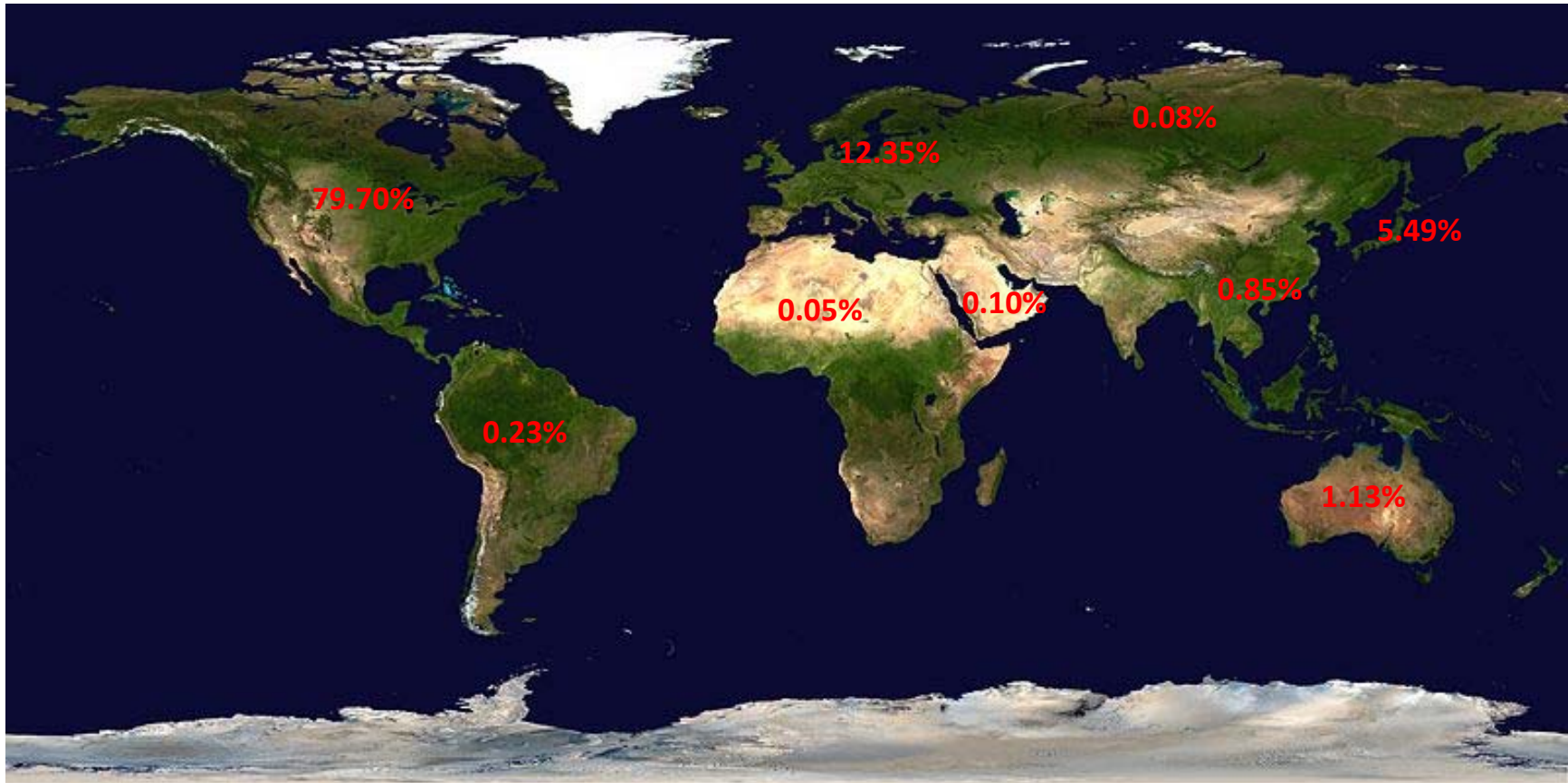


ARIZONA STATE RETIREMENT SYSTEM

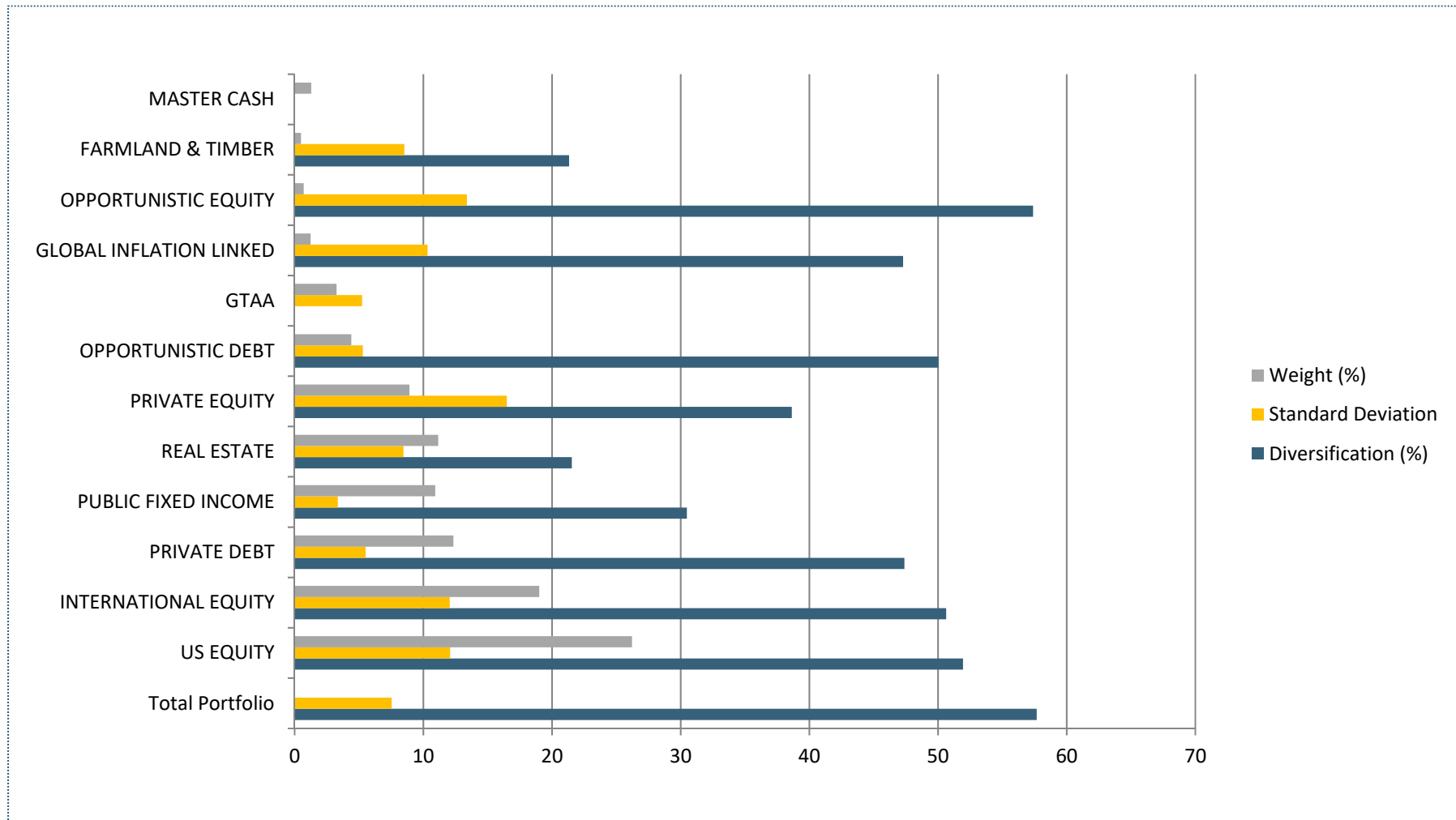
Total Plan Risk & Exposure Report for the Period Ending June, 2018

June 2018

ASRS ASSETS ARE DIVERSIFIED ACROSS REGIONS



ASRS ASSETS AND RISK SOURCES ARE DIVERSIFIED ACROSS DIFFERENT ASSET CLASSES



VARIOUS EXPOSURE ANALYSIS VS. THE SAA

	Weight (%)	SAA Weight %	Active Weight %
Equity	54.86%	58.00%	-3.14%
Fixed Income	27.68%	25.00%	2.68%
Inflation Linked	12.90%	12.00%	0.90%
Master Cash	1.29%	0.00%	1.29%
Multi Asset Class	3.26%	5.00%	-1.74%

	Weight (%)	SAA Weight (%)	Active Weight (%)
Total	100.00%	100.00%	0.00%
North America	79.70%	73.57%	6.13%
Europe DM	12.35%	13.99%	-1.64%
Asia DM	6.62%	7.49%	-0.87%
Asia EM	0.85%	3.40%	-2.56%
Latin America	0.23%	0.73%	-0.49%
Africa	0.05%	0.35%	-0.30%
Europe EM	0.08%	0.30%	-0.22%
Middle East	0.10%	0.16%	-0.06%
Others	0.01%	0.01%	0.01%

Top 15 Foreign Currency Exposures			
Currency	Weight (%)	SAA Weight (%)	Active Weight (%)
EUR	5.88%	6.18%	-0.31%
JPY	4.40%	4.86%	-0.45%
GBP	3.13%	3.55%	-0.41%
CHF	1.22%	1.46%	-0.24%
AUD	1.13%	1.36%	-0.24%
HKD	0.89%	1.88%	-0.99%
SEK	0.50%	0.56%	-0.06%
CAD	0.44%	0.06%	0.38%
DKK	0.29%	0.33%	-0.04%
SGD	0.28%	0.25%	0.02%
NOK	0.18%	0.17%	0.01%
TWD	0.15%	0.61%	-0.46%
KRW	0.13%	0.76%	-0.64%
INR	0.12%	0.45%	-0.33%
ILS	0.07%	0.07%	0.00%

CORRELATION REPORT OF THE MAJOR ASSET CLASSES

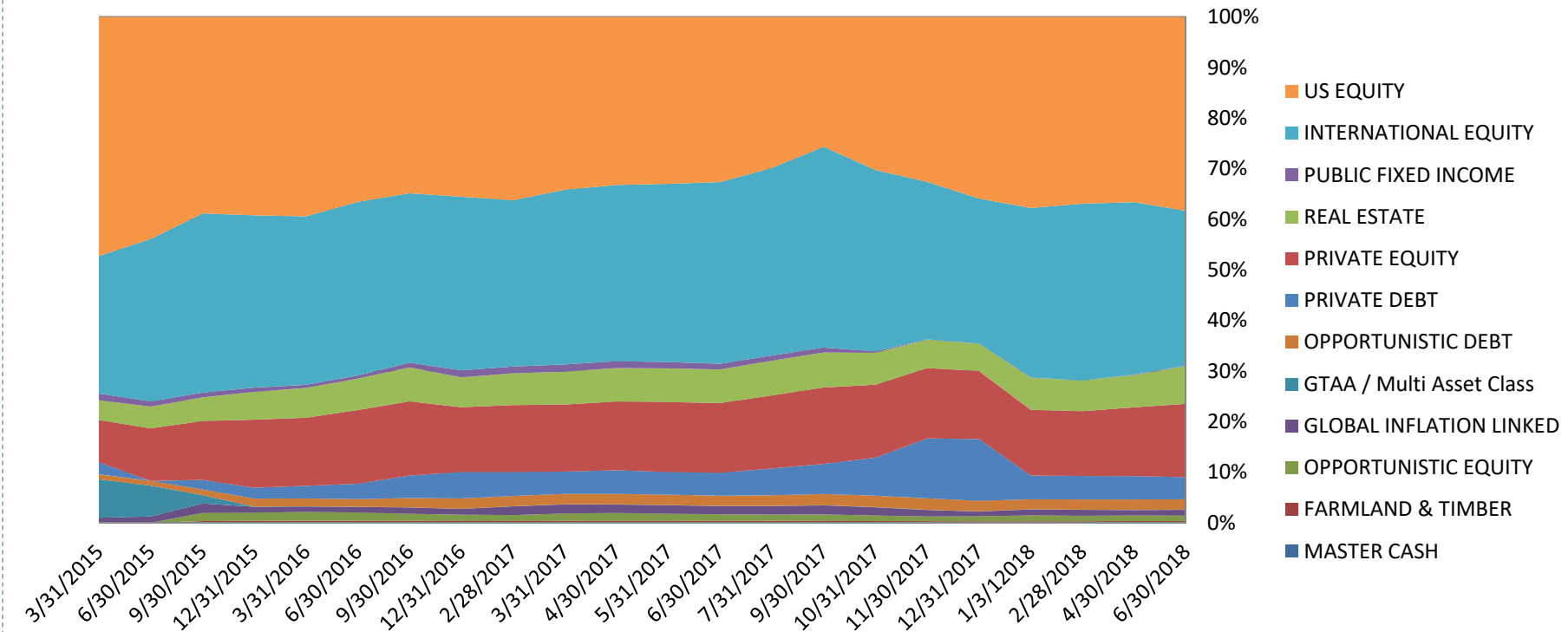
ASRS assets are fairly diversified across different asset classes. While Fixed Income investments are a major source of portfolio diversification, private assets also add meaningful diversification benefits.

Portfolio	PUBLIC FIXED INCOME	US EQUITY	INTERNA TIONAL EQUITY	REAL ESTATE	FARMLAN D & TIMBER	PRIVATE EQUITY	PRIVATE DEBT	OPPORTU NISTIC EQUITY	OPPORTU NISTIC DEBT	GLOBAL INFLATIO N LINKED
PUBLIC FIXED INCOME	1.00									
US EQUITY	-0.13	1.00								
INTERNATIONAL EQUITY	-0.01	0.74	1.00							
REAL ESTATE	0.11	0.58	0.45	1.00						
FARMLAND & TIMBER	0.11	0.58	0.45	1.00	1.00					
PRIVATE EQUITY	-0.09	0.75	0.59	0.43	0.43	1.00				
PRIVATE DEBT	0.18	0.40	0.44	0.26	0.26	0.52	1.00			
OPPORTUNISTIC EQUITY	-0.14	0.93	0.71	0.58	0.58	0.70	0.40	1.00		
OPPORTUNISTIC DEBT	0.17	0.60	0.54	0.82	0.82	0.56	0.57	0.60	1.00	
GLOBAL INFLATION LINKED	0.02	0.61	0.61	0.78	0.78	0.48	0.37	0.61	0.72	1.00

HISTORICAL RISK CONTRIBUTION OF THE MAJOR ASSET CLASSES

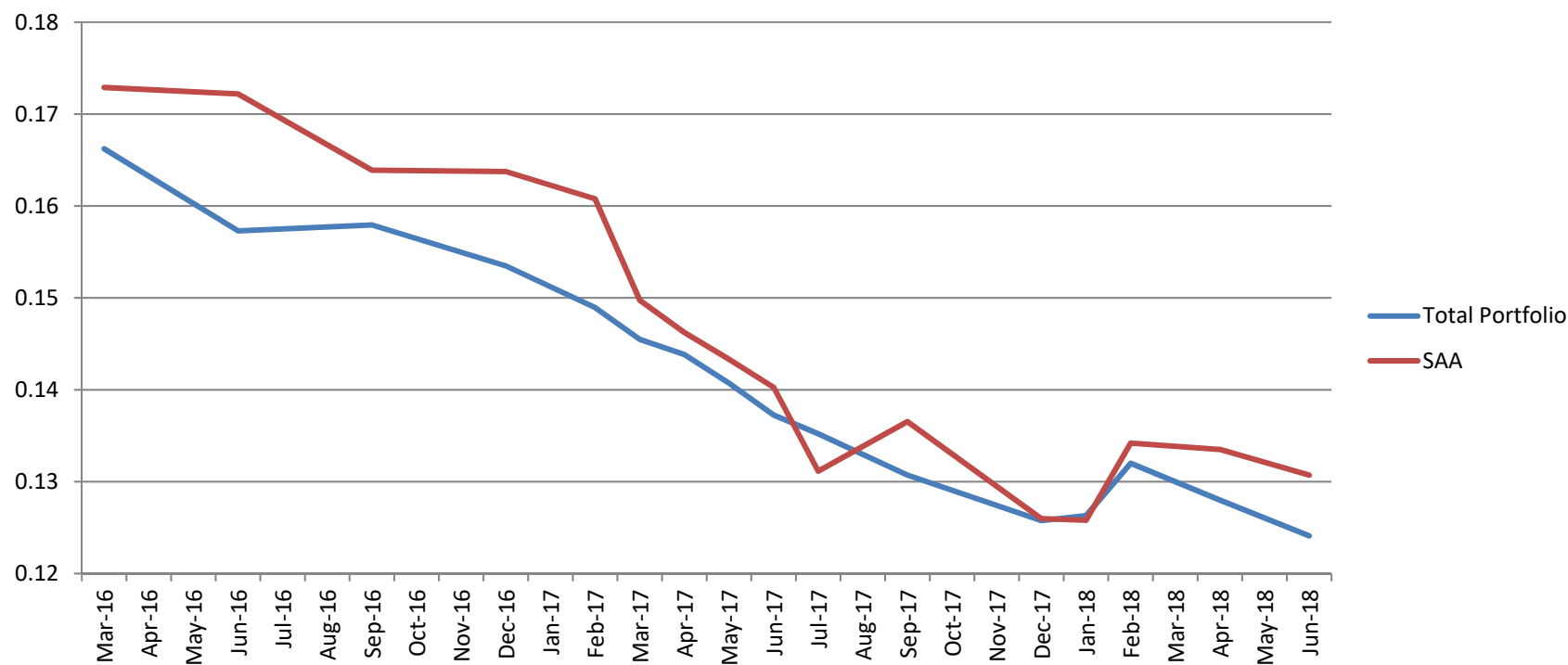
Public Equities continue to account for more than 65% of the overall portfolio risk.

HISTORICAL RISK CONTRIBUTION FROM ASSET CLASSES



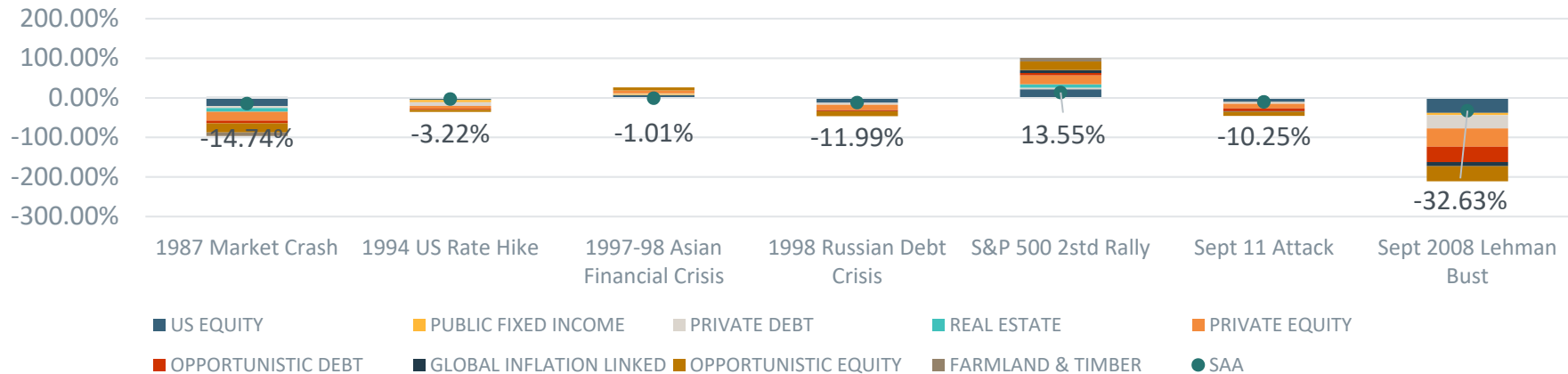
TOTAL PORTFOLIO VALUE-AT-RISK (VAR)

As of June 30, 2018, total VaR for ASRS Portfolio was 12.80%, indicating that there is a 5% chance that portfolio could lose ~\$5B in a given year. Note that a 5% event is expected to occur every 20 years

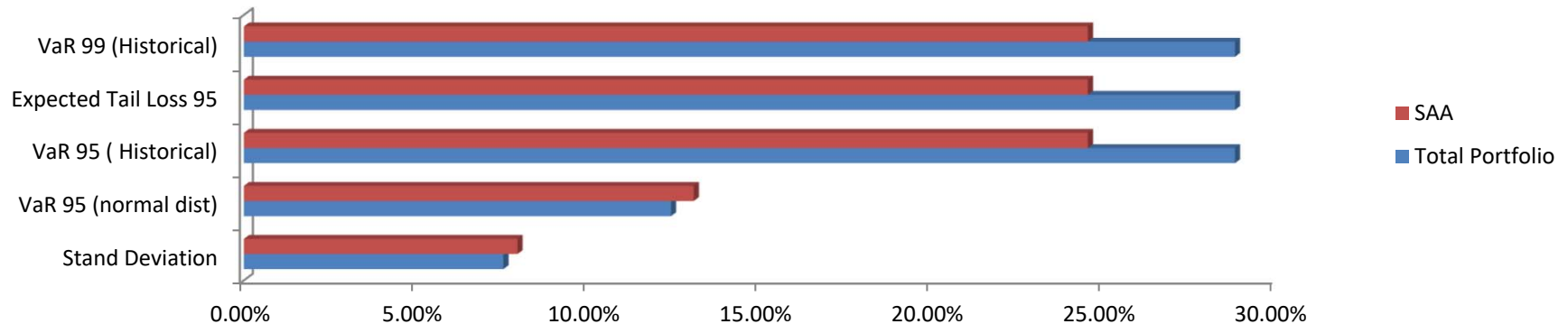


STRESS TEST AND TAIL RISK ANALYSIS

Stress Tests



VaR and Tail Risk Analysis



APPENDIX

Risk change analysis

GLOSSARY

- Diversification: shows the diversifying effect of covariance on portfolio risk. For example, a diversification figure of 60% means that you are diversifying away 60% of portfolio risk. A higher number thus indicates greater diversification arising from covariance.
- Standard Deviation: distribution of asset's return, expressed in percent. We forecast volatility using normal distribution with two-third probability in Barra's multiple factor model (BIM). The total risk for an asset depends on the asset's exposures to the risk factors, the factor variance/covariance matrix, and the forecast selection risk of the asset.
- Parametric VaR Confidence Level: 95%
- Historical VaR & Expected Tail Loss Settings:
 - Holding Period: 252 days (1 year)
 - Decay Factor: 0.94
 - Look Back Period: trailing 10 years
- Decay Factor: this parameter means that older observations are given less weight than more recent ones. Its magnitude determines how fast the weight on the observations used in the simulation decays over the historical period. BarraOne's decay factor default is 0.94.

ABOUT MSCI

For more than 40 years, MSCI's research-based indexes and analytics have helped the world's leading investors build and manage better portfolios. Clients rely on our offerings for deeper insights into the drivers of performance and risk in their portfolios, broad asset class coverage and innovative research.

Our line of products and services includes indexes, analytical models, data, real estate benchmarks and ESG research.

MSCI serves 97 of the top 100 largest money managers, according to the most recent P&I ranking.

For more information, visit us at www.msci.com.

NOTICE AND DISCLAIMER

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the “Information”) is the property of MSCI Inc. or its subsidiaries (collectively, “MSCI”), or MSCI’s licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the “Information Providers”) and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or disseminated in whole or in part without prior written permission from MSCI.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, “Index Linked Investments”). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research Inc. and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.’s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.’s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research Inc. is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI’s products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD, FEA, InvestorForce, and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor’s. “Global Industry Classification Standard (GICS)” is a service mark of MSCI and Standard & Poor’s.