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ACTIVE ASSET AND CURRENCY MANAGEMENT

Illustrative Currency Risk Report

US Perspective

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Currency Exposures

Asset Allocation

	<u>Return</u>	<u>Risk</u>	<u>Mix</u>
Domestic Equity	8.0%	18.0%	20%
Developed Equity	8.5%	19.5%	15%
Emerging Equity	9.0%	20.5%	5%
Domestic Bonds	4.0%	6.0%	20%
Developed Bonds	4.5%	7.0%	8%
Emerging Bonds	6.0%	8.0%	2%
Domestic Real Assets	6.0%	13.0%	10%
International Real Assets	6.5%	14.0%	10%
Alternatives	7.0%	10.0%	7%
Cash	1.5%	1.5%	3%
Portfolio	6.4%	8.7%	

Currency Exposure

	<u>Currency Exposures</u>	<u>Individual Ccy Risk</u>
USD	-	-
JPY	17.3%	10.1%
→ EUR	30.3%	10.9%
GBP	21.8%	11.5%
CHF	3.4%	11.7%
→ CAD	4.1%	10.5%
AUD	3.4%	14.6%
SEK	1.3%	12.2%
NOK	0.2%	12.4%
→ NZD	0.1%	15.3%
SGD	0.4%	6.4%
CZK	0.2%	13.3%
HUF	0.2%	16.1%
ILS	0.2%	9.2%
PLN	0.5%	15.4%
RUB	0.9%	17.0%
ZAR	1.0%	16.2%
TRY	0.2%	12.7%
CNY	4.9%	5.0%
IDR	0.7%	10.2%
INR	1.7%	9.2%
KRW	1.5%	8.7%
MYR	0.5%	8.3%
PHP	0.1%	6.3%
THB	0.7%	5.9%
TWD	1.5%	5.2%
BRL	1.4%	16.2%
CLP	0.2%	12.6%
COP	0.3%	15.3%
MXN	0.8%	11.1%
PEN	0.2%	6.1%
Other	0.4%	10.0%

*Currency weights of
MSCI ACWI, JPM
Global GBI Index,
JPM Diversified EM,
Bloomberg Barclays
World Government
Inflation-Linked Bond
Index*

Regional Currency Exposures

(% of portfolio value)

Northern Europe	22.8%
EMEA	1.2%
Emerging Asia	4.7%
LatAm	1.2%

Total Developed Foreign	33.0%
Total Emerging Foreign	7.0%
Total Foreign	40.0%

**Total Portfolio Risk
due to 40.0% Foreign
Currency Exposure
3.0%**

Total portfolio asset allocation methodology is appropriate

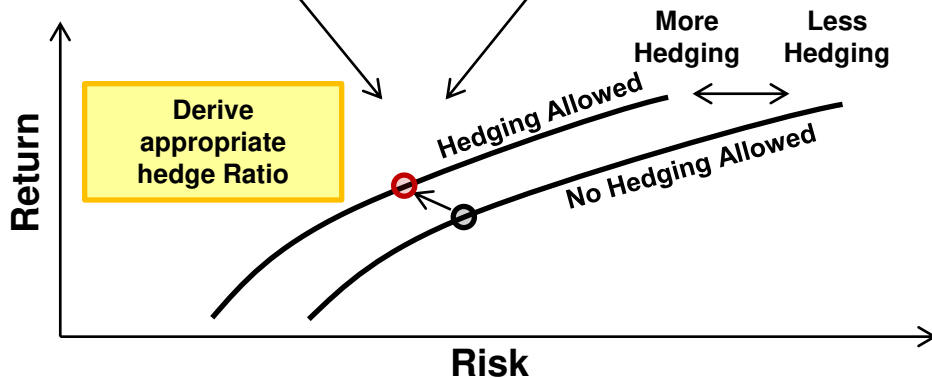
Investor Expectations

	<u>Return</u>	<u>Risk</u>	<u>Correlation</u>					
Domestic Equity	8.0%	18.0%	1.00					
Developed Equity	8.5%	19.5%	0.80	1.00				
Domestic Bond	4.0%	6.0%	0.00	0.00	1.00			
Real Assets	6.0%	13.0%	0.10	0.10	-0.15	1.00		
Absolute Return	7.0%	10.0%	0.50	0.40	0.00	0.00	1.00	
Cash	1.5%	1.5%	0.00	0.00	0.10	0.00	0.00	1.00
Foreign Currency	0.0%	7.5%	0.00	0.00	0.15	0.00	0.00	0.00

Investor risk appetite inferred from portfolio construction

Full set of expectations on pages 7 and 8

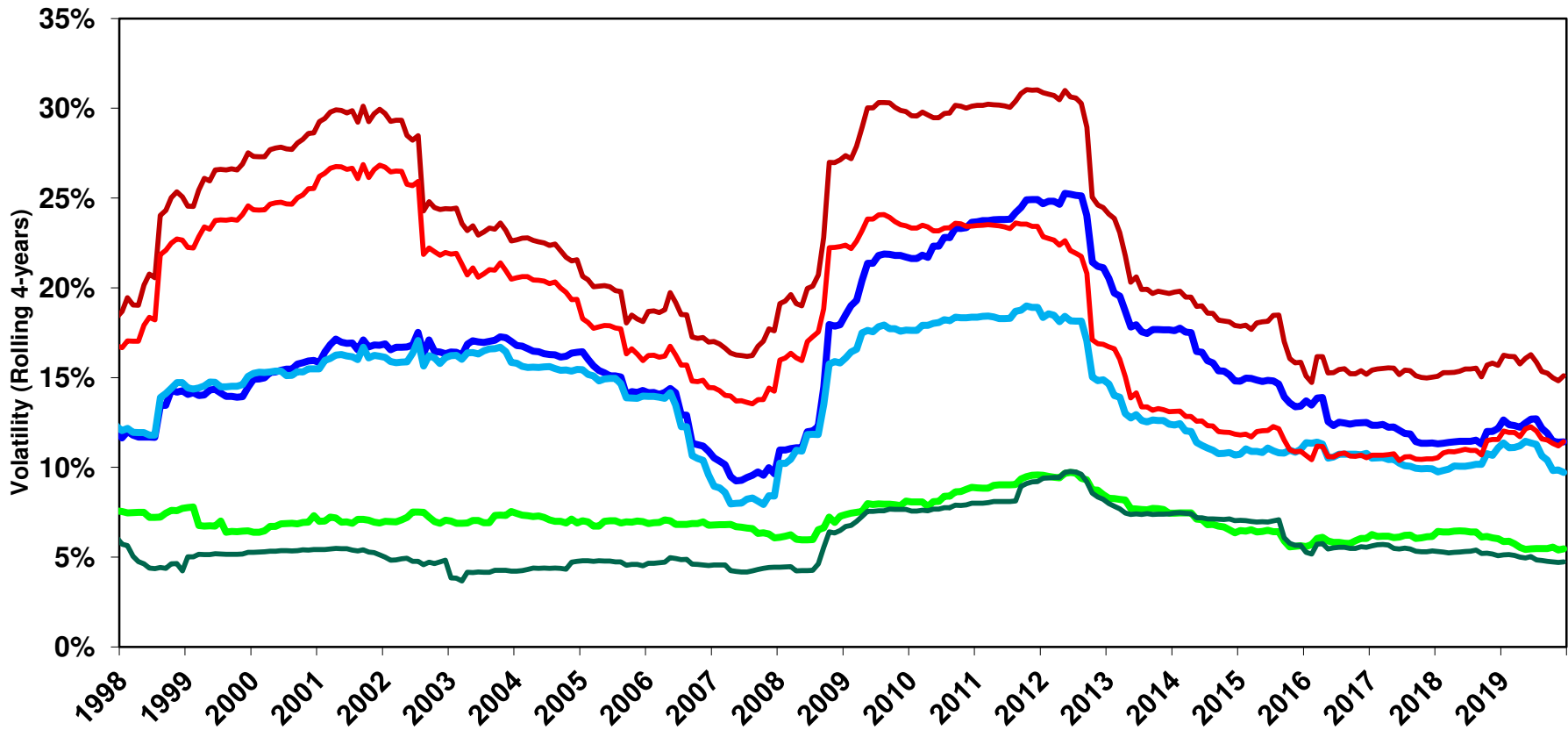
Effect of strategic currency exposure on total portfolio judged using investor expectations



International Equity Rolling Four Year Volatility

US perspective

- Unhedged Foreign Developed Stocks
 - Developed Currency
 - Hedged Foreign EM Stocks
- Hedged Foreign Developed Stocks
 - Unhedged Foreign EM Stocks
 - Emerging Currency

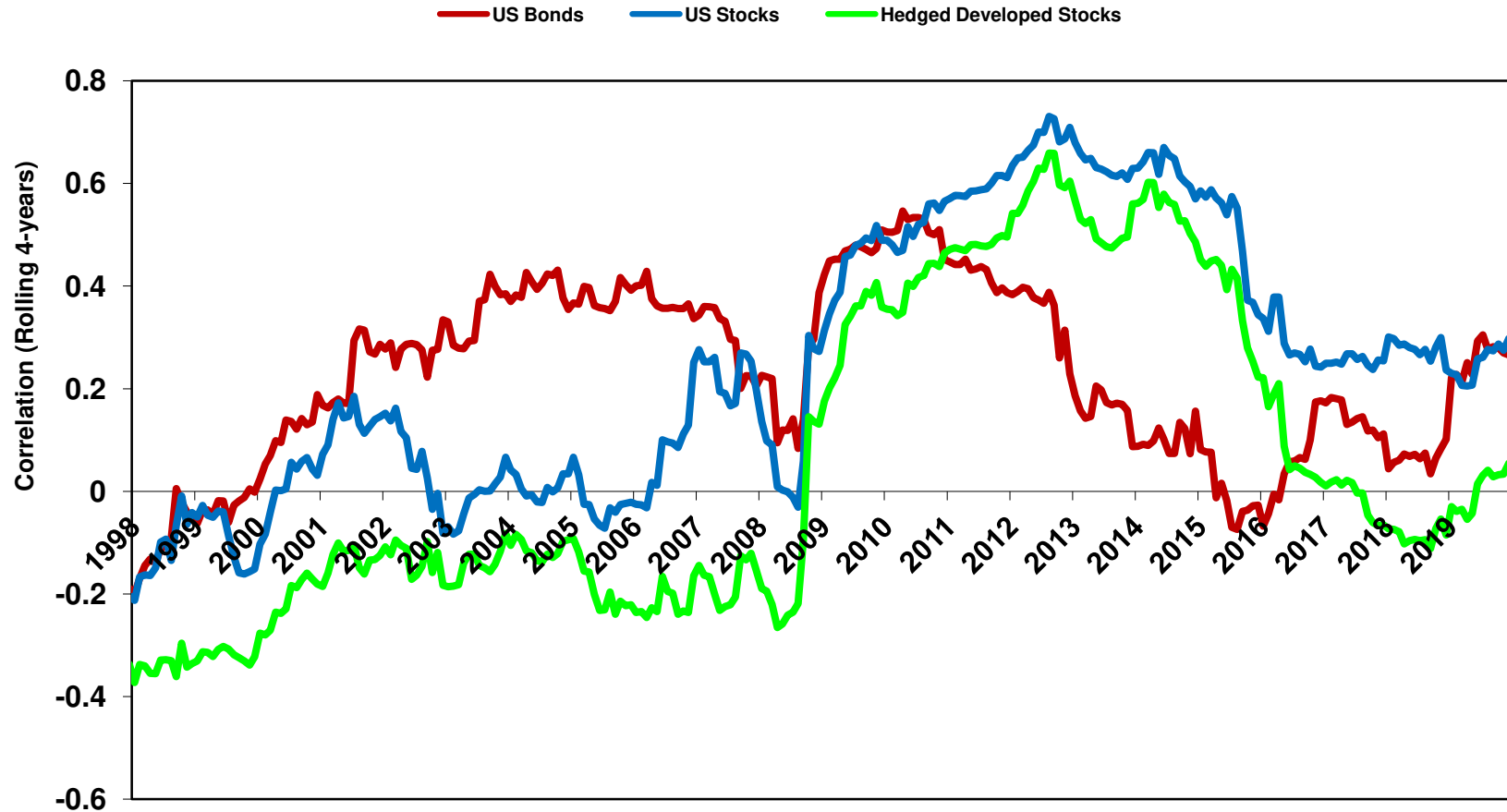


Rolling four year annualized volatility derived from monthly returns.

Source: International Equity proxy is MSCI world ex US, and EM Equity proxy is MSCI EM.

Rolling Four Year Correlations with Developed Currency

US perspective

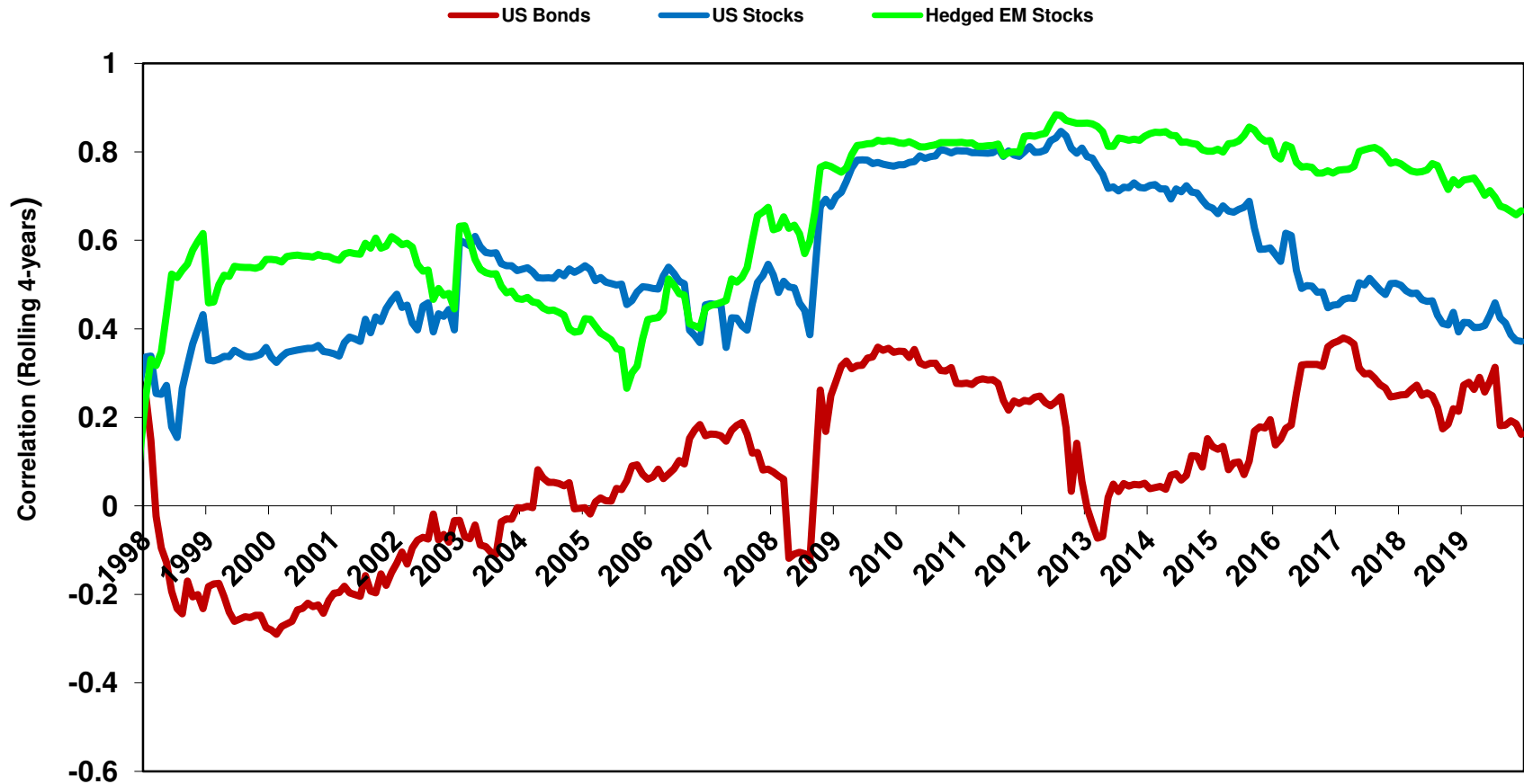


Correlations derived from monthly returns.

Source: Domestic Equity proxy is S&P 500 Index; Bond proxy is Barclays US Aggregate; International Equity proxy is MSCI World ex US.

Rolling Four Year Correlations with Emerging Currency

US perspective



Correlations derived from monthly returns.

Source: Domestic Equity proxy is S&P 500 Index; Bond proxy is Barclays US Aggregate; EM Equity proxy is MSCI EM.

Currency Risk Analysis Inputs – Expected Returns & Risk

	<u>Return</u>	<u>Risk</u>	<u>Mix</u>
Domestic Equity	8.0%	18.0%	20%
Developed Equity	8.5%	19.5%	15%
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Alternatives	7.0%	10.0%	7%
Cash	1.5%	1.5%	3%

Developed Currency	0.28%*	7.50%	
Emerging Currency	0.78%**	7.50%	

- Hedging costs are 0.10% for developed currency, 0.15% for emerging currency.

Hedge Study Inputs -- Correlations

Correlation

Domestic Equity	1.00										
Developed Equity	0.80	1.00									
Emerging Equity	0.70	0.70	1.00								
Domestic Bonds	0.00	0.00	0.00	1.00							
Developed Bonds	0.00	0.00	0.00	0.60	1.00						
Emerging Bonds	0.25	0.25	0.40	0.50	0.50	1.00					
Domestic Real Assets	0.35	0.30	0.25	0.05	0.35	0.30	1.00				
International Real Assets	0.25	0.30	0.25	0.00	0.30	0.25	0.75	1.00			
Alternatives	0.40	0.30	0.30	0.00	0.00	0.00	0.00	0.00	1.00		
Cash	0.00	0.00	0.00	0.10	0.10	0.10	0.00	0.00	0.00	1.00	
<hr/>											
Developed Currency	0.00	0.00	0.00	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00
Emerging Currency	0.30	0.30	0.30	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00

Currency Risk Analysis Results

Base case:

Transaction Costs: 10bps DM / 15bps EM

Equity Premium: 4.00%

International Allocation: 40%

Stock / Bond Mix: 57 / 43%

(A) Base Case

	DM	EM
Appropriate Hedge Ratio	55%	0%

Alternative Scenarios: Transaction Cost

(Base Case: 10bps DM / 15bps EM)

(B) Expected transaction cost for developed currencies is 5bps, and the expected transaction cost for emerging market currencies is 10bps.

	DM	EM
Appropriate Hedge Ratio	63%	0%

(C) Expected transaction cost for developed currencies is 15bps, and the expected transaction cost for emerging market currencies is 20bps.

	DM	EM
Appropriate Hedge Ratio	46%	0%

Alternative Scenarios: International Asset Allocation

(Base case: 40.0%)

(D) International asset allocation of 30%.

	DM	EM
Appropriate Hedge Ratio	41%	0

(E) International asset allocation of 50%.

	DM	EM
Appropriate Hedge Ratio	63%	0

(F) International asset allocation of 60%.

	DM	EM
Appropriate Hedge Ratio	68%	0

Alternative Scenarios: Equity Premium

(Base case: 4.00%)

(G) Equity premium is 3.00%.

	DM	EM
Appropriate Hedge Ratio	46%	0%

(H) Equity premium is 5.00%.

	DM	EM
Appropriate Hedge Ratio	61%	0%

Alternative Scenarios: Stock-Bond Mix

(Base case: 57 / 43%)

(I) Stock-bond mix is changed to 67-33%.

	DM	EM
Appropriate Hedge Ratio	47%	0%

(J) Stock-bond mix is changed to 47-53%.

	DM	EM
Appropriate Hedge Ratio	62%	0%

Alternative Scenarios: Currency Volatility

(Base case: 7.5% for developed currency, 7.5% for emerging currency)

(K) The developed market currency and the emerging market currency volatilities are changed to 6.5%

	DM	EM
Appropriate Hedge Ratio	51%	0%

(L) The developed market currency and the emerging market currency volatilities are changed to 8.5%

	DM	EM
Appropriate Hedge Ratio	57%	0%