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Applying a Portfolio Framework to the Currency Hedge Decision

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Applying a portfolio framework to the currency hedge decision

- **Rest of title:**
 - Finding hedge portfolios that reduce risk and reduce hedge costs.

Overview

- Accounting and hedge practices
- Forwards as predictors?
- EA FX risk management
- Portfolio hedge solution

Accounting for FX exposures

Exposure type	Local currency-functional entities	USD-functional entities
Transactional exposures		
CASH FLOW: Forecast non-functional revenues and expenses	Impacts FUTURE EARNINGS (above the line)	Impacts FUTURE EARNINGS (above the line)
BALANCE SHEET: Non-FC balance sheet items remeasurement	Impacts EQUITY as part of balance sheet translation	Impacts CURRENT EARNINGS (below the line)

What exposure are hedged?

Corporate hedge practices

Hedge percentages by survey year	2011	2010	2009	2008
Cash flow	94%	85%	89%	79%
Balance sheet	91%	87%	94%	96%

Hedge product use as of 2011 survey	Forwards	Options	Option combinations	Other instruments
Cash flow	88%	8%	3%	1%
Balance sheet	95%	18%	5%	2%

Source: 2011 BofAML Corporate Risk Management Survey, 2008-2010 BofAML PARS Risk Management Surveys: Monograph Numbers 284, 303, and 320

A theory of exchange rate expectations

- **Uncovered Interest Rate Parity (UIP)** – the theory that the difference between the interest rates of two countries is equivalent to the expected change in the exchange rate between the currencies.

Academic thought on forwards as predictors of future spot levels

- Forwards are an unbiased predictor of future spot rates – Frenkel (1977)
- “There is a general consensus that forward exchange rates have little if any power as forecasts of future spot rates.” – Fama (1984)
- Beta of -0.88 across 75 published estimates – Bekaert and Hodrick (1993)

Impact of negative beta

Forward rate	=	Spot rate	+	Forward Points
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Forward equation

Spot, t1	=	Spot, t0	+	Beta	x	Forward Points
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Spot forecast equation

Spot, t1	=	Spot, t0	+	1.0	x	Forward Points
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Beta = 1 means future spot positively impacted by forward points

Spot, t1	=	Spot, t0	+	-0.88	x	Forward Points
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Beta near -1 means future spot negatively impacted by forward points

Impact of new reality on FX moves

Rate differential	Forecast :	
	Old theory	Reality
Higher foreign interest rate	Foreign currency to depreciate	Foreign currency to appreciate
Lower foreign interest rate	Foreign currency to appreciate	Foreign currency to depreciate

Two examples:

GBP/USD

Today's
spot:
1.5500

More likely
forecast:
1.5700

1y Forward:
1.5295
(1% discount)

Interest Rates:
US 1y = 0.25%
GBP 1y = 1.60%

USD/INR

Today's
spot:
62.60

More likely
forecast:
57.75

1y Forward:
67.45
(7% discount)

Interest Rates:
INR 1y = 8.00%
US 1y = 0.25%

Impact of new reality on FX hedging

Typical U.S. corporate exposure profile

Rate differential	Hedge trade: Selling foreign	Buying foreign
Higher foreign interest rate	Will tend to lose forward points and more	Will tend to make forward points and more
Lower foreign interest rate	Will tend to make forward points and more	Will tend to lose forward points and more

Impact of new reality on FX hedging

- Being net long foreign revenue, a typical firm will be selling higher interest rate currencies at worse forward exchange rates than are available in the spot market.
- Academic testing as well as the experience of the “carry trade” would characterize these trades as poor bets.

Currency risk management at Electronic Arts

Electronic Arts “EA”

- **Develops, markets, publishes and distributes game software content and services that can be played by consumers on a variety of platforms**
 - Video game consoles (Sony PS3, Microsoft Xbox, Nintendo Wii)
 - PC
 - Mobile devices (phones, tablets, e-readers)
 - Internet (Social websites, pogo.com)
- **FY13 Net Revenue (non-GAAP): \$3.8B**
 - 45% Domestic / 55% International (distribution > 75 countries)
 - Packaged Goods: \$2.1B
 - Digital: \$1.7B (36% y-o-y growth)
- **Key Titles: FIFA, Battlefield, Plants vs. Zombies, Madden NFL, Need for Speed**



EA FY14 Q1 Currency Guidance

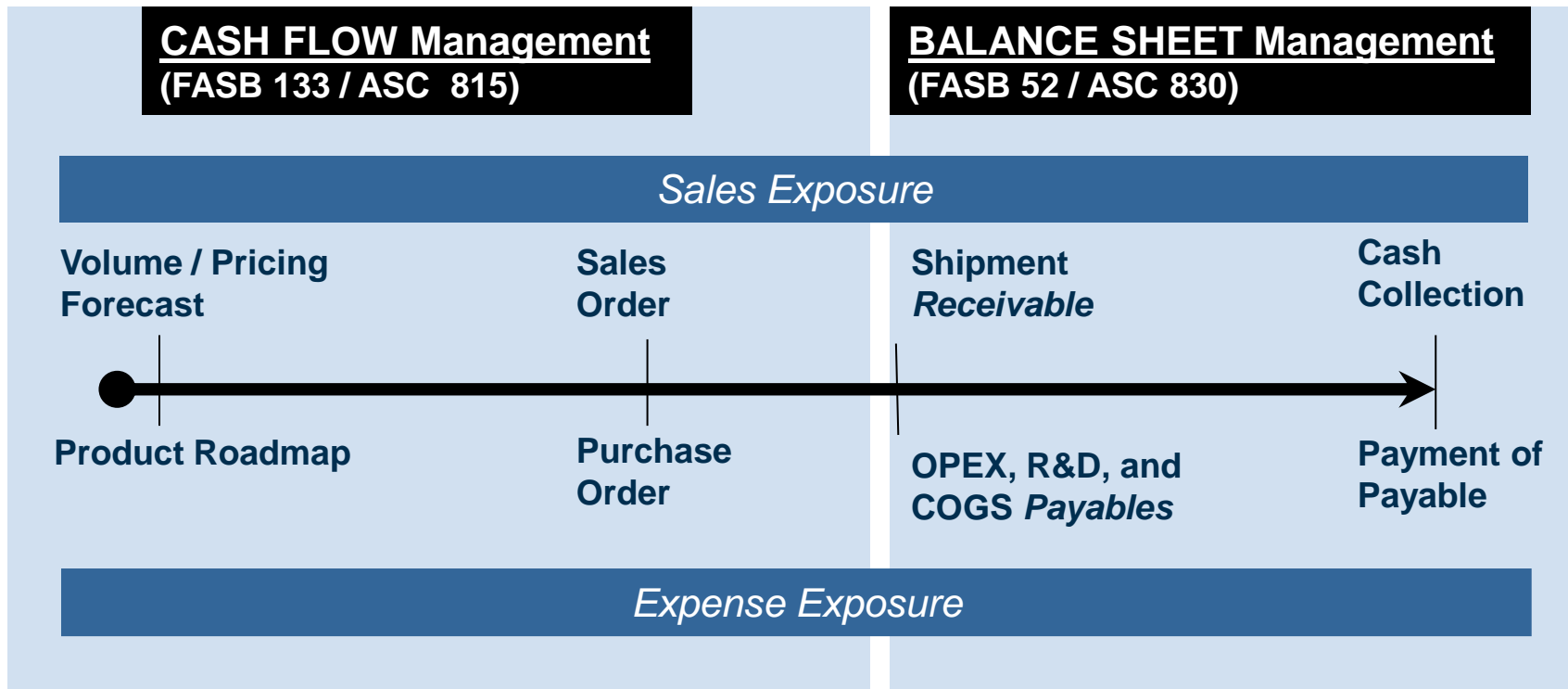
Currency Assumptions:

- Exchange rates remain volatile
- Current guidance FX assumptions:
 - \$1.29 USD/Euro
 - Revenue and EPS decreases if the Euro weakens v. USD
 - \$0.98 USD/Canadian Dollar
 - R&D costs increase if the Canadian Dollar strengthens v. USD
 - \$1.53 USD/British Pound Sterling
 - Revenue and EPS decreases if the British Pound Sterling weakens v. USD
- Using spot exchange rates as of May 6, 2013:
 - Negligible impact to FY14 non-GAAP EPS
 - Approximately \$20 million benefit to FY14 non-GAAP Net Revenue



¹ These forward-looking statements are valid as of May 07, 2013 only. Electronic Arts assumes no obligation and does not intend to update these forward-looking statements.

FX Exposure Timeline



- **Hedging Purpose:** Mitigate volatility due to foreign currency fluctuations on future earnings based on forecasted revenue and expense

EA FX Program Objectives

CASH FLOW

- Manage FX risks at a reasonable cost
- Mitigate volatility in revenue and expense due to foreign currency fluctuations on future earnings based on forecasted revenue and expense
- Ensure eligibility for hedge accounting (FAS133/ASC815)

BALANCE SHEET

- Mitigate volatility in other income and expense and protect USD cash value of AR/AP/ICO balances due to currency fluctuations

Additional Objectives:

- Do not engage in speculative activity
- Maximize natural hedging opportunities

EA Cash Flow Hedging Program

- **Exposures**

- Foreign currency forecasted transactions (primarily related to a portion of the revenue and expenses denominated in foreign currency generated by operational subsidiaries)
- Excel models leverage off existing FP&A reporting tools
- Focus on the largest notional exposures in USD equivalent

- **Hedging**

- Hedge based on notional exposure and target coverages
 - **Adding another currency likely increases hedge costs**
 - **May not be reducing FX risk**
- Option and Forward contracts (Maturities generally < 12 months)
- Designated and qualify as cash flow hedges (FAS133/ASC815)

EA Balance Sheet Hedging Program

- **Exposures**

- FX risk associated with foreign currency denominated monetary assets and liabilities (primarily certain intercompany receivables and payables)
- Exposure identification
 - **Historically EA has been limited by Excel and lack of scalability**
 - **Actuals data extracted from ERP and stored in AtlasFX**
 - **Controllership/Treasury load forecasts in AtlasFX to identify B/S exposure by entity and currency on a notional basis**

- **Hedging**

- Hedge all non-functional currency exposures above threshold
- Forward contracts (maturities generally < 3 months)
- Not designated as hedging instruments (FAS52/ASC830)
- Outstanding hedge contracts stored in AtlasFX

Finding efficient hedge portfolios

Exposure profile for example

Currency	Long/short local currency	Exposure, USD MM-equivalent	Sep 2013 interest rate differentials	Annualized hedge costs, USD MM
EUR	Long	\$1,200	0.13%	\$1.5
JPY	Long	\$500	0.12%	\$0.6
GBP	Long	\$300	-0.24%	-\$0.7
CHF	Long	\$100	0.25%	\$0.3
NOK	Long	\$100	-1.33%	-\$1.3
AUD	Long	\$200	-2.68%	-\$5.4
NZD	Long	\$100	-2.56%	-\$2.6
MXN	Long	\$300	-3.31%	-\$9.9
CNY	Short	\$500	0.00%	\$0.0
BRL	Long	\$500	-7.81%	-\$39.1
INR	Long	\$200	-0.07%	-\$0.1
			Total	-\$56.7

Not EA Exposure Profile!

Typical Hedge Portfolios

Hedge portfolios	95% VaR	Annual hedge cost
No hedge	-\$366	\$0.0
50% E-W hedge	-\$183	-\$28.4
80% E-W hedge	-\$73	-\$45.4
100% total hedge	\$0	-\$56.7

Reducing BRL hedge cost

- BRL hedging constitutes nearly 70% of the total annual hedge cost
- So let's examine other currencies for hedge offset suitability

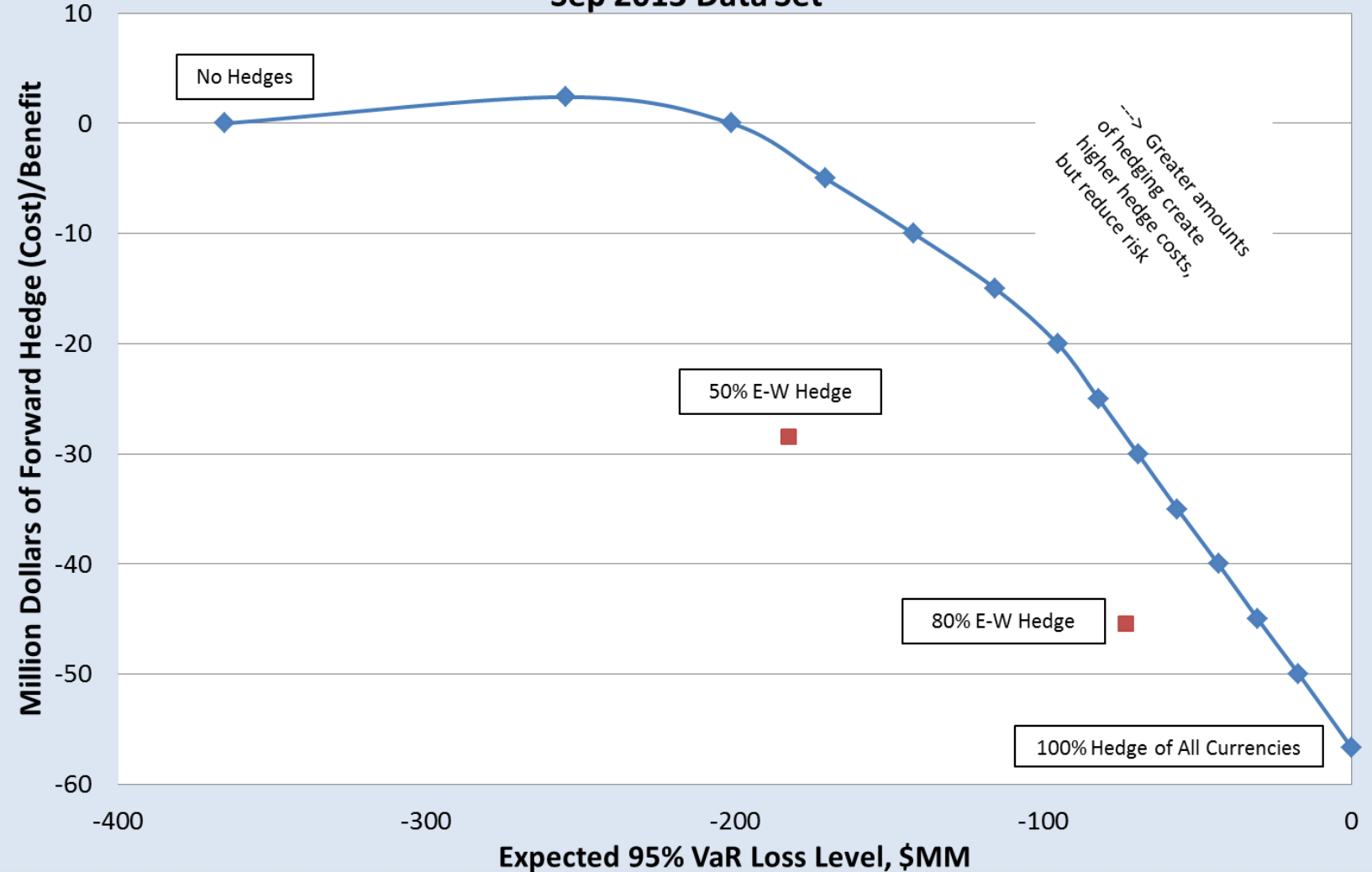
Moderate correlation	3y average	High correlation	3y average
GBP	58%	NZD	80%
EUR	67%	MXN	83%
INR	68%	CHF	84%

Risk and hedge cost trade-offs

Portfolio hedge coverage	EUR	JPY	GBP	CHF	NOK	AUD	NZD	MXN	CNY	BRL	INR	95% VaR level	Annual hedge cost
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-365.6	\$0.0
58%	100%	100%	0%	100%	0%	0%	0%	0%	100%	0%	0%	-254.9	\$2.4
66%	100%	49%	100%	100%	91%	0%	0%	0%	100%	0%	100%	-201.2	\$0.0
70%	100%	42%	100%	100%	100%	90%	0%	0%	100%	0%	100%	-170.7	-\$5.0
74%	100%	44%	100%	100%	100%	100%	100%	19%	95%	0%	100%	-142.2	-\$10.0
76%	100%	59%	100%	100%	100%	100%	100%	71%	61%	0%	100%	-115.6	-\$15.0
77%	100%	66%	100%	100%	100%	100%	100%	100%	40%	5%	100%	-95.4	-\$20.0
80%	100%	71%	100%	100%	100%	100%	100%	100%	48%	18%	100%	-82.2	-\$25.0
83%	100%	76%	100%	100%	100%	100%	100%	100%	56%	31%	100%	-69.4	-\$30.0
86%	100%	80%	100%	100%	100%	100%	100%	100%	65%	44%	100%	-56.6	-\$35.0
89%	100%	85%	100%	100%	100%	100%	100%	100%	73%	57%	100%	-43.3	-\$40.0
92%	100%	89%	100%	100%	100%	100%	100%	100%	81%	70%	100%	-30.5	-\$45.0
96%	100%	94%	100%	100%	100%	100%	100%	100%	89%	83%	100%	-17.2	-\$50.0
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0.0	-\$56.7
50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	-\$183	-\$28.4
80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	-\$73	-\$45.4

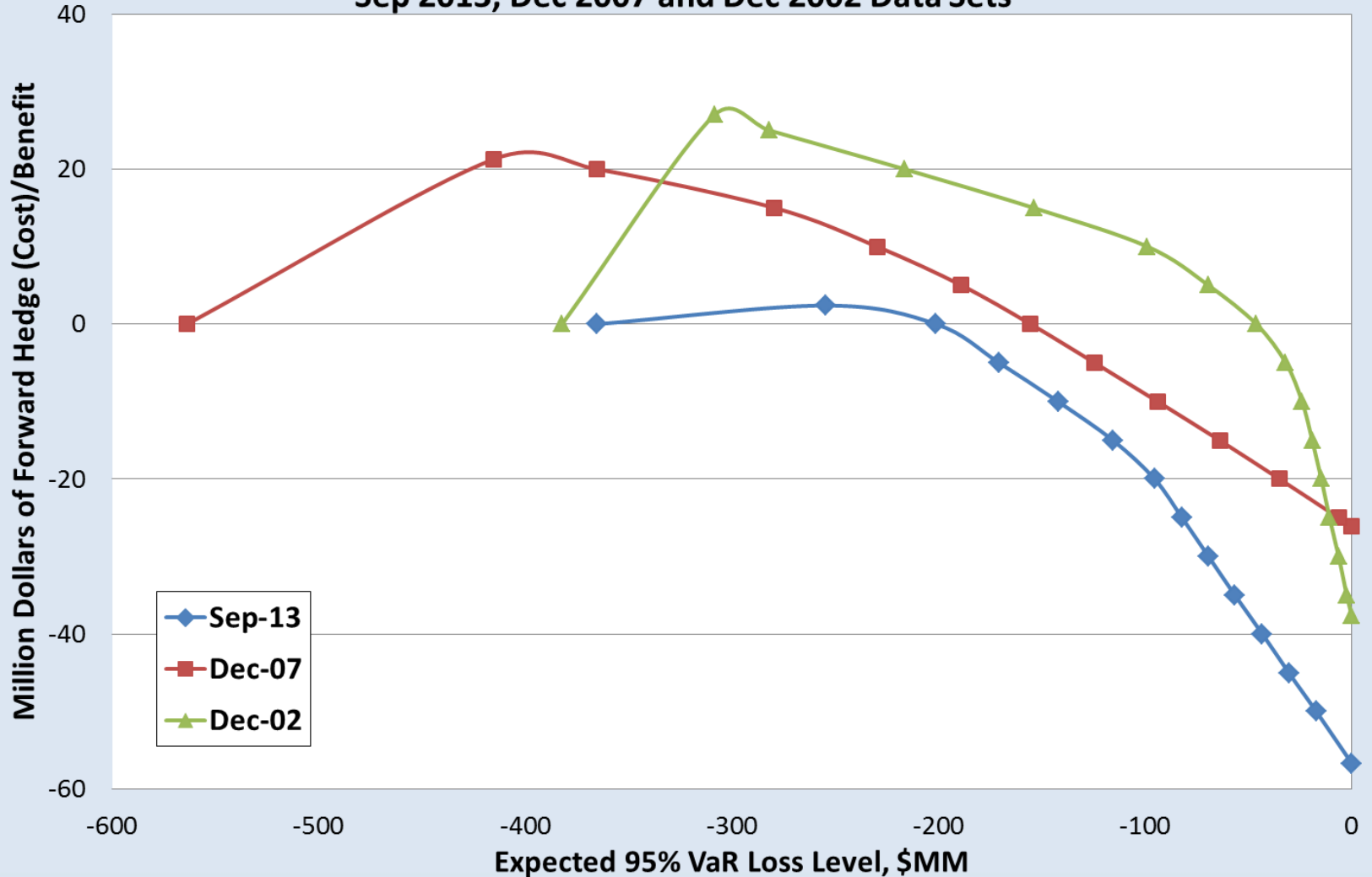
Efficient Hedge Frontier

Sep 2013 Data Set



Efficient Hedge Frontier

Sep 2013, Dec 2007 and Dec 2002 Data Sets



Exposure type applicability

Exposure type	Applicability of portfolio approach:	
	Yes	No
Balance sheet (forecast non-FC rev and exp)	All results within quarter	Want exact hedge dollar offset for risk
Cash flow (non- functional BS remeasurement)	Absence of exact dollar offset will not impact financial results	Need for risk offset for individual units will require hedge G/L shifting between units

Applicability of Portfolio Approach to EA

- **Risk and Hedge Cost Quantification**
 - Understand risk associated with exposed currencies
 - Estimate hedge costs by currency
- **Estimate Portfolio Relationships**
 - Understand impact on overall risk portfolio and total hedge costs of each individual exposure
- **Risk Mitigation**
 - Manage EA risks and hedge costs with consideration of Efficient Hedge Frontier

Good and bad hedge bets

Exposure profile:		Bet
Produce	Sell	
U.S.	Europe	Bad
Brazil	U.S. and Europe	Good
U.S.	Canada	Bad
High-rate countries	Low-rate countries	Good

Speaker Bios

- **John Bird is a Partner with Atlas Risk Advisory LLC, where he consults and conducts research for corporate treasury groups on risk management issues. John has more than 30 years of experience in risk and portfolio management, quantitative modeling, research and trading. For 14 years, he led the Portfolio and Risk Solutions group at Bank of America/BofA Merrill Lynch, consulted with more than 1,000 corporations, asset managers and other entities on risk and portfolio issues, and built a set of systematic FX models. In previous positions, he managed fixed income and FX derivatives trading groups for CIBC/Wood Gundy and First Interstate Bank. John holds a BA in Management Science from UCSD and an MBA in Finance from USC.**
- **Ara Hamamjian is Director of Treasury with Electronic Arts in Redwood City, CA. He's currently responsible for the Global FX Program as well as Treasury Operations and over the last 2 years with EA, has been focused on implementing FX accounting and exposure management tools to automate the treasury functions. Over the last 11 years in the San Francisco Bay Area, he's been in several corporate treasury roles including, cash management, M & A integration and foreign exchange management. Mr. Hamamjian has an undergraduate degree in Economics from UCLA.**

Appendix

- **Sources:**

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- Frenkel, J.A., “The Forward Exchange Rate, Expectations, and the Demand for Money: The German Hyperinflation”, *American Economic Review*, September 1977