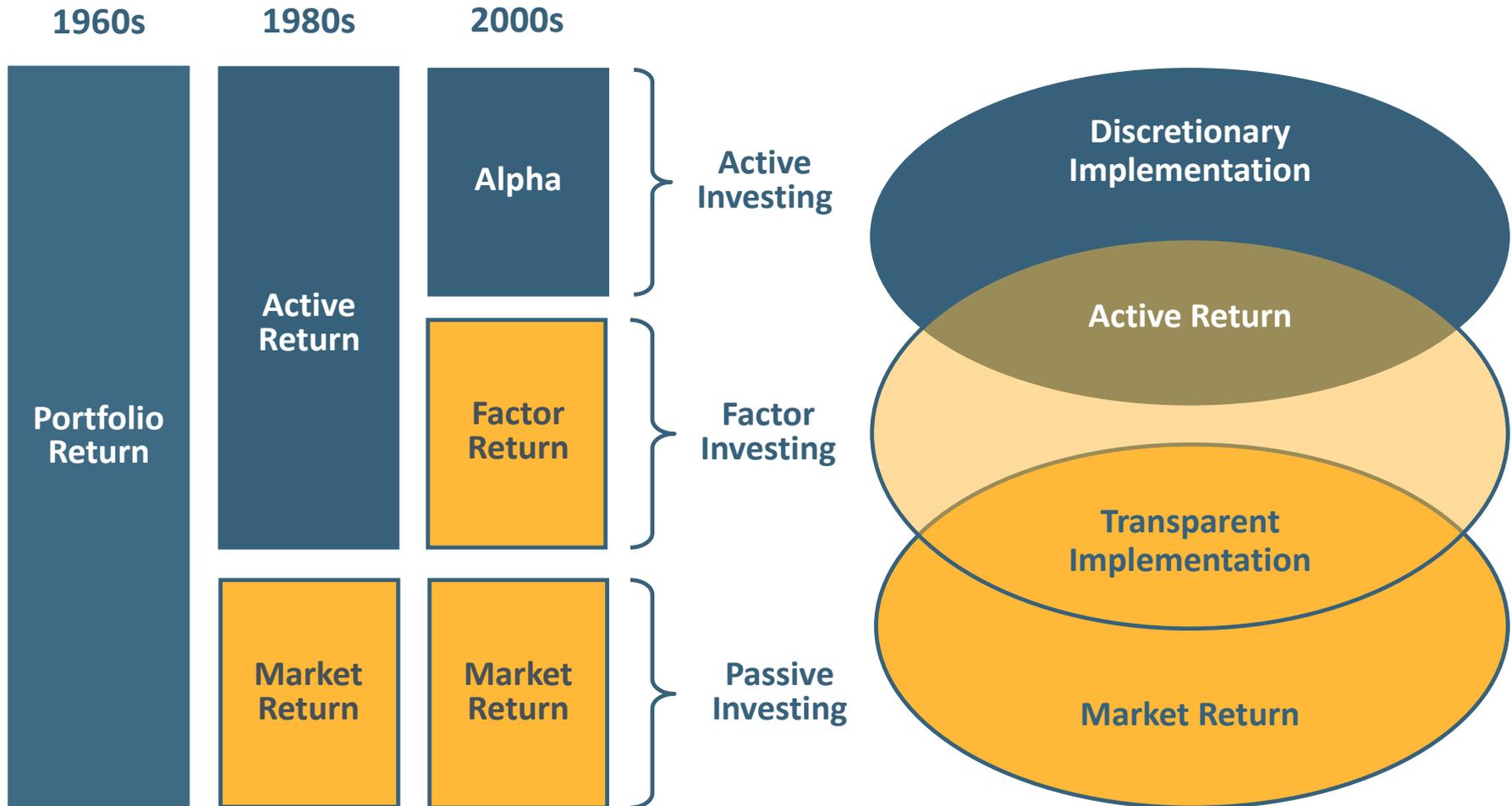


FACTOR INVESTING AND ESG INTEGRATION

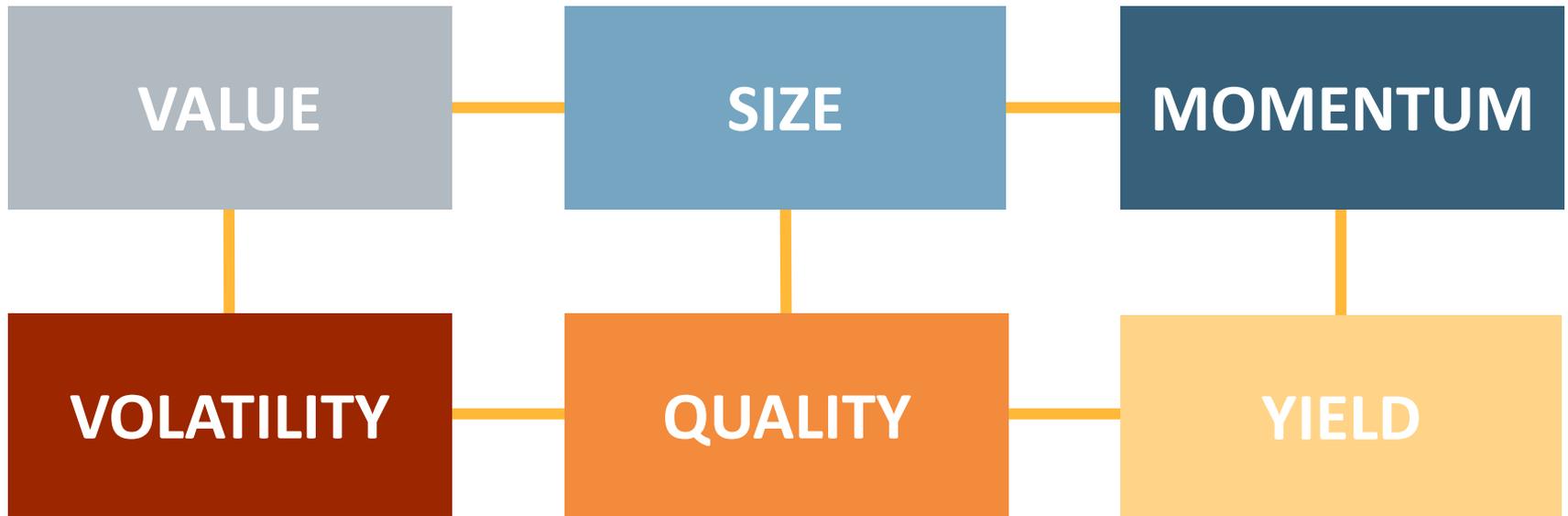
Dimitris Melas, PhD, *Managing Director & Global Head of Equity Research*, MSCI

September 27, 2017

INSTITUTIONAL INVESTORS ALLOCATE TO FACTORS



FACTORS TARGETED BY LONG TERM INSTITUTIONS



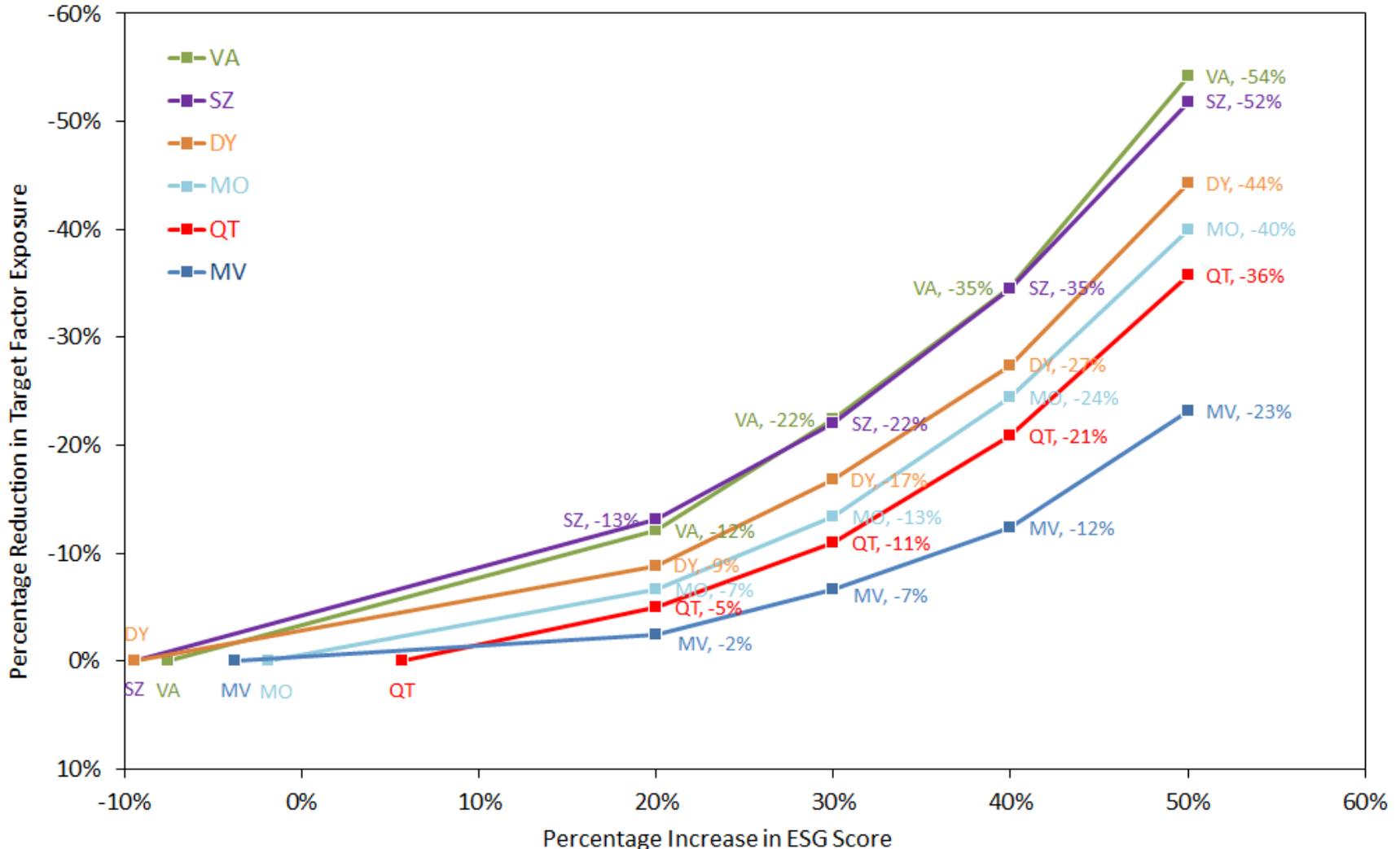
- Factors are stock characteristics that explain portfolio performance over long horizons
- Factors are well documented in academic research and have been used extensively in portfolio risk models and in quantitative investment strategies. Active fund managers use these characteristics in their security selection and portfolio construction process.
- Factor indexes provide a transparent and efficient method to seek exposure to factors

CORRELATIONS BETWEEN ESG AND RISK FACTORS

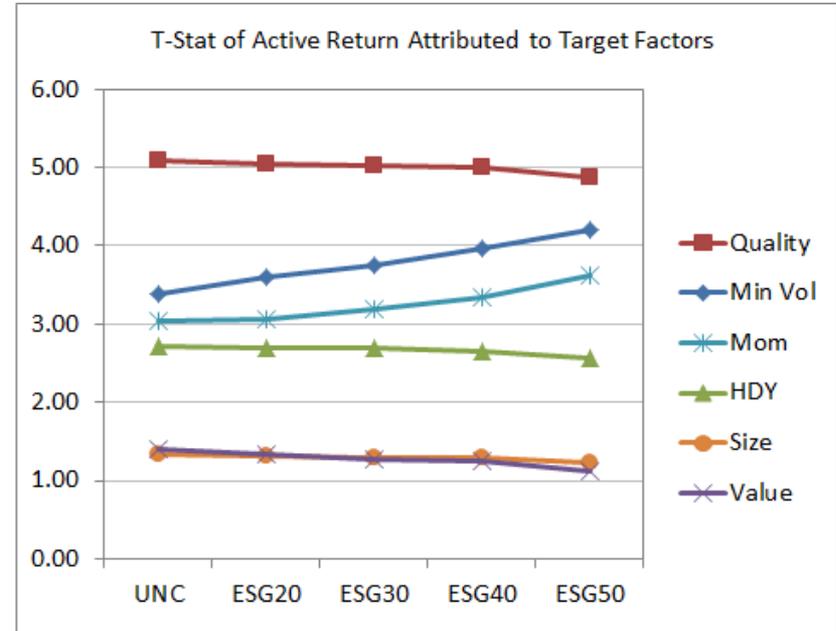
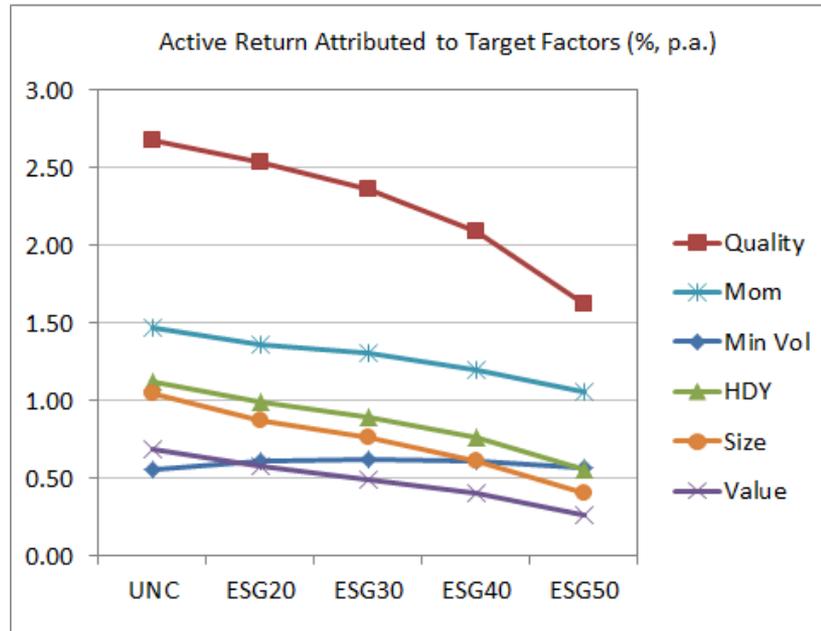
Correlations	ESG	E	S	G	Correlation T-stats	ESG	E	S	G
Mid Capitalization	-0.17	-0.19	-0.07	-0.04	Mid Capitalization	-6.87	-7.59	-2.81	-1.65
Earnings Variability	-0.12	-0.12	-0.08	-0.10	Earnings Variability	-4.95	-4.62	-2.96	-3.99
Residual Volatility	-0.07	-0.07	-0.06	-0.11	Residual Volatility	-2.97	-2.65	-2.49	-4.46
Book-to-Price Ratio	-0.06	-0.08	-0.03	-0.07	Book-to-Price Ratio	-2.32	-3.09	-1.11	-2.63
Liquidity	-0.04	-0.03	-0.01	0.01	Liquidity	-1.43	-1.24	-0.43	0.26
Leverage	-0.03	0.02	0.00	-0.03	Leverage	-1.29	0.92	0.01	-1.03
Beta	-0.03	0.00	-0.02	-0.07	Beta	-0.98	0.05	-0.77	-2.71
Growth	-0.02	0.00	-0.02	-0.02	Growth	-0.87	-0.02	-0.88	-0.79
Momentum	0.00	0.02	-0.01	0.03	Momentum	-0.15	0.92	-0.38	1.34
Earnings Yield	0.01	0.01	-0.03	0.01	Earnings Yield	0.31	0.56	-1.03	0.27
Earnings Quality	0.03	0.05	0.04	0.03	Earnings Quality	1.24	1.99	1.47	1.03
Long-Term Reversal	0.04	0.01	0.04	-0.03	Long-Term Reversal	1.50	0.48	1.47	-1.08
Profitability	0.06	0.06	0.03	0.08	Profitability	2.17	2.35	1.25	3.23
Dividend Yield	0.07	0.04	0.05	0.07	Dividend Yield	2.68	1.69	1.89	2.88
Investment Quality	0.08	0.09	0.05	0.05	Investment Quality	3.17	3.36	1.78	2.07
Size	0.17	0.19	0.07	0.04	Size	6.62	7.46	2.76	1.47

- We examine cross-sectional correlations of stock-level factor exposures with ESG scores
- While the correlation level was low, many of these relationships were highly significant:
 - Positive correlation with the Size, Investment Quality and Profitability GEMLT factors
 - Negative correlation with Midcap, Earnings Variability, Residual Volatility, Book/Price

ESG INTEGRATION IMPACT ON TARGET FACTORS



FACTORS REMAIN SIGNIFICANT RETURN SOURCES



- Factor attribution analysis confirms that ESG integration into defensive strategies did not impair their ability to generate significant active returns from their target factors
- Value and low size strategies also enjoyed positive active returns from their respective target factors but the returns were lower in magnitude and not statistically significant

ESG CONSTRAINT IMPROVED MANY DIMENSIONS

ESG Metrics	MSCI World	Min Vol	ESG20	ESG30	ESG40	ESG50
Key Integration Metrics						
ESG Score	5.3	5.1	6.3	6.8	7.3	7.9
ESG Leaders (AAA-AA) (%)	20.8	18.1	33.5	42.5	52.7	64.9
ESG Laggards (B-CCC) (%)	17.0	14.8	4.3	2.3	1.1	0.0
ESG Pillars						
Environmental Score	5.5	5.4	6.0	6.3	6.5	6.7
Social Score	4.3	4.1	4.6	4.9	5.2	5.5
Governance Score	5.0	4.9	5.2	5.3	5.5	5.6
Key Governance Metrics						
Lack of Indep. Board Majority (%)	13.1	15.4	15.0	15.6	16.7	17.3
Deviation from 1 Share1 Vote (%)	21.3	22.9	21.1	19.5	17.3	15.0
No Female Directors (%)	6.6	9.5	8.7	8.5	8.6	8.2
Values						
Global Compliance Watch List (%)	13.9	12.5	8.8	6.5	4.4	3.6
Red Flag Controversies (%)	2.8	1.4	1.0	0.9	0.5	0.0
Orange Flag Controversies (%)	27.8	22.7	19.2	17.4	15.9	14.6

ESG Metrics	MSCI World	Qual	ESG20	ESG30	ESG40	ESG50
Key Integration Metrics						
ESG Score	5.3	5.6	6.4	6.9	7.4	7.9
ESG Leaders (AAA-AA) (%)	20.8	25.8	36.6	46.6	57.3	68.5
ESG Laggards (B-CCC) (%)	17.0	11.1	4.6	1.6	0.8	0.2
ESG Pillars						
Environmental Score	5.5	5.9	6.3	6.5	6.8	7.0
Social Score	4.3	4.3	4.7	5.0	5.2	5.4
Governance Score	5.0	5.0	5.2	5.3	5.5	5.7
Key Governance Metrics						
Lack of Indep. Board Majority (%)	13.1	18.6	17.6	17.8	16.9	16.1
Deviation from 1 Share1 Vote (%)	21.3	19.9	17.5	16.0	15.0	15.8
No Female Directors (%)	6.6	7.4	7.6	7.7	6.9	6.4
Values						
Global Compliance Watch List (%)	13.9	12.1	6.5	6.3	4.9	5.8
Red Flag Controversies (%)	2.8	3.9	1.9	1.0	0.0	0.0
Orange Flag Controversies (%)	27.8	21.5	20.2	20.5	17.5	17.3

- Portfolio level ESG score improvement was not achieved through a barbell strategy that overweighted leaders and laggards. Both categories moved consistently in the right way
- We observe improvement across all three individual pillars. We see a similar improving picture for companies on the watch list and those that are subject to ESG controversies.

CONCLUSION

- We investigated the impact of incorporating ESG into passive and active strategies. We used factors as proxies for active strategies. Our analysis shows that ESG generally had **positive impact on historical risk adjusted performance** of the strategies we evaluated
- Integrating ESG tilted the portfolio towards companies with higher market cap, better earnings quality, higher earnings stability, lower leverage and lower residual volatility
- To quantify the potential impact of ESG constraints on the **ex-ante information ratio** we focus on percentage **reduction in target factor exposure**. An x% drop in factor exposure due to an ESG constraint translated directly into an x% reduction in ex-ante information ratio, everything else being equal
- Significant ESG improvement was achieved with **modest impact on target factors**: a 30% ESG improvement was achieved with only a 7 - 22% reduction in target factor exposures
- ESG had remarkably **low impact on minimum volatility strategies**. Target factor exposure only decreased by 7% for a 30% ESG uplift. Quality strategies were also less affected. On the other hand, value, size, momentum, and yield strategies experienced more material target factor exposure reductions ranging between 13-22% for a 30% ESG improvement

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