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# An Update on ESP Scorecard

## A Framework to Identify Relative Value in Credit

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# Introduction

- In August 2016 we started publishing Excess Spread over Peers (ESP) Scorecard
- Quantitative framework to identify relative value in credit
- Bonds are ranked on excess spread over peers (ESP) adjusted for fundamentals
  - US Corporate IG and HY B-Ba
  - Euro Corporate IG Senior



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## Excess Spread over Peers (ESP) Scorecard – May 2017

- The ESP scorecard continued to perform well in May. The performance was predominantly driven by high-quality non-financial bonds in the US and low-quality financials in Europe.
- Top quintile ESP portfolios outperformed bottom quintile portfolios by 4.56%/yr (US IG), 8.09%/yr (US HY B-Ba), and 3.65%/yr (Euro IG Senior) before transaction costs over the past 10 years, with information ratios above 1.7.
- However, a concentrated portfolio of 100 randomly selected US IG bonds with above-median ESP scores had a 24% chance to underperform a similar Low-ESP portfolio in May. For Euro IG portfolios, the underperformance probability was lower (11%).

### ESP Scorecard Summary

The ESP Scorecard is a quantitative framework designed to identify relative value opportunities in credit. See *Relative Value Investing in Credit*, 9 May 2016. The scorecard assigns scores from 1 to 10 to bonds according to their relative valuation. A high score indicates attractiveness. The ESP scorecard incorporates both market and fundamental information. The framework is implemented in two steps:

Step1: Peer groups are identified within the corporate bond universe. In this process, individual bonds are grouped based on their characteristics to capture systematic credit

Portfolios sorted on ESP scores have demonstrated attr over the past two decades. Investors can use the E screening tool to identify potential relative value oppor should be used in conjunction with fundamental analysis QPS Research maintains and publishes the performan monthly basis. Individual scores are calculated at the sample performance of bonds ranked by ESP Score i period. Individual security scores are available upon requ

Figure 1 provides summary performance statistics of Euro IG Senior, and US HY B-Ba markets. Corporate b ESP Score. Figure 1 reports returns of top (Q5) and bott

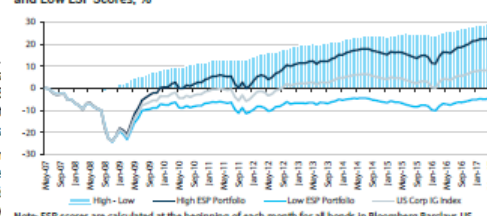
FIGURE 1  
ESP Scorecard Performance: Top (Q5) vs. Bottom (Q1)

Universe	Portfolio	Cum. Exc. Returns, %				Avg. Exc. Returns, %/yr			
		1m	3m	12m	3Y	5Y	10Y	3Y	5Y
US IG	Q5	0.44	0.80	7.63	2.37	4.61	3.57		
	Q1	0.27	0.16	2.27	-0.55	0.72	-0.99		
	Q5-Q1	0.17	0.64	5.36	2.92	3.89	4.56		
US HY B-Ba	Q5	0.09	0.83	17.75	5.48	7.99	8.40		
	Q1	0.15	0.38	9.39	1.58	3.92	0.30		
	Q5-Q1	-0.06	0.45	7.71	3.90	4.07	8.09		
EUR IG	Q5	0.28	1.32	3.84	1.82	3.32	2.59		
	Q1	0.19	0.81	1.16	0.26	0.97	-1.06		

Barclays | Excess Spread over Peers (ESP) Scorecard – May 2017

### ESP Scorecard for US IG Credit

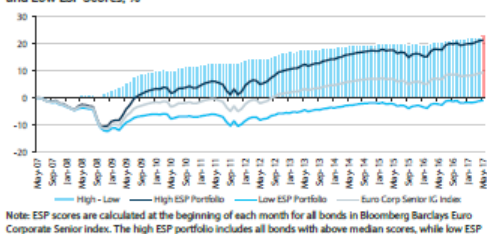
FIGURE 2  
US IG Corporate Bonds: Cumulative Excess Returns of Bond Portfolios with High and Low ESP Scores, %



Barclays | Excess Spread over Peers (ESP) Scorecard – May 2017

### ESP Scorecard for Euro IG Credit

FIGURE 12  
Euro Corporate Bonds: Cumulative Excess Returns of Portfolio of Bonds with High and Low ESP Scores, %



Note: ESP scores are calculated at the beginning of each month for all bonds in Bloomberg Barclays Euro Corporate Senior Index. The High ESP portfolio includes all bonds with above median scores, while low ESP

FIGURE 3  
US Corporate Bonds: Performance of High-ESP over Low-ESP Portfolios, %

	Cumulative Excess Returns (High - Low), %				Avg. Annualized Excess Returns, %/yr			Annualized Volatility, %/yr			Information Ratio		
	1m	3m	6m	12m	3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y
Total	0.11	0.34	1.14	2.79	1.58	2.11	2.56	0.82	0.74	1.25	1.92	2.84	2.04
Financial	0.01	0.32	0.75	1.36	1.45	2.36	2.79	0.46	0.72	3.61	3.13	3.28	0.77
Non-financial	0.15	0.35	1.31	3.43	1.54	1.82	2.49	1.31	1.08	1.30	1.18	1.69	1.92
By Quality													
AAA-AA	0.17	0.23	0.74	2.10	0.86	1.47	1.87	1.05	0.98	1.59	0.82	1.49	1.18
A	0.22	0.43	0.99	2.56	1.69	2.43	2.46	0.59	0.68	2.78	2.87	3.56	0.88
BAA	0.02	0.32	1.50	3.67	1.85	2.09	2.99	1.32	1.22	2.51	1.41	1.72	1.19
By Trade Efficiency Score (Liquidity)													
TES1-	0.11	0.30	0.97	2.06	1.17	2.12	2.35	0.74	0.86	1.30	1.59	2.46	1.81

FIGURE 13  
Euro Corporate Bonds: Performance of High-ESP over Low-ESP Portfolios, %

	Cumulative Excess Returns (High - Low), %				Avg. Annualized Excess Returns, %/yr			Annualized Volatility, %/yr			Information Ratio		
	1m	3m	6m	12m	3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y
Total	0.07	0.27	0.71	1.50	0.90	1.39	2.04	0.53	0.58	0.99	1.69	2.40	2.06
Financial	0.23	0.59	1.09	1.50	1.20	1.68	2.65	0.45	0.56	1.32	2.67	3.01	2.02
Non-financial	-0.02	0.09	0.50	1.50	0.73	1.25	1.65	0.66	0.74	1.05	1.10	1.69	1.57
By Quality													
AAA-AA	0.07	-0.09	-0.05	0.37	0.84	0.62	2.11	0.54	0.50	1.12	1.56	1.24	1.87
A	0.00	0.05	0.34	0.82	0.88	1.27	1.69	0.33	0.48	1.34	2.66	2.67	1.26
BAA	0.12	0.55	1.26	2.45	0.80	1.51	1.57	1.37	1.27	1.77	0.59	1.20	0.89
By Trade Efficiency Score (Liquidity)													
TES1-	0.07	0.27	0.71	1.50	0.90	1.39	2.04	0.53	0.58	0.99	1.69	2.40	2.06

# Methodology, Step 1: Excess Spread over Peers

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- Peer groups to control for systematic credit risk
  - Calculate excess spreads over peer group averages (ESP)
  - => ESP captures first-order relative value effects
  - But ESP can be high due to weak fundamentals => Step 2 (next slide)
- 

## Rating

- Reflect long-term credit risk
  - Regularly updated by rating agencies
  - Watched by investors and issuers
  - Often targeted by corporate management
- 

## Sector

- Comparable risk/business profiles across issuers
  - RV across sector peers – standard approach in fundamental analysis
- 

## Maturity

- Higher spread for longer maturity bonds
  - Higher market risk for longer duration bonds
-

# Methodology, Step 2: Adjust for Issuer Fundamentals

---

- High/low ESP can be attributed to weak/strong fundamentals
  - Use statistical approach (regression) to obtain ESP *unexplained* by fundamentals
    - Overweight bonds with high ESP and strong fundamentals
    - Underweight bonds with low ESP and weak fundamentals
- 

## Financial Leverage

- $\text{DEBT} / \text{ASSETS} \Rightarrow z\text{-score}$
  - Reflects % of debt in firm's total assets
  - Firms with higher financial leverage tend to be riskier
- 

## Net Debt / EBITDA

- $\# \text{ years to repay DEBT} \Rightarrow z\text{-score}$
  - Medium-term solvency
  - Relevant for lower quality names
- 

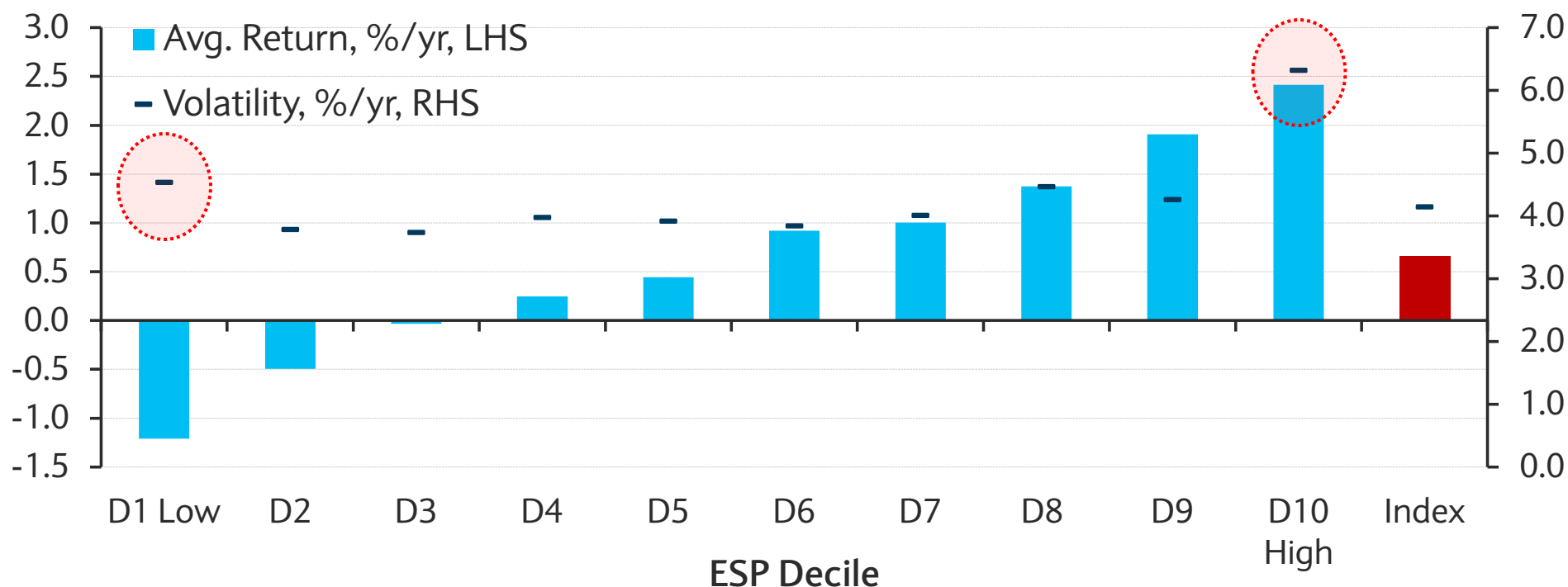
## Coverage Ratio

- $\text{EBITDA} / \text{Interest} \Rightarrow z\text{-score}$
  - Medium/short-term solvency
  - Relevant for small, low quality names
-

# Performance by ESP Deciles in US IG

- Universe: *Bloomberg Barclays US Corporate Investment Grade Index*
- We sort bonds into deciles by ESP score and report average returns and volatilities
- Return increases with ESP score
  - Bonds in the top and bottom ESP deciles are more volatile

## Average Return and Volatility by ESP Deciles, Jan 1993 – May 2017

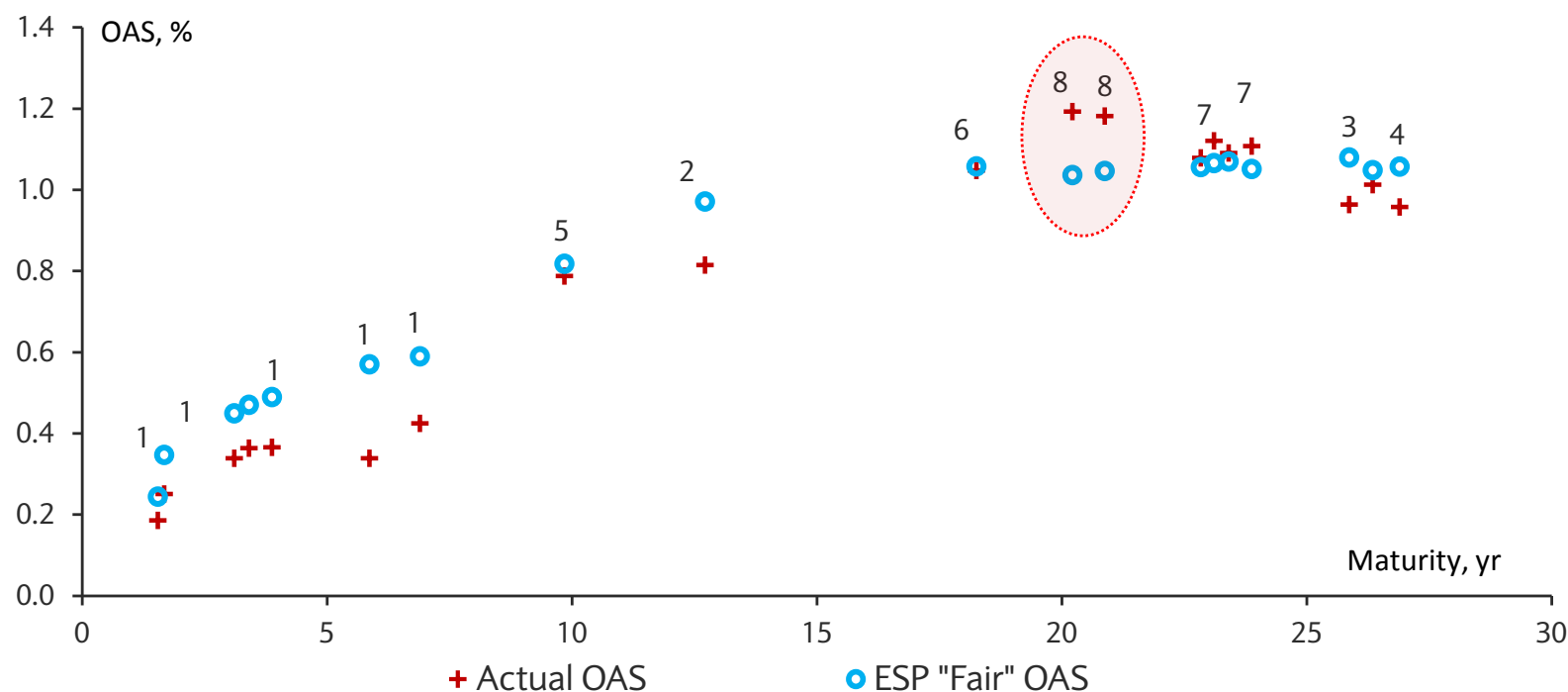


Source: Barclays Research

# Bonds of the Same Issuer Might Have Different Scores

- ESP Scorecard can assign different scores to bonds issued by the same issuer
- Example:
  - US retail, AA-rated Issuer
  - Senior bonds only
  - Two bonds with maturity ~ 20 year have high ESP scores

## Actual and ESP "Fair" Spreads of a Retail Company, 31 May 2017



Source: Barclays Research

# Performance of the ESP Scorecard - Summary

- We sort corporate bonds into quintiles by ESP score
- We report the performance of the top (Q5) and bottom (Q1) quintile portfolios in the last 10 years
- US Corp IG, US HY B-Ba, Euro Corp IG Senior

## Performance of Top and Bottom Quintile ESP Portfolios, 31 May 2017

Universe	Portfolio by ESP Score	Cum. Exc. Return %			Avg. Exc. Return %/yr			Volatility, %/yr			Information Ratio		
		1m	3m	12m	3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y
US IG	Q5 (Top)	0.44	0.80	7.63	2.37	4.61	3.57	3.79	3.41	6.91	0.62	1.35	0.52
	Q1 (Bottom)	0.27	0.16	2.27	-0.55	0.72	-0.99	2.40	2.33	5.95	-0.23	0.31	-0.17
	Q5-Q1	<b>0.17</b>	<b>0.64</b>	<b>5.26</b>	<b>2.92</b>	<b>3.89</b>	<b>4.56</b>	<b>1.59</b>	<b>1.41</b>	<b>2.53</b>	<b>1.84</b>	<b>2.76</b>	<b>1.80</b>
US HY B-Ba	Q5 (Top)	0.09	0.83	17.75	5.48	7.99	8.40	7.62	6.21	11.84	0.72	1.29	0.71
	Q1 (Bottom)	0.15	0.38	9.39	1.58	3.92	0.30	5.82	5.06	10.53	0.27	0.77	0.03
	Q5-Q1	<b>-0.06</b>	<b>0.45</b>	<b>7.71</b>	<b>3.90</b>	<b>4.07</b>	<b>8.09</b>	<b>2.75</b>	<b>2.27</b>	<b>4.13</b>	<b>1.42</b>	<b>1.79</b>	<b>1.96</b>
EUR IG Sen	Q5 (Top)	0.28	1.32	3.84	1.82	3.32	2.59	2.55	2.21	4.22	0.72	1.50	0.61
	Q1 (Bottom)	0.19	0.81	1.16	0.26	0.97	-1.06	1.75	1.57	2.83	0.15	0.62	-0.37
	Q5-Q1	<b>0.10</b>	<b>0.51</b>	<b>2.66</b>	<b>1.57</b>	<b>2.35</b>	<b>3.65</b>	<b>1.18</b>	<b>1.16</b>	<b>2.11</b>	<b>1.33</b>	<b>2.03</b>	<b>1.73</b>

Source: Barclays Research



# Performance of the ESP Scorecard – US Corp IG

- High ESP - all bonds with *above*-median ESP scores
- Low ESP - all bonds with *below*-median ESP scores
- We report historical performance of High ESP over Low ESP portfolios

## Performance of High over Low ESP Portfolios, 31 May 2017

	Cumulative Excess Return (High - Low), %				Avg. Annualized Excess Return, %/yr			Annualized Volatility, %/yr			Information Ratio		
	1m	3m	6m	12m	3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y
<b>Total</b>	<b>0.11</b>	0.34	1.14	2.79	1.58	2.11	2.56	0.82	0.74	1.25	1.92	2.84	2.04
Financial	0.01	0.32	0.75	1.36	1.45	2.36	2.79	0.46	0.72	3.61	3.13	3.28	0.77
Non-financial	0.15	0.35	1.31	3.43	1.54	1.82	2.49	1.31	1.08	1.30	1.18	1.69	1.92
<b>By Quality</b>													
AAA-AA	0.17	0.23	0.74	2.10	0.86	1.47	1.87	1.05	0.98	1.59	0.82	1.49	1.18
A	0.22	0.43	0.99	2.56	1.69	2.43	2.46	0.59	0.68	2.78	2.87	3.56	0.88
BAA	0.02	0.32	1.50	3.67	1.85	2.09	2.99	1.32	1.22	2.51	1.41	1.72	1.19
<b>By Trade Efficiency Score (Liquidity)</b>													
TES1-Liquid	0.11	0.30	0.97	2.06	1.17	2.12	2.35	0.74	0.86	1.30	1.59	2.46	1.81
TES2	0.13	0.34	0.98	3.17	1.48	1.88	3.03	1.67	1.37	2.70	0.89	1.37	1.12
TES3	0.15	0.33	1.13	3.22	1.80	1.87	2.83	0.86	0.75	1.77	2.10	2.47	1.60
TES4	0.10	0.34	1.07	2.84	1.46	1.70	1.92	0.82	0.67	1.60	1.78	2.53	1.20
TES5-Illiquid	0.09	0.44	1.33	3.15	2.12	2.46	2.83	0.58	0.54	1.39	3.69	4.58	2.04
<b>Over US Corporate IG Index</b>													
High - Index	0.05	0.17	0.57	1.41	0.80	1.04	1.26	0.41	0.37	0.63	1.92	2.81	2.00

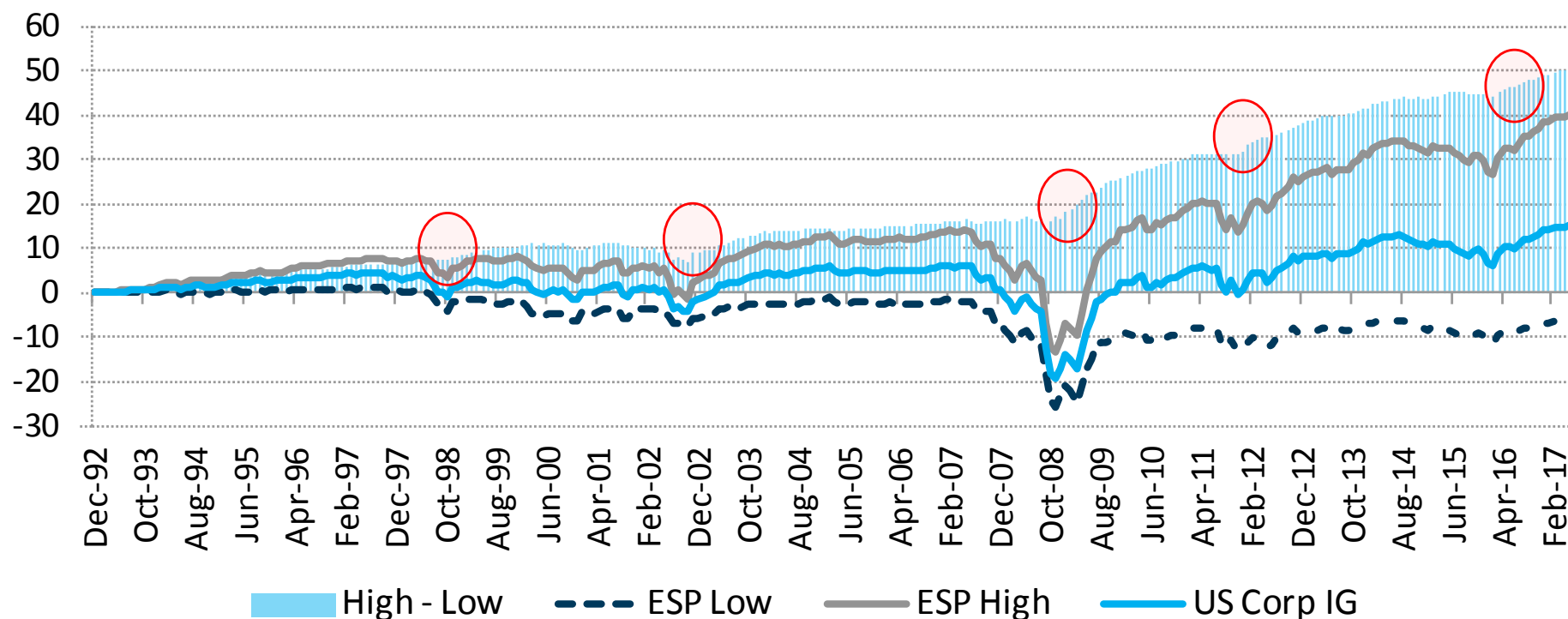
Source: Barclays Research



# Performance of ESP Scorecard – Extended Period

- We can include earlier period to analyse ESP performance over cycles:
  - add 1993 - 2006
- We report cumulative excess returns of:
  - High ESP, Low ESP, US Corp IG Index
  - High ESP vs Low ESP

## Cumulative Performance of ESP Portfolios, Dec 1992 – May 2017



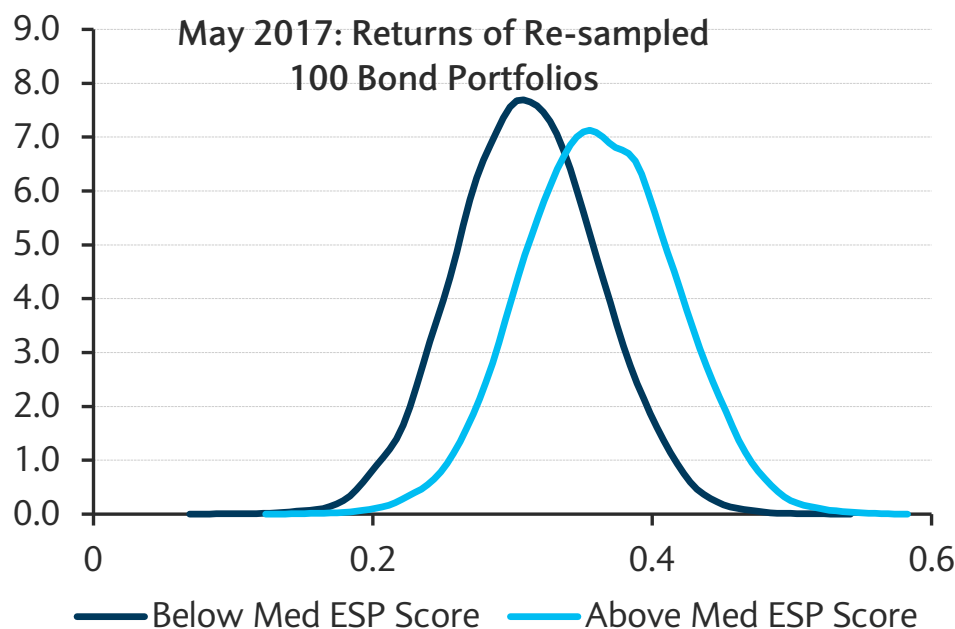
Source: Barclays Research

# ESP Performance – Portfolio Selection Risk

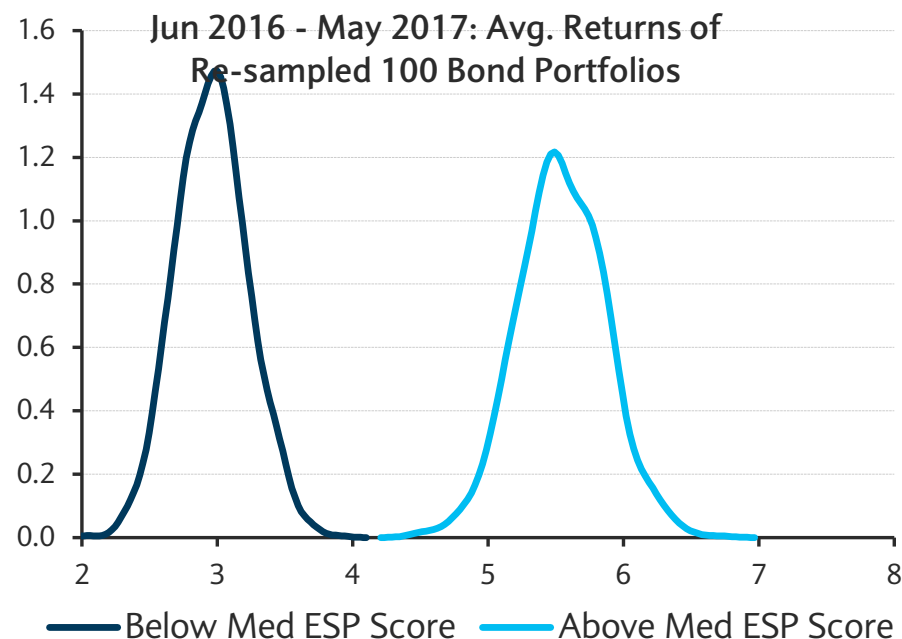
- ESP Scorecard has worked well for broad portfolios (2000+ securities)
- Realistic portfolios would have fewer bonds - can we quantify selection risk of the ESP Scorecard?
  - Randomly select 100 bonds into *High* and *Low* ESP portfolios
  - Control for the broad market structure of the Index
  - Measure portfolio realised returns in the subsequent period
  - Repeat random sampling 1000 times to obtain distributions

## Return Distribution of ESP Portfolios with 100 Randomly Selected Bonds

### 1 Month: May 2017



### 1 Year: Jun 2016 – May 2017



Source: Barclays Research

# Turnover and Transition Dynamics of ESP Scores

- We construct transition average matrices of ESP scores over 3-month horizons
- Transition seems to occur slowly as probabilities are clustered around the main diagonal

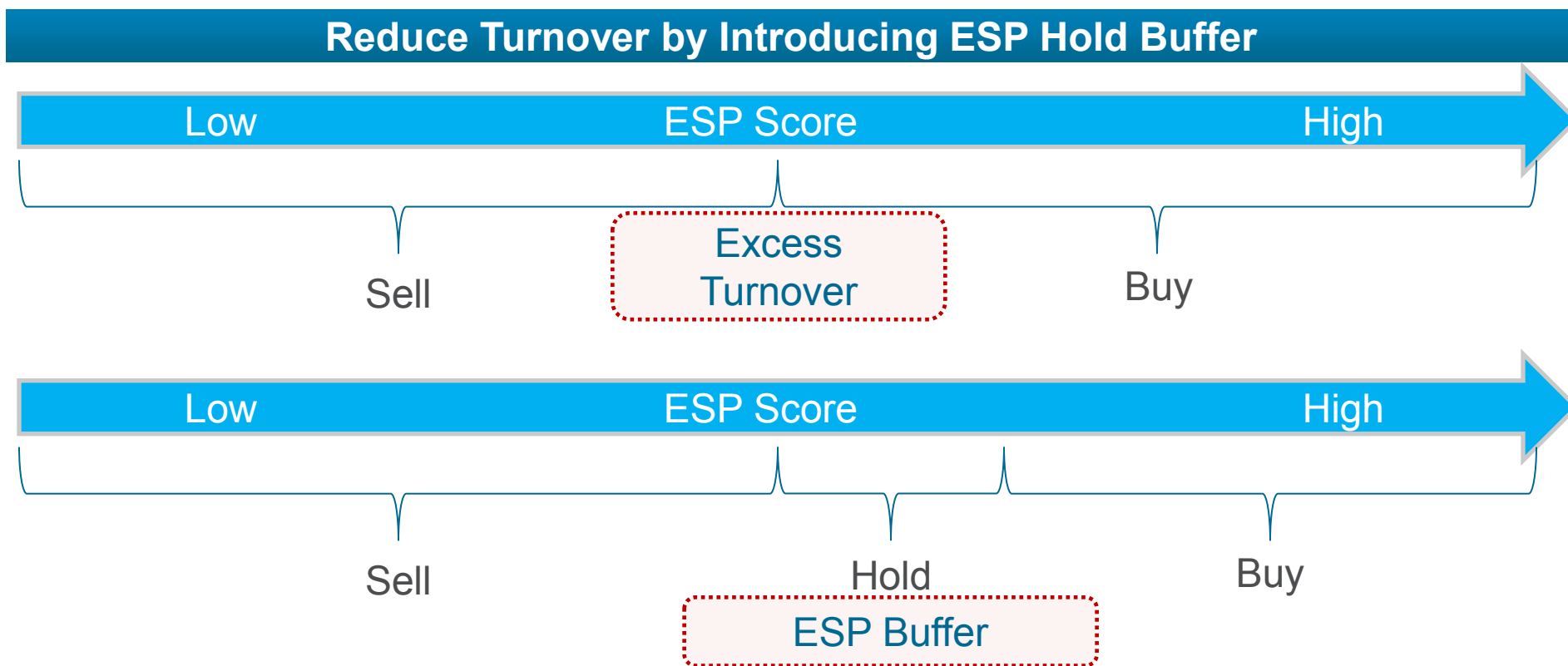
=> *Moderate portfolio turnover is likely*

Average 3-Month ESP Transition Frequencies, Dec 1992 – May 2017										
ESP Scores Beginning of Period	ESP Scores - End of Period									
	D1 Low	D2	D3	D4	D5	D6	D7	D8	D9	D10 High
	D1 Low	63%	20%	7%	3%	2%	1%	1%	1%	1%
	D2	21%	35%	21%	11%	5%	3%	2%	1%	1%
	D3	7%	21%	26%	20%	12%	6%	3%	2%	1%
	D4	3%	11%	20%	23%	19%	12%	7%	3%	2%
	D5	2%	6%	12%	19%	22%	19%	12%	6%	3%
	D6	1%	3%	7%	12%	18%	22%	19%	11%	5%
	D7	1%	2%	4%	7%	12%	19%	24%	21%	10%
	D8	1%	1%	2%	3%	6%	11%	20%	28%	22%
	D9	1%	1%	1%	2%	3%	5%	9%	20%	39%
	D10 High	1%	1%	1%	1%	1%	1%	2%	5%	17%

Source: Barclays Research

# Controlling Turnover via Hold Buffer

- High ESP portfolio
  - buys bonds with above-median scores
  - sells bonds with below-median scores
- Excess turnover is likely for bonds with scores close to the median
- Turnover can be reduced by introducing a hold buffer:
  - Buy bonds with ESP in top 20% and sell if ESP declines below bottom 75%



Source: Barclays Research

# Controlling Turnover via Hold Buffer (cont'd)

- ESP1: Buy top 20% by ESP rank / sell otherwise
- ESP2: Buy top 20% by ESP rank / sell if below bottom 75% / hold otherwise
- ESP3: Buy *liquid* top 20% by ESP rank / sell if below bottom 75% / hold otherwise
  - ESP3 only buys bonds with trade efficiency scores (TES) in the top half of the Index
- We use Liquidity Cost Scores to estimate transaction costs in excess of those of the Index

## Performance of EMC Strategies After Transaction Costs, Feb 2007 – Apr 2017

	US Corp IG Index	Buy Top 20% sell Otherwise ESP1	Top 20%, sell if bottom 75% ESP2	Liq Top 20%, sell if bottom 75% ESP3	Buy Top 20% sell Otherwise ESP1 - Index	Top 20%, sell if bottom 75% ESP2 - Index	Liq Top 20%, sell if bottom 75% ESP3 - Index
Avg. Turnover, %/m	-	18.4	13.1	12.2	18.4	13.1	12.2
Avg. Trans. Costs, %/m	-	16.8	11.9	9.3	16.8	11.9	9.3
<b>Before Transaction Costs</b>							
Avg. Return, %/y	0.95	3.49	3.22	3.10	2.55	2.28	2.15
Volatility, %/y	5.91	6.85	6.74	6.87	1.73	1.59	1.76
Information Ratio	0.16	0.51	0.48	0.45	1.47	1.43	1.22
<b>After Transaction Costs</b>							
Avg. Return, %/y	0.95	1.48	1.79	1.98	0.53	0.85	1.03
Volatility, %/y	5.91	6.89	6.77	6.90	1.69	1.53	1.72
Information Ratio	0.16	0.21	0.27	0.29	0.31	0.55	0.60

Source: Barclays Research

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## Combining Excess Spread over Peers (ESP) and Equity Momentum (EMC) Signals

# Equity Momentum in Credit (EMC) Signal

- For each issuer, we calculate equity momentum signal (EMC)
- We use equity momentum strength to identify groups of issuers with high and low equity momentum:
  - High EMC: above median equity momentum (EMC) rank
  - Low EMC: below median equity momentum (EMC) rank
- Relative value (ESP) and equity momentum (EMC) can be combined together

## Performance of High over Low EMC Portfolios – US Corporate IG, 31 May 2017

	Cumulative Excess Return (High - Low), %				Avg. Annualized Excess Return, %/yr			Annualized Volatility, %/yr			Information Ratio		
	1m	3m	6m	12m	3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y
<b>Total</b>	<b>0.04</b>	0.13	0.45	1.14	2.26	1.80	4.17	0.82	0.77	2.39	2.76	2.33	1.75
<b>By Quality</b>													
AAA-AA	<b>0.27</b>	0.35	-0.35	0.15	0.73	0.63	2.49	1.00	0.83	2.31	0.73	0.76	1.08
A	<b>-0.06</b>	0.01	0.03	-0.21	0.98	1.02	3.49	0.59	0.80	3.01	1.65	1.28	1.16
BAA	<b>0.09</b>	0.23	1.07	2.46	3.60	2.70	5.47	1.47	1.26	2.63	2.44	2.14	2.08
<b>Over US Corporate IG Index</b>													
High - Index	<b>0.02</b>	0.06	0.20	0.61	0.97	0.83	2.28	0.37	0.35	1.35	2.64	1.96	1.86

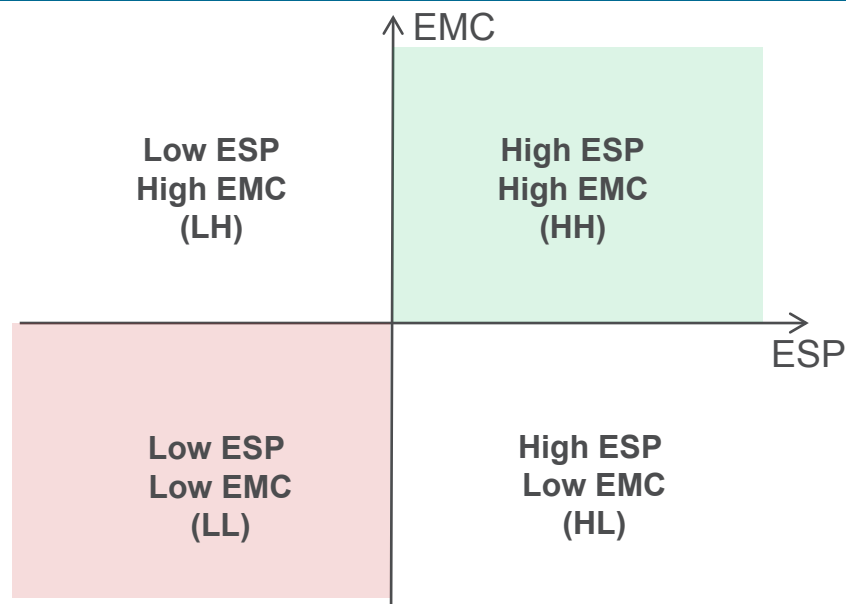
Source: Barclays Research



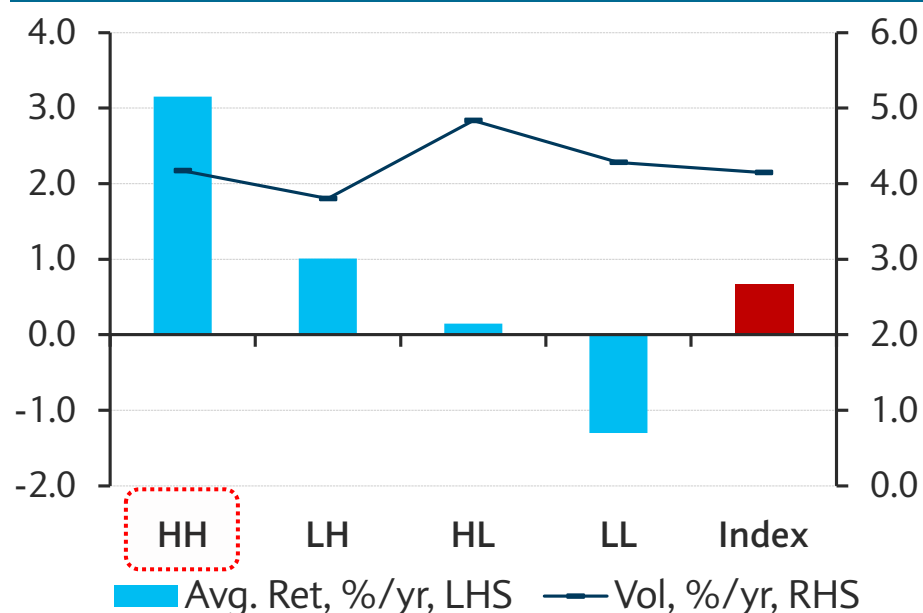
# Combining RV (ESP) and Equity Momentum (EMC) Signals

- Every month we split our IG bond universe into high / low relative value (by ESP) and high / low equity momentum (by EMC) to obtain four subsets:
  - High ESP / High EMC => high relative value and high equity momentum
  - Low ESP / High EMC => low relative value and high equity momentum
  - High ESP / Low EMC => high relative value and low equity momentum
  - Low ESP / Low EMC => low relative value and low equity momentum
- Market-weighted portfolios in the four categories have very different performance

## Sorting Bonds on ESP and EMC



## Performance (Jan 1993 - May 2017)

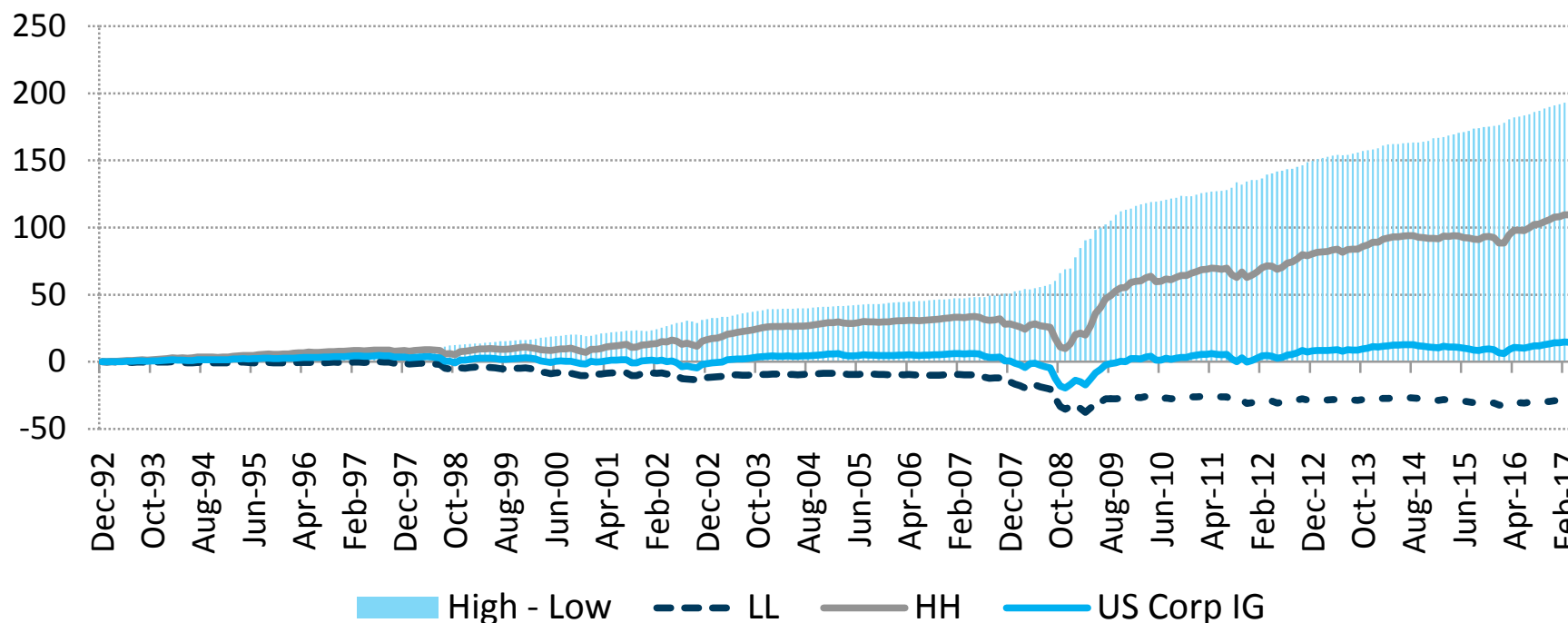


Source: Barclays Research

# Performance of Portfolios Based on Combined Signals

- We report cumulative excess returns of portfolios based on combined value (ESP) and equity momentum (EMC) signals:
  - Portfolios of bonds with *high* relative value (ESP) and positive equity momentum (EMC) significantly outperformed the index
  - Portfolios of bonds with *low* relative value (ESP) and negative equity momentum (EMC) significantly underperformed the index

## Cumulative Excess Returns of Portfolios Based on ESP and EMC Signals



Source: Barclays Research

# Performance of Portfolios Based on Combined Signals (cont)

- Evaluate performance relative to market-weighted index of US Corp IG
- Combining signals helps outperform the index in both absolute and risk-adjusted terms
- Excess return of combined strategy over the index has low correlation with the market

## Performance of Portfolios Based on ESP and EMC Signals, Jan 1993 - May 2017

	Absolute Performance				Performance over Index		
	Index	High ESP	High EMC	Combined (HH)	ESP - Index	EMC - Index	Comb - Index
January 1993 - August 2016							
Avg. Ret [%/yr]	0.67	1.52	2.09	3.15	0.85	1.43	2.49
Volatility [%/yr]	4.15	4.43	3.97	4.17	0.56	0.99	1.16
Information Ratio	0.16	0.34	0.53	0.76	1.54	1.44	2.14
Corr with Index	100%	99%	97%	96%	46%	-30%	-12%
January 1993 - June 2007							
Avg. Ret [%/yr]	0.41	0.97	1.24	2.00	0.56	0.83	1.59
Volatility [%/yr]	2.09	2.42	1.89	2.13	0.48	0.57	0.70
Information Ratio	0.20	0.40	0.66	0.94	1.18	1.46	2.28
Corr with Index	100%	99%	96%	95%	63%	-47%	-10%
July 2007 - May 2017							
Avg. Ret [%/yr]	1.04	2.32	3.34	4.83	1.28	2.30	3.79
Volatility [%/yr]	6.01	6.31	5.79	6.00	0.63	1.35	1.54
Information Ratio	0.17	0.37	0.58	0.81	2.02	1.70	2.46
Corr with Index	100%	100%	97%	97%	43%	-27%	-14%

Source: Bloomberg Barclays Indices, Barclays Research

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## Properties of the ESP Strategy

# ESP Performance is Directional on Credit Returns

- We calculate correlations of ESP (High-Low) returns with
  - US Corp IG (excess returns), US Treasury
  - Equity Market (MKT), Size (SMB), Value (HML), and Momentum (MOM) Fama-French factors
  - Equity Quality Minus Junk (QMJ) factor published by AQR
- ESP returns are positively correlated with credit and equity markets

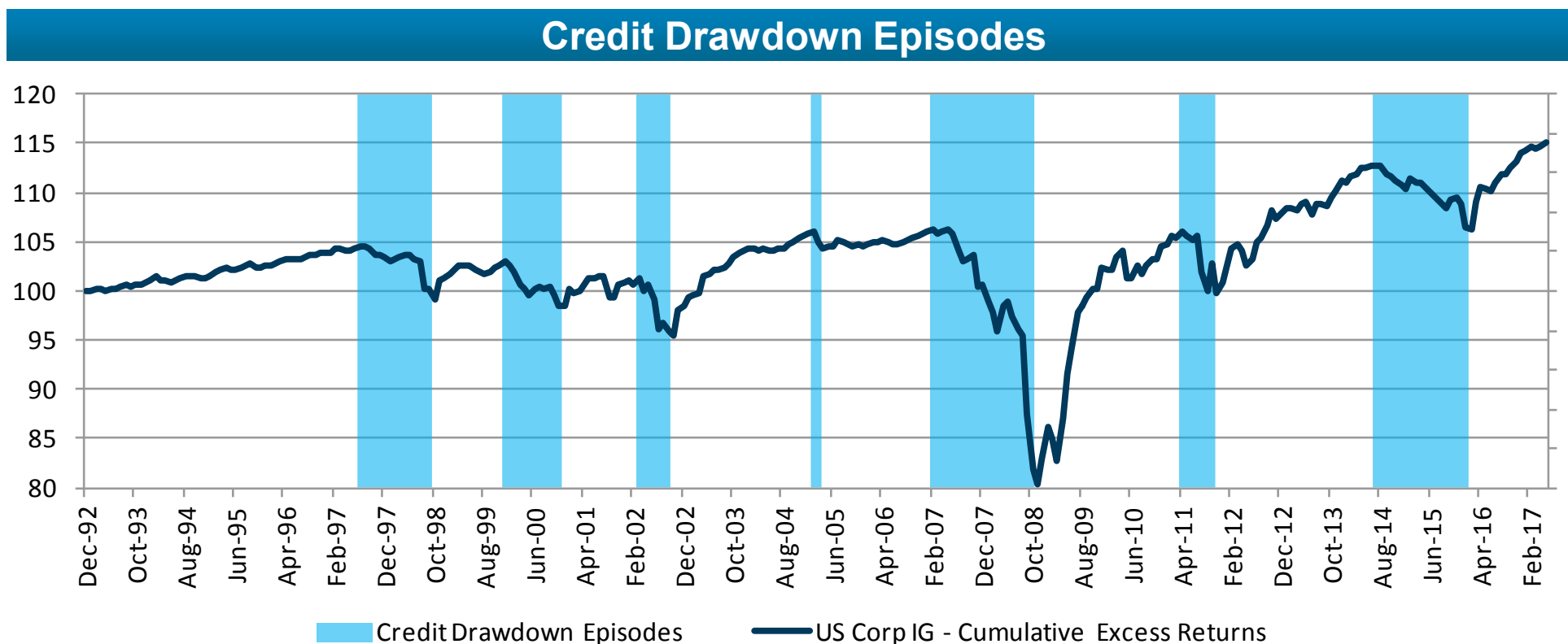
## Correlation of ESP Returns with Equity and FI Factors, Jan 1993 – Apr 2017

	ESP	US Corp	EQ MKT	EQ SMB	EQ HML	EQ MOM	EQ QMJ
US Corp IG	46%						
EQ MKT	24%	55%					
EQ SMB	10%	20%	22%				
EQ HML	-8%	-2%	-15%	-30%			
EQ MOM	-29%	-33%	-27%	9%	-18%		
EQ QMJ	-35%	-52%	-65%	-50%	15%	29%	
US Tsy	-27%	-33%	-21%	-19%	4%	19%	20%

Source: Barclays Research

# ESP Performance in Credit Down-Cycles

- How did ESP Scorecard perform during credit down-cycles?
- Define drawdown episodes as down-cycles
- Measure performance of the ESP scorecard (High-Low ESP portfolios) during drawdowns



Source: Barclays Research

# ESP Performance in Credit Down-Cycles (cont'd.)

- ESP performance in credit down-cycles has been flat
- The ESP performance in April 2002 – October 2012 was negative

## Performance of ESP Scorecard in Credit Drawdown Periods, %

Drawdown Episodes	US Corp IG	ESP HI- LO	EQ MKT	EQ SMB	EQ HML	EQ MOM	EQ QMJ
Aug 1997 - Oct 1998	-5.2	1.0	6.7	-19.4	6.4	13.5	14.6
Jan 2000 - Dec 2000	-4.4	0.4	-16.7	-5.0	38.2	16.7	23.7
Apr 2002 - Oct 2002	-5.7	-3.1	-22.6	-1.7	0.3	28.2	22.9
Mar 2007 - Nov 2008	-24.2	0.7	-37.9	-6.3	-11.6	54.6	52.3
May 2011 - Nov 2011	-5.8	0.0	-8.6	-5.6	-7.7	0.7	19.7
Aug 2014 - Feb 2016	-5.8	0.2	1.2	-5.1	-12.1	21.7	36.1

Source: Barclays Research



# ESP Performance in Credit Down-Cycles (cont'd.)

- ESP performance has been weak during credit down-cycles
- ESP performance has been strong in recoveries and benign environments

## ESP Returns in Credit Down-Cycles and Recoveries, Jan 1993 – May 2017

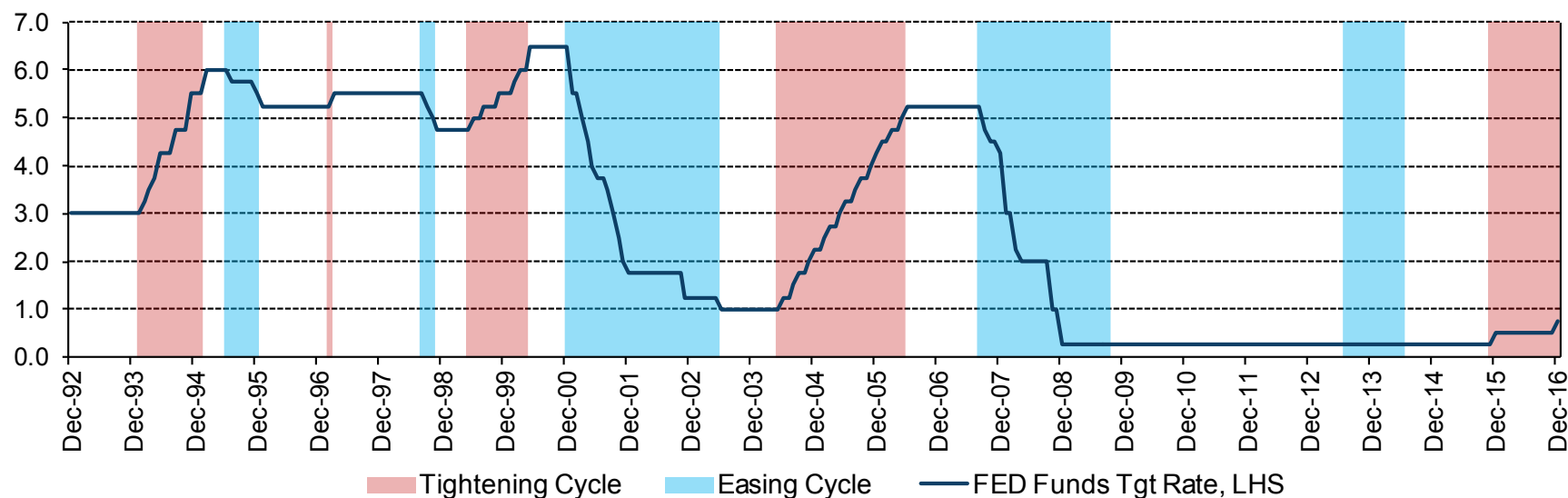
	Down-Cycle			Recovery			Overall		
	Avg. Ret %/yr	Vol %/yr	IR	Avg. Ret %/yr	Vol %/yr	IR	Avg. Ret %/yr	Vol %/yr	IR
<b>US Corp IG</b>	<b>-8.07</b>	<b>5.15</b>	<b>-1.57</b>	<b>4.12</b>	<b>3.18</b>	<b>1.30</b>	<b>0.65</b>	<b>4.15</b>	<b>0.16</b>
ESP (High-Low)	-0.19	1.37	-0.14	2.50	0.92	2.71	1.74	1.12	1.55
EQ MKT	-12.34	18.12	-0.68	15.73	12.56	1.25	7.75	14.76	0.53
EQ SMB	-6.24	15.55	-0.40	5.14	9.11	0.56	1.90	11.37	0.17
EQ HML	1.74	12.53	0.14	3.58	9.93	0.36	3.06	10.70	0.29
EQ MOM	18.36	17.08	1.07	0.26	17.23	0.02	5.40	17.29	0.31
EQ QMJ	22.58	11.77	1.92	-1.54	8.66	-0.18	5.32	10.11	0.53

Source: Barclays Research

# ESP Performance in Fed Monetary Cycles

- How did ESP Scorecard perform in different monetary cycles?
  - Tightening = rising Fed Rate
  - Easing = falling Fed rate or yoy growth in Fed assets above 25% (Dec 2008 – Nov 2015)
- Measure performance of the ESP scorecard in Fed monetary cycles
  - Easing: 1<sup>st</sup> half / 2<sup>nd</sup> half
  - Tightening: 1<sup>st</sup> half / 2<sup>nd</sup> half
  - On-hold before easing / on-hold before tightening

## Fed Easing and Tightening Episodes

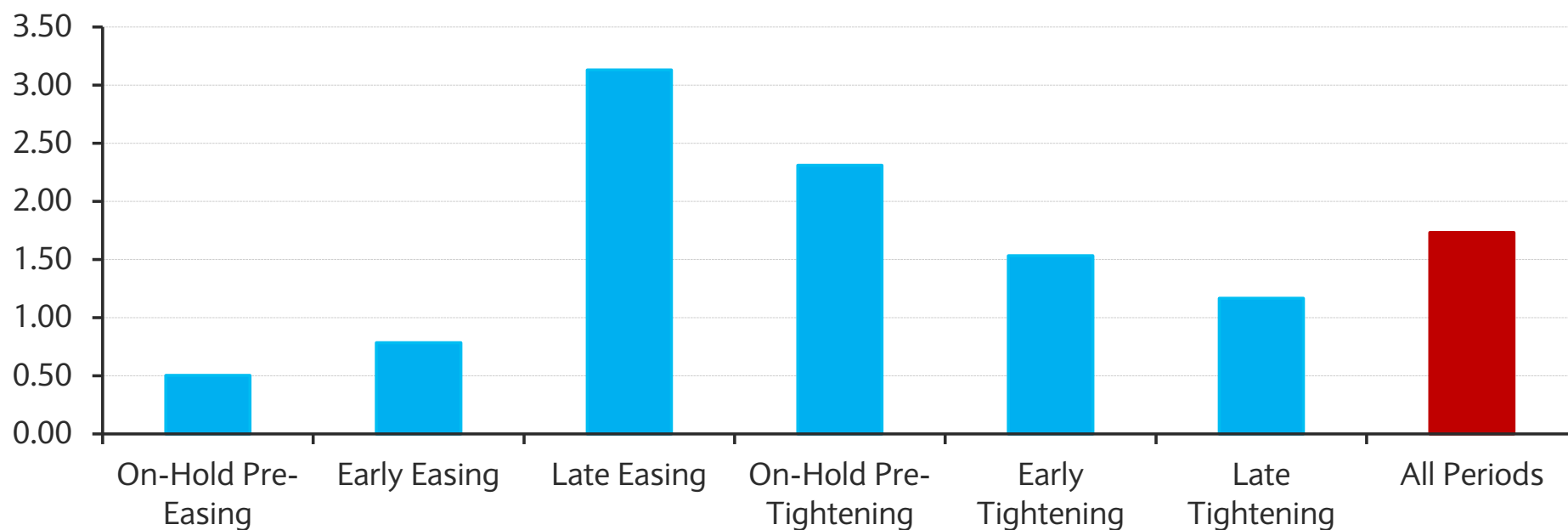


Source: Barclays Research

# ESP Performance in Fed Monetary Cycles (cont'd.)

- Weak performance during early easing and on-hold before easing
- Strong performance during late easing and on-hold before tightening

## Annualised ESP Returns in Fed Cycles, Jan 1993 – May 2017



Source: Barclays Research

# ESP Performance in Fed Monetary Cycles (cont'd.)

- Weak returns during early easing and on-hold before easing
- Strong returns during late easing and on-hold before tightening
- High information ratios in tightening / pre-tightening regimes
- Lower information ratios in easing pre-easing regimes

## Annualised ESP Performance in Fed Cycles, Jan 1993 – May 2017

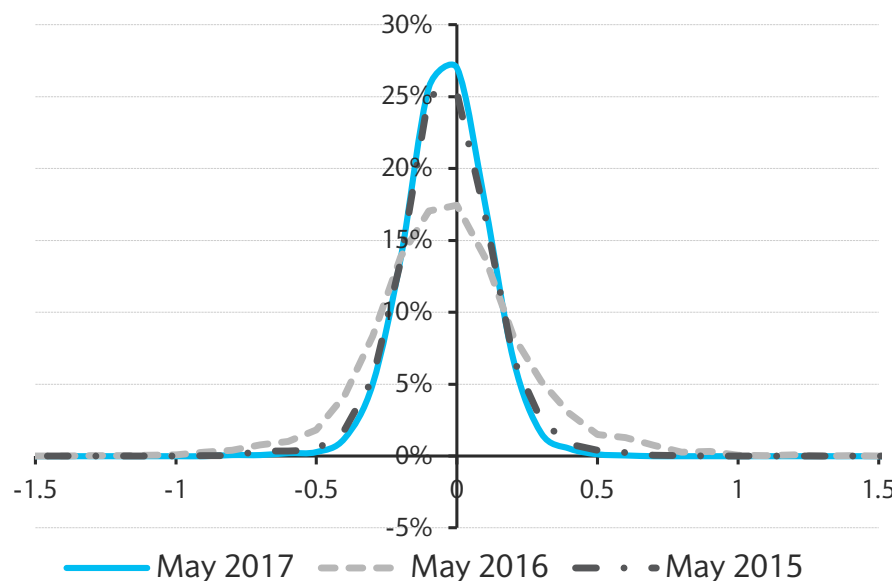
	# obs	ESP Strategy			Index		
		Avg. Ret %/yr	Volatility %/yr	IR	Avg. Ret %/yr	Volatility %/yr	IR
On-Hold Pre-Easing	42	0.50	0.45	1.11	-0.87	1.50	-0.58
Early Easing	40	0.78	0.77	1.02	-1.52	3.95	-0.39
Late Easing	38	3.13	2.49	1.26	1.97	8.93	0.22
On-Hold Pre-Tightening	103	2.31	0.70	3.29	1.59	3.03	0.52
Early Tightening	46	1.53	0.75	2.03	1.58	2.28	0.69
Late Tightening	24	1.17	0.41	2.87	-0.77	1.29	-0.60
<b>All Periods</b>	<b>293</b>	<b>1.73</b>	<b>1.12</b>	<b>1.55</b>	<b>0.67</b>	<b>4.15</b>	<b>0.16</b>

Source: Barclays Research

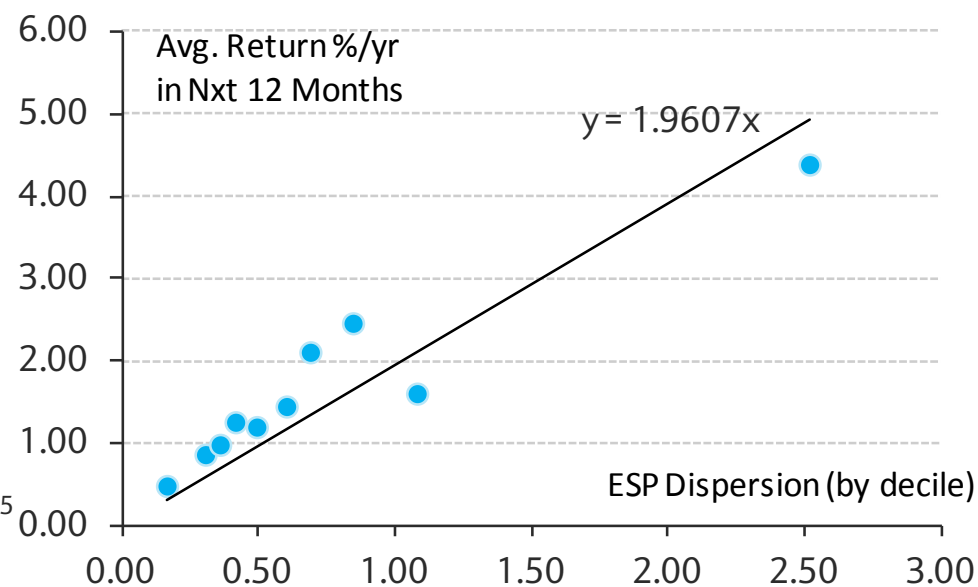
# ESP Dispersion and Subsequent Returns

- ESP Scorecard performs best when ESP varies across bonds
  - High ESP dispersion in May 2016
  - Lower ESP dispersion in May 2015 and May 2017
- ESP dispersion is positively related to subsequent performance
  - Split monthly observations by ESP dispersion, calculate subsequent 12 month returns
  - Calculate avg. return for each dispersion decile
- Higher dispersion => higher subsequent ESP performance

## ESP X-Sect Distributions



## ESP Dispersion vs Avg. Returns



Source: Barclays Research

# Conclusions

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- We present Excess Spread over Peer (ESP) scorecard, a quantitative framework designed to identify undervalued corporate securities
- ESP calculates excess spreads over peers adjusted for issuers' fundamentals
- Portfolios with higher ESP scores tend to perform better than those with low ESP in absolute and risk-adjusted terms
- ESP “validation” strategy goes long above median and short below median ESP
  - The strategy has attractive risk-return characteristics
  - Security selection risk is moderate and declines as the investment horizon increases
  - The strategy is moderately directional on returns of the credit market
  - Strategy performance is weaker during credit down-cycles
- ESP scores can be used for issue selection or advanced beta strategies in credit
  - Can be used to filter investment universe
- ESP scorecard can be applied to new issues or to corporate bonds outside of the index universe
- Practical ESP portfolios with turnover controls can be designed

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