

Investment and Profitability – Quality Factor that Actually Works

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Quality—What Is it Exactly?

- » An insurance:
 - as in flight to “quality”?
- » A risk premium:
 - as in quality stocks are risky?
- » An overlooked attribute:
 - as people undervalue quality stocks?



A Detailed Examination of Quality



Quality Definitions in Product Offerings

Index Provider	Measures Defining Quality	Corresponding Broader Quality Category
MSCI	<ul style="list-style-type: none"> • Return on Equity • Debt to Equity • EPS Growth 	<ul style="list-style-type: none"> • Profitability • Capital Structure • Growth
S&P	<ul style="list-style-type: none"> • EPS Growth • DPS Growth • EPS Stability • DPS Stability 	<ul style="list-style-type: none"> • Growth • Growth • Earnings Stability • Earnings Stability
FTSE	<ul style="list-style-type: none"> • Return on Assets • Change in Asset Turnover • Debt to Cash Flows • Accruals 	<ul style="list-style-type: none"> • Profitability • Growth • Capital Structure • Accounting Quality
Deutsche Bank	<ul style="list-style-type: none"> • Return on Invested Capital • Accruals 	<ul style="list-style-type: none"> • Profitability • Accounting Quality
EDHEC	<ul style="list-style-type: none"> • Gross Profitability • Growth in Total Assets 	<ul style="list-style-type: none"> • Profitability • Growth
AQR	<ul style="list-style-type: none"> • Multiple Variables 	<ul style="list-style-type: none"> • Profitability • Growth • Safety • Payout



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Multiple Quality Definitions

Profitability0.05

Operating Profitability

Gross Profitability

Return on Equity

Return on Assets

Return on Invested Capital

Cash Flow Profitability

Gross Margins

Growth in Profitability

LT Change in Gross Profitability

LT Change in Cash Flow Profitability

LT Change in Return on Equity

LT Change in Return on Assets

LT Change in Gross Margins

ST Change in Asset Turnover

YoY Change in DPS

YoY Change in EPS

Payout/Dilution

Equity Issuance

Debt Issuance

Total Payout

Net Payout

Earnings Stability

Stability of EPS

Stability of DPS

Stability of Gross Profitability

Stability of Cash Flow Profitability

Stability of Gross Margins

Accounting Quality

Accruals

Accruals2

Net Operating Assets

ST Change in Accruals

Investment

Low Asset Growth

Low Book Growth

Low Capital ex Growth

Low Fixed Assets Growth

Capital Structure

Total Leverage

Debt-to-Equity

Financial Leverage



Issues with Multi-Signal Definitions

» Possible Alternatives

- Different definitions of quality proxy to a common “attribute/factor”
- Quality is a multi-factor portfolio of heterogeneous “attributes/factors”



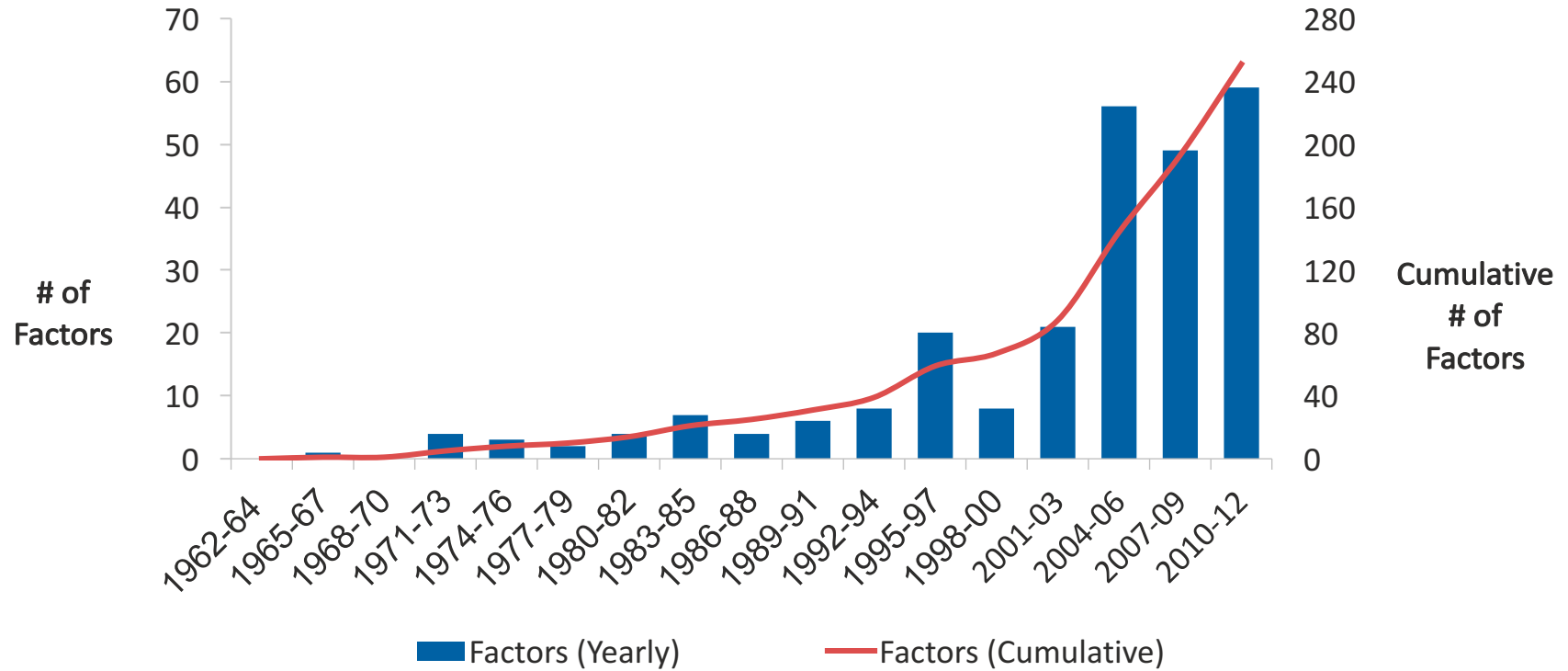
Correlation of Quality Categories

	Profitability	Earnings Stability	Capital Structure	Growth in Profitability	Accounting Quality	Payout/Dilution	Investment
Profitability	0.70	0.16	0.02	0.22	0.16	0.22	-0.19
Earnings Stability	0.16	0.16	0.10	0.07	0.00	0.10	-0.03
Capital Structure	0.02	0.10	0.63	0.06	0.06	-0.05	-0.08
Growth in Profitability	0.22	0.07	0.06	0.31	0.09	0.02	-0.10
Accounting Quality	0.16	0.00	0.06	0.09	0.08	0.16	0.07
Payout/Dilution	0.22	0.10	-0.05	0.02	0.16	0.42	0.31
Investment	-0.19	-0.03	-0.08	-0.10	0.07	0.31	0.36

» Quality is heterogeneous!

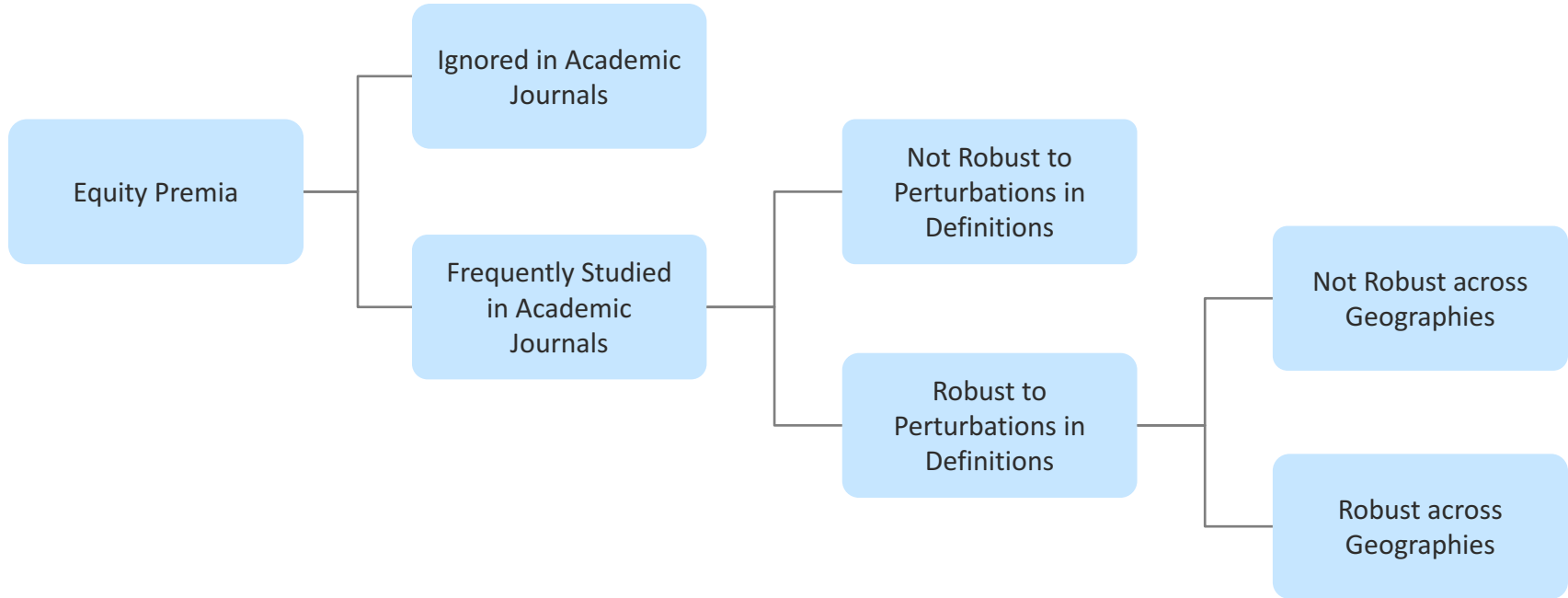


Factor Proliferation



Source: "... and the Cross-Section of Expected Returns" by Harvey, Liu, and Zhu (2013).

A Framework for Assessing Factor Robustness



Growth in Earnings (1/2)

- » We were unable to identify published papers exploring the relationship between return and past earnings growth.
- » Working paper by Akbas, Jiang, and Koch (2015) found that the gross profitability trend derived from quarterly data forecasts return



Growth in Earnings (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	38%	50%	63%	50%
Europe	38%	38%	50%	42%
Asia Pacific ex Japan	13%	13%	13%	13%
Japan	0%	0%	0%	0%
Global Developed	25%	38%	38%	33%
Average of Significance	23%	28%	33%	28%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Earnings Stability (1/2)

- » No research exploring the relationship between earnings stability with subsequent returns*
- » Hsu, Kudo, and Yamada (2014) find that low volatility effect may be related to earnings growth volatility



* Note: Dichev and Tang (2009) find earnings growth volatility contains information on both short-term and long-term earnings growth. Donelson and Resutek (2015) find that earnings uncertainty is correlated with overly optimistic expectation on earnings growth. Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Earnings Stability (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	0%	40%	60%	33%
Europe	20%	40%	20%	27%
Asia Pacific ex Japan	20%	0%	0%	7%
Japan	20%	20%	40%	27%
Global Developed	20%	40%	20%	27%
Average of Significance	16%	28%	28%	24%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Capital Structure (1/2)

- » Theoretical Arguments
 - High leverage can increase risk of default (–)
 - High leverage can increase profitability of equity (+)
- » Bhandari (1988) and Fama and French (1992) document a strong and positive relation between leverage (as computed using market prices for the corporate bonds) and returns.
- » Fama and French (1992), Penman, Richardson, and Tuna (2007), George and Hwang (2010), and Gomes and Schmid (2010) show that controlling for market leverage, book leverage is negatively related to stock returns.



Capital Structure (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	0%	33%	0%	11%
Europe	0%	33%	33%	22%
Asia Pacific ex Japan	0%	0%	0%	0%
Japan	0%	0%	0%	0%
Global Developed	0%	33%	33%	22%
Average of Significance	0%	20%	13%	11%



Accounting Quality (1/2)

- » Theoretical argument: Accruals are used by management to manipulate up earnings.
 - WorldCom
 - Enron
 - Toshiba (2015)
- » Sloan (1996), Hirshleifer, Hou, Hong, and Zhang (2004), Dechow and Ge (2006), and Chan, Chan, Jegedeesh, and Lakonishok (2006) document that firms with various accounting indicators associated with high accruals tend to have low subsequent returns.



Accounting Quality (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	100%	75%	100%	92%
Europe	50%	50%	50%	50%
Asia Pacific ex Japan	0%	50%	50%	33%
Japan	0%	0%	25%	8%
Global Developed	100%	75%	100%	92%
Average of Significance	50%	50%	65%	55%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Dilution (1/2)

» Theoretical Arguments

- **Asymmetric information** – company managers have a better observation of company value and issue stocks when company is overpriced and buy when company is underpriced
- **Investment risk related**
- **Governance related** – issuance related to stock options is used to compensate management and is not processed by investors who focus on the headline earnings reports

» Boudoukh, Michaely, Richardson, and Roberts (2005), Loughran and Ritter (1995), Spiess and Affleck-Graves (1999), and Fama and French (2008) among others document abnormal low returns associated with dilution.



Dilution (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	75%	100%	100%	92%
Europe	75%	75%	100%	83%
Asia Pacific ex Japan	50%	50%	50%	50%
Japan	0%	0%	0%	0%
Global Developed	50%	75%	100%	75%
Average of Significance	50%	60%	70%	60%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Profitability (1/2)

» Theoretical Arguments

- **Risk-Based** – high profitability in equilibrium should proxy for high risk and high costs of capital
 - **Mispricing** – market participant do not fully price in persistence in profitability
- » Fama and French (2006, 2008, 2014, and 2016), Novy-Marx (2013), Hou, Xue, and Zhang (2014), and Ball, Gerakos, Linnainmaa, and Nikolaev (2015) found a positive premium associated with the profitability characteristic.



Profitability (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	43%	100%	86%	76%
Europe	86%	86%	100%	90%
Asia Pacific ex Japan	0%	29%	29%	19%
Japan	0%	29%	29%	19%
Global Developed	100%	100%	100%	100%
Average of Significance	46%	69%	69%	61%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Investment (1/2)

» Theoretical Arguments

- **Risk-Based** – low investment in equilibrium should proxy for high risk and high costs of capital
 - **Mispricing** – high investment is associated with glamour stocks
- » Fama and French (2008 and 2016), Titman, Wei, and Xie (2004), and Gulen and Schill (2008) show that high investment firms underperform low investment firms.



Investment (2/2)

	Average Return	4-Factor Alpha	Sharpe Ratio	Average
United States	100%	75%	100%	92%
Europe	75%	0%	75%	50%
Asia Pacific ex Japan	0%	50%	75%	42%
Japan	0%	0%	0%	0%
Global Developed	75%	25%	100%	67%
Average of Significance	50%	30%	70%	50%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Summary of Robustness of Quality Categories (1/2)

Ratio of Significant Long–Short Spreads: Sector Neutral Factors

	Average Return	Alpha	Sharpe Ratio
United States, 1963-2016			
Profitability	43%	100%	86%
Earnings Stability	0%	40%	60%
Capital Structure	0%	33%	0%
Growth in Profitability	38%	50%	63%
Accounting Quality	100%	75%	100%
Payout/Dilution	75%	100%	100%
Investment	100%	75%	100%

Europe, 1990-2016			
Profitability	86%	86%	100%
Earnings Stability	20%	40%	20%
Capital Structure	0%	33%	33%
Growth in Profitability	38%	38%	50%
Accounting Quality	50%	50%	50%
Payout/Dilution	75%	75%	100%
Investment	75%	0%	75%

	Average Return	Alpha	Sharpe Ratio
Global Developed, 1990-2016			
Profitability	100%	100%	100%
Earnings Stability	20%	40%	20%
Capital Structure	0%	33%	33%
Growth in Profitability	25%	38%	38%
Accounting Quality	100%	75%	100%
Payout/Dilution	50%	75%	100%
Investment	75%	25%	100%

Japan, 1990-2016			
Profitability	0%	29%	29%
Earnings Stability	20%	20%	40%
Capital Structure	0%	0%	0%
Growth in Profitability	0%	0%	0%
Accounting Quality	0%	0%	25%
Payout/Dilution	0%	0%	0%
Investment	0%	0%	0%



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Summary of Robustness of Quality Categories (2/2)

Ratio of Significant Long–Short Spreads: Sector Neutral Factors

	Average Return	Alpha	Sharpe Ratio
Asia Pacific ex Japan, 1990-2016			
Profitability	0%	29%	29%
Earnings Stability	20%	0%	0%
Capital Structure	0%	0%	0%
Growth in Profitability	13%	13%	13%
Accounting Quality	0%	50%	50%
Payout/Dilution	50%	50%	50%
Investment	0%	50%	75%

	Average Return	Alpha	Sharpe Ratio	
Average of Significance Over Markets				Average
Profitability	46%	69%	69%	61%
Earnings Stability	16%	28%	28%	24%
Capital Structure	0%	20%	13%	11%
Growth in Profitability	23%	28%	33%	28%
Accounting Quality	50%	50%	65%	55%
Payout/Dilution	50%	60%	70%	60%
Investment	50%	30%	70%	50%

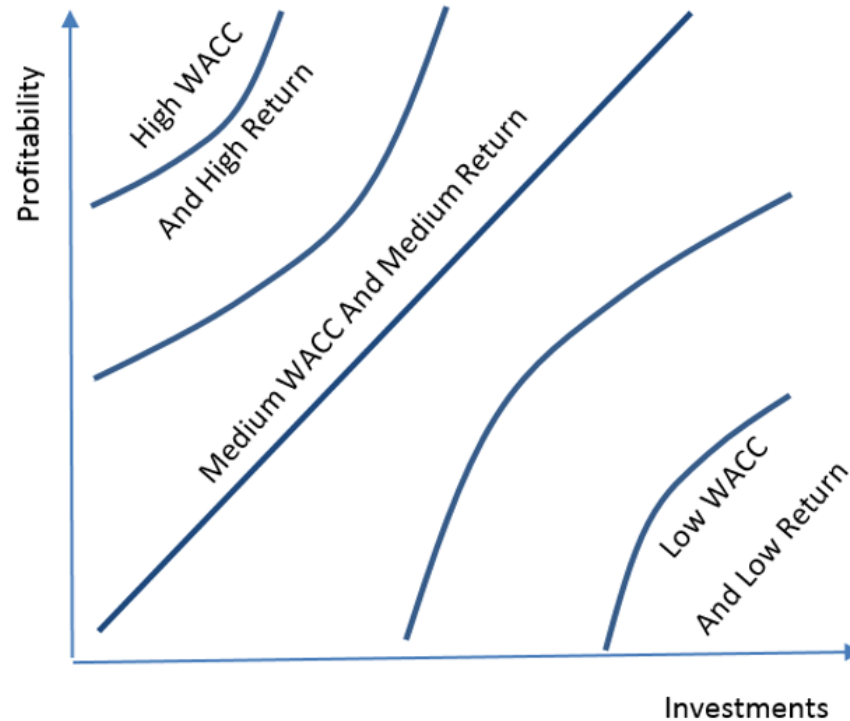


Source: “Survey of Quality Investing,” Hsu, Kalesnik, and Kose (2017).

Profitability and Investment Deep Dive



Risk Explanation for Investment and Profitability



Source: "Survey of Quality Investing," Hsu, Kalesnik, and Kose (2017).

Investment and Profitability Examples

	Portfolio	Company	Investment	Return on Equity	Earnings Yield	Subsequent 5-Year Total Return	Subsequent 10-Year Total Return
July 1999	Benchmark		31.1%	14.1%	3.1%	-7.8%	-14.8%
	High Investment / Low Profitability	Compaq	57.5%	-24.2%	-6.8%	-	-
		MCI Worldcomm	285.9%	-5.7%	-1.6%	-	-
		Yahoo	338.3%	4.8%	0.1%	-15.5%	-63.6%
	Low Investment / High Profitability	Coca-Cola	6.1%	94.2%	4.4%	14.7%	20.8%
		Exxon	-3.6%	14.7%	3.4%	29.6%	124.8%
	Kelloggs	3.6%	56.5%	3.8%	48.8%	87.5%	
July 2007	Benchmark		18.4%	16.5%	5.5%	4.7%	-
	High Investment / Low Profitability	Wachovia	35.8%	11.1%	7.9%	-	-
		Merrill Lynch	23.5%	20.9%	10.1%	-	-
		Lehman Brothers	22.8%	21.9%	9.9%	-	-
	Low Investment / High Profitability	Coca-Cola	1.8%	30.0%	4.2%	72.8%	-
		Exxon	5.1%	34.7%	8.4%	14.2%	-
	Kelloggs	1.3%	48.5%	4.9%	10.4%	-	
July 2016	Benchmark		9.4%	11.9%	5.0%	-	-
	High Investment / Low Profitability	Tesla	38.4%	-78.6%	-2.8%	-	-
		Facebook	23.0%	8.3%	1.4%	-	-
		Netflix	44.6%	5.5%	0.3%	-	-
	Low Investment / High Profitability	Coca-Cola	-2.1%	28.8%	3.8%	-	-
		Exxon	-3.6%	9.5%	4.2%	-	-
	Kelloggs	70.0%	28.9%	2.1%	-	-	



Source: "Sustainable Earnings Growth at Reasonable Prices," Brightman, Clements, and Kalesnik (2017).

Earnings Growth at Reasonable Prices

Portfolio Strategy	Total Excess Return	Return From Dividends	Growth in Valuations	Real Growth in Earnings
Value Large	1.55%	1.09%	0.22%	0.23%
Growth Large	-0.50%	-0.82%	-0.41%	0.73%
Difference	2.04%	1.92%	0.63%	-0.50%
High Profitability Large	0.04%	-0.30%	-0.47%	0.81%
Low Profitability Large	-0.95%	-0.15%	1.82%	-2.63%
Difference	0.98%	-0.16%	-2.29%	3.43%
Low Investment Large	2.04%	0.56%	0.66%	0.82%
High Investment Large	-1.45%	-0.80%	-0.44%	-0.21%
Difference	3.48%	1.36%	1.10%	1.02%
High Prof., Low Inv. Large	1.76%	0.37%	0.40%	0.99%
Low Prof., High Inv. Large	-2.13%	-0.80%	0.78%	-2.10%
Difference	3.89%	1.17%	-0.37%	3.09%



Source: "Sustainable Earnings Growth at Reasonable Prices," Brightman, Clements, and Kalesnik (2017).

Does Investment Subsume Value?

	Dependent Variable	
	Value	Investment
Alpha (ann.)	-0.12%	2.88%
(Alpha t-stat)	(-0.15)	(4.27)
Market	0.05	-0.13
Size	0.04	-0.03
Profitability	0.16	-0.13
Value	–	0.45
Investment	0.97	–

- » Fama and French (2014): Value factor becomes redundant in the multifactor model when controlling for investment

Investment \neq Value

	Dependent Variable			
	Value	Investment	Sector Neutral Value	Sector Neutral Investment
Alpha (ann.)	-0.12%	2.88%	2.16%	2.51%
(Alpha t-stat)	(-0.15)	(4.27)	(2.83)	(4.64)
Market	0.05	-0.13	0.05	-0.09
Size	0.04	-0.03	0.17	0.05
Profitability	0.16	-0.13	-0.18	-0.15
Value	–	0.45	–	0.26
Investment	0.97	–	0.49	–

- » Value is correlated with Investment due to similar sector exposure
- » Controlling for sector exposure Investment and Value are two independent factors

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