

PARKER GLOBAL STRATEGIES, LLC

Managing Hedge Fund Risk

Terrapinn

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The Palace Hotel
Tokyo, Japan

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- II. Control**
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- IV. Risk Measurement**
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I. Overview

PGS Overview

- Founded 1995, 22 professionals
- Specialist in designing and managing customized multi-manager hedge fund portfolios
- Advised on over \$1.5 billion in placements, \$430 in mandates
- Daily risk oversight, estimated p/l's and risk analytics available 24/7 with drill down capability via secured website
- Registered in the U.S. as RIA, CTA, CPO

What is Risk?

“Risk is the link between investment of assets and the promise of return.”

What is Risk?

“Risk is the potential for loss of control and/or value. Risk may range from the benign to the malignant, from the dormant to the brewing to the exploding. Risk may be expected or it may be a surprise. Most importantly, risk is ever present.”

Risks Involved in Hedge Funds

Portfolio Risks

- Market
- Liquidity
- Leverage
- Concentration
- Hedge Ratios
- Short Volatility
- Style drift

Risks Involved in Hedge Funds

Operational Risks

- Counterparty
- Legal
- Credit
- Model
- Accounting
- Regulatory
- Clearing
- Human
- Fraud

The Group of Thirty

Recommendations for Dealers and End-Users July 1993

- *Determine the scope* of activities and policies at the highest level of management.
- *Value derivative positions* at market.
- *Perform stress tests* and forecast cash and funding needs.
- *Establish an independent, middle office* reporting directly to senior management.
- *Empower professionals* with appropriate skills to perform required duties.
- *Install systems* capable of measuring, managing and reporting risks in a timely and accurate manner.

Best Practices Approach to Risk Management

- Adhere to highest standards of implementation
- Independent of trading function
- Integrated across strategies
- Empowered to act
- Finger on the pulse of the market

II. Control

Control

We must constantly be aware of portfolio risk and operational risk:

- Choosing
- Measuring
- Monitoring
- Controlling Exposure

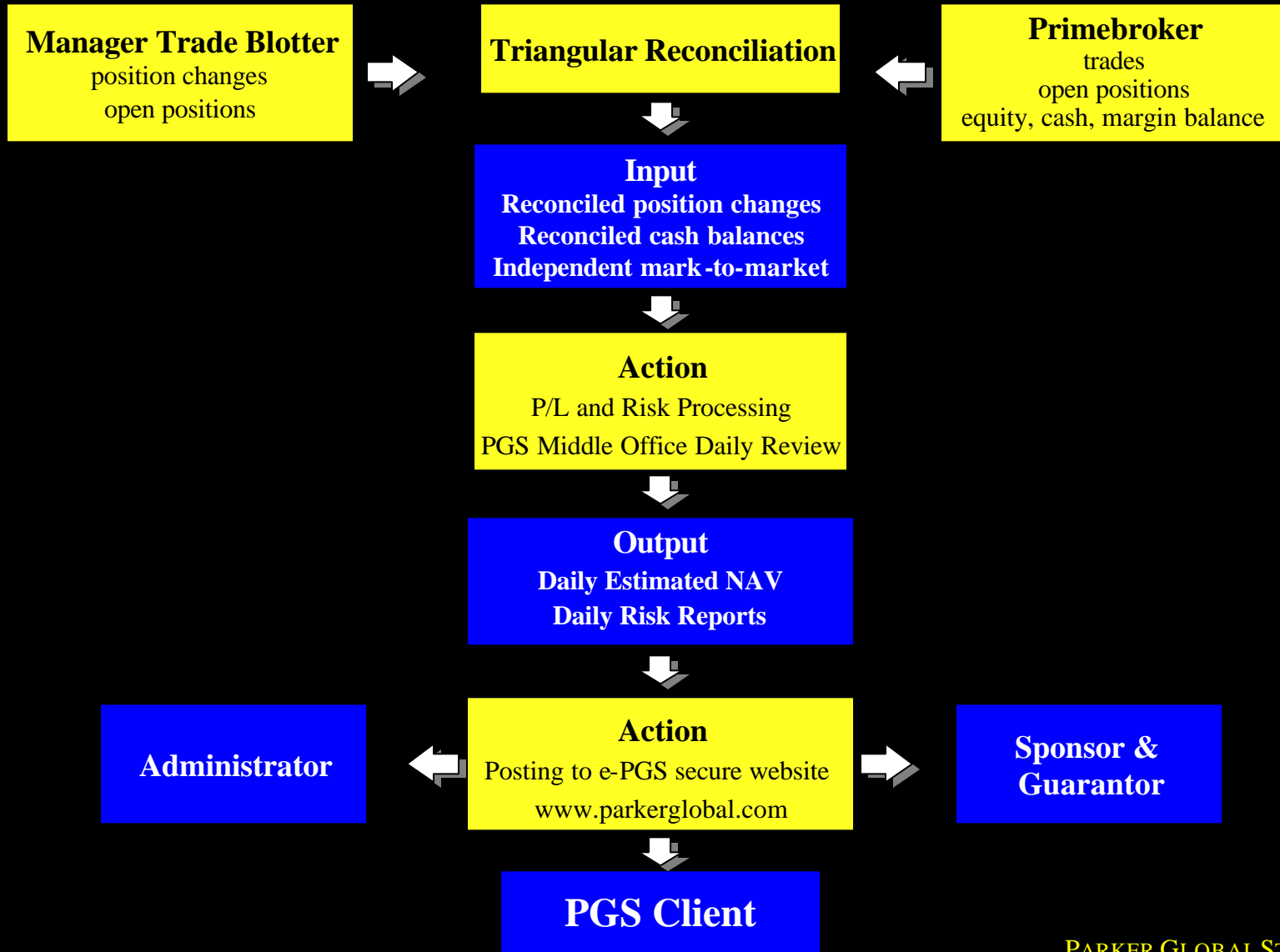
Successful Risk Management

- Policies and Procedures
- Middle Office
- Quantitative Models
- Strict Accounting Standards
- Strong Documentation
- Savvy Managers

Building Control

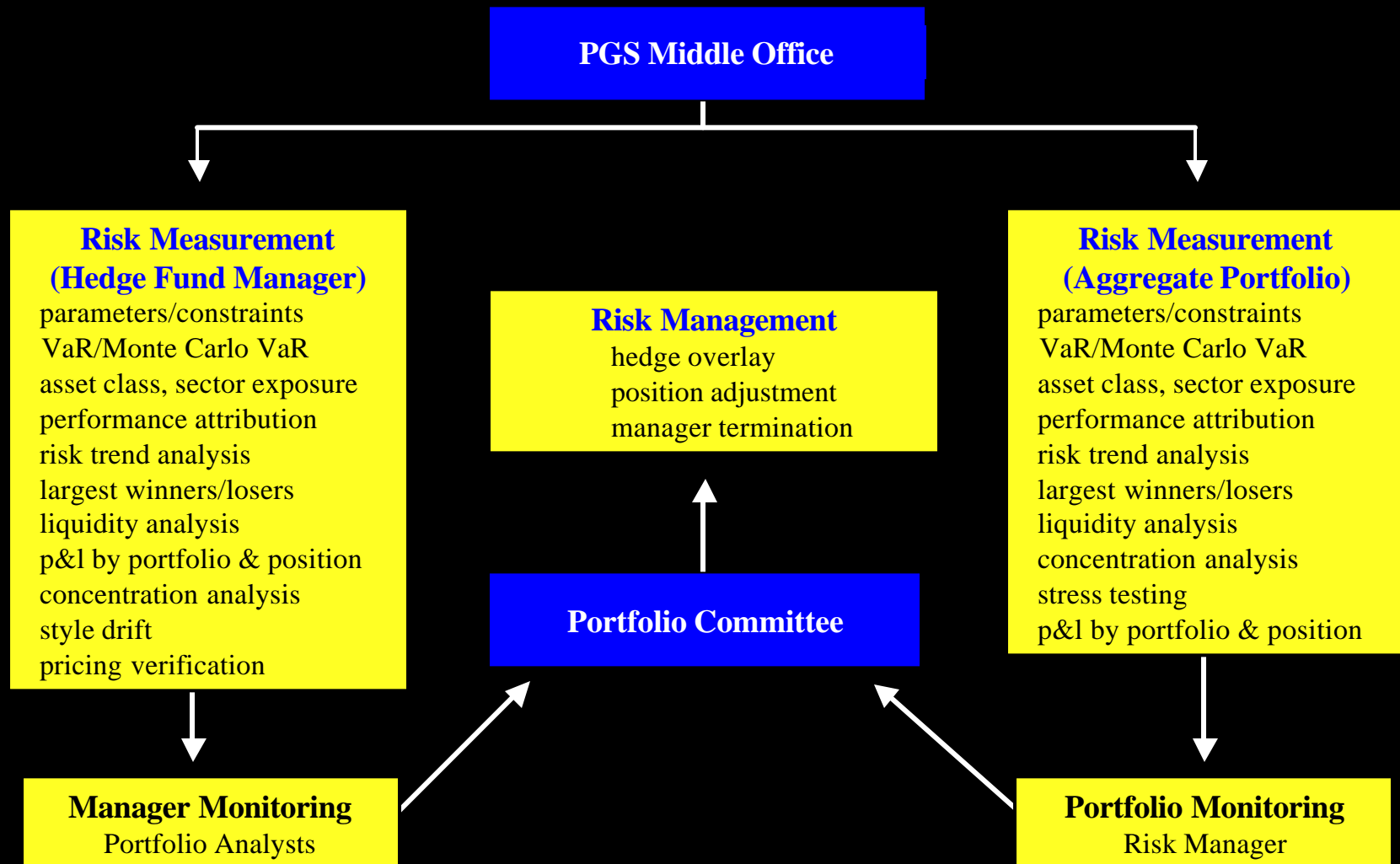
- Managed Accounts
- Selection of Program Participants
- Party to All Agreements
 - *Hedge Fund Manager*
 - *Administrator*
 - *Prime Broker*
 - *Auditor*
- Redemption / Termination Rights

Maintaining Control: Active Portfolio Risk Oversight



III. Risk Monitoring

Risk Monitoring Process



IV. Risk Measurement

The Quantitative Tools

Risk Measurement Must Be Tailored to the Strategy

- **Value at Risk**

Contribution to Risk ? Incremental Risk

- **Gross • Net Analysis (Beta-Adjusted)**

Sector ? Country

- **Stress Testing**

Key Drivers ? Factor Analysis

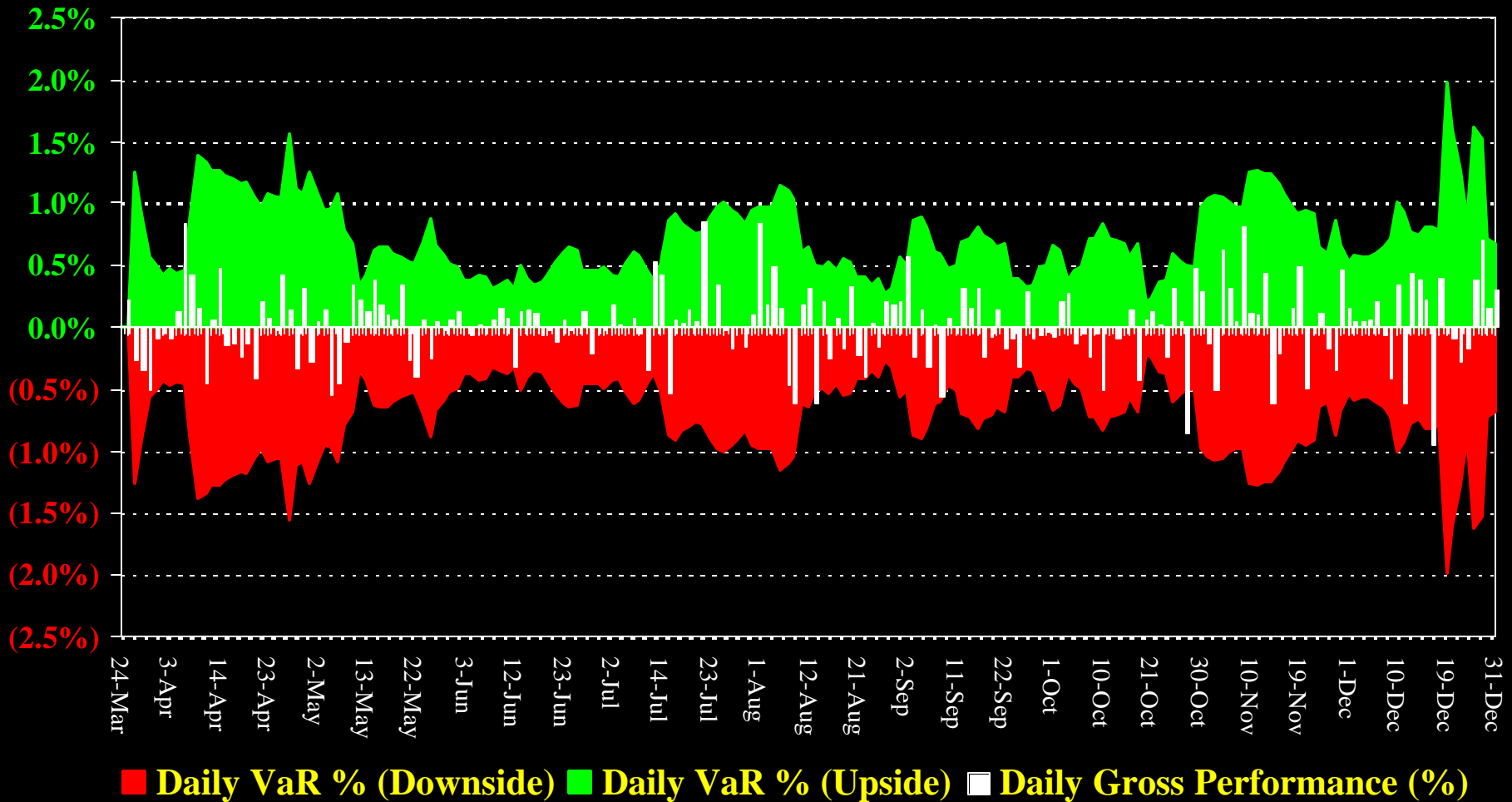
- **Scenario Analysis**

Monte Carlo ? Recursive Models

- **Downside Deviation**

Minimum Acceptable Return ? Maximum Acceptable Loss

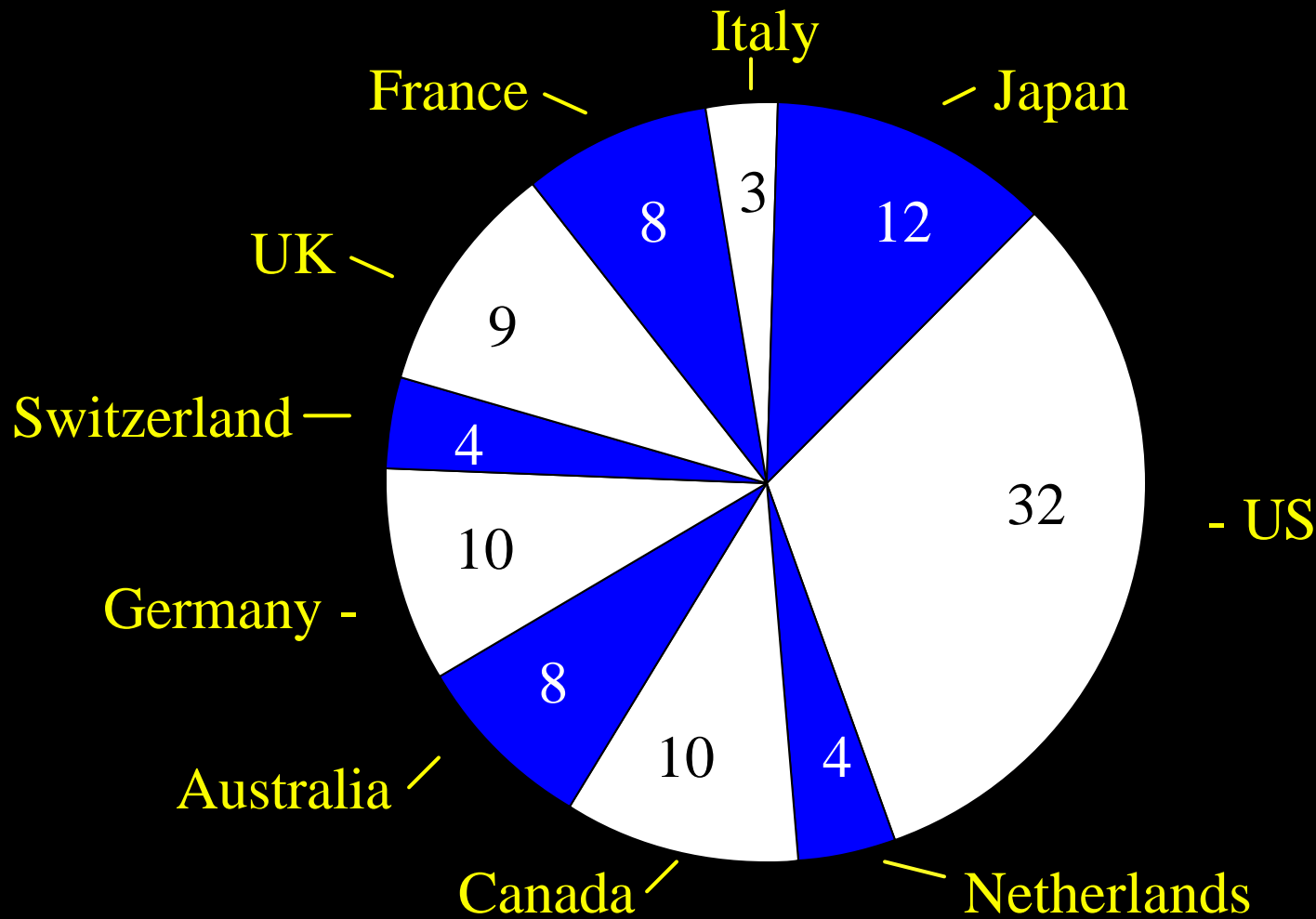
Sample VaR Track*



*Based on 2 standard deviations

Contribution to Risk

Percentage Risk In Proportion to Total Risk



VaR_? = additive
VaR_? = correlated

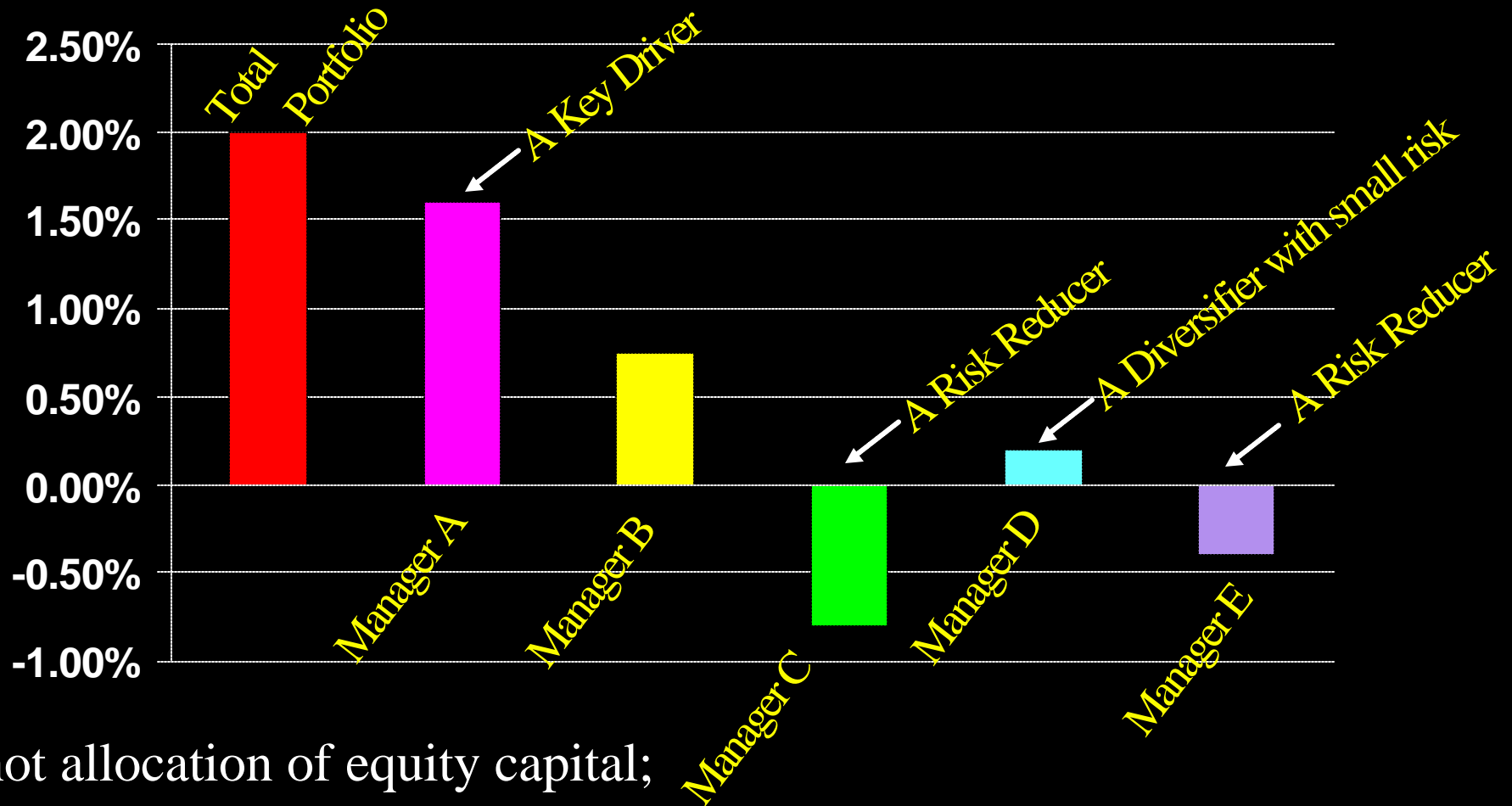
Based upon each country's contribution to total value at risk.

Analyze highly correlated regions

Net correlated VaR for Europe = 24%

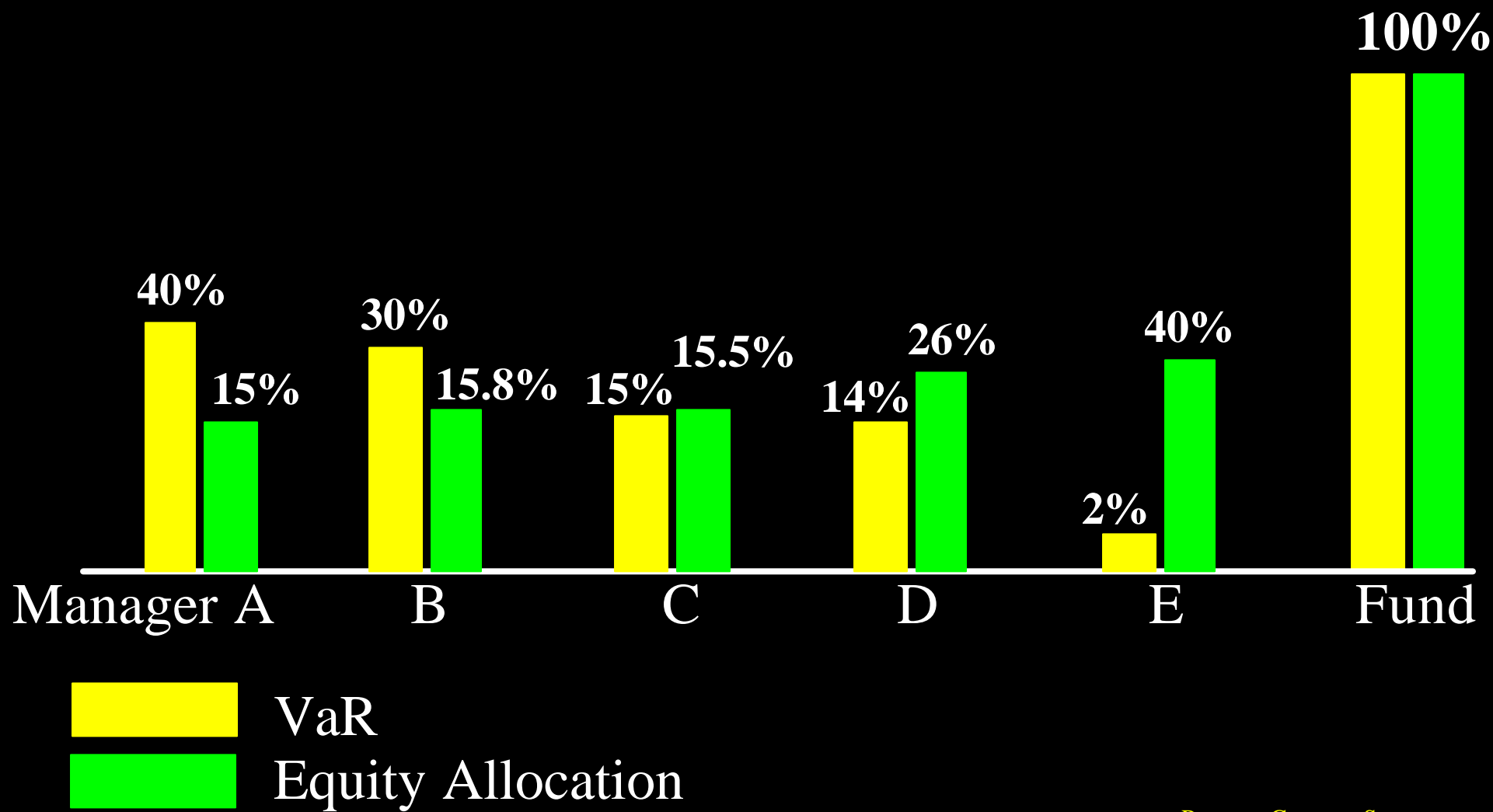
Incremental Risk

Portfolio Risk *With* Versus *Without*



It's not allocation of equity capital;
it's allocation of **VaR**.

VaR By Manager



Aggregate Portfolio Sector Exposure Report

Portfolio: SAMPLE

Position Date: 11/05/2001

NAV: 20.58 (Millions)

MTD Returns: 0.1%
YTD Returns: 9.2%

	\$	%
Net:	10.7	52.21
Gross:	38.5	187.2

Percent (%) Industry Sectors	USD			EUR			GBP			CAD			CHF			Total		
	Lng	Sht	Net	Lng	Sht	Net	Lng	Sht	Net	Lng	Sht	Net	Lng	Sht	Net	Lng	Sht	Net
ST Interest Rate Futures	83.8	-19.5	64.3	.	.	.	.	.	.	.	.	.	.	.	.	83.8	-19.5	64.3
Financial	6.3	-4.8	1.5	.3	-.1	.3	.2	-.1	.1	.	.	.	.	-.1	-.1	6.9	-5.2	1.7
Consumer, Non-cyclical	5.3	-4.	1.3	.2	.	.2	.	-.1	-.1	.	.	.	.1	.	.1	5.7	-4.2	1.5
Industrial	3.6	-2.6	.9	.2	.	.2	.1	-.1	.	.	.	.	.1	.	.1	4.	-2.7	1.3
Consumer, Cyclical	3.9	-1.8	2.	.1	.	.1	.	-.1	-.1	.	.	.	.	.	.	4.1	-2.	2.1
Index Futures	.	-5.8	-5.8	.	.	.	.	.	.	.	.	.	.	.	.	.	-5.8	-5.8
Communications	3.5	-1.8	1.6	.1	.	.1	.1	-.1	.	.	.	.	.	-.1	-.1	3.7	-2.	1.7
Technology	2.6	-2.9	-.4	.	.	.	.	.	.	.	.	.	.	.	.	2.6	-3.	-.4
Utilities	2.4	-.8	1.6	.	.	.	.	.	.	.	.	.	.	.	.	2.5	-.9	1.6
Basic Materials	1.6	-1.2	.4	.1	.	.1	.	.	.	.	-.1	-.1	.	.	.	1.8	-1.4	.4
Energy	1.9	-.3	1.6	.1	.	.1	.	.	.	.	.	.	.	.	.	2.	-.3	1.7
LT Bond Future	.	-.5	-.5	.9	.	.9	.	.	.	.	.3	.3	.	.	.	1.5	-.5	1.
Unclassified	1.1	-.2	.9	.	.	.	.	.	.	.	.	.	.	.	.	1.1	-.2	.9
Funds	.	-.3	-.3	.	.	.	.	.	.	.	.	.	.	.	.	.	-.3	-.3
Diversified	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Total Long & Short (%)	116.	-46.7	69.3	2.1	-.2	1.9	.6	-.6	-.1	.3	-.1	.2	.3	-.2	.	119.7	-48.	71.7
NAV:(Millions)	20.6																	
Fund Net Exp. (\$1,000,%NAV)	14.3	69.3%		.4	1.9%		-.01	-0.1%		.05	.2%		.01	.%		14.8	71.7%	
Fund Gross Exp. (\$1,000,%NAV)	33.5	162.7%		.5	2.2%		.24	1.2%		.09	.4%		.1	.5%		34.5	167.7%	

Equity Long/Short

Sector Exposure Report (Beta-Adjusted)

	Short	0	Long	Gross	Net
Financial	-3.4		5.5	8.9	2.1
Industrial	-1.3		4.4	5.7	3.1
Consumer, Non-Cyclical	-1.5		3.3	4.8	2.2
Consumer, Cyclical	-1.0		1.5	2.5	.5
Communications	-1.3		2.0	3.3	.7
Basic Materials	-.4		1.3	1.7	.9
Energy			.1	.1	.1
Technology	-.4		.1	.5	-.3
Diversified	-.4			.4	-.4
Utilities			.4	.4	.4

Stress Testing

Moving key portfolio drivers - *factors* - to extremes and measuring expected outcome.

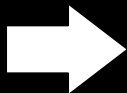
Traditional Factor Model:

$$\tilde{R} = [b_{i1}\tilde{F}_1 + b_{i2}\tilde{F}_2 + \dots + b_{in}\tilde{F}_n] + \tilde{e}_i$$

The \tilde{e}_i , non-factor return, is assumed to be uncorrelated with all others.

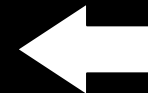
The factors are the *only* sources of correlation among returns.

Explained
variance



$$R^2 =$$

$$1 - \frac{\text{VAR}(\tilde{e}_i)}{\text{VAR}(\tilde{R}_i)}$$



Unexplained
variance

Scenario Analysis

- *Considers outcomes* given multiple scenarios, *assigns probabilities* to each, and *gives value* by averaging the results.
- *Monte Carlo*, best known, works on principle of average coin tosses.
- *Excels* valuing instruments with:
 - *Predictable cash flows*
 - *European options*
 - *Floating rate instruments without optionality*
- *Implodes* for instruments or portfolios with complex optionality and unpredictable cash flows.

Downside Deviation

- Challenge of performance measurement - we know what outcome *was*, not what it *could have been*.
- Shape of uncertainty is probability distribution - need to know *mean, variance, skewness* and *kurtosis* to begin to judge risk.
- Calculation error arises because we measure what *did* happen (discrete time), not what *could have* happened (continuous time).
- Need to curve fit monthly histogram of data and calculate DD applying continuous distribution using integral calculus.

Source: *Sortino & Forsey*
Journal of Portfolio Management, Winter 1996

Downside Deviation (continued)

- Earlier work on DD assumes normal or lognormal distribution.
- Enhance 2 parameter (mean and ?) lognormal model by flipping distribution to incorporate negative returns and skewness.
- Creates 3 parameters - *mean*, *variance* and *extreme value* to determine skewness and kurtosis.
- Alternative is to apply *bootstrapping*, generating thousands of annual returns from 10 years of data.

Stress Analysis

	\$ Allocation	2 ? VaR \$	2 ? VaR %	2 ? HV %	2 Max DDD%	5 ? VaR \$	5 ? VaR %
Manager A	\$10.2	\$122.4	1.2%	1.1%	2.4%	\$306.0	3.0%
Manager B	5.7	125.4	2.2	1.8	3.2	313.5	5.5
Manager C	7.3	54.8	.75	.6	1.2	137.0	1.9
Manager D	9.4	60.2	.64	.5	0.9	150.5	1.6
Manager E	<u>7.4</u>	<u>68.1</u>	<u>.92</u>	1.1	1.4	<u>170.3</u>	<u>2.3</u>
Fund	\$40.0	\$360.0?	.90?			\$900.0	2.3?
Uncorrelated		430.9?	1.08%			1077.3?	

V. Risk Management

Risk Management is Action

Prudent Actions Before Investing

- Establish Watch/Cut/Termination Levels
- Careful Due Diligence
 - *independently verify reputation*
 - *understand what can go wrong with the strategy*
 - *examine the portfolio*
- Thorough Review of All Documentation
 - *offering memorandum*
 - *investment manager contract*
 - *subscription agreements*
 - *administrator and Auditing engagement letters*
 - *audits*
 - *client communications*
- Diversify, Diversify, Diversify

Risk Management is Action

After Investing

- Terminate a manager/redeem from a fund
- Require a manager to reduce exposure
- Independently overlay an offsetting hedge
- Remember, no action is an action

V. Summary

Effective Hedge Fund Risk Management Requires:

- Some level of investor or gatekeeper control in the process
- Transparency to monitor style, risk, and performance measurement
- Quantitative risk measurement tools for objective, independent evaluation
- Accurate performance measurement to judge the quality of the return

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