



# ASTORIA'S INVESTMENT COMMITTEE ETF RISK ANALYTICS

# TABLE OF CONTENTS

<b>Executive Summary.....</b>	<b>3-8</b>	VTI vs. SPY: Style Factor Exposures.....	35
Report Information.....	3	VTI vs. SPY: Industry Factor Exposures.....	36
Analysis Conclusions.....	4	GSLC vs. SPY: Total Risk.....	37
Total Projected Risk.....	5	GSLC vs. SPY: Style Factor Exposures.....	38
Style Risk Factor Heat Map.....	6	GSLC vs. SPY: Industry Factor Exposures.....	39
Industry Risk Factor Heat Map.....	7	EES vs. IWM: Total Risk.....	40
Yield Curve & Spread Factor Risk Heat Map.....	8	EES vs. IWM: Style Factor Exposures.....	41
<b>ETF Risk Analytics: US Equity.....</b>	<b>9-42</b>	EES vs. IWM: Industry Factor Exposures.....	42
DGRW vs. SPY: Total Risk.....	10	<b>ETF Risk Analytics: International Equities.....</b>	<b>43-52</b>
DGRW vs. SPY: Style Factor Exposures.....	11	MCHI vs. EEM: Total Risk.....	44
DGRW vs. SPY: Industry Factor Exposures.....	12	MCHI vs. EEM: Style Factor Exposures.....	45
KBWB vs. SPY: Total Risk.....	13	MCHI vs. EEM: Industry Factor Exposures.....	46
KBWB vs. SPY: Style Factor Exposures.....	14	EDIV vs. EEM Total Risk.....	47
KBWB vs. SPY: Industry Factor Exposures.....	15	EDIV vs. EEM: Style Factor Exposures.....	48
XLC vs. SPY: Total Risk.....	16	EDIV vs. EEM: Industry Factor Exposures.....	49
XLC vs. SPY: Style Factor Exposures.....	17	DNL vs. ACWX: Total Risk.....	50
XLC vs. SPY: Industry Factor Exposures.....	18	DNL vs. ACWX: Style Factor Exposures.....	51
XLU vs. SPY: Total Risk.....	19	DNL vs. ACWX: Industry Factor Exposures.....	52
XLU vs. SPY: Style Factor Exposures.....	20	<b>ETF Risk Analytics: Fixed Income.....</b>	<b>53-65</b>
XLU vs. SPY: Industry Factor Exposures.....	21	VMBS vs. AGG: Total Risk.....	54
XLV vs. SPY: Total Risk.....	22	VMBS vs. AGG: Yield Curve Factor Exposures.....	55
XLV vs. SPY: Style Factor Exposures.....	23	VMBS vs. AGG: Spread Factor Exposures.....	56
XLV vs. SPY: Industry Factor Exposures.....	24	VTEB vs. AGG: Total Risk.....	57
QUAL vs. SPY: Total Risk.....	25	VTEB vs. AGG: Yield Curve Factor Exposures.....	58
QUAL vs. SPY: Style Factor Exposures.....	26	VTEB vs. AGG: Spread Factor Exposures.....	59
QUAL vs. SPY: Industry Factor Exposures.....	27	RVNU vs. AGG: Total Risk.....	60
USMF vs. SPY: Total Risk.....	28	RVNU vs. AGG: Yield Curve Factor Exposures.....	61
USMF vs. SPY: Style Factor Exposures.....	29	RVNU vs. AGG: Spread Factor Exposures.....	62
USMF vs. SPY: Industry Factor Exposures.....	30	JPST vs. AGG: Total Risk.....	63
JQUA vs. SPY: Total Risk.....	31	JPST vs. AGG: Yield Curve Factor Exposures.....	64
JQUA vs. SPY: Style Factor Exposures.....	32	JPST vs. AGG: Spread Factor Exposures.....	65
JQUA vs. SPY: Industry Factor Exposures.....	33	<b>Warranties &amp; Disclaimers.....</b>	<b>66-67</b>
VTI vs. SPY: Total Risk.....	34		

# EXECUTIVE SUMMARY



In this report, we analyze several of our ETF holdings across a suite of our portfolios using Bloomberg's risk model (PORT). We highlight each ETF's projected risks and factor exposures.



We compare our ETF holdings, which are mostly factor based, against their market cap weighted equivalent.



In pages 5-7, we provide heat maps for the top 3-6 factor exposures relative to the appropriate market cap weighted ETF. Please refer to the individual slides for a more in depth list of factor exposures.



Astoria's ETF holdings highlighted in this report do not constitute an aggregate portfolio. We maintain a variety of strategic and dynamic ETF portfolios where the holdings vary across solutions. For a complete list of all our holdings, please contact us.

We would like to thank Bryan Singh for his valuable insights in this report.

# EXECUTIVE SUMMARY



## Total Projected Risk

Relative to their market cap weighted peer (**SPY**), several of Astoria's US Equity ETF holdings (**DGRW**, **USMF**, **JQUA**) have **lower projected total risks**. Our Fixed Income ETF holdings (**VMBS**, **VTEB**, **JPST**) generally have **lower projected total risks** relative to their market cap weighted peer (**AGG**).



## Style Factor Exposures

Astoria's US Equity ETF holdings are generally tilted towards **US Dividend Yields**, **US Profit**, **US Value**, **US Earnings**, **US Trade Activity**, & **US Leverage**, and away from **US Size & US Volatility**. Astoria's International Equity ETF holdings are tilted towards **AS Trade Activity**, **AS Momentum**, **EU Profit**, **EU Earnings**, & **EU Growth**, and away from **EU Size**, **EU Value**, & **EU Leverage**.



## Industry Factor Exposures

Astoria's US Equity ETF holdings are generally tilted slightly towards **US Financial Services & US Consumer Finance**, and away from **US Media**, **US Banks**, **US Retail**, & **US Medical Equipment**. Astoria's International Equity ETF holdings are tilted towards **AS Telecommunications**, **EU Electric**, **EU Telecommunications**, **EM Oil Exploration**, & **JP Appliances**, and away from **AS Tech Hardware**, **AS Specialty Finance**, **EU Oil Exploration**, **EU Banks**, & **LA Banks**.



## Yield Curve Factor Exposures

Astoria's Fixed Income ETF holdings are tilted towards **1Y KR Swaps & Volatility**, and away from **30Y KR Sovereigns**, **20Y KR Sovereigns**, & **20Y KR Swaps**.

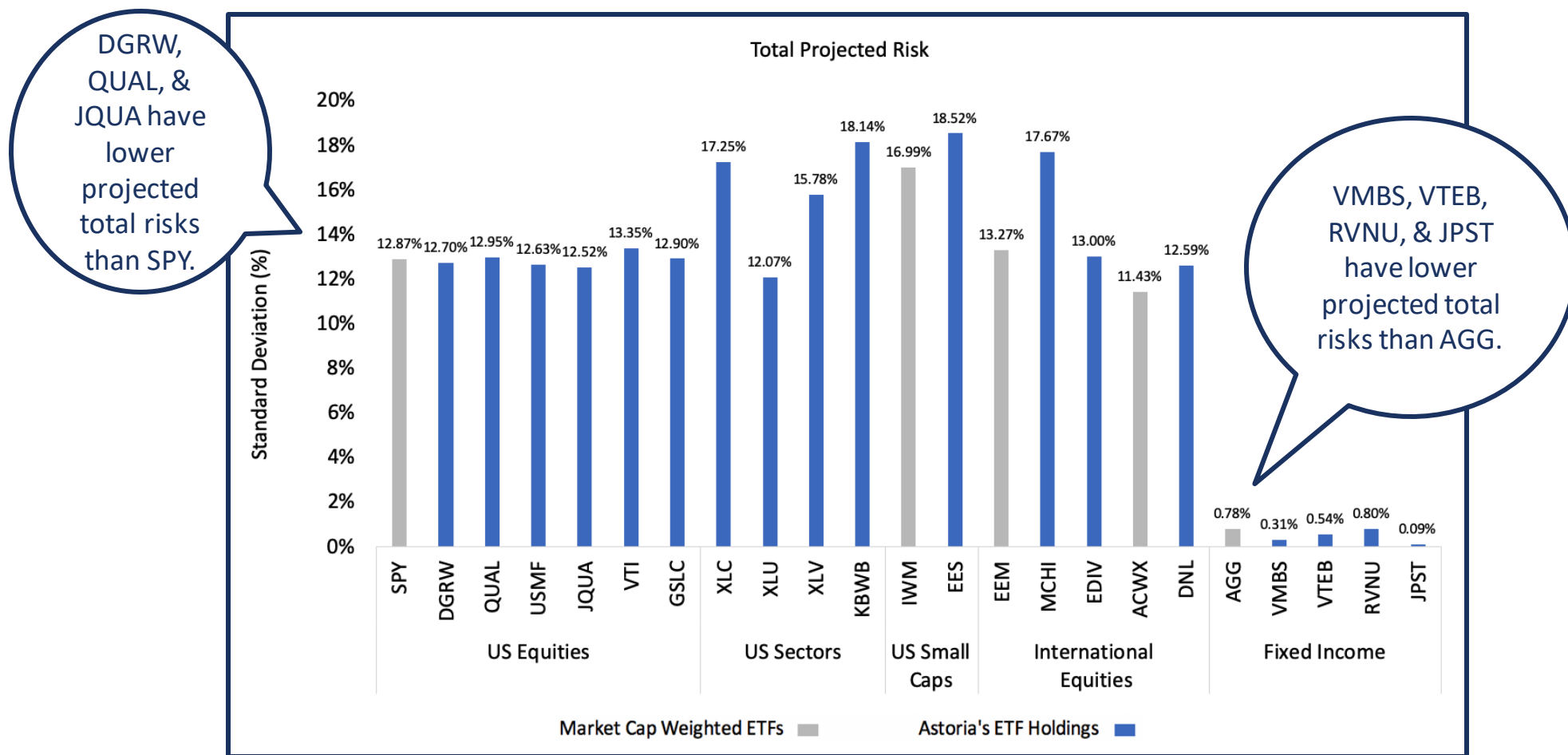


## Spread Factor Exposures

Astoria's Fixed Income ETF holdings are tilted towards **Muni Spreads & Muni Slopes**, and away from **Long Duration**, **Sovereign Slopes**, & **Sovereign Spreads**.

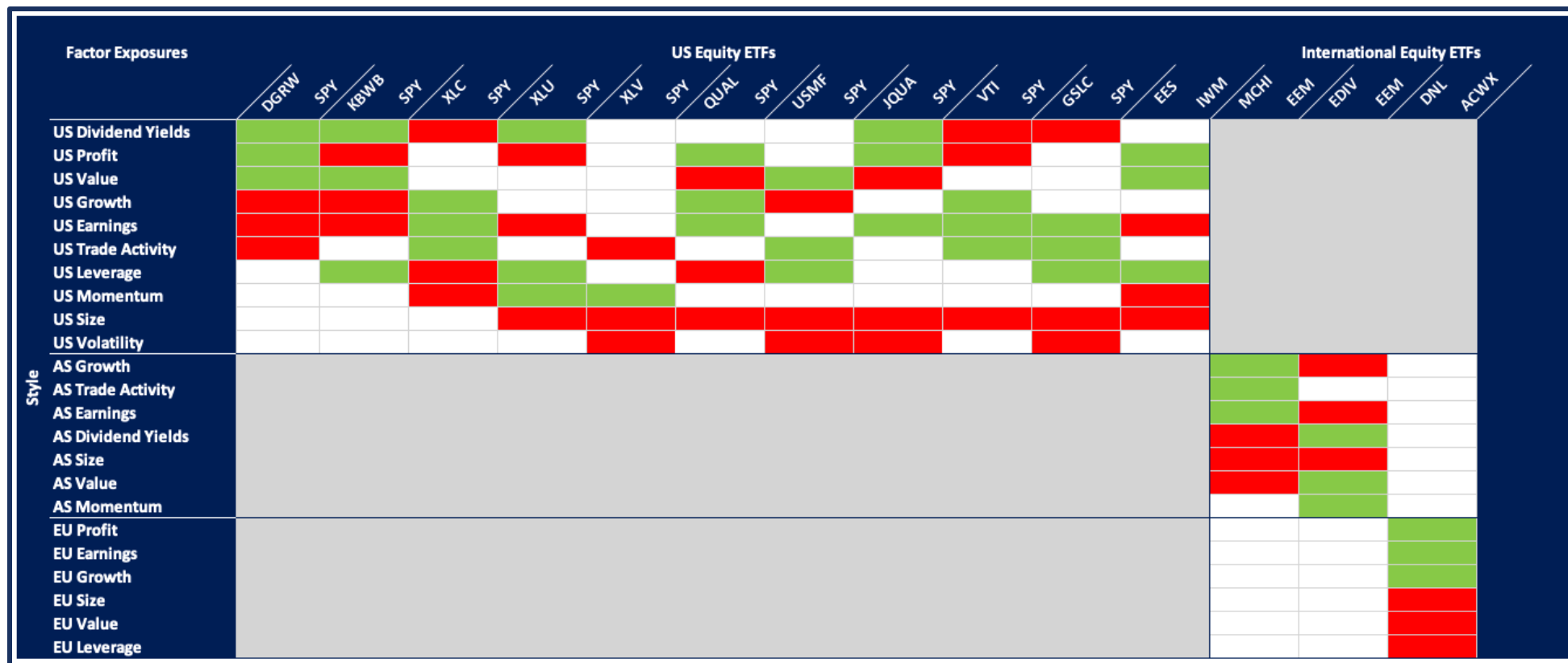


# TOTAL PROJECTED RISK



Source: Bloomberg. Astoria's ETF holdings as of July 25, 2019.

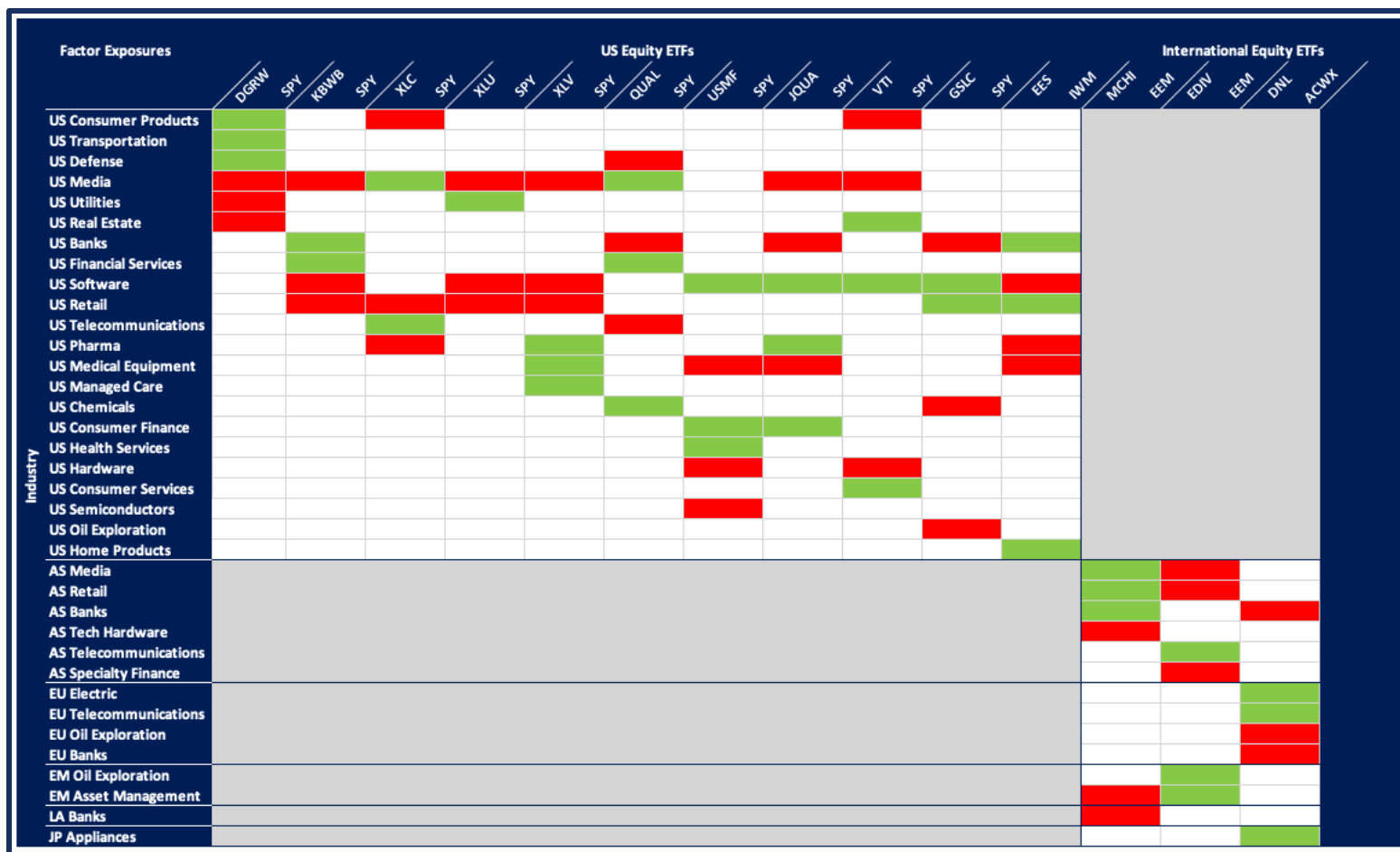
# STYLE RISK FACTOR HEAT MAP: US EQUITY & INTERNATIONAL EQUITY



Source: Bloomberg. Astoria's ETF holdings as of July 25, 2019.

Green boxes indicate that Astoria's ETF holdings are tilted towards a particular factor exposure compared to their comparable market cap weighted ETFs. Red boxes indicate that Astoria's ETF holdings are tilted away from a particular factor exposure compared to their comparable market cap weighted ETFs.

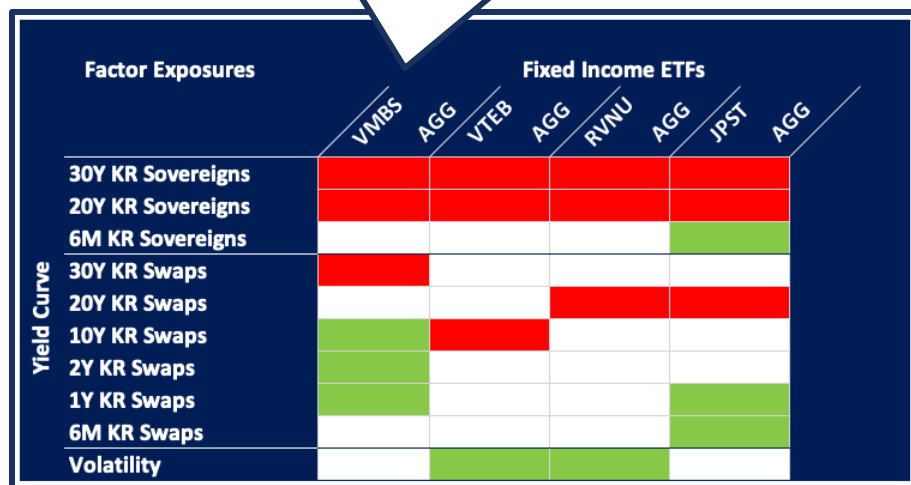
# INDUSTRY RISK FACTOR HEAT MAP: US EQUITY & INTERNATIONAL EQUITY



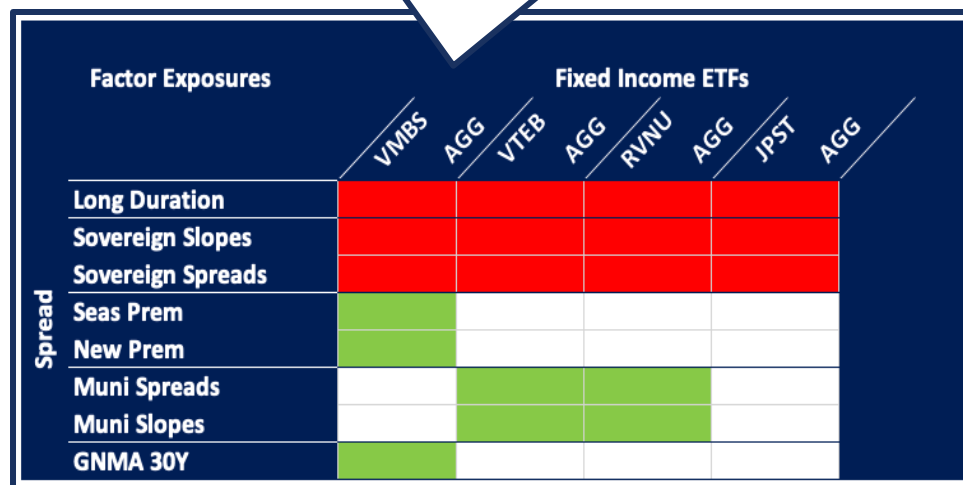
Source: Bloomberg. Astoria's ETF holdings as of July 25, 2019.

# YIELD CURVE & SPREAD RISK FACTOR HEAT MAP: FIXED INCOME

VMBS is tilted more towards 1Y KR Swaps, 2Y KR Swaps, & 10Y KR Swaps while AGG is tilted more towards 30Y KR Sovereigns, 20Y KR Sovereigns, & 30Y KR Swaps.



VMBS is tilted more towards Seas Prem, New Prem, & GNMA 30Y while AGG is tilted more towards Long Duration, Sovereign Slopes, & Sovereign Spreads.



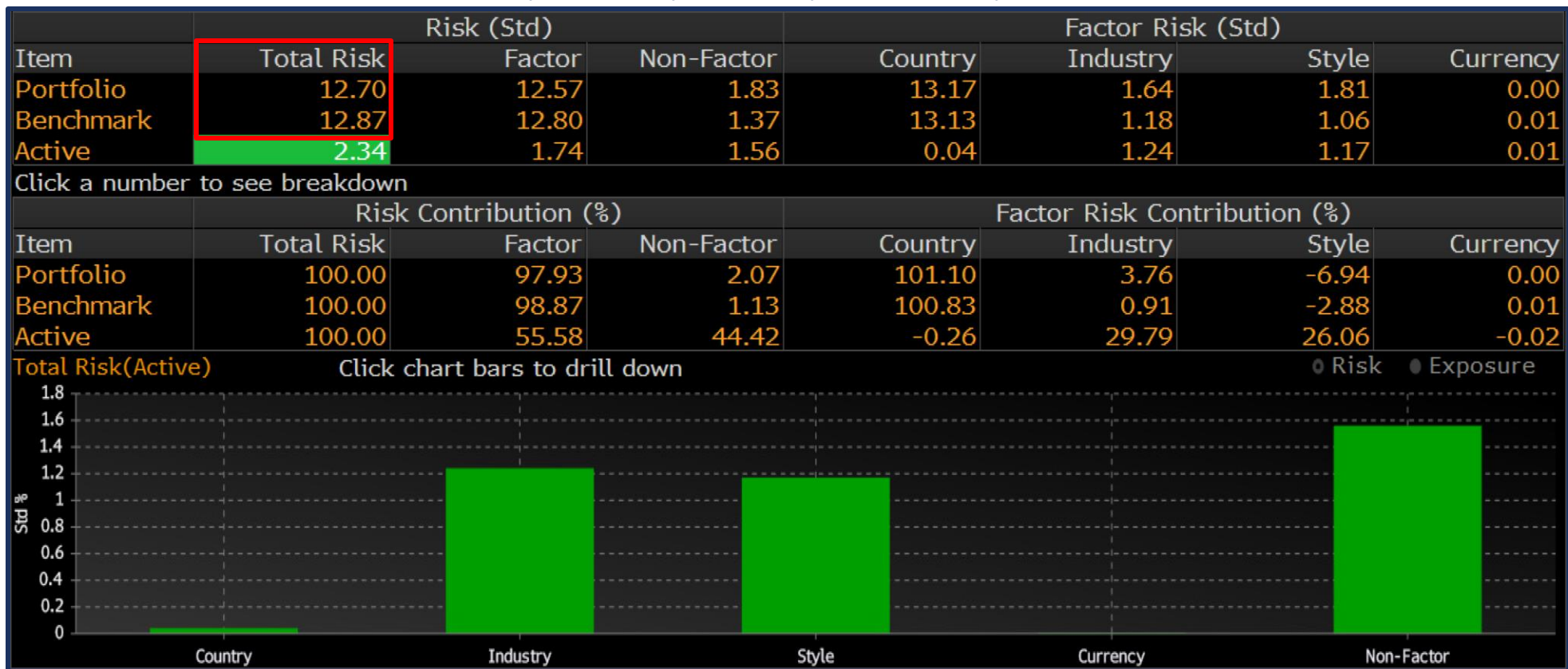
Source: Bloomberg. Astoria's ETF holdings as of July 25, 2019.

# ETF RISK ANALYTICS

## US EQUITY

# BLOOMBERG PROJECTS DGRW & SPY TO HAVE TOTAL RISKS OF 12.70% & 12.87% RESPECTIVELY

DGRW (Portfolio) vs. SPY (Benchmark): Total Risk

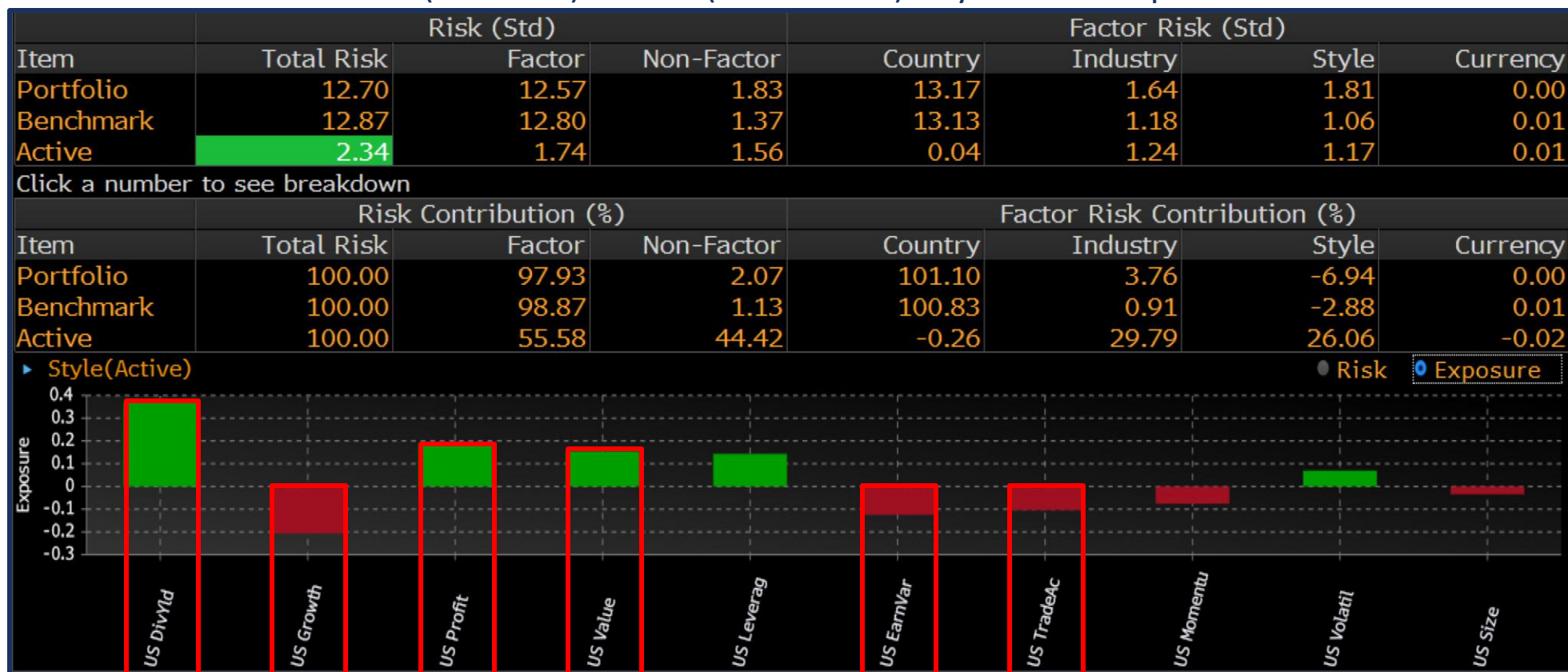


Source: Bloomberg. Data accessed on July 25, 2019.

DGRW HAS GREATER EXPOSURE TO US DIVIDEND YIELDS, US PROFIT, & US VALUE

SPY HAS GREATER EXPOSURE TO US GROWTH, US EARNINGS, & US TRADE ACTIVITY

DGRW (Portfolio) vs. SPY (Benchmark): Style Factor Exposures



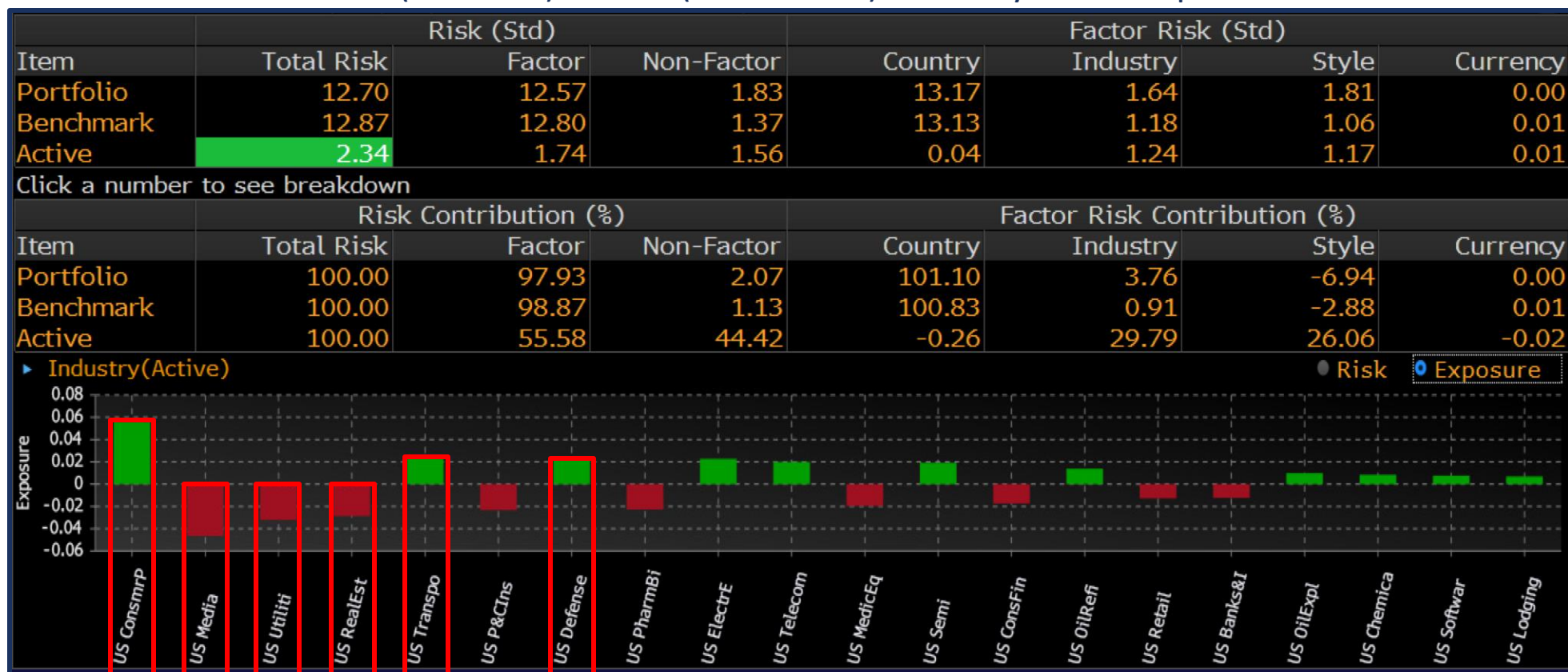
Source: Bloomberg. Data accessed on July 25, 2019.



DGRW HAS GREATER EXPOSURE TO US CONSUMER PRODUCTS, US TRANSPORTATION, & US DEFENSE

SPY HAS GREATER EXPOSURE TO US MEDIA, US UTILITIES, & US REAL ESTATE

DGRW (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures

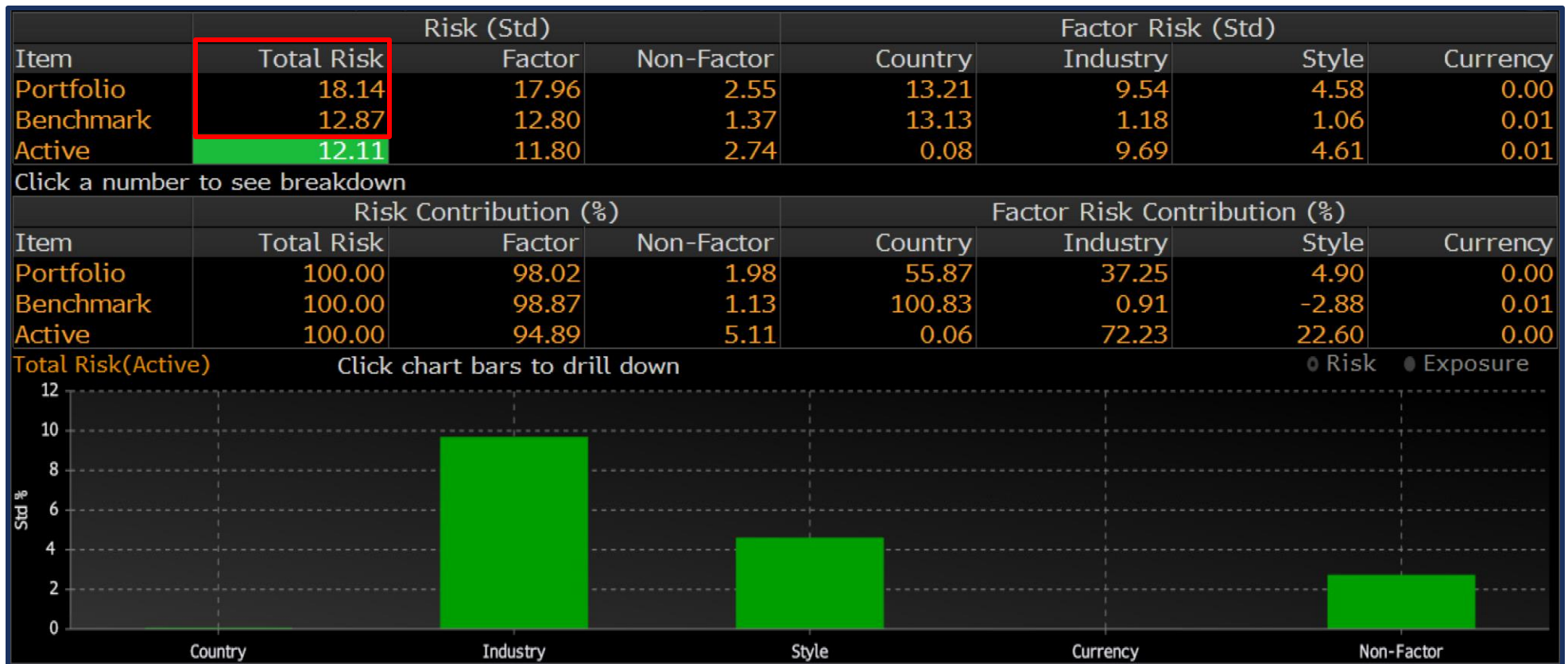


Source: Bloomberg. Data accessed on July 25, 2019.



# BLOOMBERG PROJECTS KBWB & SPY TO HAVE TOTAL RISKS OF 18.14% & 12.87% RESPECTIVELY

KBWB (Portfolio) vs. SPY (Benchmark): Total Risk

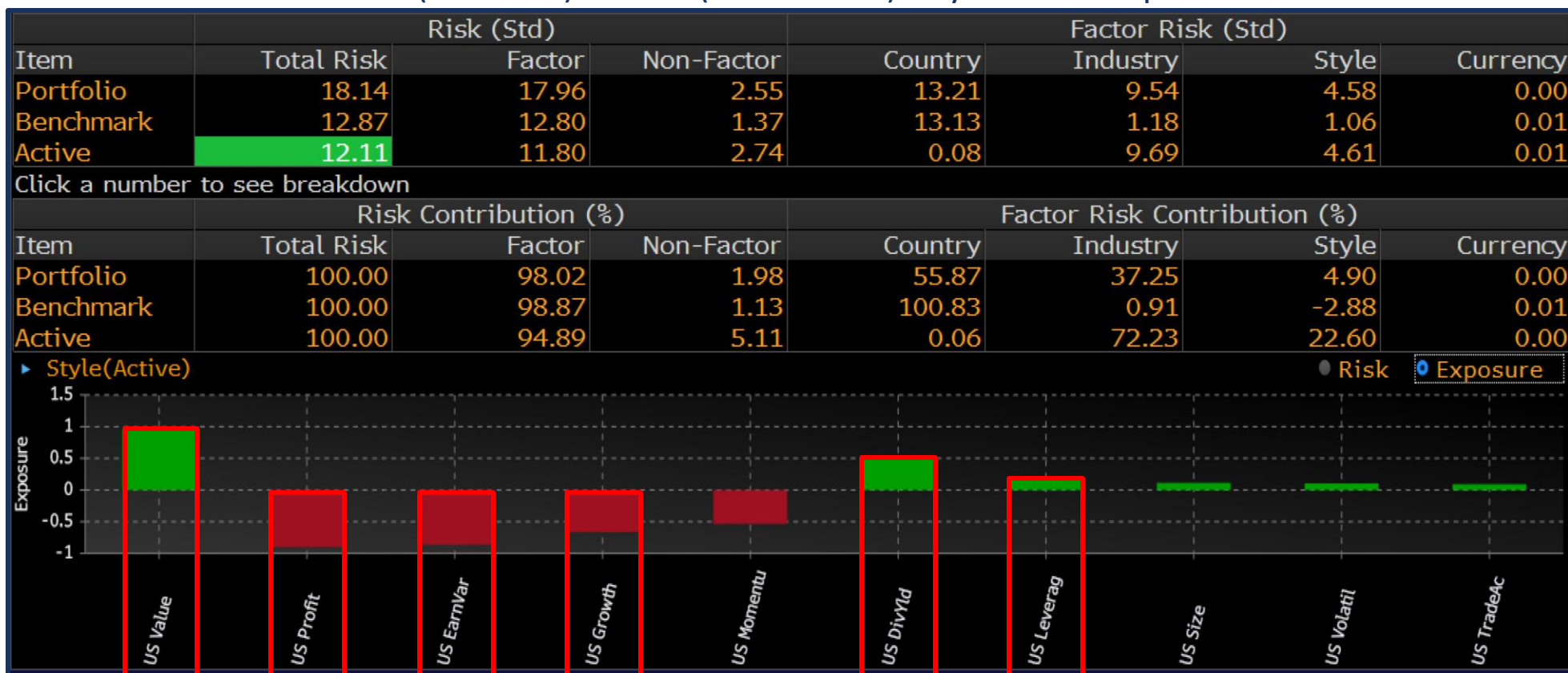


Source: Bloomberg. Data accessed on July 25, 2019.

KBWB HAS GREATER EXPOSURE TO US VALUE, US DIVIDEND YIELDS, & US LEVERAGE

SPY HAS GREATER EXPOSURE TO US PROFIT, US EARNINGS, & US GROWTH

KBWB (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

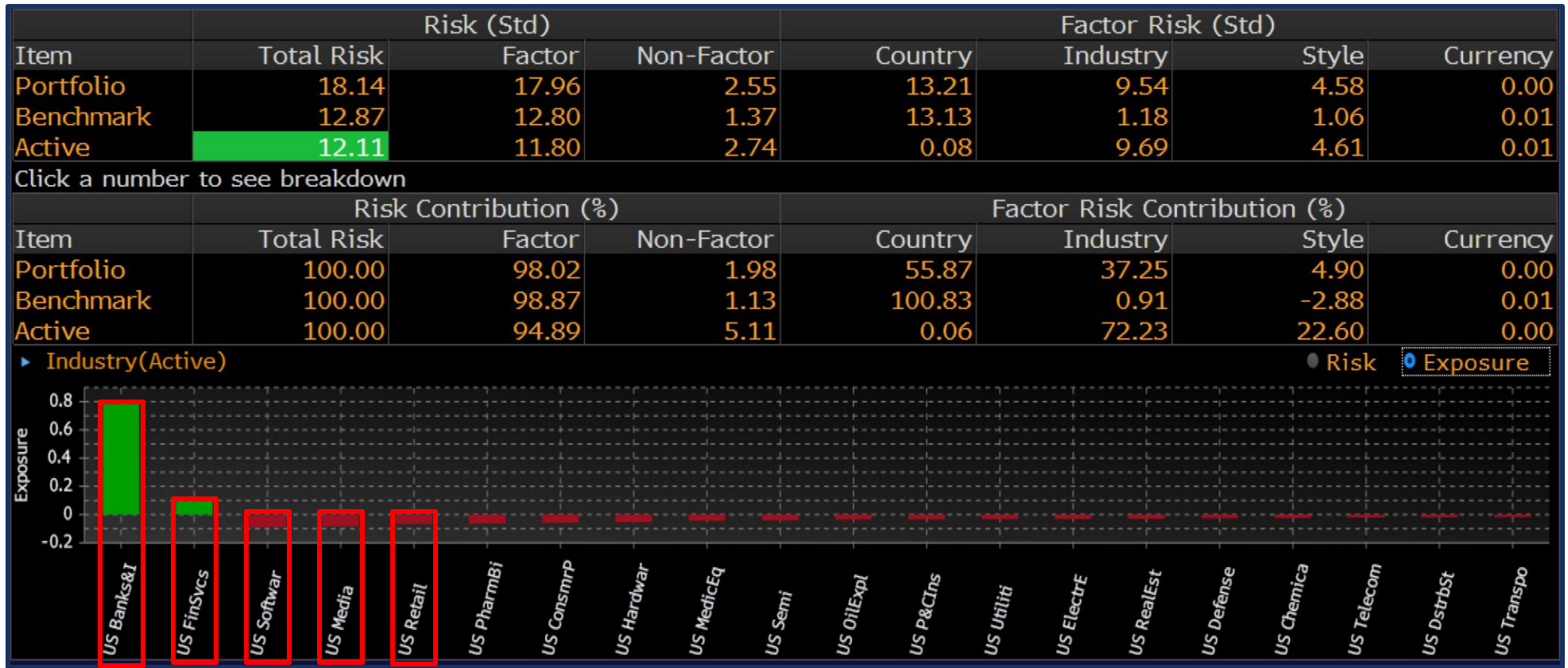


Source: Bloomberg. Data accessed on July 25, 2019.

KBWB HAS GREATER EXPOSURE TO US BANKS & US FINANCIAL SERVICES

SPY HAS GREATER EXPOSURE TO US SOFTWARE, US MEDIA, & US RETAIL

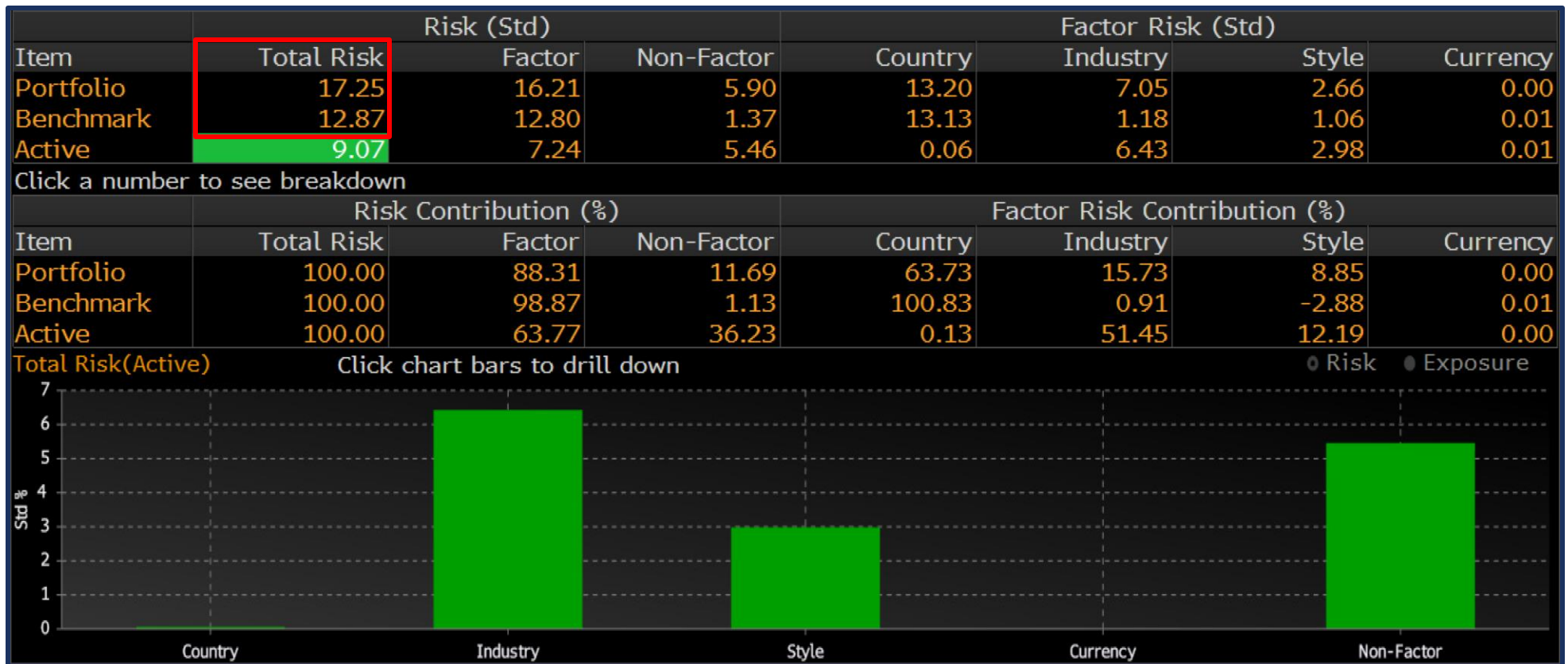
### KBWB (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS XLC & SPY TO HAVE TOTAL RISKS OF 17.25% & 12.87% RESPECTIVELY

## XLC (Portfolio) vs. SPY (Benchmark): Total Risk



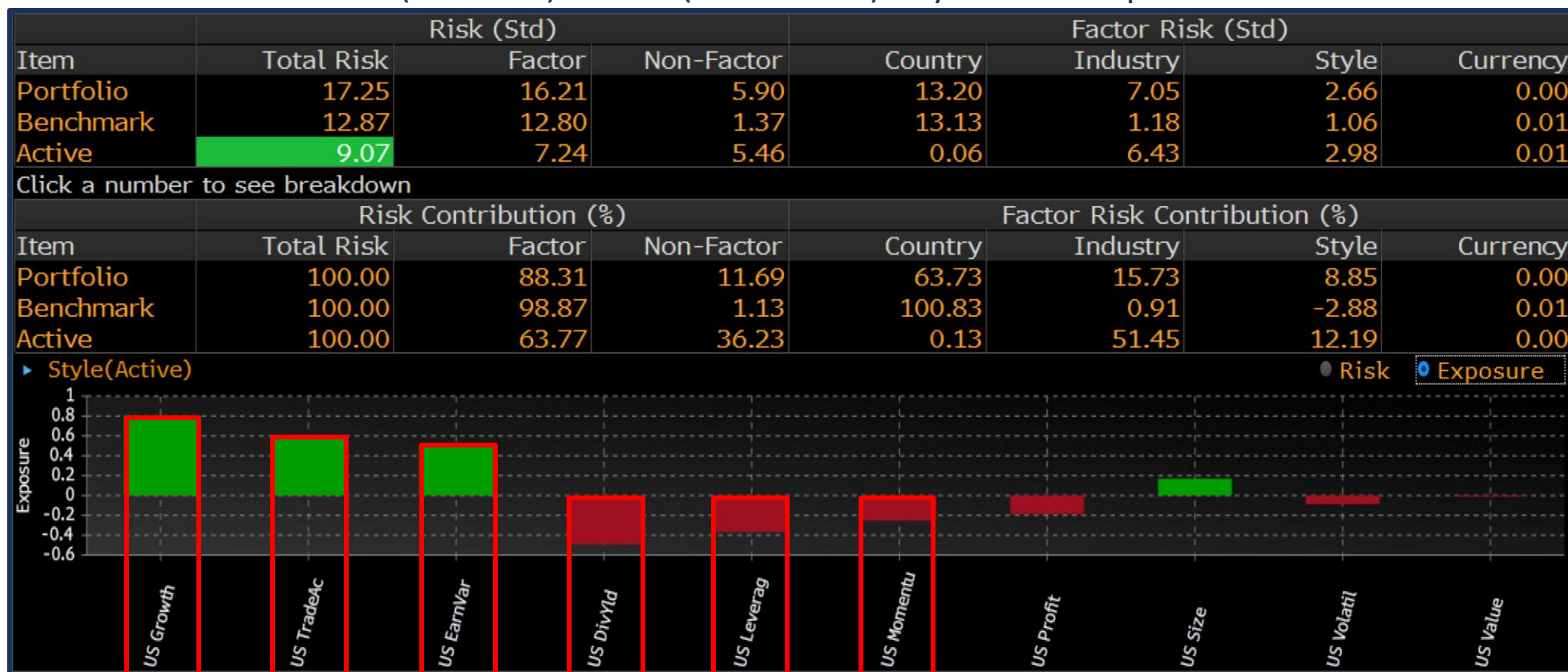
Source: Bloomberg. Data accessed on July 25, 2019.



**XLC HAS GREATER EXPOSURE TO US GROWTH, US TRADE ACTIVITY, & US EARNINGS**

**SPY HAS GREATER EXPOSURE TO US DIVIDEND YIELDS, US LEVERAGE, & US MOMENTUM**

XLC (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

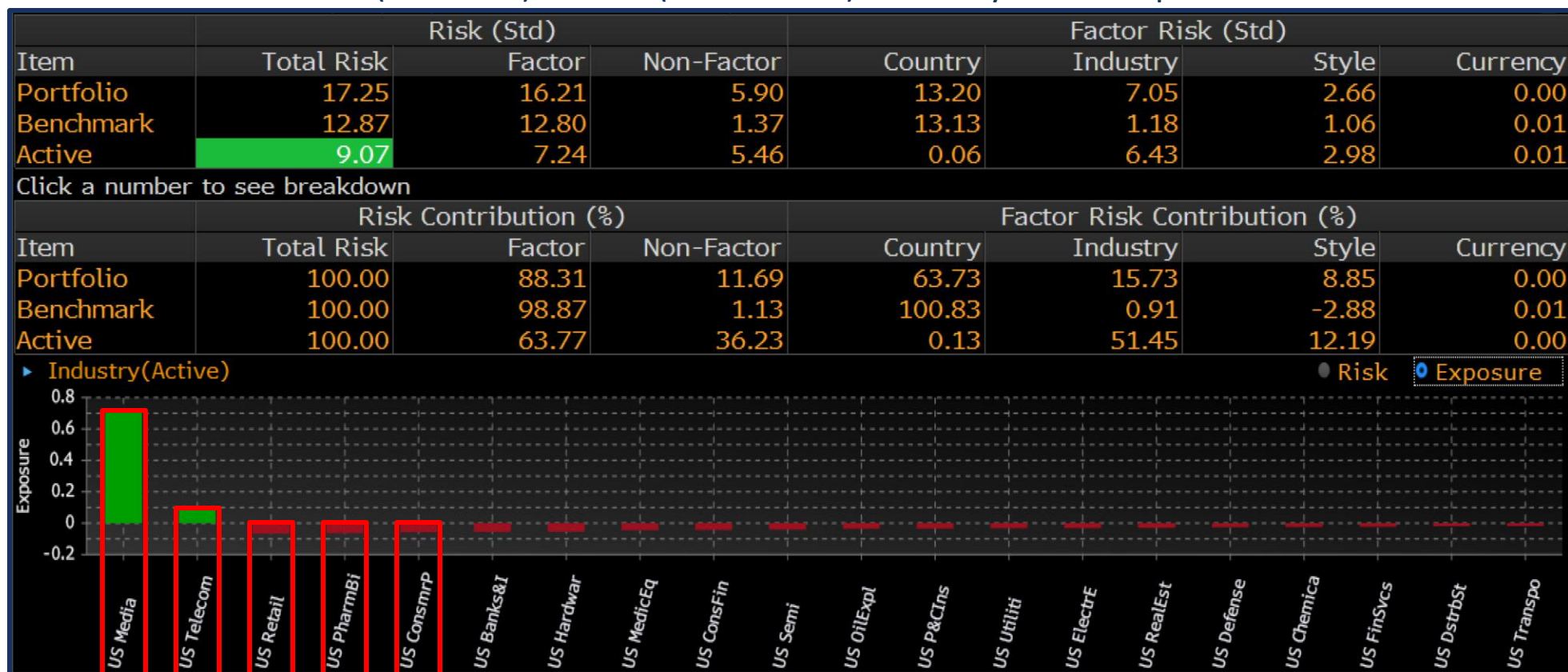


Source: Bloomberg. Data accessed on July 25, 2019.

# XLC HAS GREATER EXPOSURE TO US MEDIA & US TELECOMMUNICATIONS

## SPY HAS GREATER EXPOSURE TO US RETAIL, US PHARMA, & US CONSUMER PRODUCTS

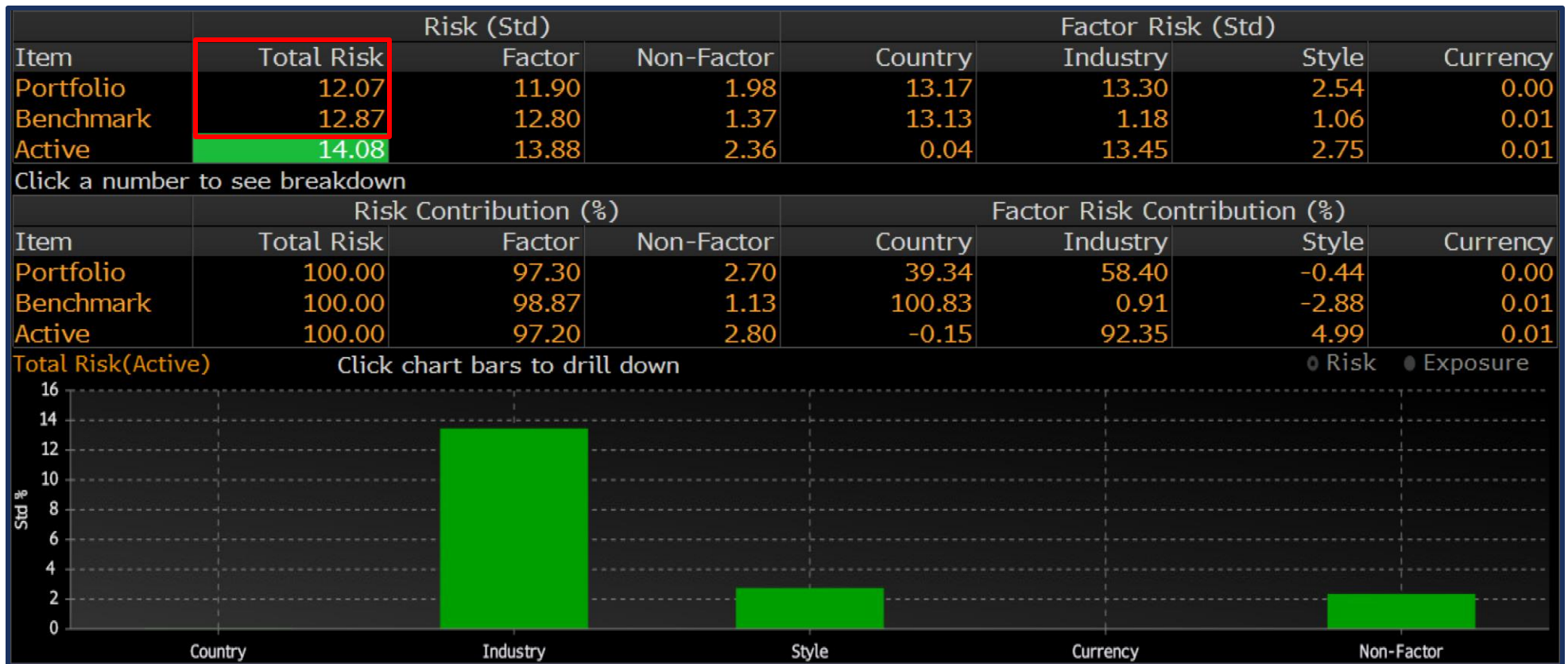
XLC (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS XLU & SPY TO HAVE TOTAL RISKS OF 12.07% & 12.87% RESPECTIVELY

## XLU (Portfolio) vs. SPY (Benchmark): Total Risk

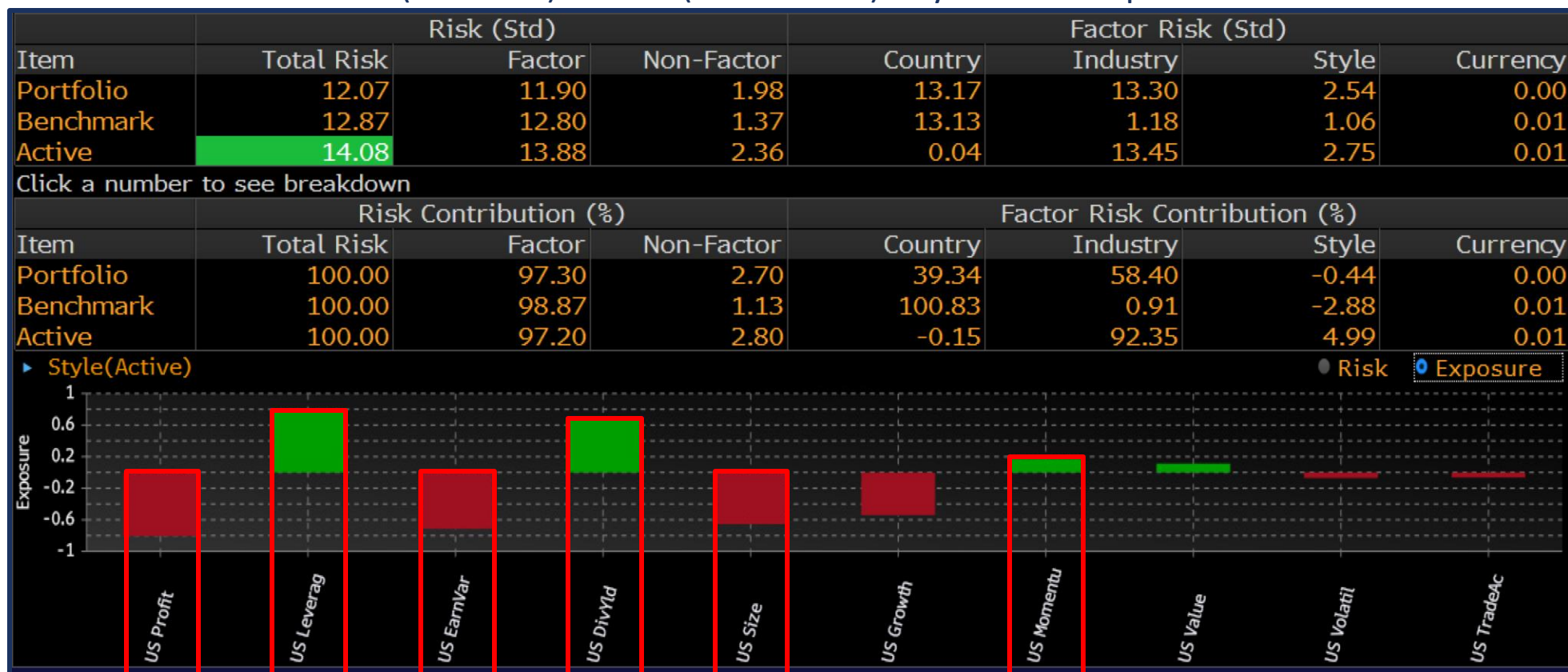


Source: Bloomberg. Data accessed on July 25, 2019.

**XLU HAS GREATER EXPOSURE TO US LEVERAGE, US DIVIDEND YIELDS, & US MOMENTUM**

**SPY HAS GREATER EXPOSURE TO US PROFIT, US EARNINGS, & US SIZE**

XLU (Portfolio) vs. SPY (Benchmark): Style Factor Exposures



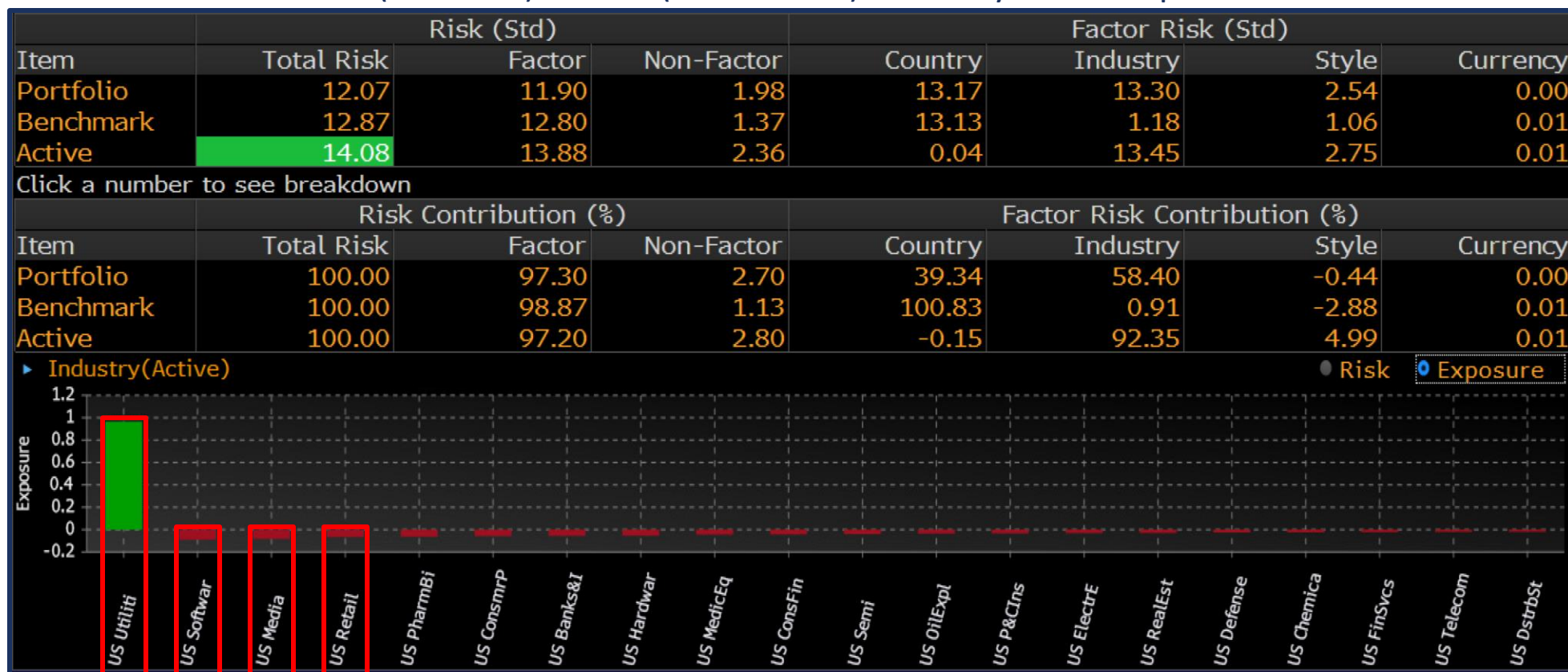
Source: Bloomberg. Data accessed on July 25, 2019.



# XLU HAS GREATER EXPOSURE TO US UTILITIES

## SPY HAS GREATER EXPOSURE TO US SOFTWARE, US MEDIA, & US RETAIL

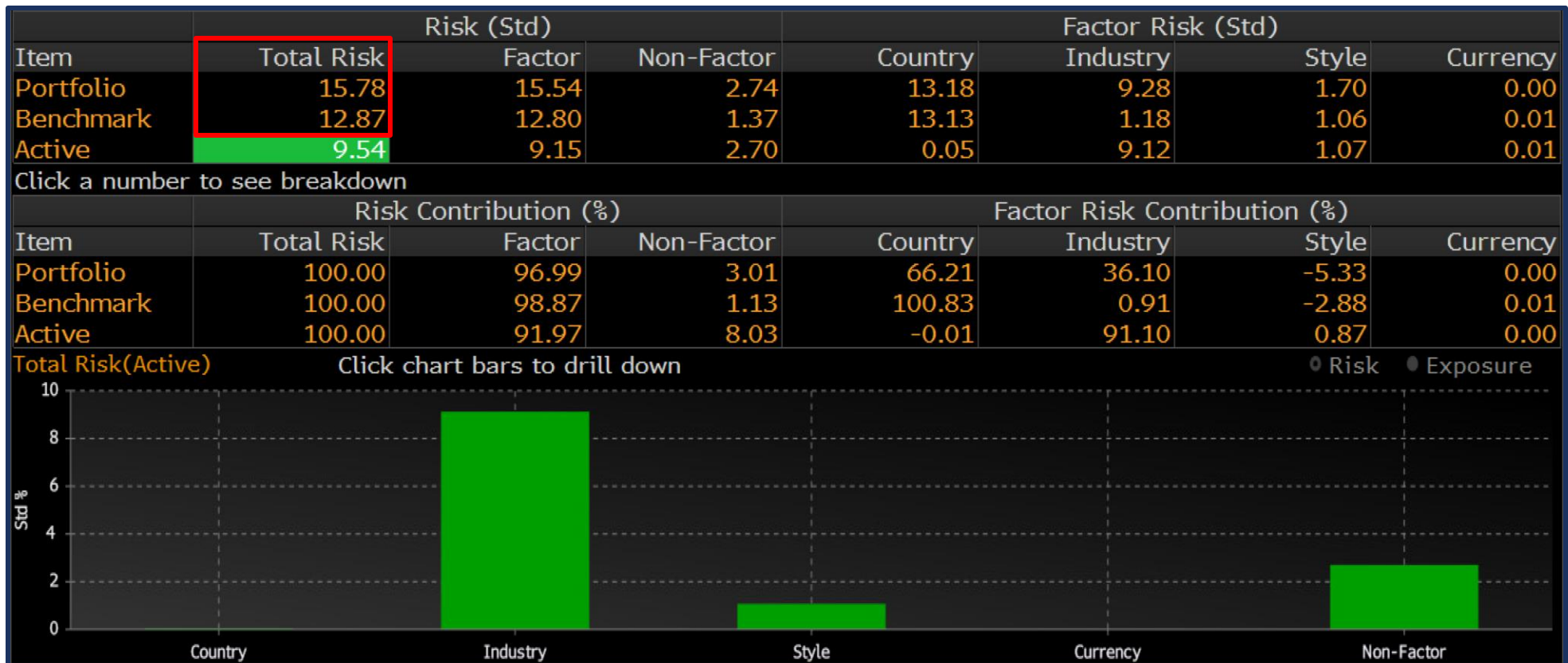
XLU (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS XLV & SPY TO HAVE TOTAL RISKS OF 15.78% & 12.87% RESPECTIVELY

## XLV (Portfolio) vs. SPY (Benchmark): Total Risk

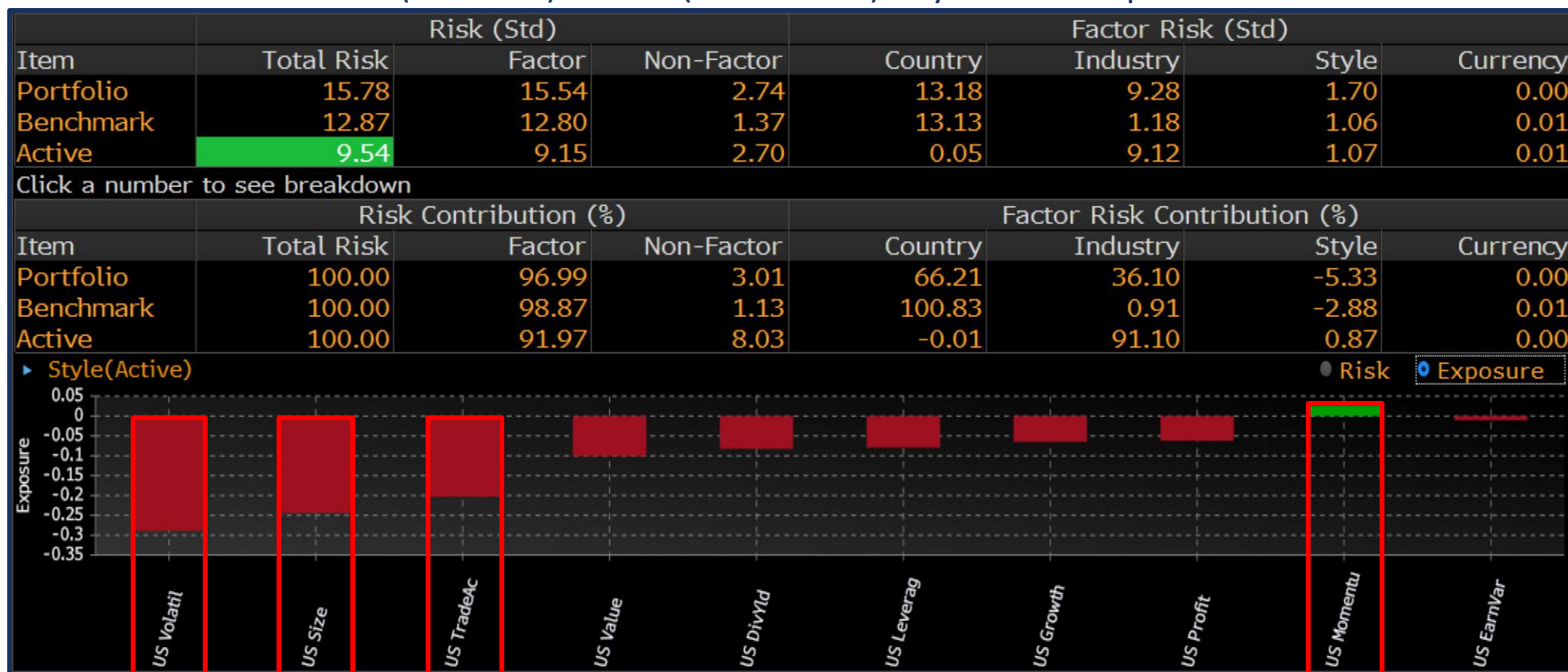


Source: Bloomberg. Data accessed on July 25, 2019.

# XLV HAS GREATER EXPOSURE TO US MOMENTUM

## SPY HAS GREATER EXPOSURE TO US VOLATILITY, US SIZE, & US TRADE ACTIVITY

XLV (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

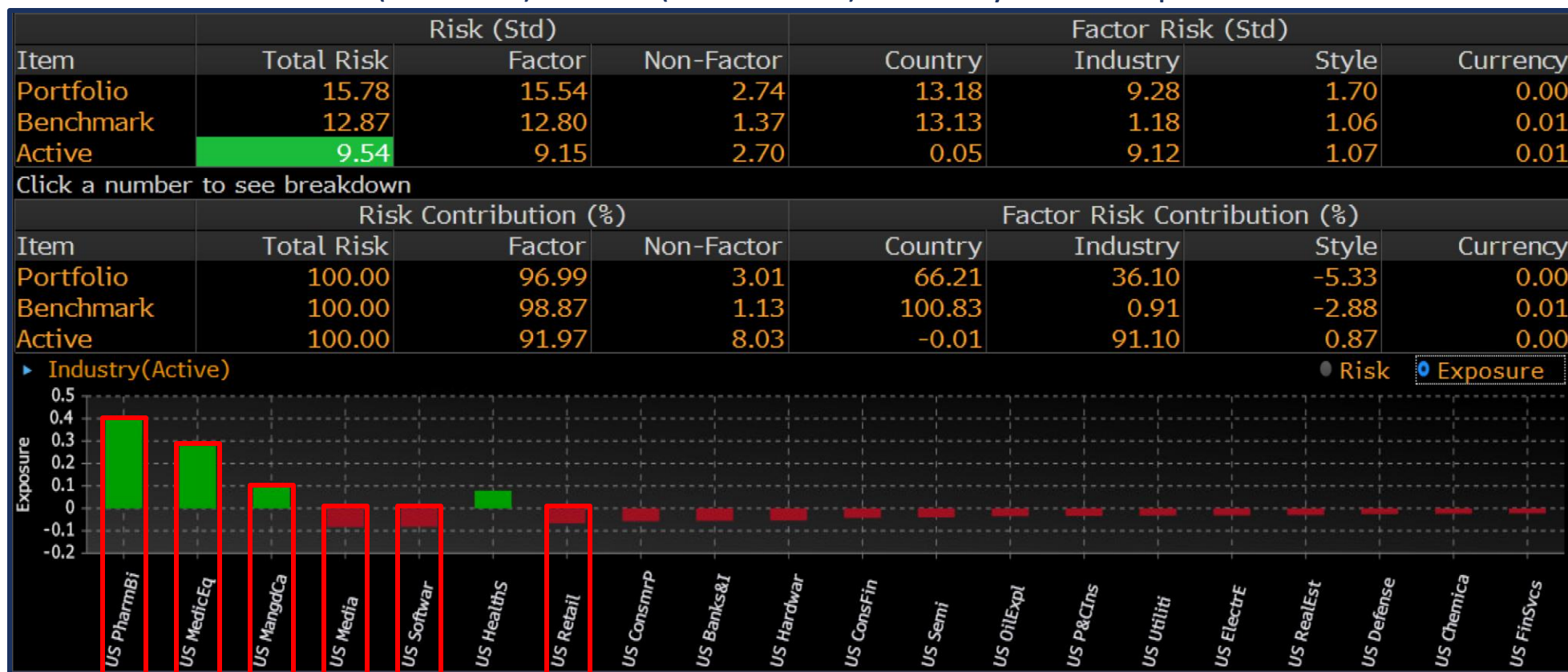


Source: Bloomberg. Data accessed on July 25, 2019.

**XLV HAS GREATER EXPOSURE TO US PHARMA, US MEDICAL EQUIPMENT, & US MANAGED CARE**

**SPY HAS GREATER EXPOSURE TO US MEDIA, US SOFTWARE, & US RETAIL**

XLV (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures

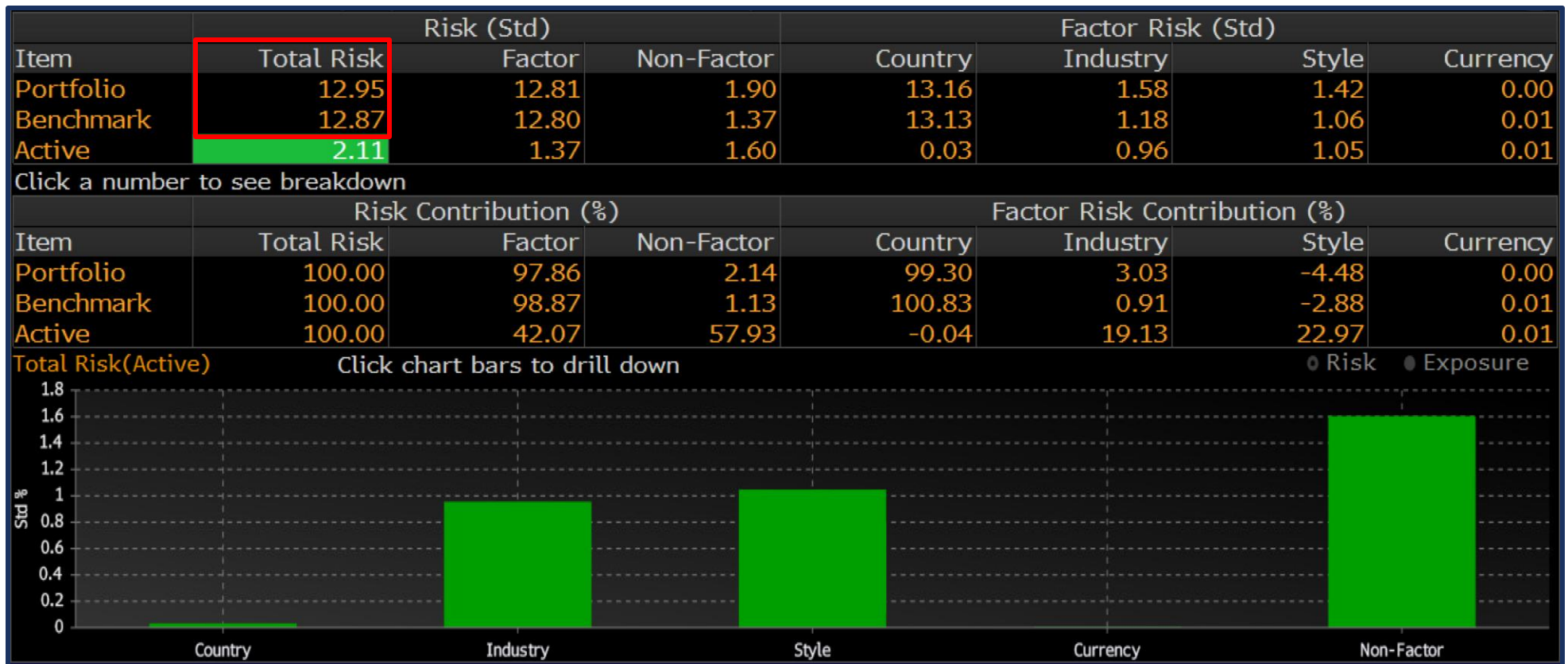


Source: Bloomberg. Data accessed on July 25, 2019.



# BLOOMBERG PROJECTS QUAL & SPY TO HAVE TOTAL RISKS OF 12.95% & 12.87% RESPECTIVELY

## QUAL (Portfolio) vs. SPY (Benchmark): Total Risk

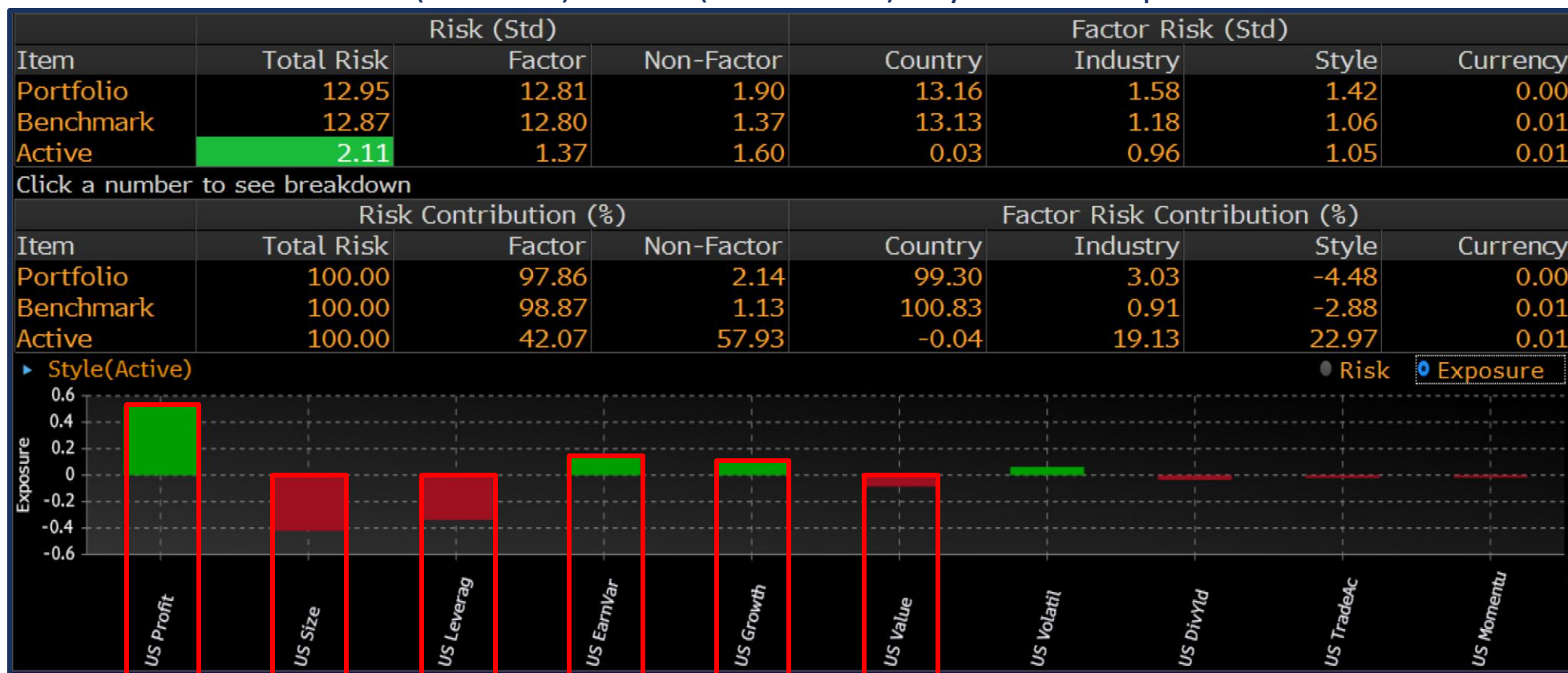


Source: Bloomberg. Data accessed on July 25, 2019.

QUAL HAS GREATER EXPOSURE TO US PROFIT, US EARNINGS, & US GROWTH

SPY HAS GREATER EXPOSURE TO US SIZE, US LEVERAGE, & US VALUE

QUAL (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

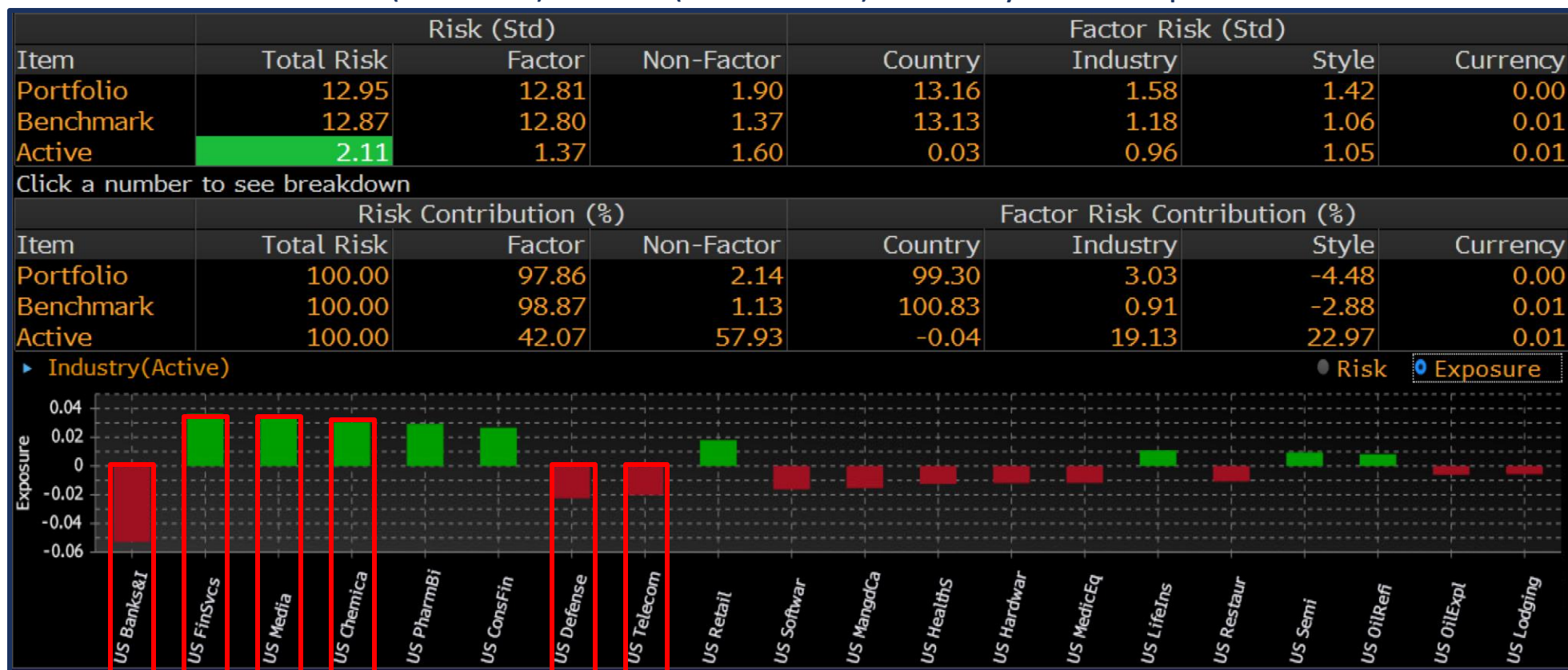


Source: Bloomberg. Data accessed on July 25, 2019.

QUAL HAS GREATER EXPOSURE TO US FINANCIAL SERVICES, US MEDIA, & US CHEMICALS

SPY HAS GREATER EXPOSURE TO US BANKS, US DEFENSE, & US TELECOMMUNICATIONS

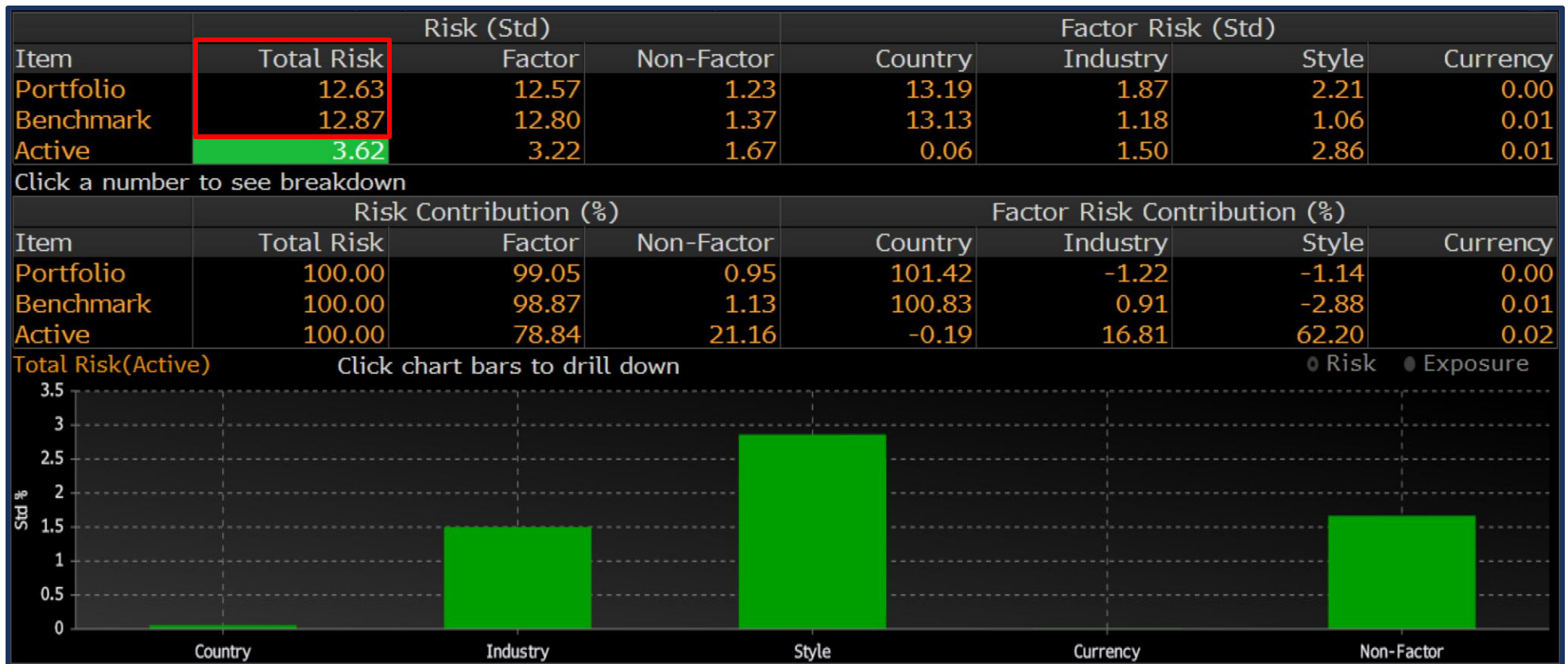
QUAL (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS USMF & SPY TO HAVE TOTAL RISKS OF 12.63% & 12.87% RESPECTIVELY

## USMF (Portfolio) vs. SPY (Benchmark): Total Risk



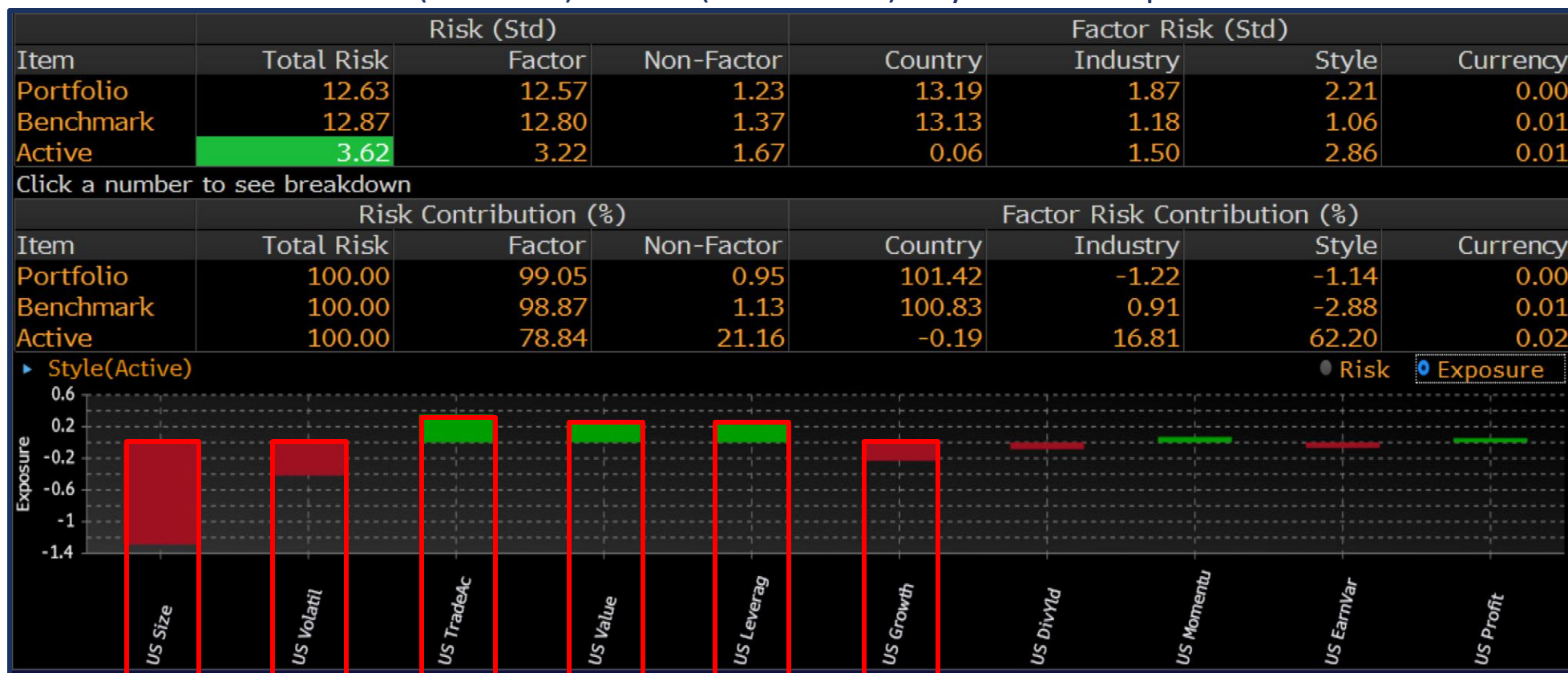
Source: Bloomberg. Data accessed on July 25, 2019.



USMF HAS GREATER EXPOSURE TO US TRADE ACTIVITY, US VALUE, & US LEVERAGE

SPY HAS GREATER EXPOSURE TO US SIZE, US VOLATILITY, & US GROWTH

### USMF (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

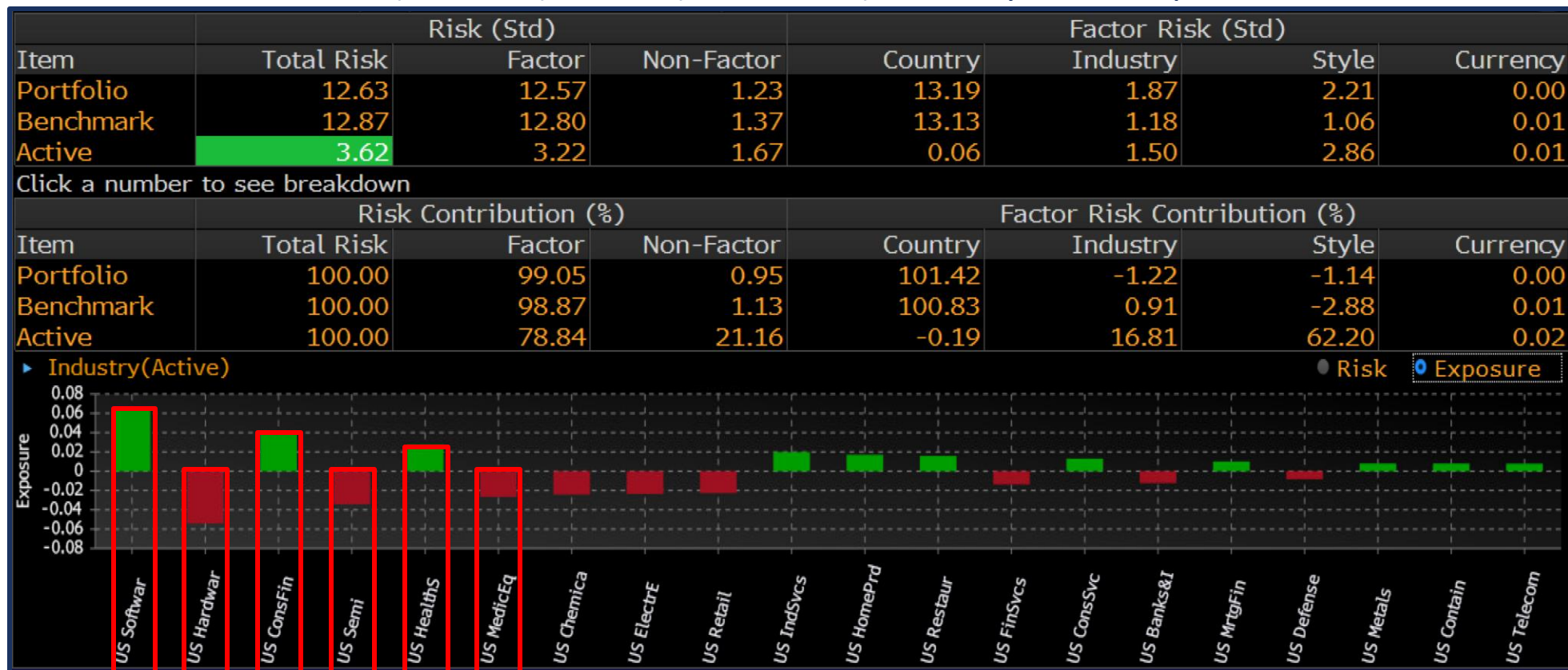


Source: Bloomberg. Data accessed on July 25, 2019.

USMF HAS GREATER EXPOSURE TO US SOFTWARE, US CONSUMER FINANCE, & US HEALTH SERVICES

SPY HAS GREATER EXPOSURE TO US HARDWARE, US SEMICONDUCTORS, & US MEDICAL EQUIPMENT

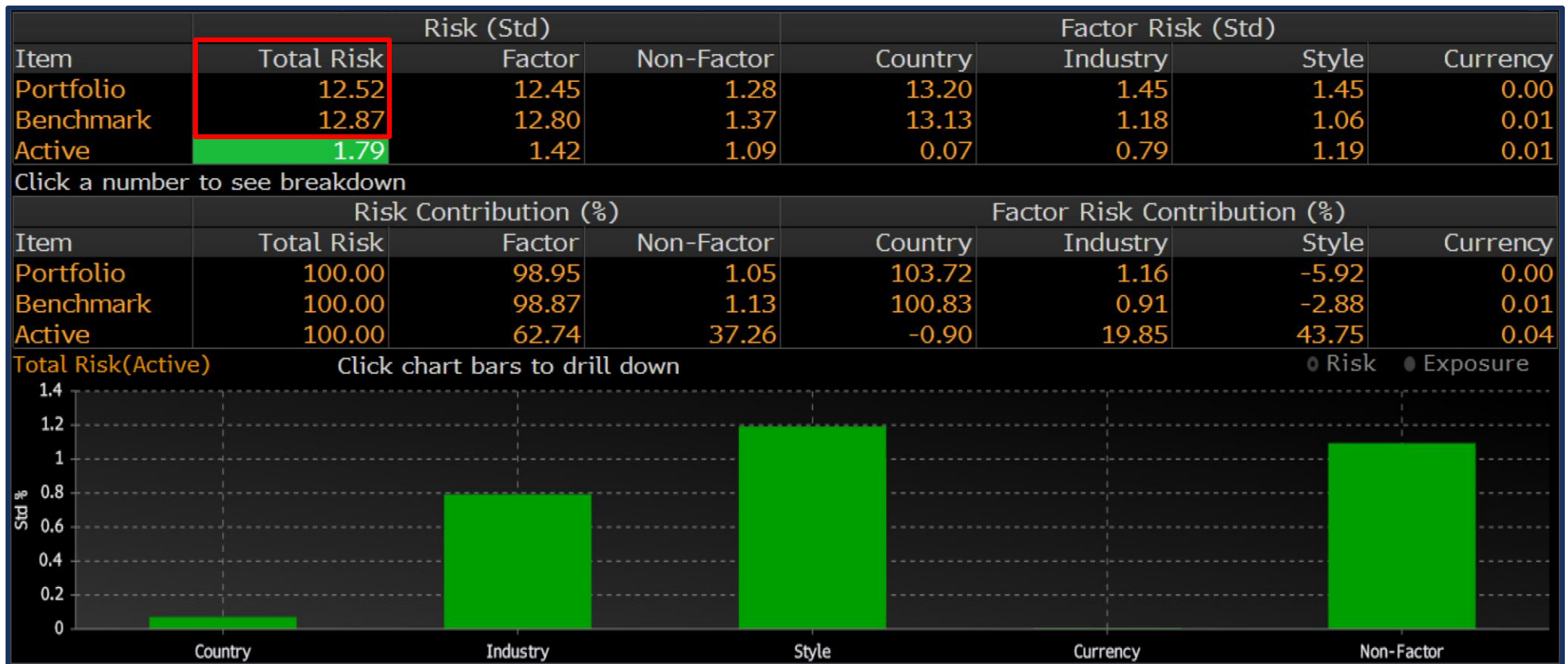
### USMF (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS JQUA & SPY TO HAVE TOTAL RISKS OF 12.52% & 12.87% RESPECTIVELY

## JQUA (Portfolio) vs. SPY (Benchmark): Total Risk

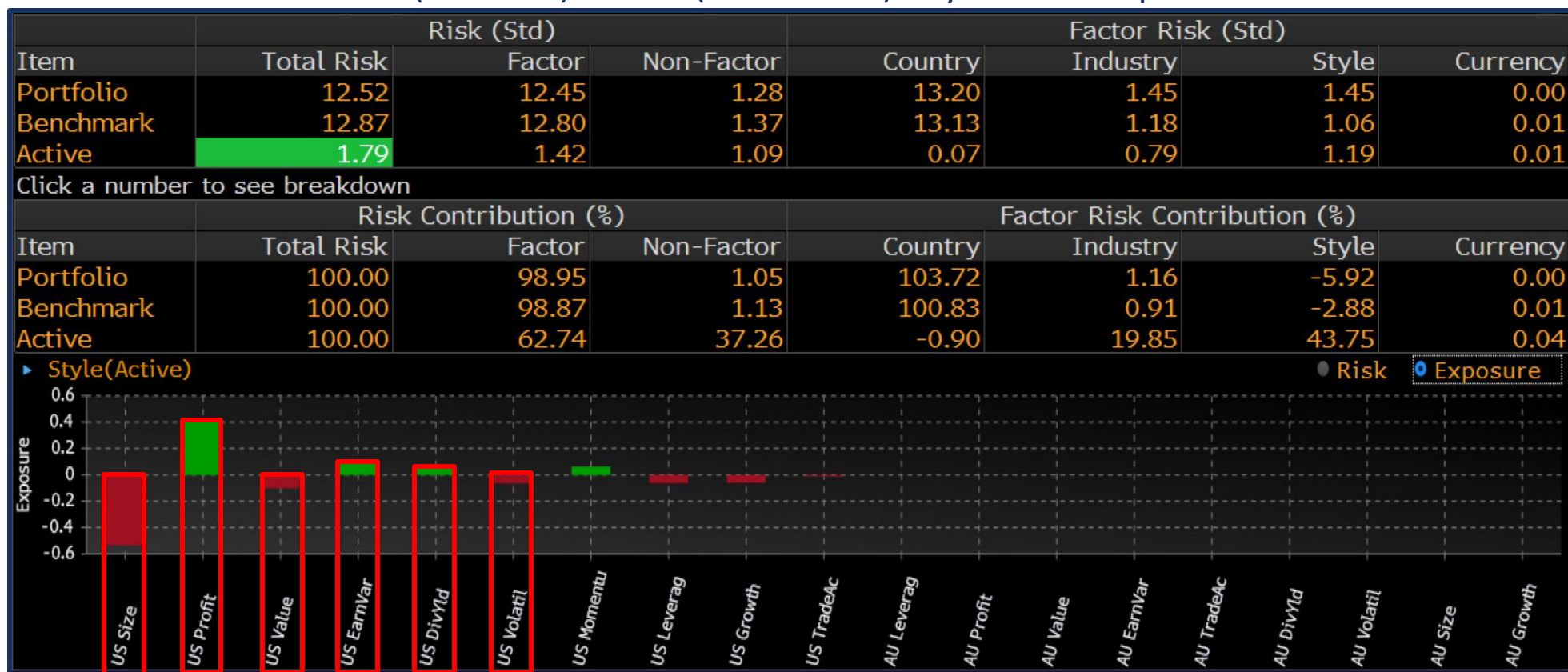


Source: Bloomberg. Data accessed on July 25, 2019.

# JQUA HAS GREATER EXPOSURE TO US PROFIT, US EARNINGS, & US DIVIDEND YIELDS

# SPY HAS GREATER EXPOSURE TO US SIZE, US VALUE, & US VOLATILITY

JQUA (Portfolio) vs. SPY (Benchmark): Style Factor Exposures



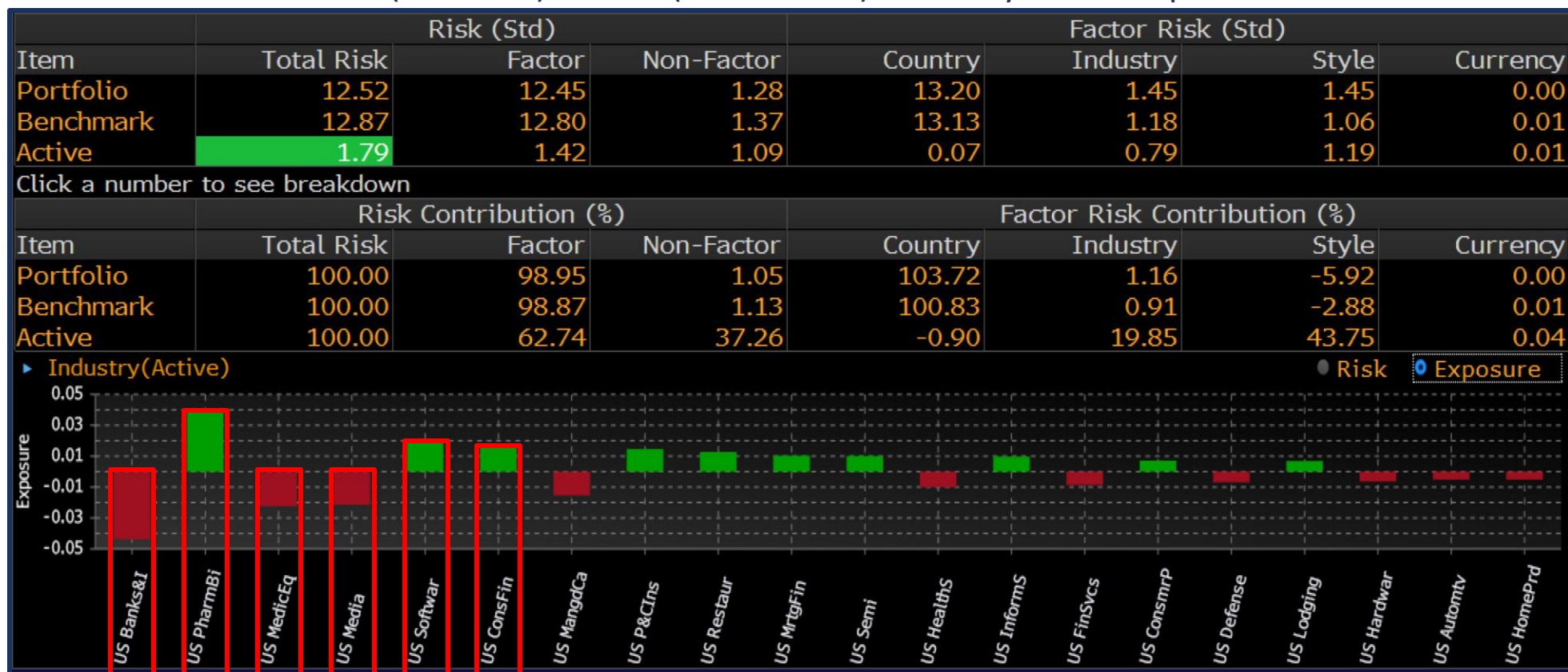
Source: Bloomberg. Data accessed on July 25, 2019.



JQUA HAS GREATER EXPOSURE TO US PHARMA, US SOFTWARE, & US CONSUMER FINANCE

SPY HAS GREATER EXPOSURE TO US BANKS, US MEDICAL EQUIPMENT, & US MEDIA

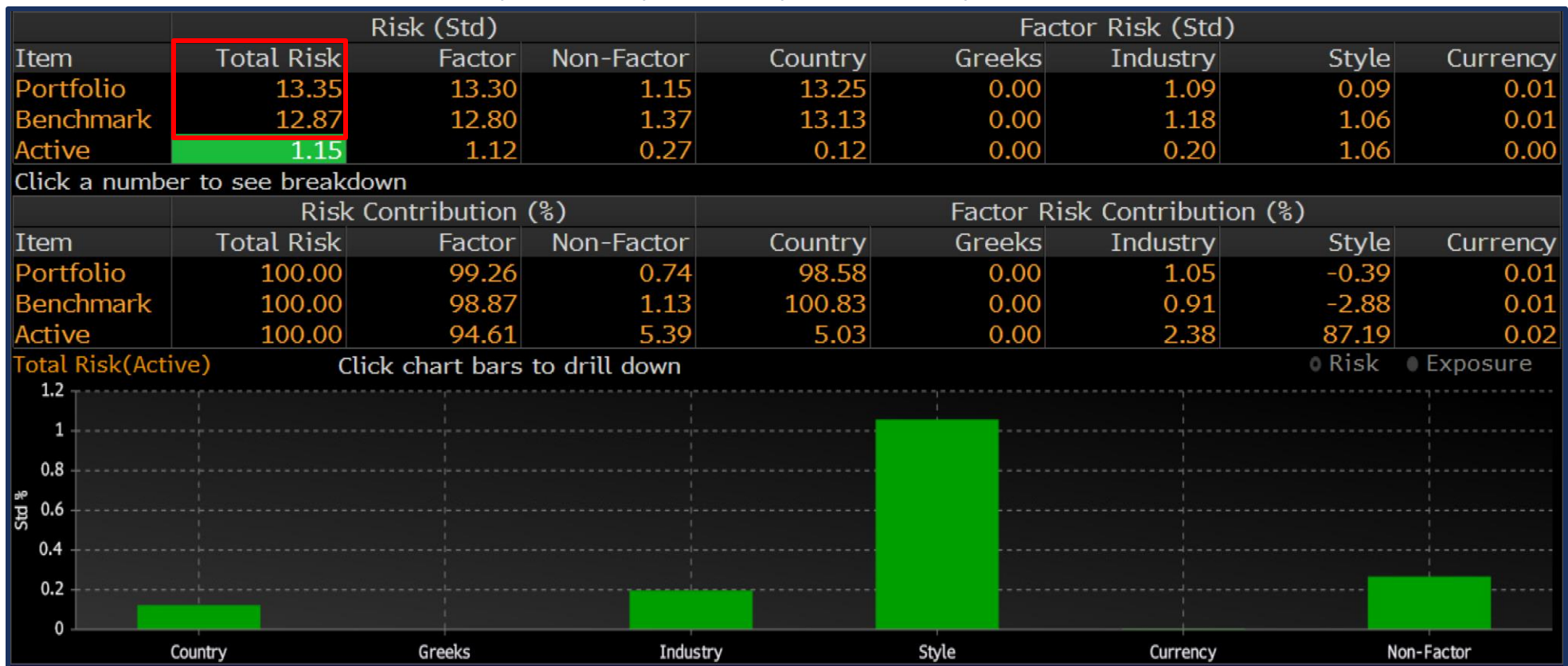
JQUA (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS VTI & SPY TO HAVE TOTAL RISKS OF 13.35% & 12.87% RESPECTIVELY

## VTI (Portfolio) vs. SPY (Benchmark): Total Risk

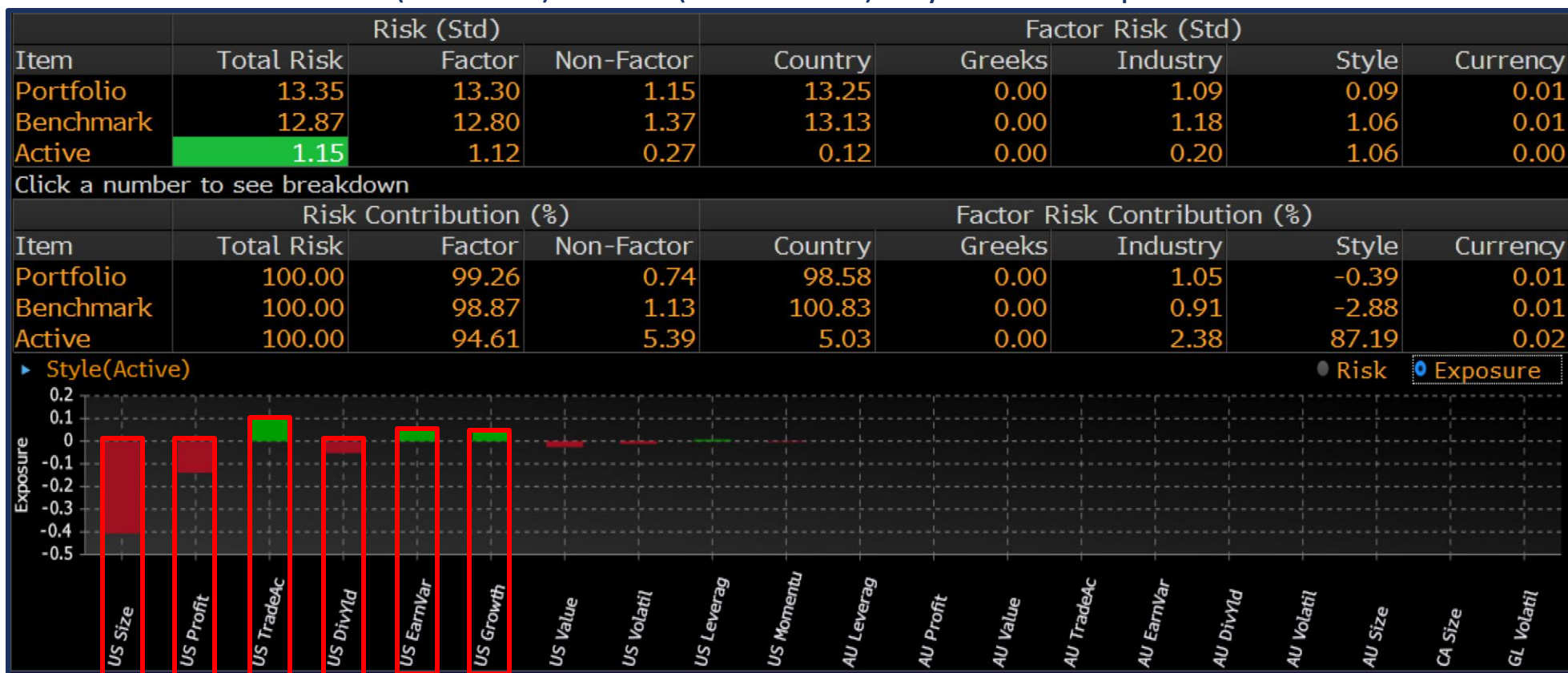


Source: Bloomberg. Data accessed on July 25, 2019.

VTI HAS GREATER EXPOSURE TO US TRADE ACTIVITY, US EARNINGS, & US GROWTH

SPY HAS GREATER EXPOSURE TO US SIZE, US PROFIT, & US DIVIDEND YIELDS

VTI (Portfolio) vs. SPY (Benchmark): Style Factor Exposures



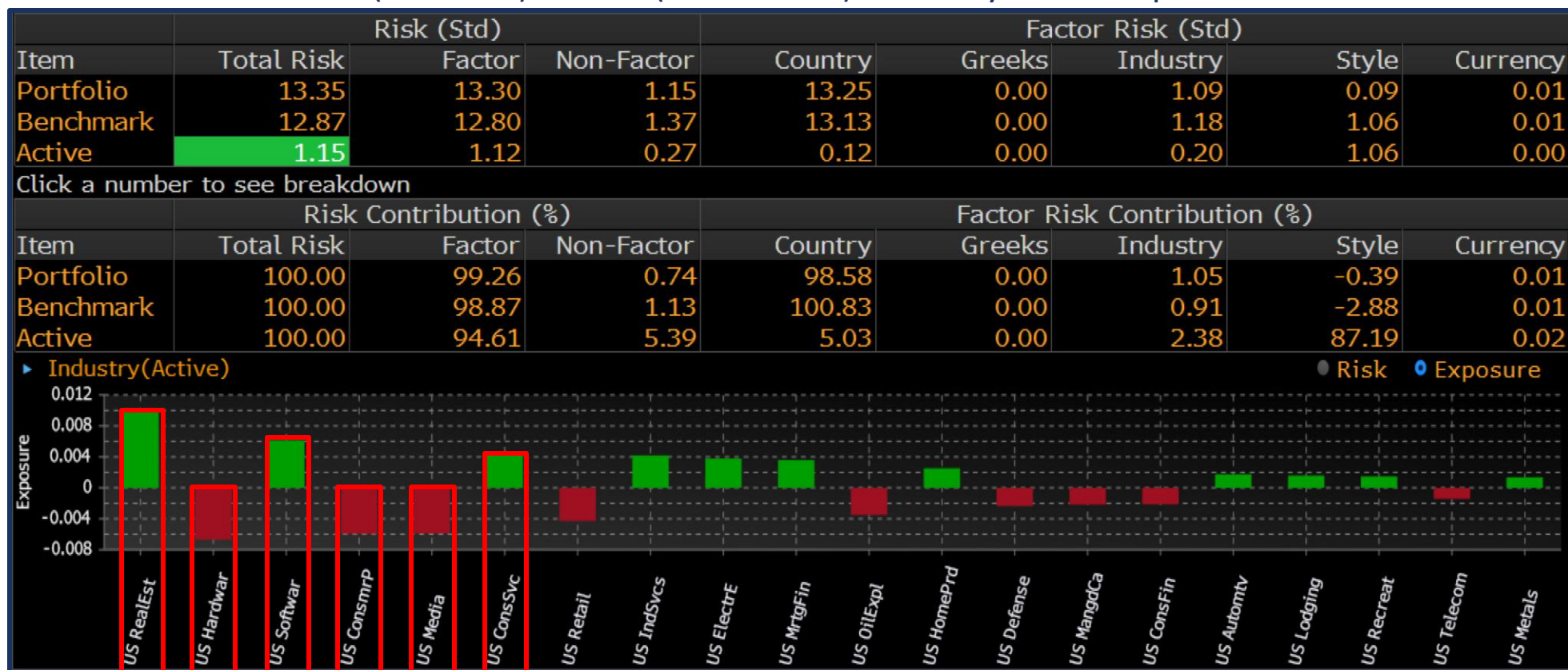
Source: Bloomberg. Data accessed on July 25, 2019.



VTI HAS GREATER EXPOSURE TO US REAL ESTATE, US SOFTWARE, & US CONSUMER SERVICES

SPY HAS GREATER EXPOSURE TO US HARDWARE, US CONSUMER PRODUCTS, & US MEDIA

### VTI (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures

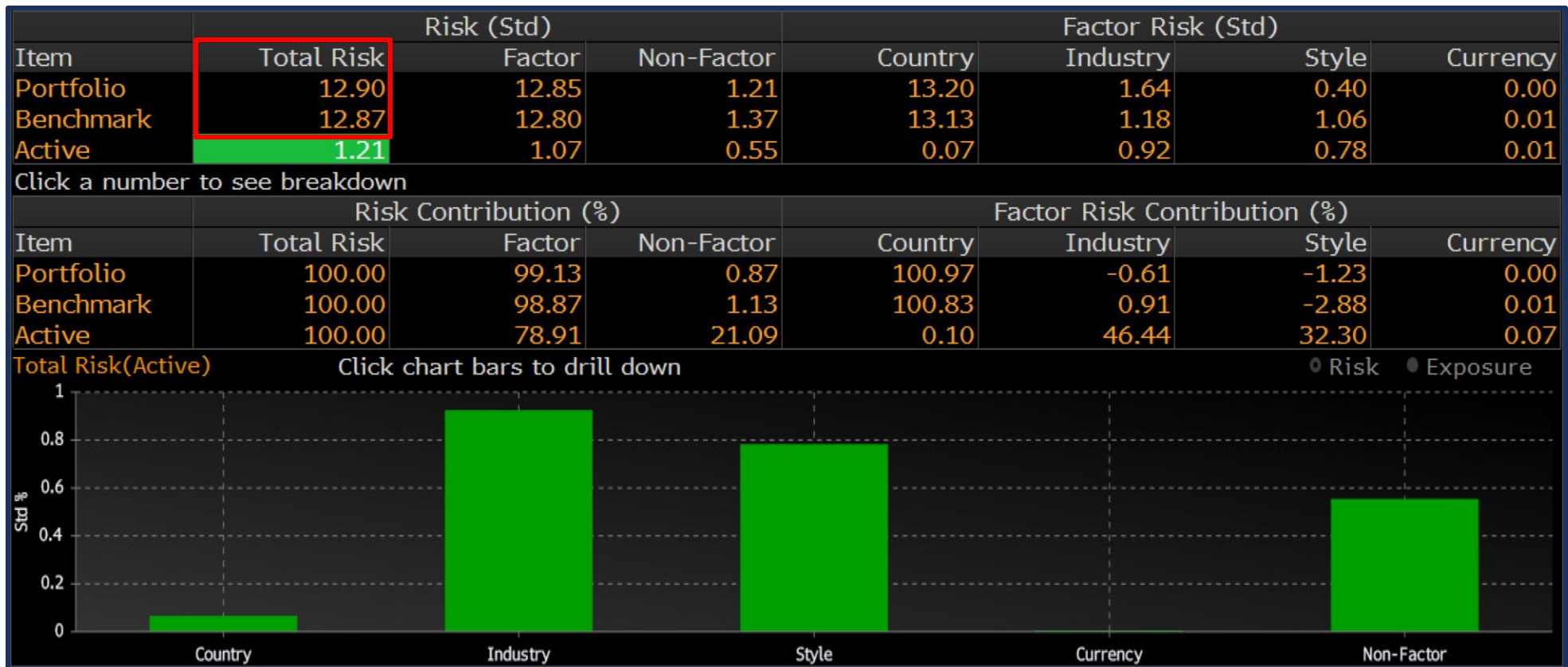


Source: Bloomberg. Data accessed on July 25, 2019.



# BLOOMBERG PROJECTS GSLC & SPY TO HAVE TOTAL RISKS OF 12.90% & 12.87% RESPECTIVELY

## GSLC (Portfolio) vs. SPY (Benchmark): Total Risk

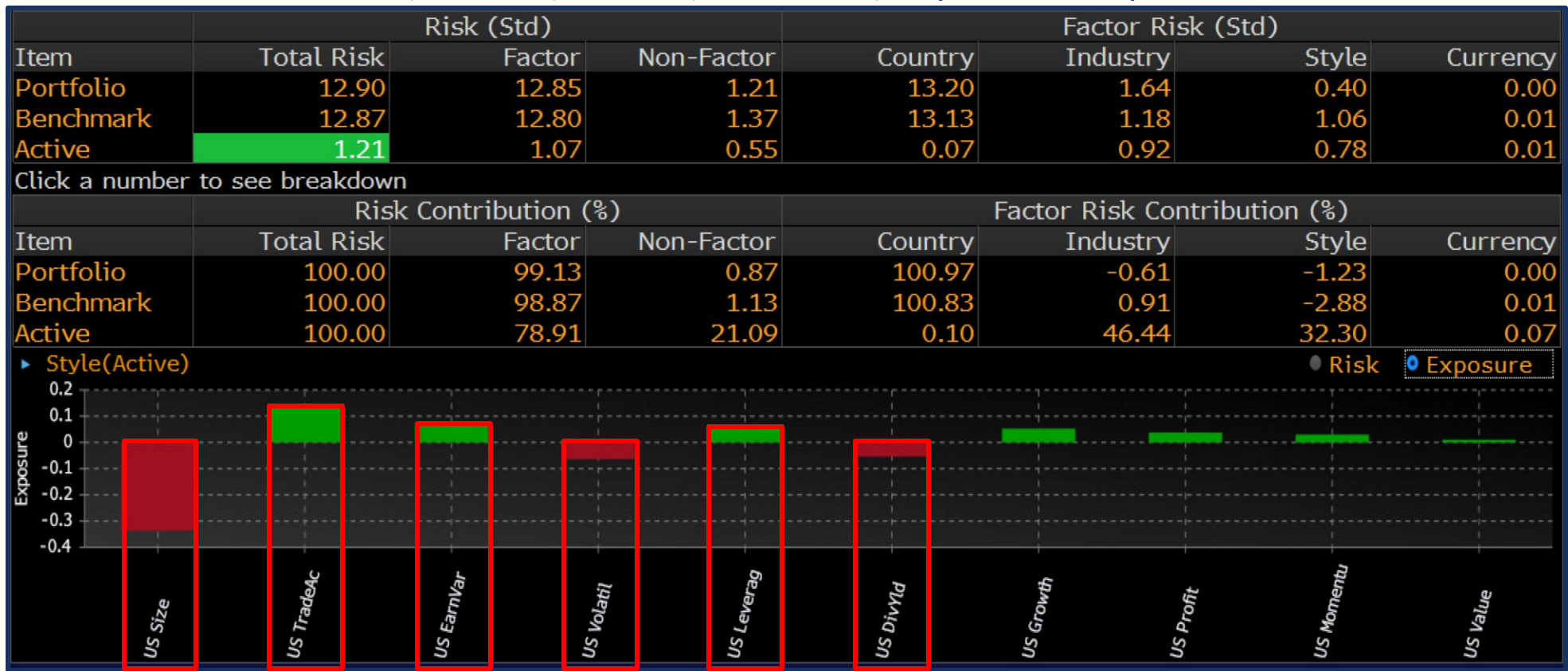


Source: Bloomberg. Data accessed on July 25, 2019.

GSLC HAS GREATER EXPOSURE TO US TRADE ACTIVITY, US EARNINGS, & US LEVERAGE

SPY HAS GREATER EXPOSURE TO US SIZE, US VOLATILITY, & US DIVIDEND YIELDS

GSLC (Portfolio) vs. SPY (Benchmark): Style Factor Exposures

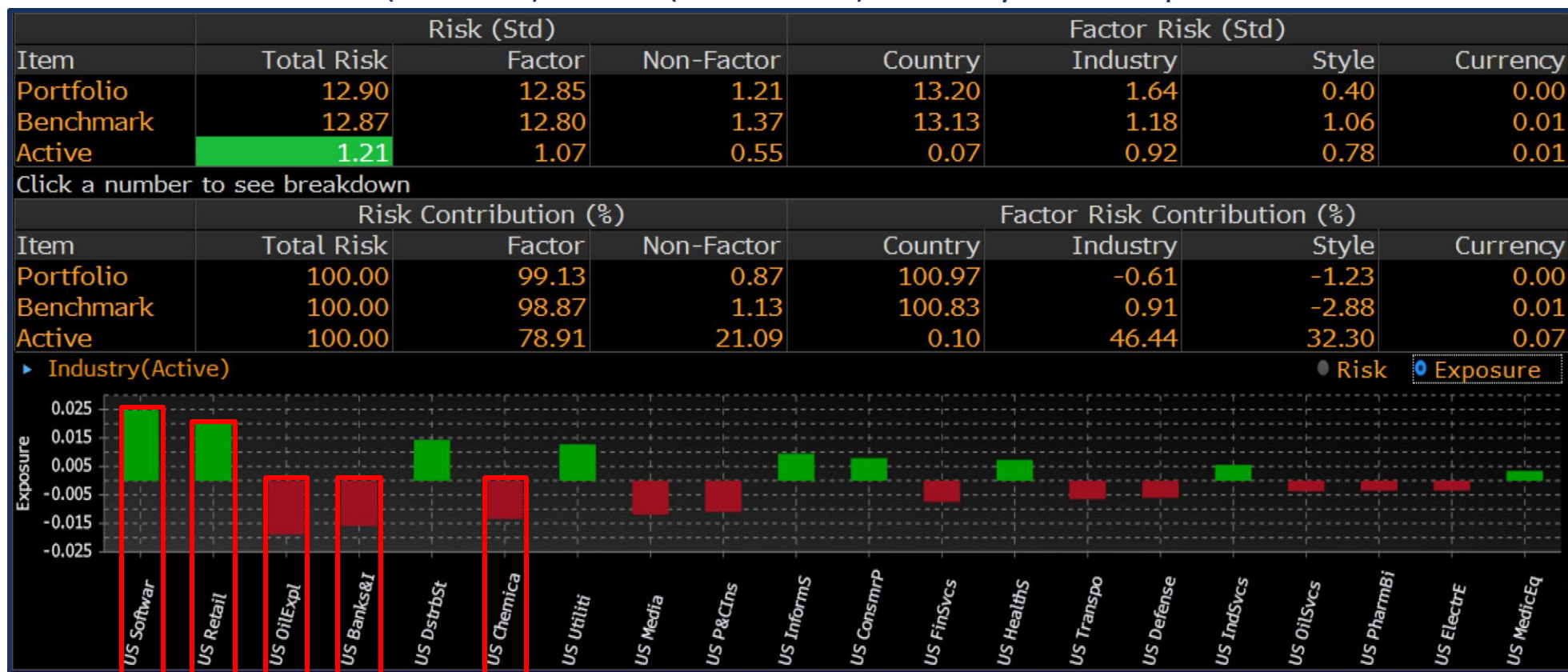


Source: Bloomberg. Data accessed on July 25, 2019.

# GSLC HAS GREATER EXPOSURE TO US SOFTWARE & US RETAIL

# SPY HAS GREATER EXPOSURE TO US OIL EXPLORATION, US BANKS, & US CHEMICALS

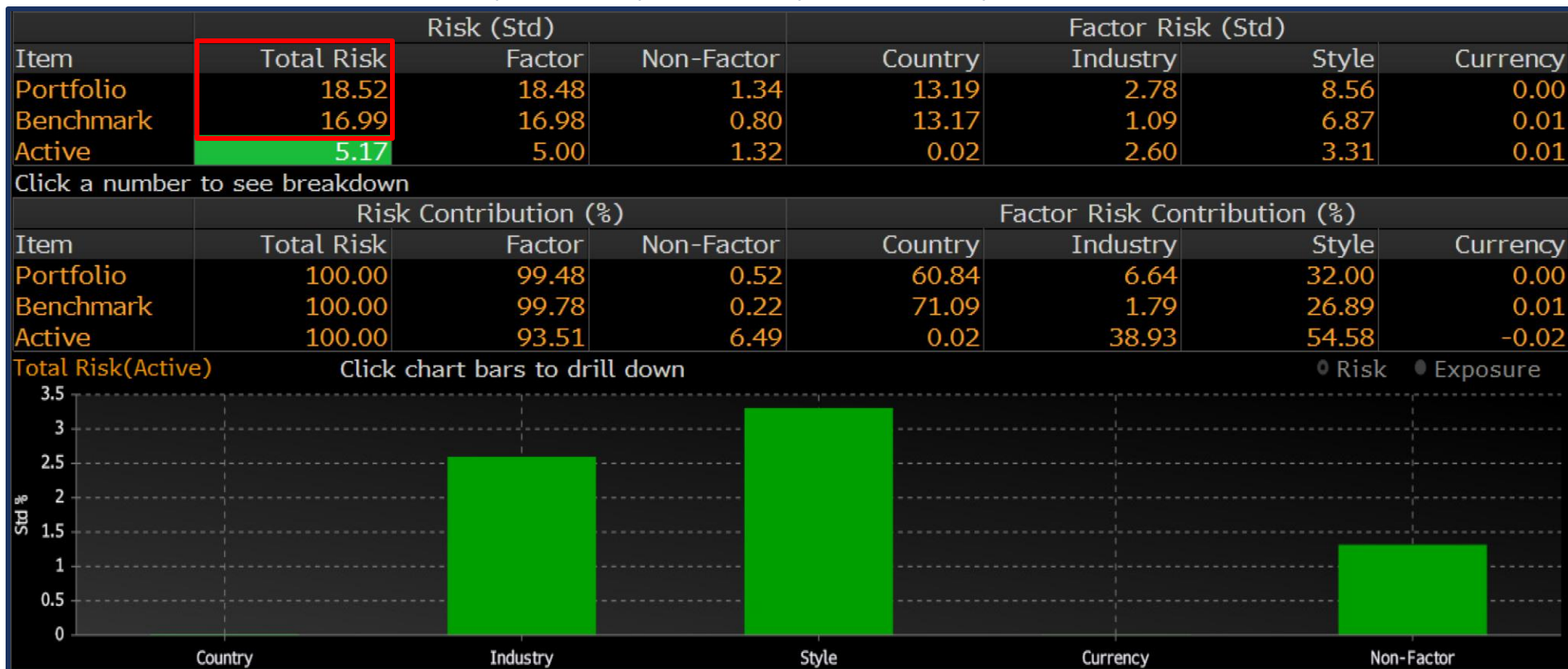
GSLC (Portfolio) vs. SPY (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS EES & IWM TO HAVE TOTAL RISKS OF 18.52% & 16.99% RESPECTIVELY

EES (Portfolio) vs. IWM (Benchmark): Total Risk



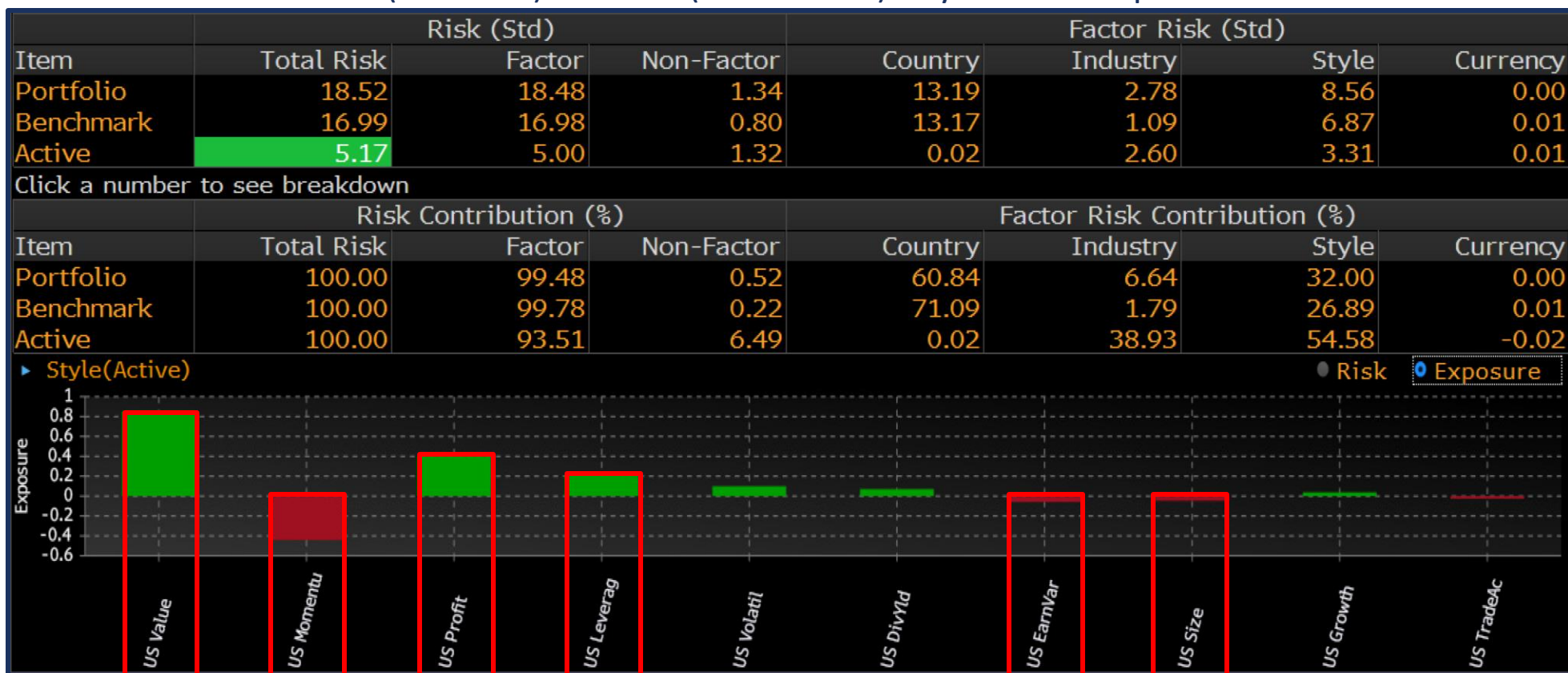
Source: Bloomberg. Data accessed on July 25, 2019.



EES HAS GREATER EXPOSURE TO US VALUE, US PROFIT, & US LEVERAGE

IWM HAS GREATER EXPOSURE TO US MOMENTUM, US EARNINGS, & US SIZE

EES (Portfolio) vs. IWM (Benchmark): Style Factor Exposures



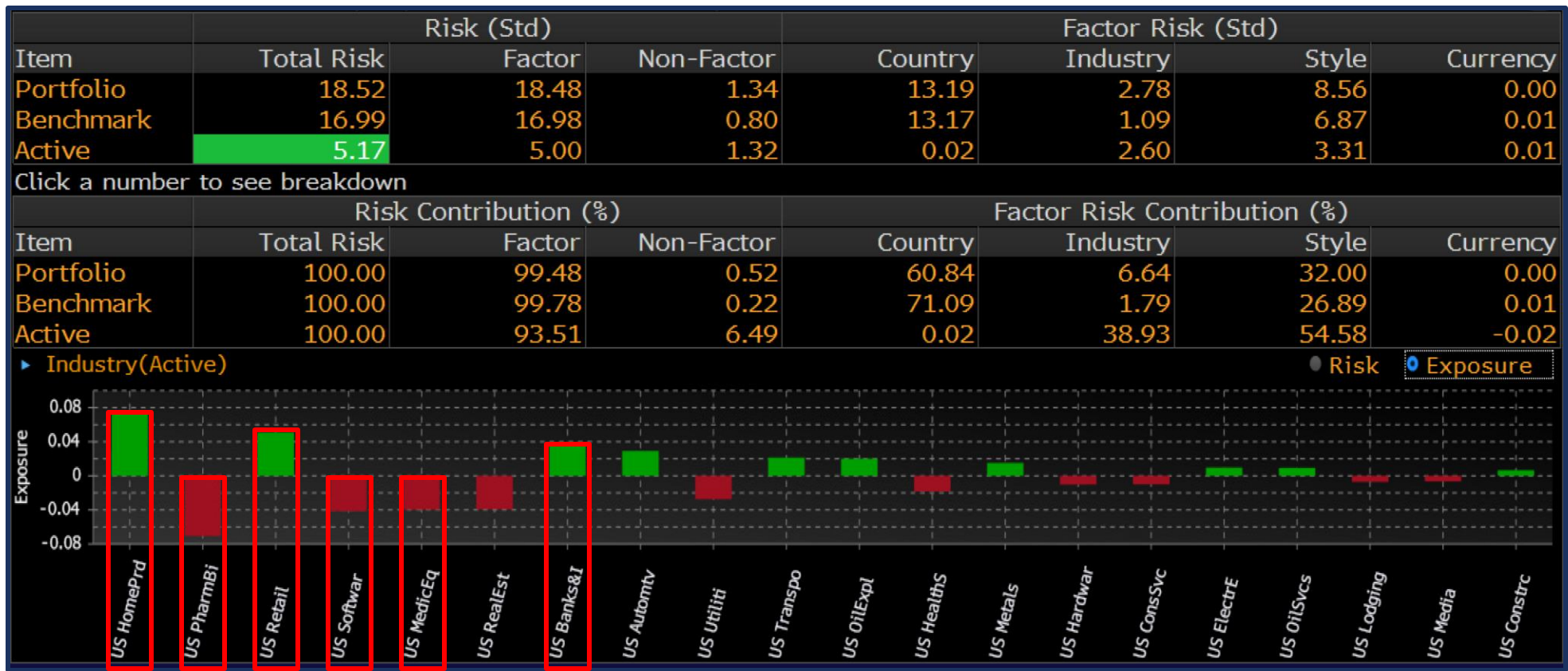
Source: Bloomberg. Data accessed on July 25, 2019.



EES HAS GREATER EXPOSURE TO US HOME PRODUCTS, US RETAIL, & US BANKS

IWM HAS GREATER EXPOSURE TO US PHARMA, US SOFTWARE, & US MEDICAL EQUIPMENT

EES (Portfolio) vs. IWM (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

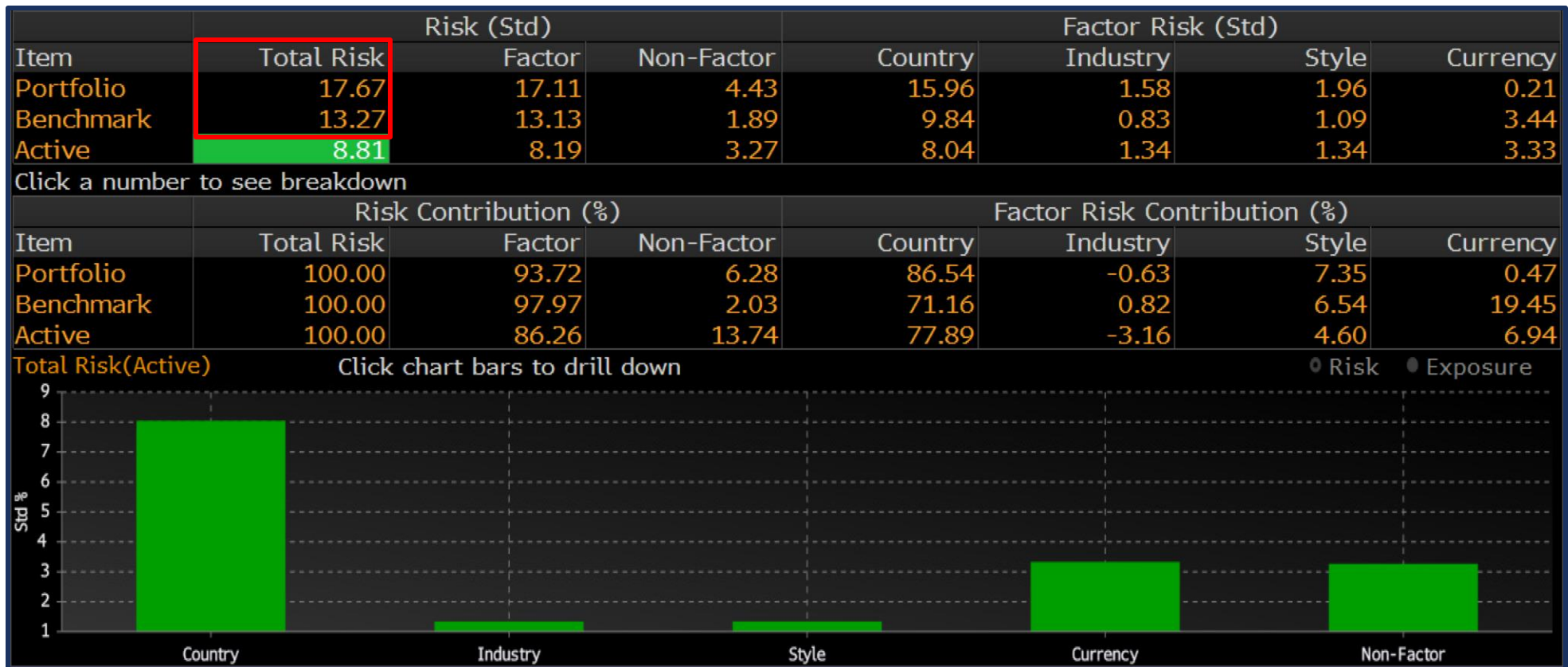
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## ETF RISK ANALYTICS

# INTERNATIONAL EQUITY

# BLOOMBERG PROJECTS MCHI & EEMTO HAVE TOTAL RISKS OF 17.67% & 13.27% RESPECTIVELY

## MCHI (Portfolio) vs. EEM (Benchmark): Total Risk

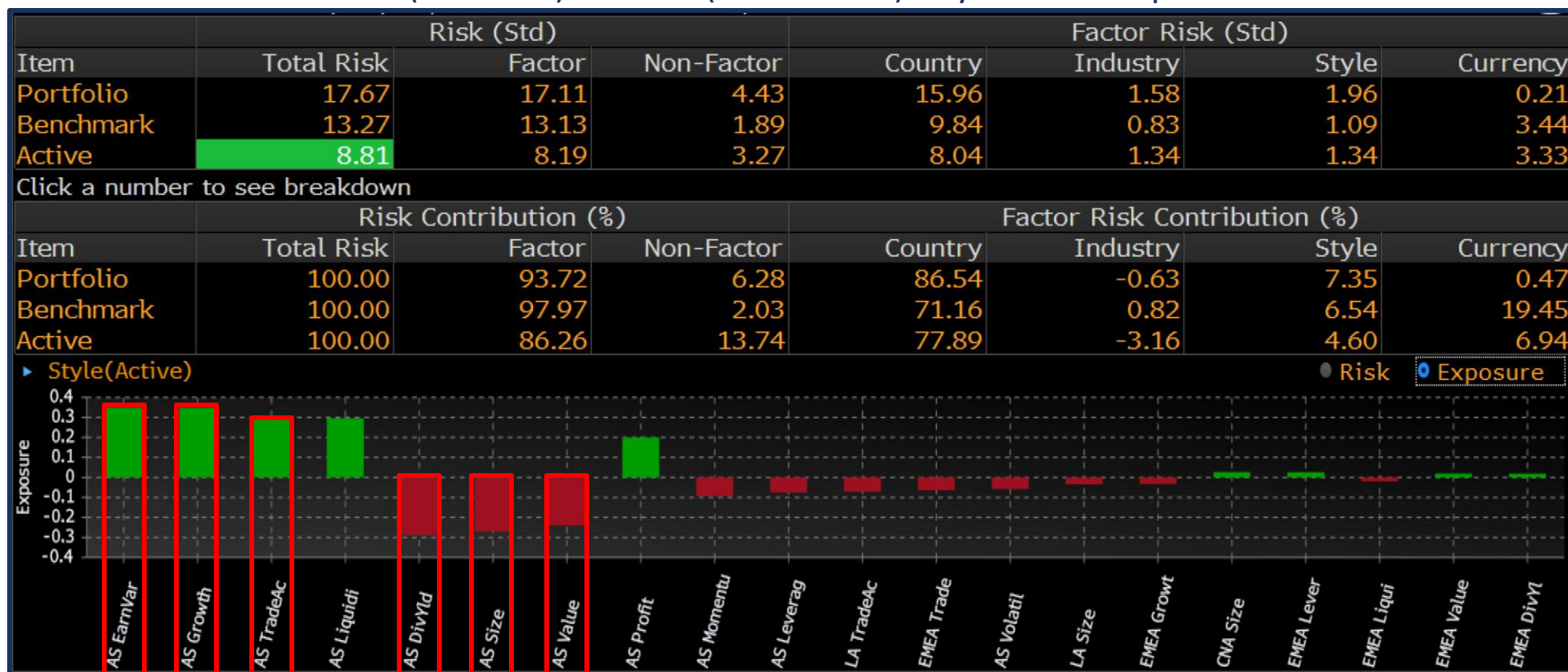


Source: Bloomberg. Data accessed on July 25, 2019.

MCHI HAS GREATER EXPOSURE TO AS EARNINGS, AS GROWTH, & AS TRADE ACTIVITY

EEM HAS GREATER EXPOSURE TO AS DIVIDEND YIELDS, AS SIZE, & AS VALUE

MCHI (Portfolio) vs. EEM (Benchmark): Style Factor Exposures



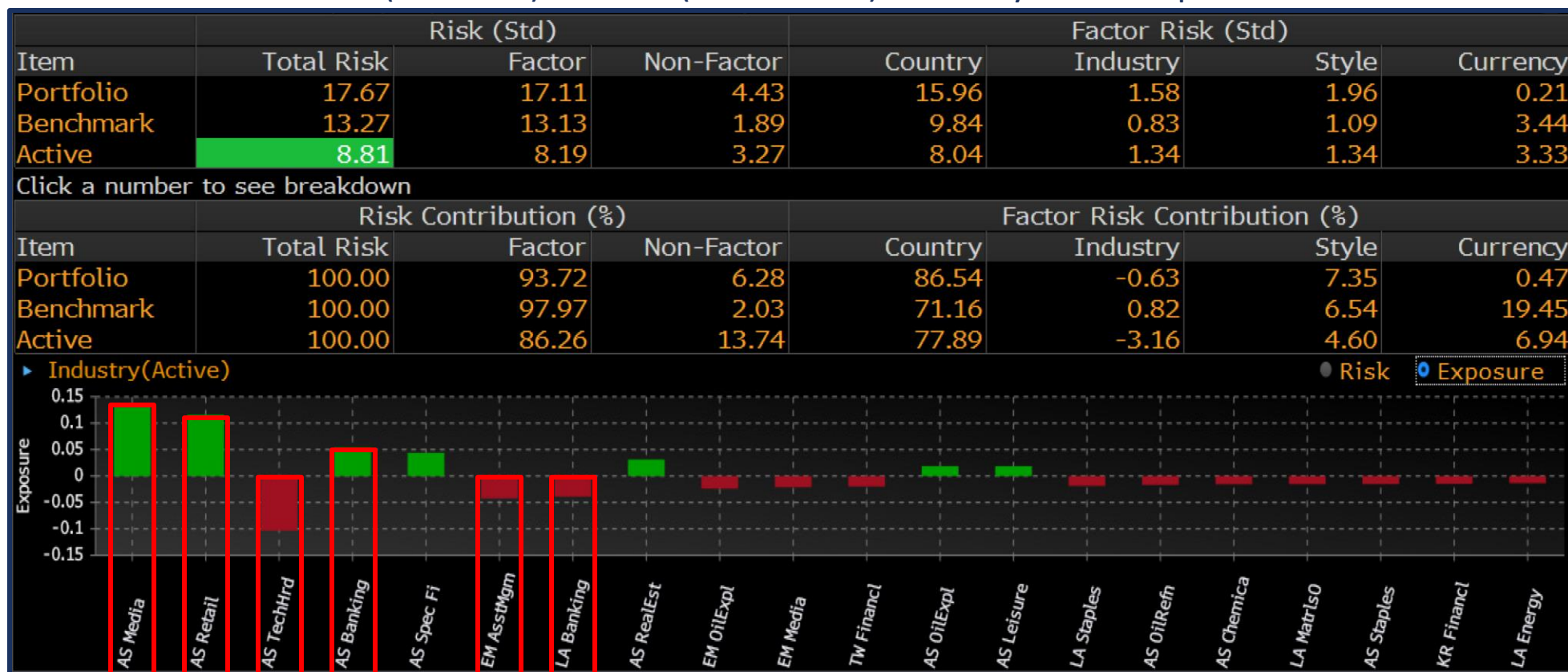
Source: Bloomberg. Data accessed on July 25, 2019.



MCHI HAS GREATER EXPOSURE TO AS MEDIA, AS RETAIL, & AS BANKS

EEM HAS GREATER EXPOSURE TO AS TECH HARDWARE, EM ASSET MANAGEMENT, & LA BANKS

MCHI (Portfolio) vs. EEM (Benchmark): Industry Factor Exposures

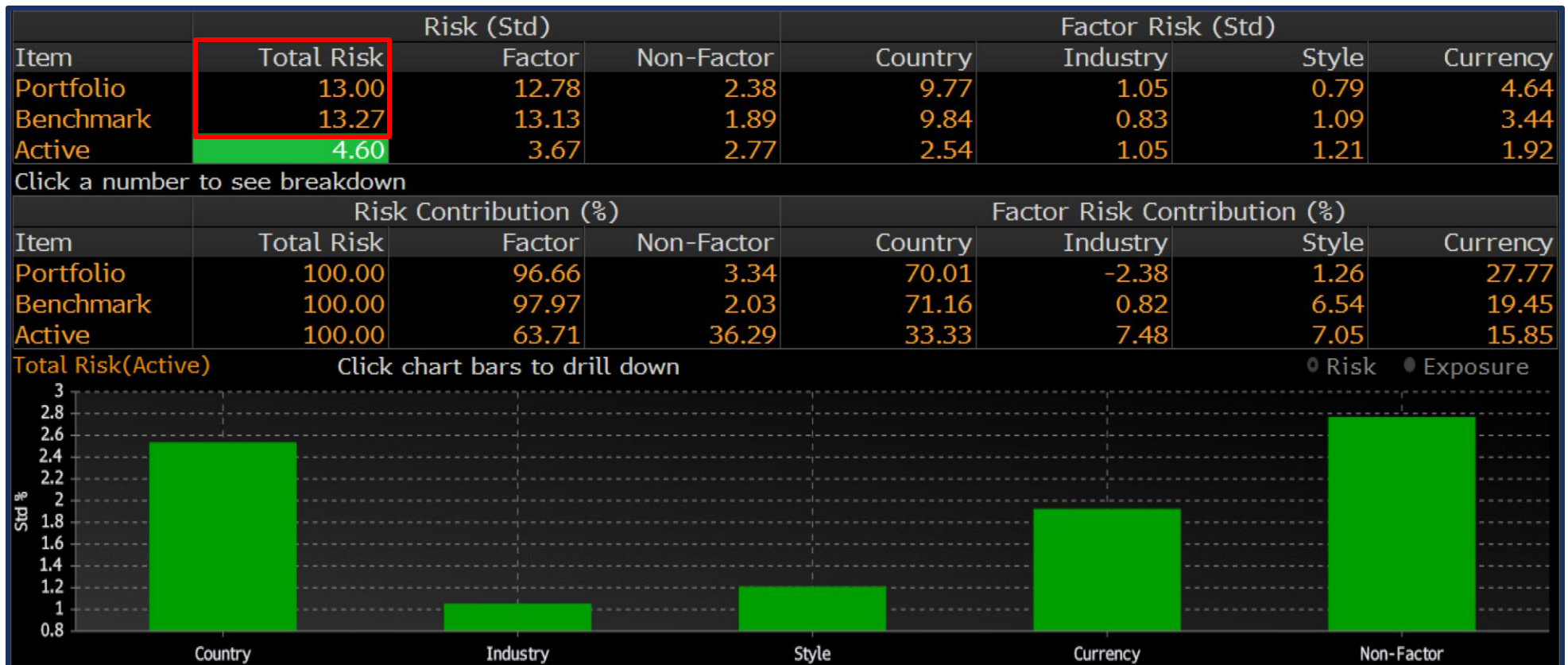


Source: Bloomberg. Data accessed on July 25, 2019.



# BLOOMBERG PROJECTS EDIV & EEM TO HAVE TOTAL RISKS OF 13.00% & 13.27% RESPECTIVELY

EDIV (Portfolio) vs. EEM (Benchmark): Total Risk

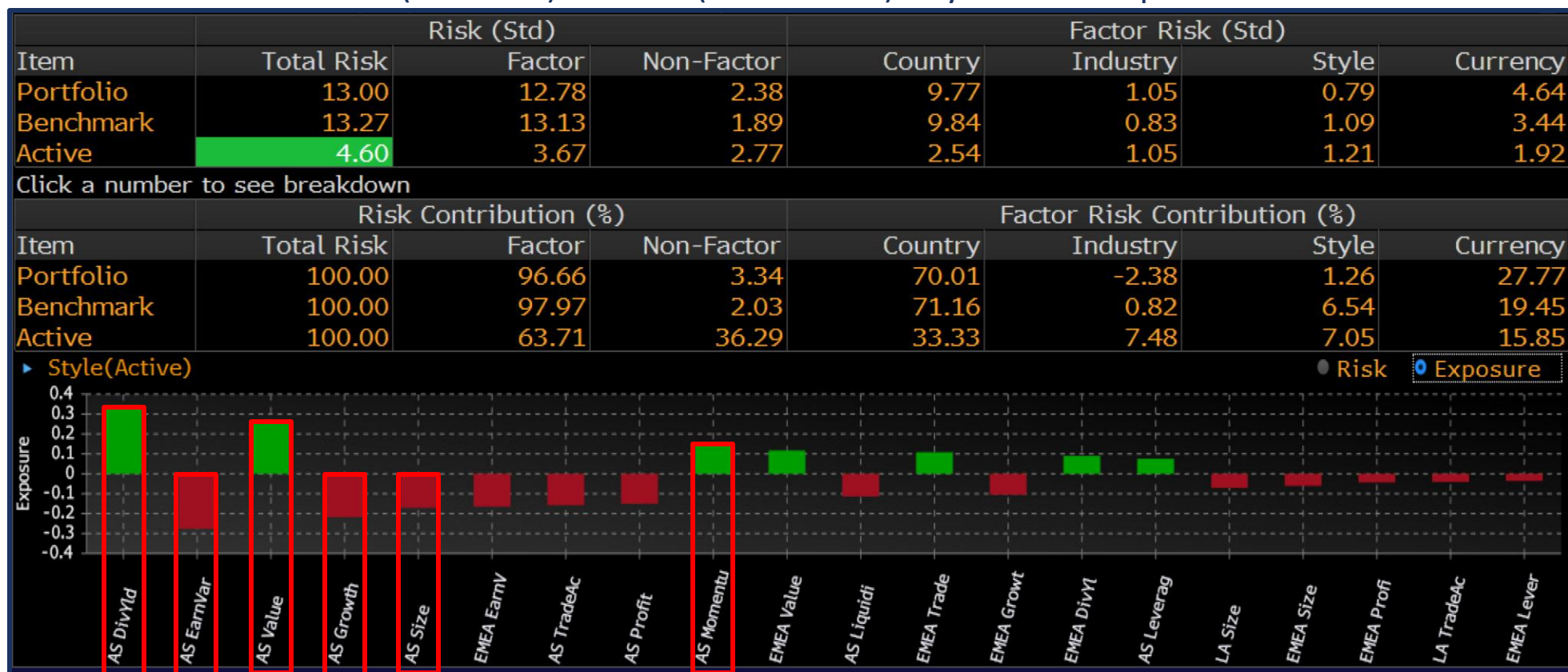


Source: Bloomberg. Data accessed on July 25, 2019.

EIDV HAS GREATER EXPOSURE TO AS DIVIDEND YIELDS, AS VALUE, & AS MOMENTUM

EEM HAS GREATER EXPOSURE TO AS EARNINGS, AS GROWTH, & AS SIZE

EDIV (Portfolio) vs. EEM (Benchmark): Style Factor Exposures

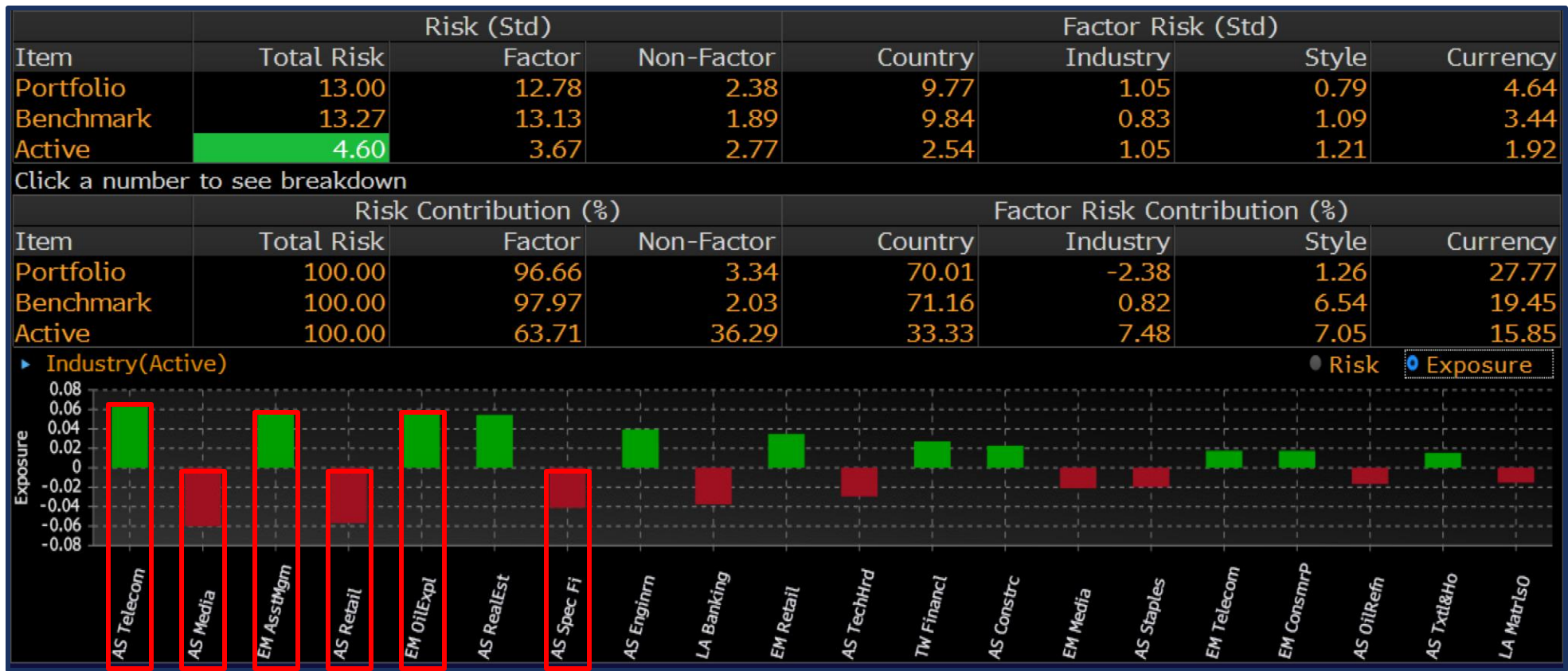


Source: Bloomberg. Data accessed on July 25, 2019.

EDIV HAS GREATER EXPOSURE TO AS TELECOMMUNICATIONS, EM ASSET MANAGEMENT, & EM OIL EXPLORATION

EEM HAS GREATER EXPOSURE TO AS MEDIA, AS RETAIL, & AS SPECIALTY FINANCE

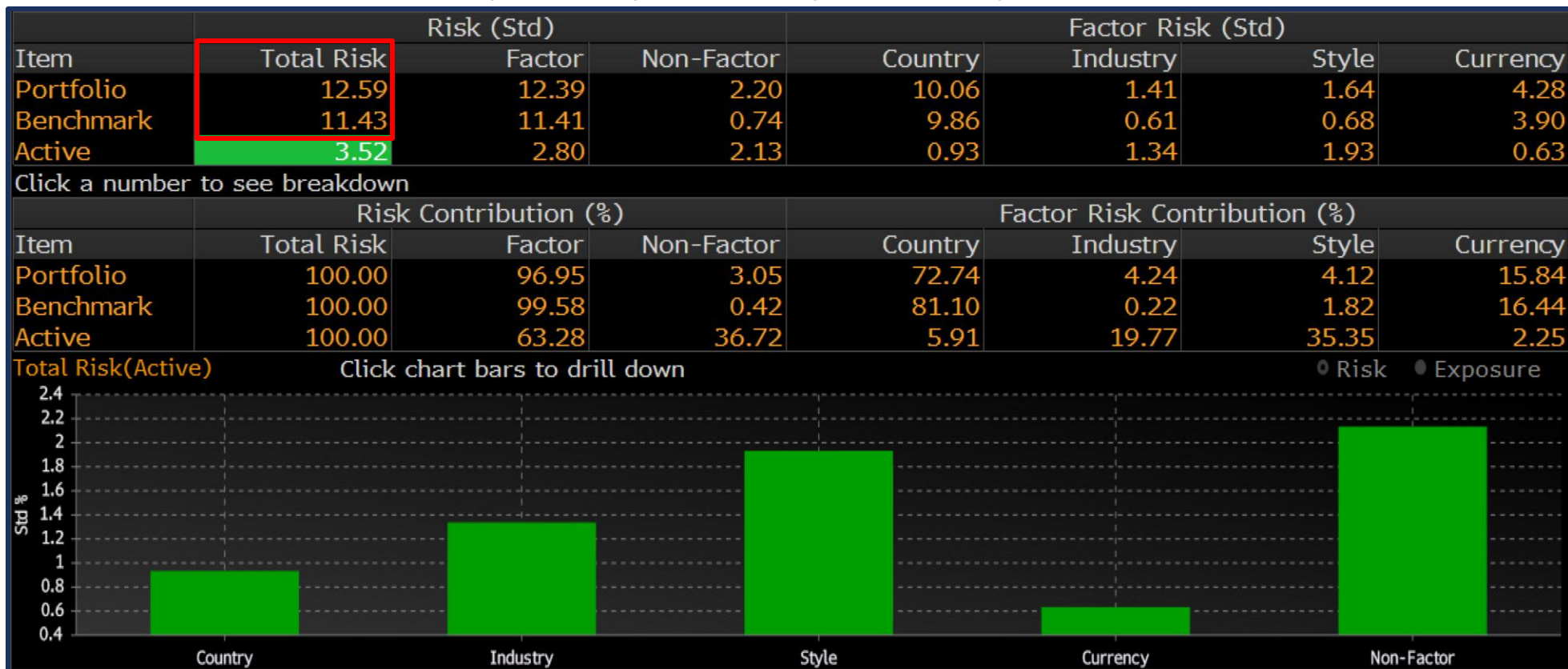
EDIV (Portfolio) vs. EEM (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS DNL & ACWX TO HAVE TOTAL RISKS OF 12.59% & 11.43% RESPECTIVELY

DNL (Portfolio) vs. ACWX (Benchmark): Total Risk



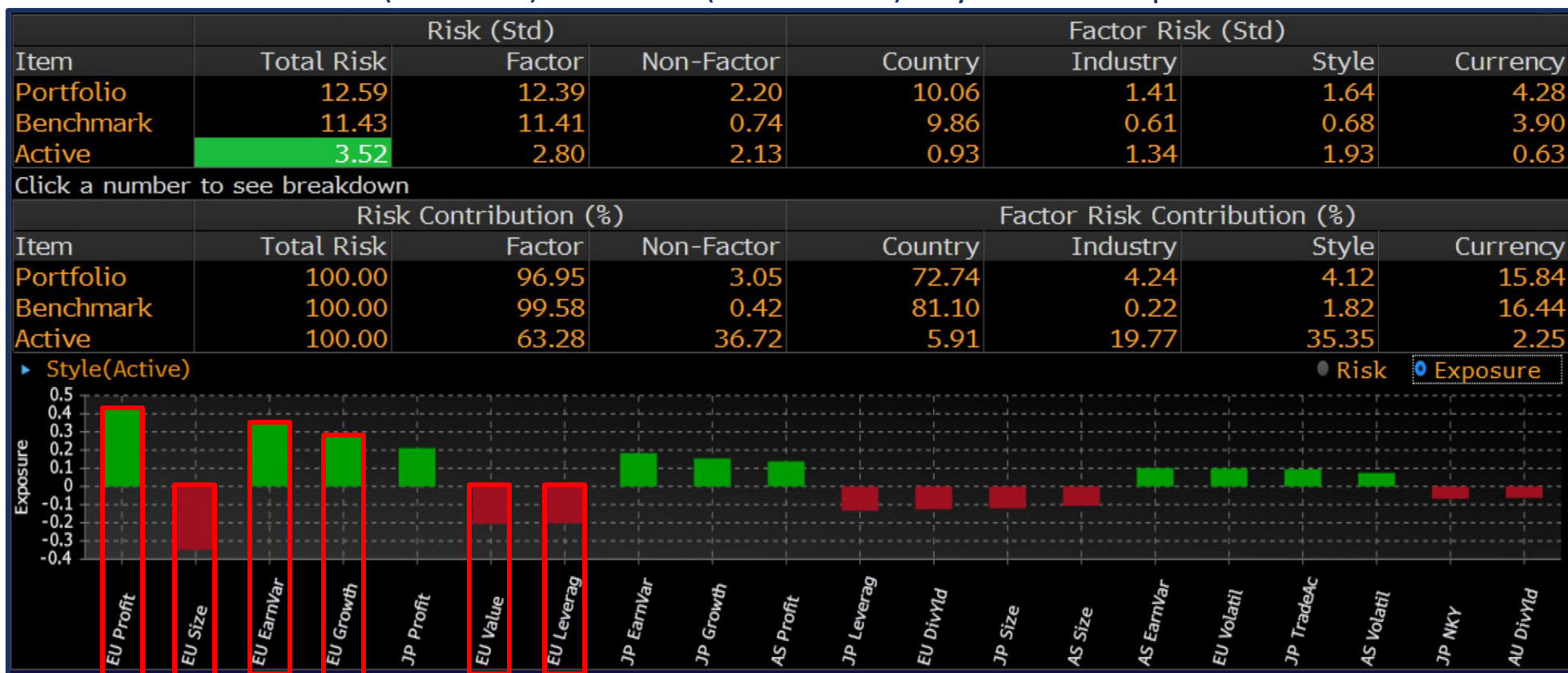
Source: Bloomberg. Data accessed on July 25, 2019.



DNL HAS GREATER EXPOSURE TO EU PROFIT, EU EARNINGS, & EU GROWTH

ACWX HAS GREATER EXPOSURE TO EU SIZE, EU VALUE, & EU LEVERAGE

DNL (Portfolio) vs. ACWX (Benchmark): Style Factor Exposures



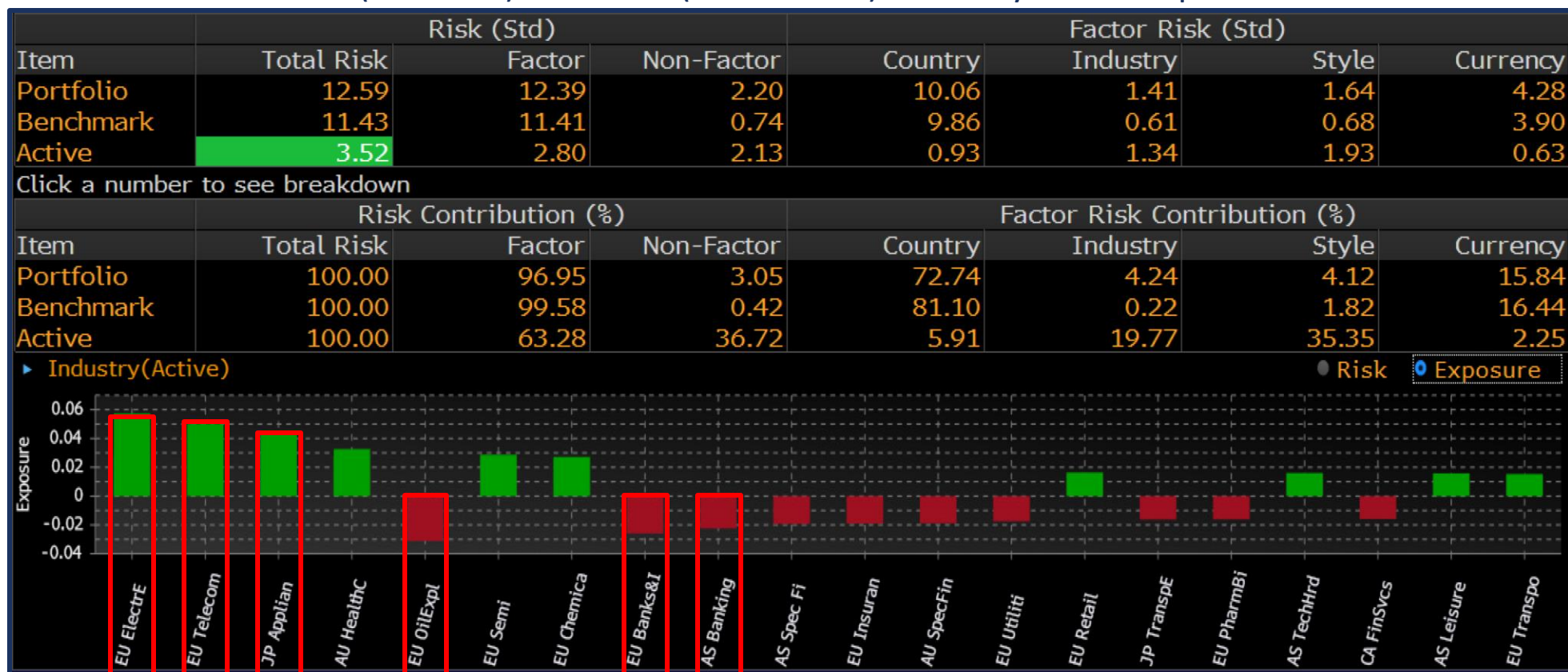
Source: Bloomberg. Data accessed on July 25, 2019.



DNL HAS GREATER EXPOSURE TO EU ELECTRIC, EU TELECOMMUNICATIONS, & JP APPLIANCES

ACWX HAS GREATER EXPOSURE TO EU OIL EXPLORATION, EU BANKS, & AS BANKS

DNL (Portfolio) vs. ACWX (Benchmark): Industry Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# ETF RISK ANALYTICS

## FIXED INCOME

# BLOOMBERG PROJECTS VMBS & AGG TO HAVE TOTAL RISKS OF 0.31% & 0.78% RESPECTIVELY

VMBS (Portfolio) vs. AGG (Benchmark): Total Risk

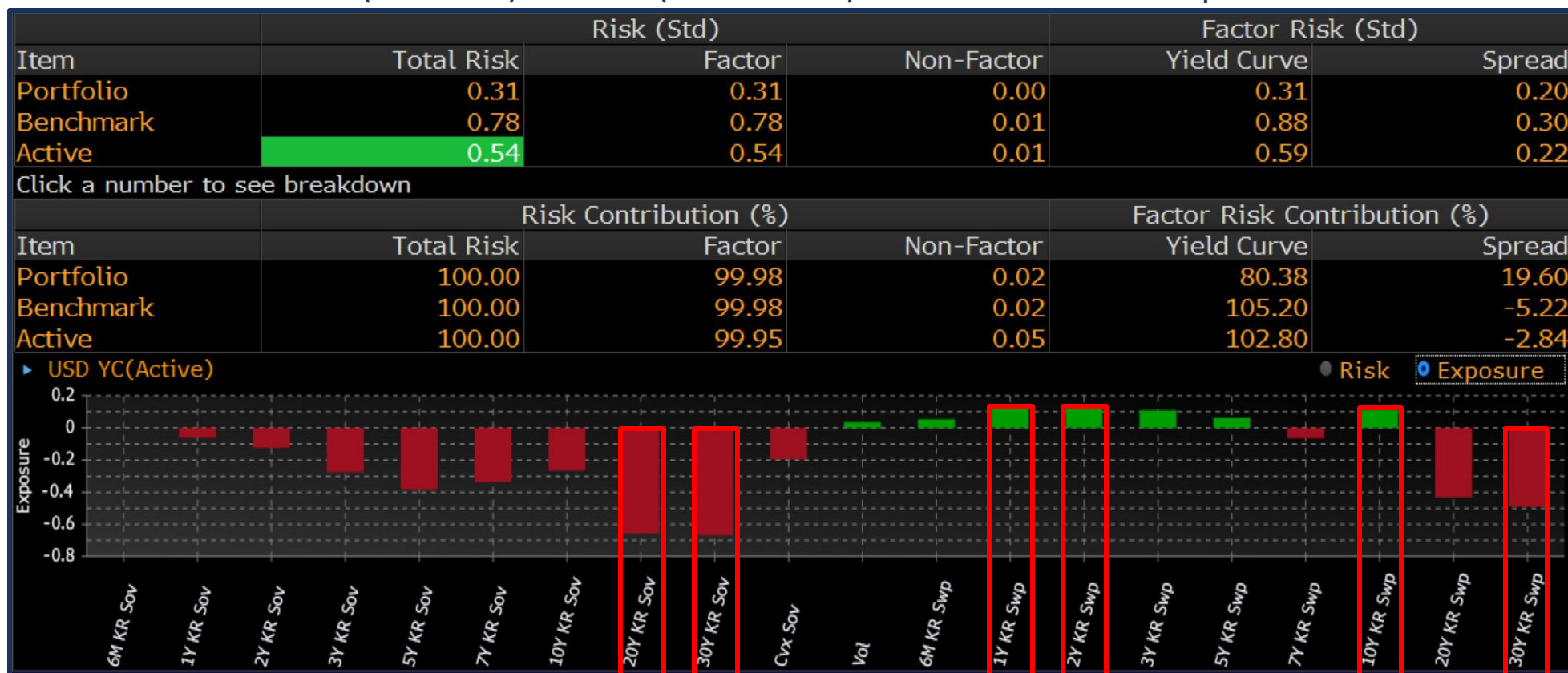


Source: Bloomberg. Data accessed on July 25, 2019.

VMBS HAS GREATER EXPOSURE TO 1Y KR SWAPS, 2Y KR SWAPS, & 10Y KR SWAPS

AGG HAS GREATER EXPOSURE TO 30Y KR SOVEREIGNS, 20Y KR SOVEREIGNS, & 30Y KR SWAPS

VMBS (Portfolio) vs. AGG (Benchmark): Yield Curve Factor Exposures



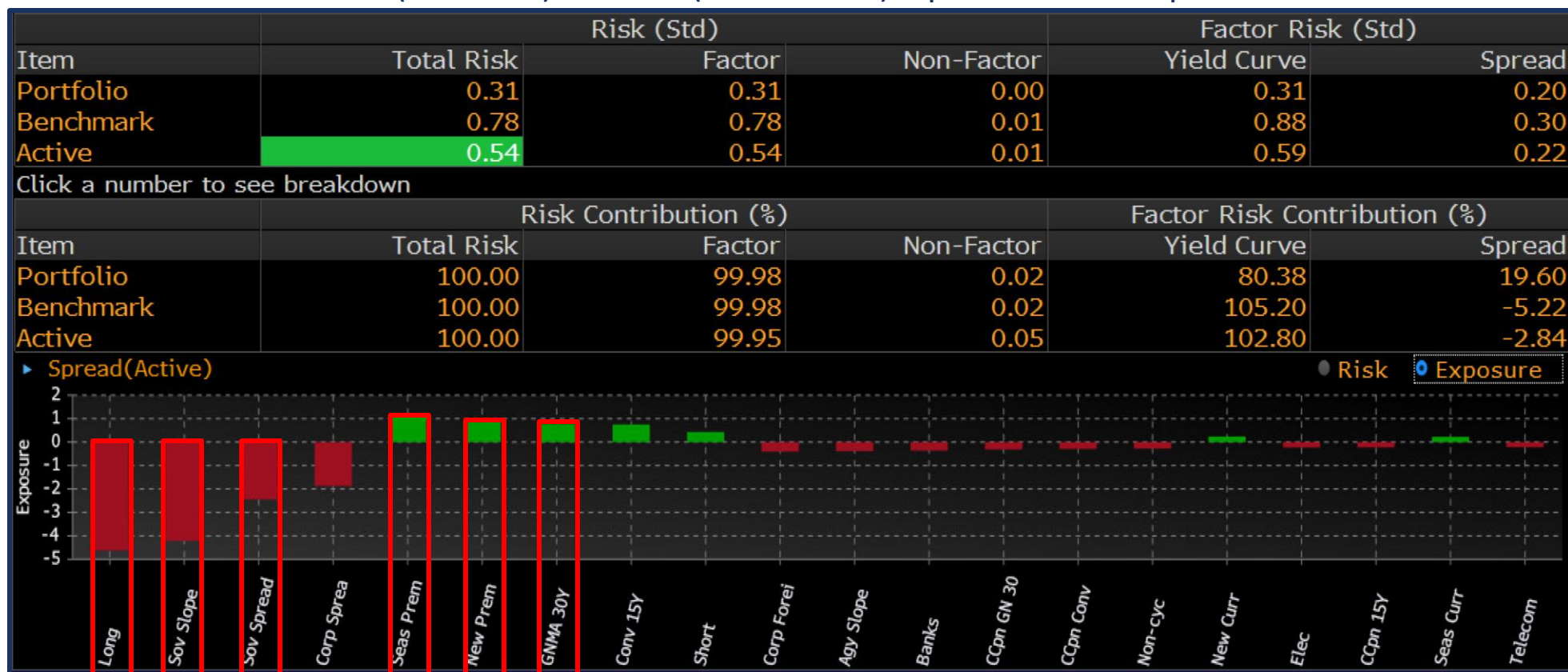
Source: Bloomberg. Data accessed on July 25, 2019.



VMBS HAS GREATER EXPOSURE TO SEAS PREM, NEW PREM, & GNMA 30Y

AGG HAS GREATER EXPOSURE TO LONG DURATION, SOVEREIGN SLOPES, & SOVEREIGN SPREADS

VMBS (Portfolio) vs. AGG (Benchmark): Spread Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTSVTEB & AGG TO HAVETOTAL RISKS OF 0.54% & 0.78% RESPECTIVELY

VTEB (Portfolio) vs. AGG (Benchmark): Total Risk

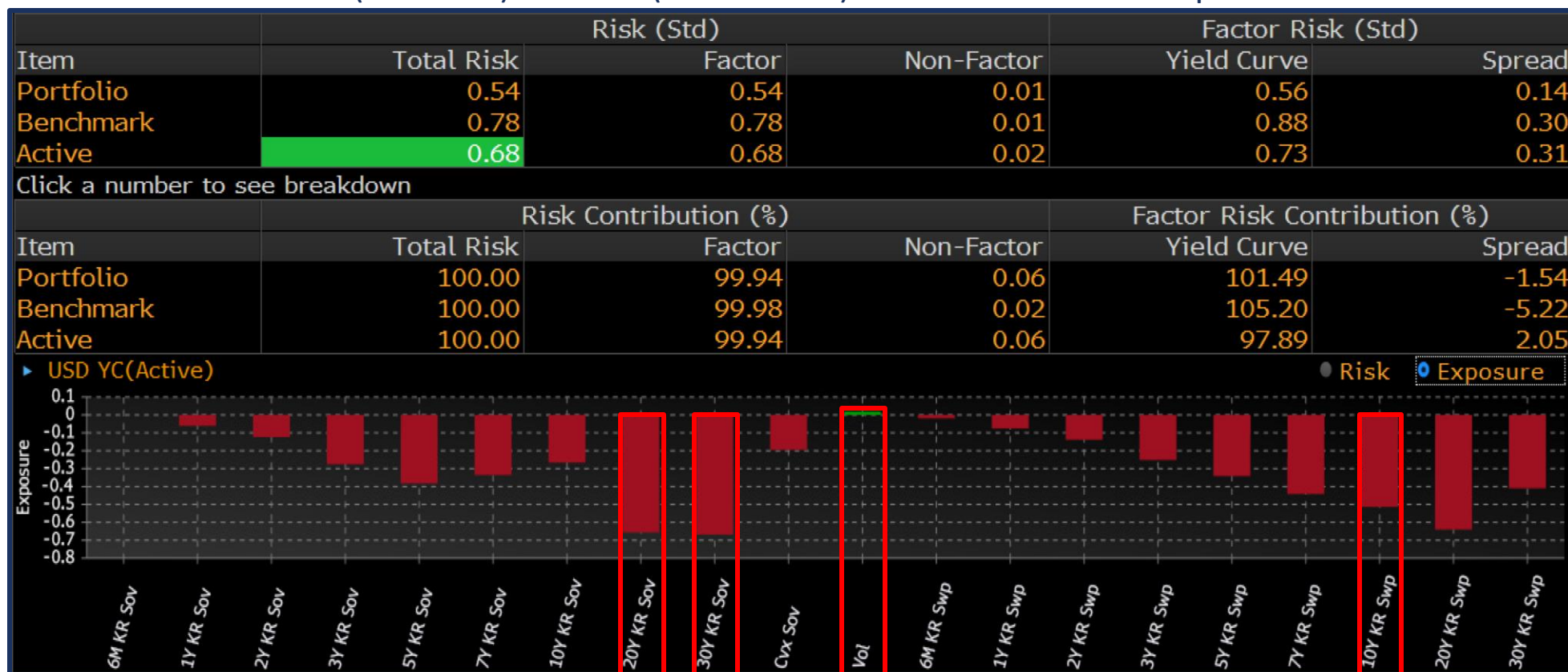


Source: Bloomberg. Data accessed on July 25, 2019.

# VTEB HAS GREATER EXPOSURE TO VOLATILITY

AGG HAS GREATER EXPOSURE TO 30Y KR SOVEREIGNS, 20Y KR SOVEREIGNS, & 10Y KR SWAPS

VTEB (Portfolio) vs. AGG (Benchmark): Yield Curve Factor Exposures

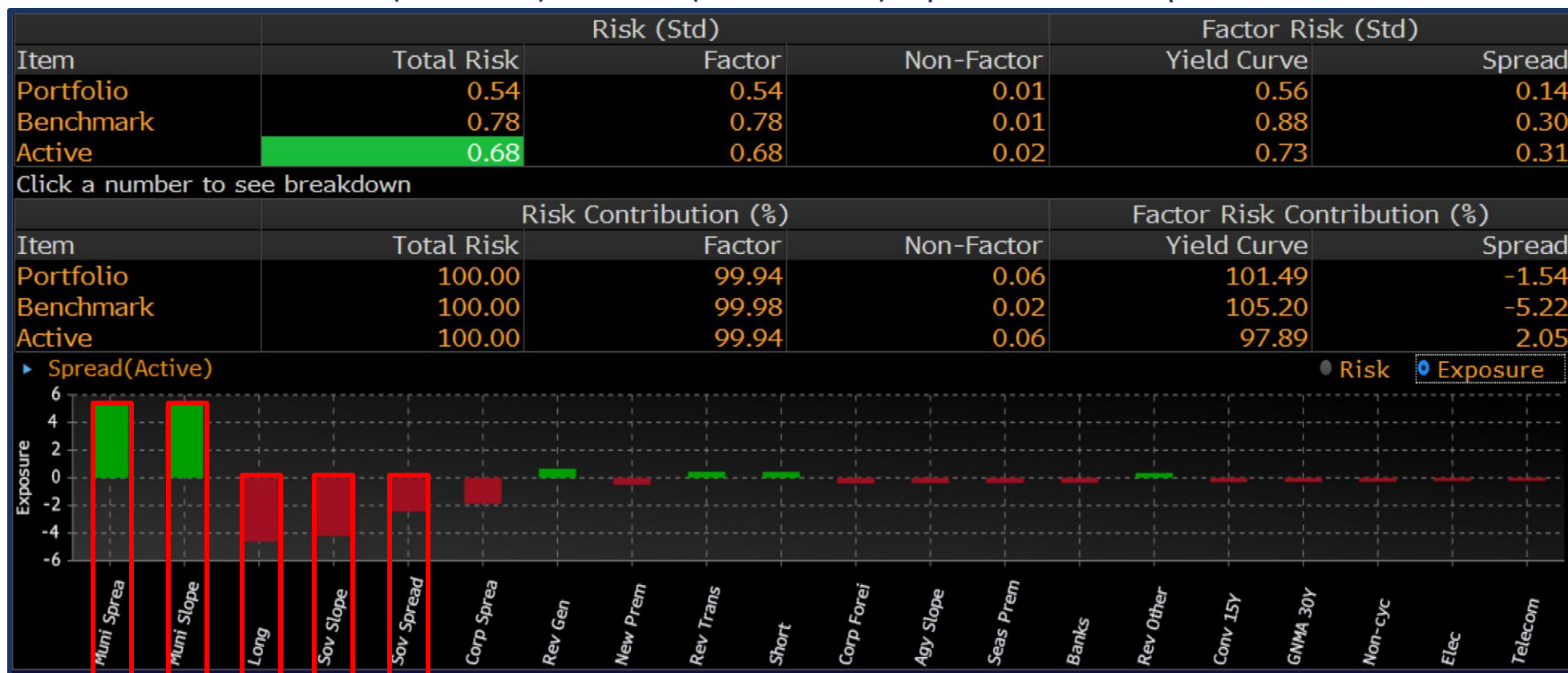


Source: Bloomberg. Data accessed on July 25, 2019.

# VTEB HAS GREATER EXPOSURE TO MUNI SPREADS & MUNI SLOPES

# AGG HAS GREATER EXPOSURE TO LONG DURATION, SOVEREIGN SLOPES, & SOVEREIGN SPREADS

VTEB (Portfolio) vs. AGG (Benchmark): Spread Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.



# BLOOMBERG PROJECTS RVNU & AGG TO HAVE TOTAL RISKS OF 0.80% & 0.78% RESPECTIVELY

## RVNU (Portfolio) vs. AGG (Benchmark): Total Risk

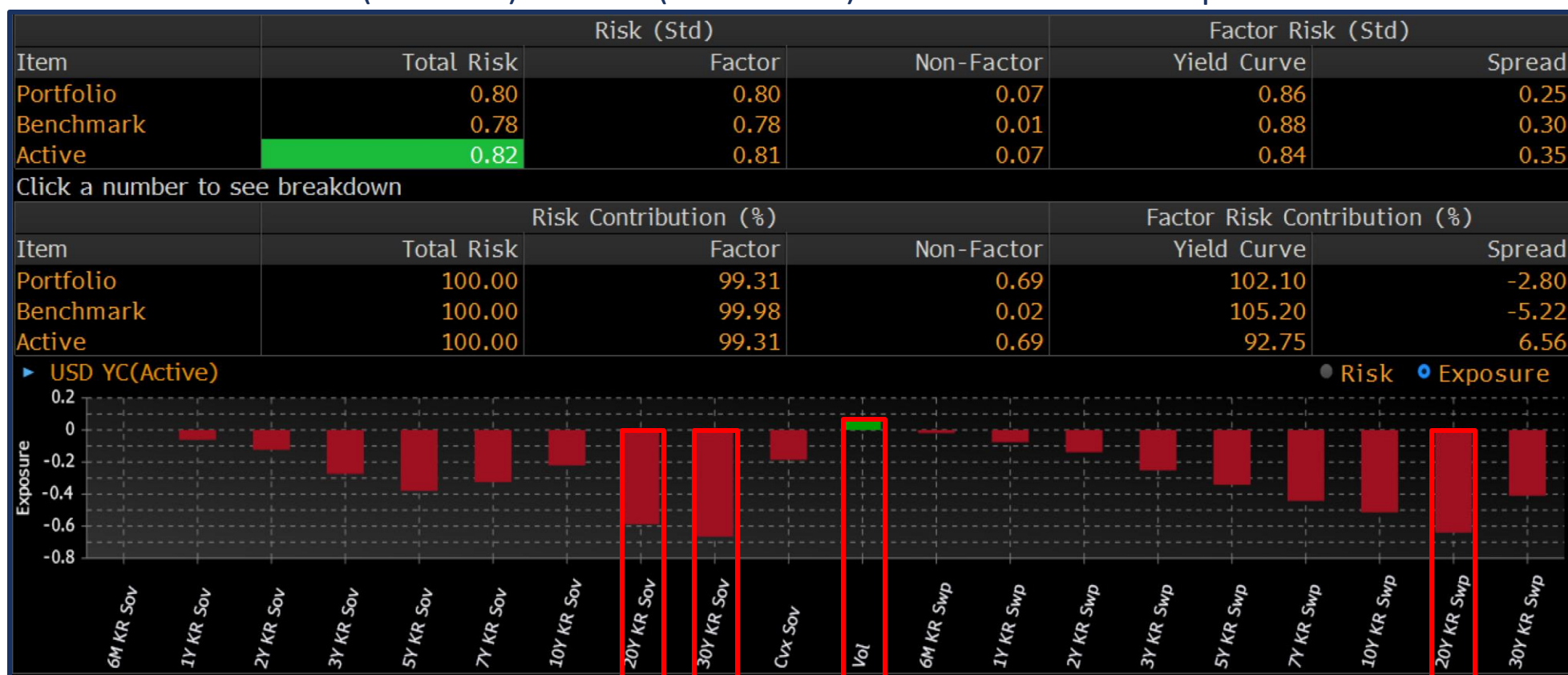


Source: Bloomberg. Data accessed on July 25, 2019.

# RVNU HAS GREATER EXPOSURE TO VOLATILITY

## AGG HAS GREATER EXPOSURE TO 30Y KR SOVEREIGNS, 20Y KR SWAPS, & 20Y KR SOVEREIGNS

RVNU (Portfolio) vs. AGG (Benchmark): Yield Curve Factor Exposures

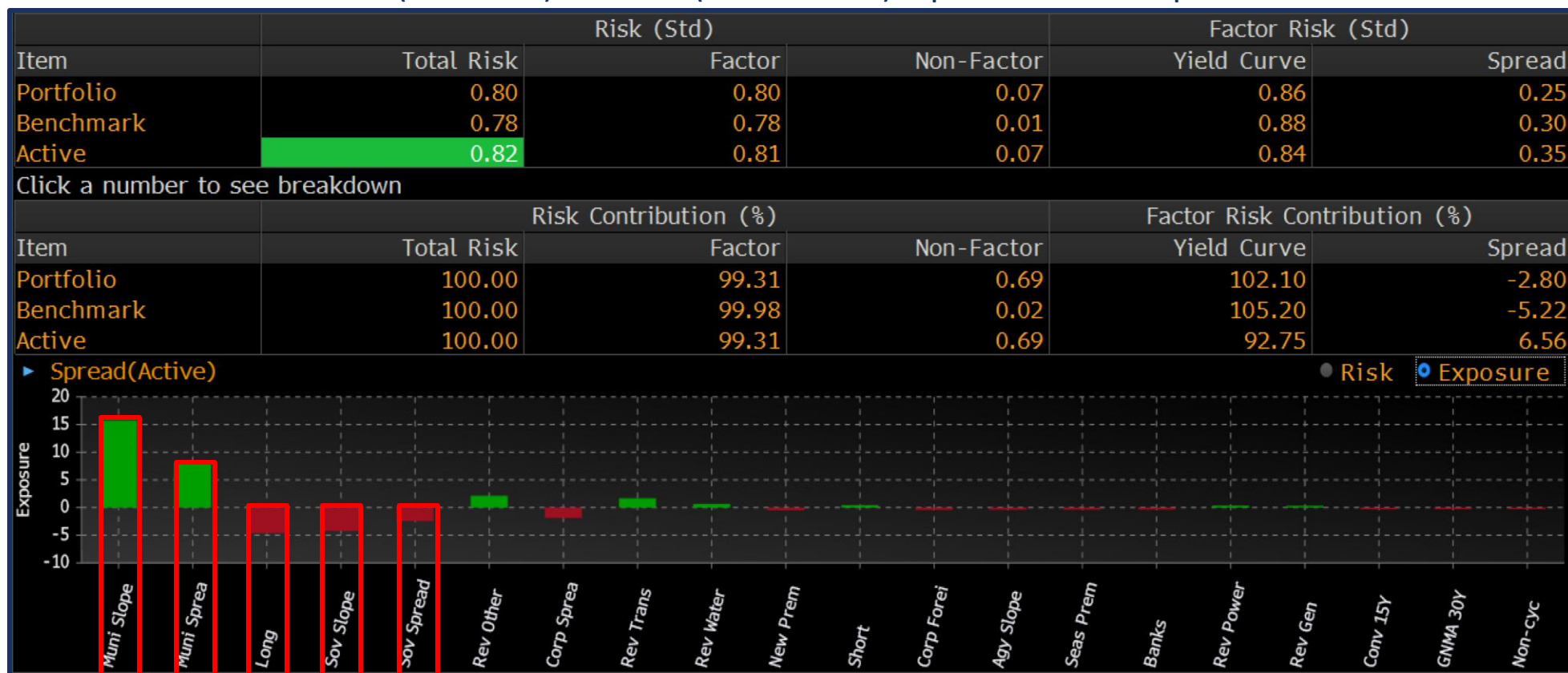


Source: Bloomberg. Data accessed on July 25, 2019.

# RVNU HAS GREATER EXPOSURE TO MUNI SLOPES & MUNI SPREADS

# AGG HAS GREATER EXPOSURE TO LONG DURATION, SOVEREIGN SLOPES, & SOVEREIGN SPREADS

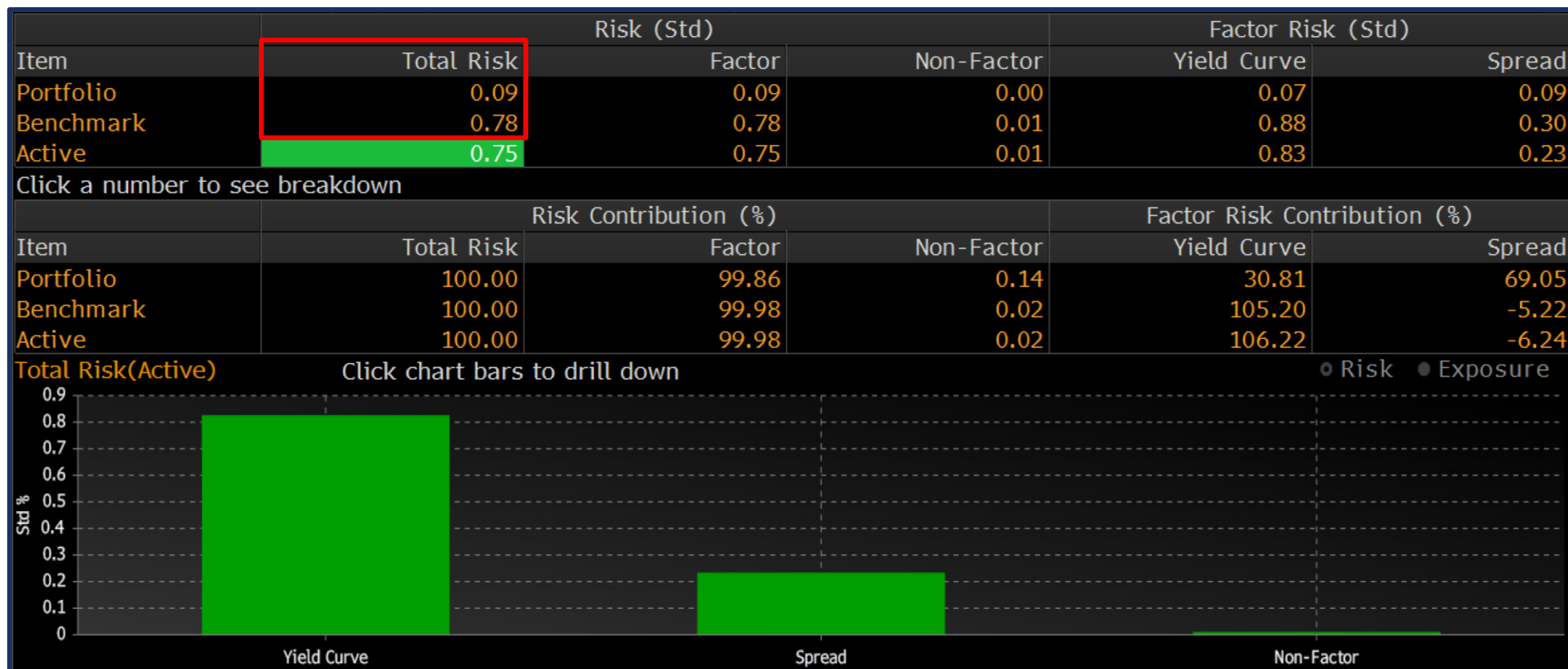
RVNU (Portfolio) vs. AGG (Benchmark): Spread Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# BLOOMBERG PROJECTS JPST & AGG TO HAVE TOTAL RISKS OF 0.09% & 0.78% RESPECTIVELY

JPST (Portfolio) vs. AGG (Benchmark): Total Risk



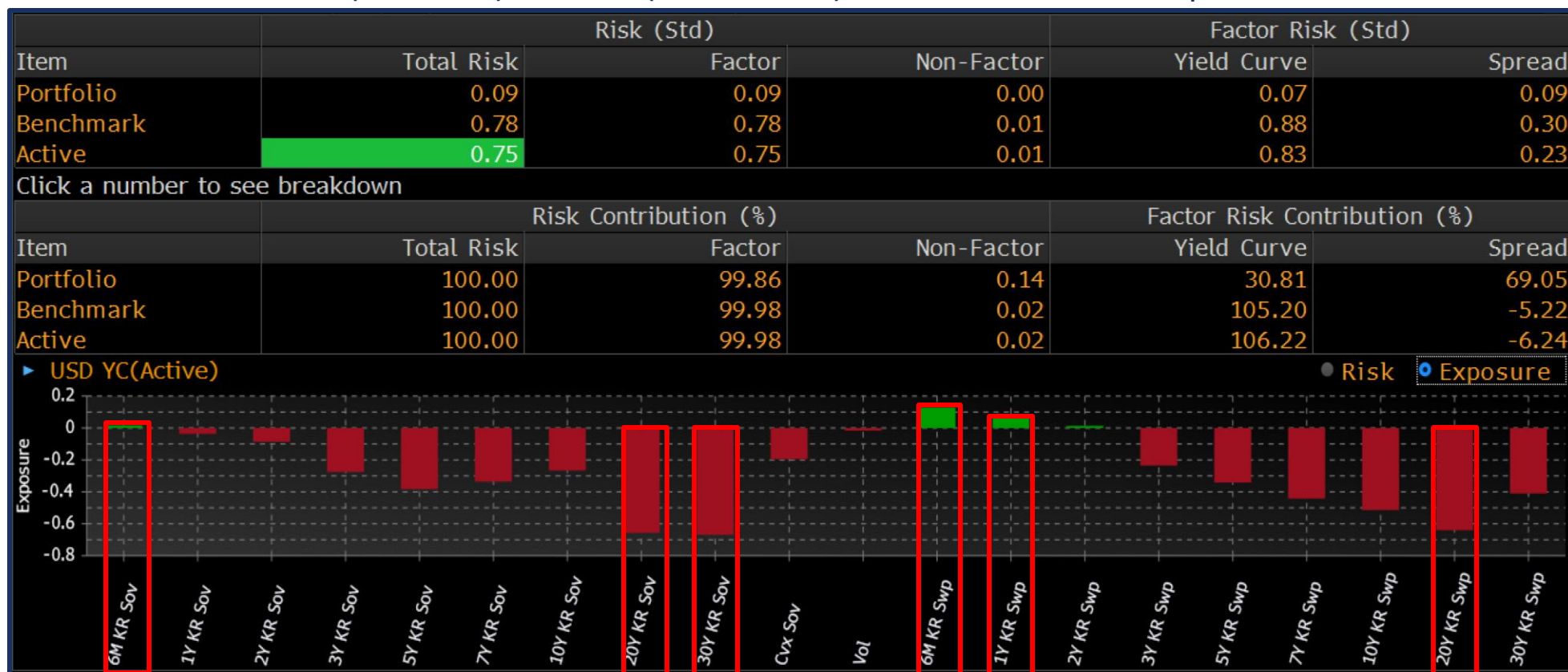
Source: Bloomberg. Data accessed on July 25, 2019.



JPST HAS GREATER EXPOSURE TO 6M KR SWAPS, 1Y KR SWAPS, & 6M KR SOVEREIGNS

AGG HAS GREATER EXPOSURE TO 30Y KR SOVEREIGNS, 20Y KR SOVEREIGNS, & 20Y KR SWAPS

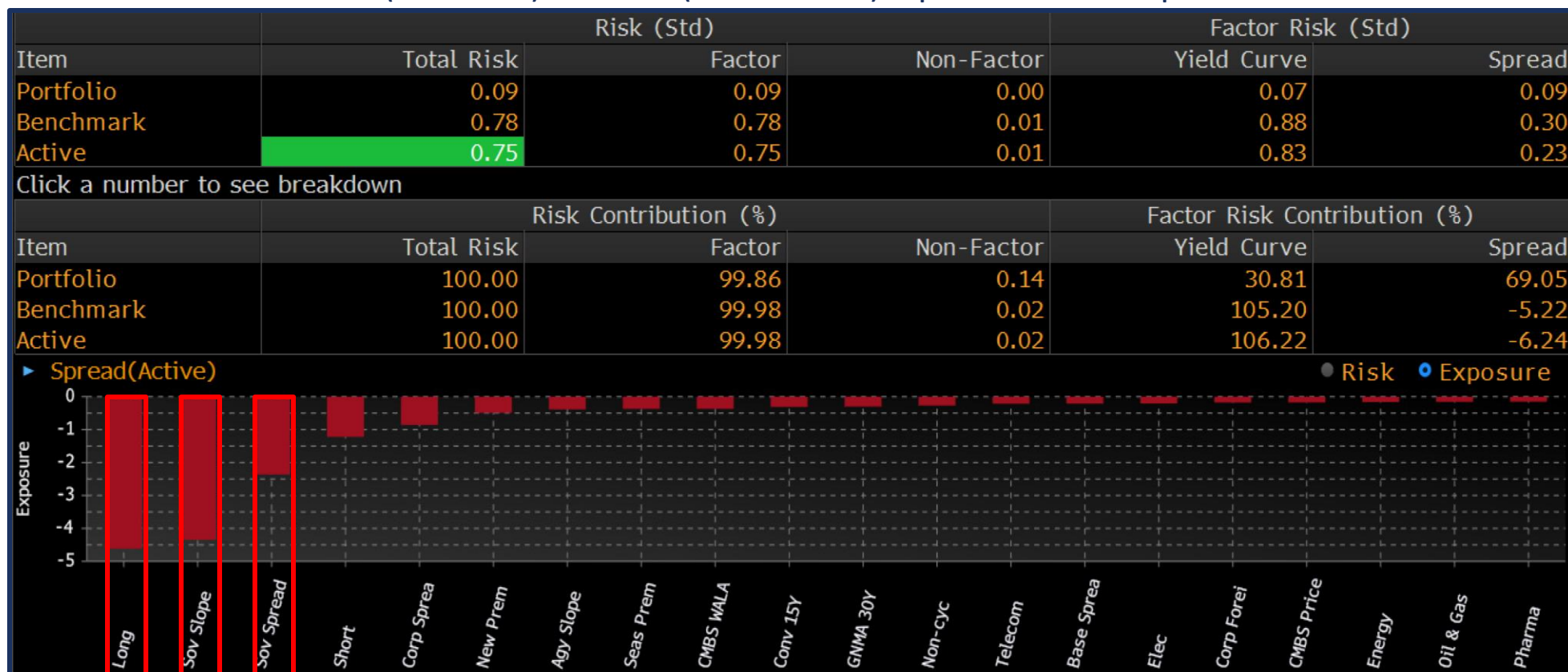
JPST (Portfolio) vs. AGG (Benchmark): Yield Curve Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

# AGG HAS GREATER EXPOSURE TO LONG DURATION, SOVEREIGN SLOPES, & SOVEREIGN SPREADS

## JPST (Portfolio) vs. AGG (Benchmark): Spread Factor Exposures



Source: Bloomberg. Data accessed on July 25, 2019.

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