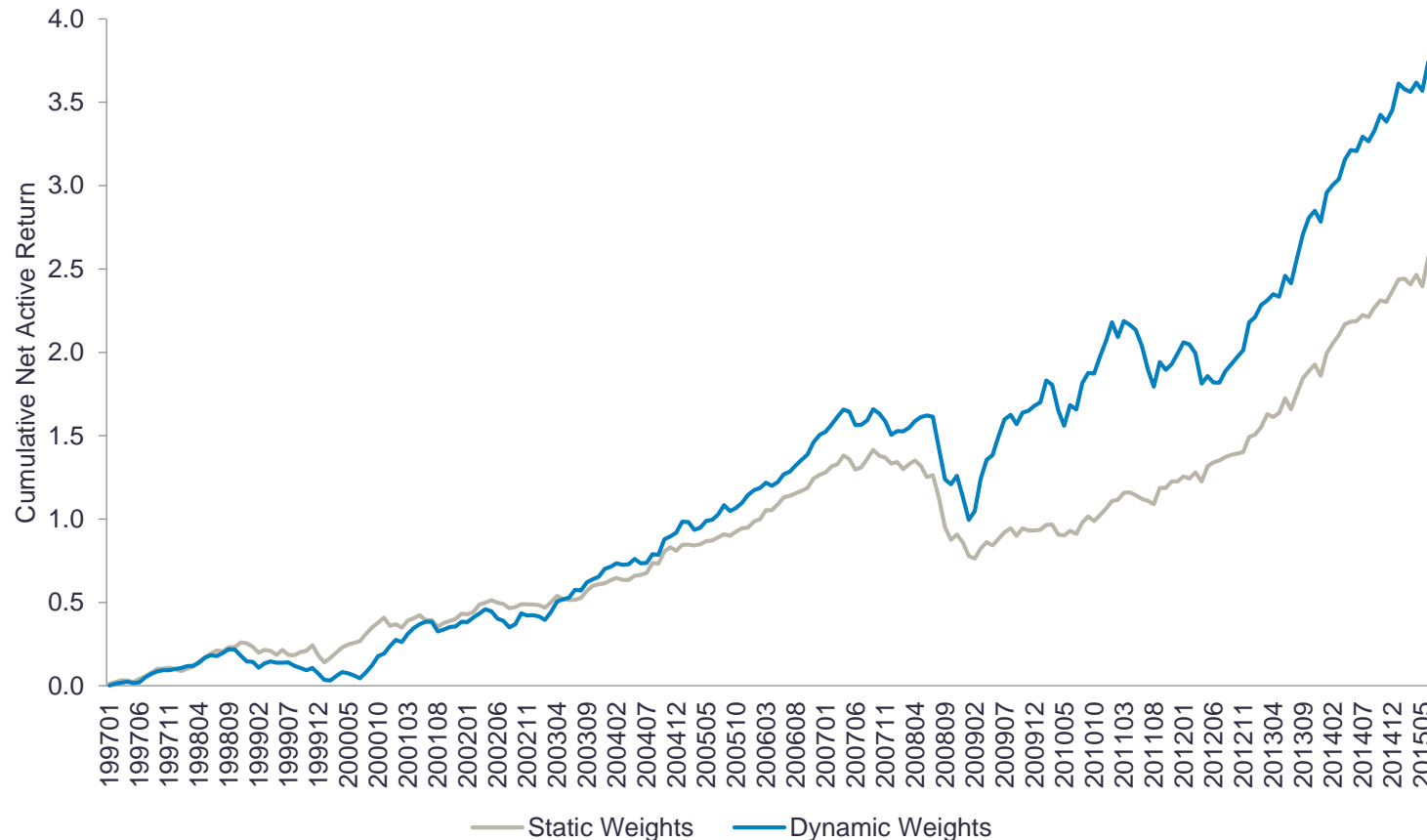
- Annualized Excess Returns = 2.60%
- Tracking Error = 4.10%
- IR = 0.63

Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Dates for the two portfolios illustrated on slides 46 and 47 do not match given that they were produced as two independent research projects. The two projects were conducted by the Investment Solutions Group and Active Quantitative Group respectively.

Illustration #2: A Timing Strategy with Multiple Predictors Embedding Sentiment and Macroeconomic Variables

Cumulative Portfolio Returns (January 1997 to September 2015, USD Gross Returns)



Static Portfolio:

- Annualized Excess Returns = 3.45%
- Tracking Error = 3.93%
- IR = 0.88

Dynamic Portfolio:

- Annualized Excess Returns = 4.53%
- Tracking Error = 3.88%
- IR = 1.17

Source: SSGA, Kenneth French. As of 8/31/2017. Factor returns represent the returns of components of a universe comprised of publicly listed US companies as defined by Eugene Fama and Kenneth French. The portfolios used are those of the Fama-French long-only portfolios. The performance assumes no transaction and rebalancing costs, so actual results will differ. Past performance is not a guarantee of future results. Performance of the factor portfolios is not indicative of the performance of any product managed by SSGA.

Dates for the two portfolios illustrated on slides 46 and 47 do not match given that they were produced as two independent research projects. The two projects were conducted by the Investment Solutions Group and Active Quantitative Group respectively.

Appendix

Disclosures

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