Multi-Currency Attribution
Currency Overlay Management

19th Meeting of The Asset Owner Roundtable

November 16, 2022

San Diego, CA

Claude Giguère

Passionate about Performance

MANDATE:

1. **Sector Allocation Decision**

			Weight	
Sector	**Ccy**	**Return**	**Bench**	**Portf**
Financial	USD	15%	50%	?
Industrial	USD	5%	50%	?
		Uncertainty (Predict)	Known	Decision

MANDATE:

1. Sector Allocation Decision

			Weight				
Sector	Ccy	Return	Bench	Portf	Allocation	Selection	Allocation
Financial	USD	15%	50%	100%	2.50%	0.00%	7.50%
Industrial	USD	5%	50%	0%	2.50%	0.00%	-2.50%
Total	**USD**		**10%**	**15%**	**5.00%**	**0.00%**	**5.00%**
					Brinson Fachler		Brinson Hood Beebower

Attribution Story:

SECTOR ALLOCATION:

Overweighting Financial Equities **added** value because it **outperformed** the benchmark (15% vs 10%).

Underweighting Industrial Equities **retracted** value because it **underperformed** the benchmark (5% vs 10%).

Meaningful represents mandate

MANDATES:

1. **Country Allocation Decision (Hedged)**
2. **Currency Overlay Strategies**

						Bench		Portf	
Country	**Ccy**	**Local**	**Ccy**	**Base** (USD) Unh.	**Risk Free**	**Country**	**Ccy**	**Country**	**Ccy**
Brazil	BRL	15%	-5%	10%	16%	50%	0%	?	?
U.K.	GBP	5%	5%	10%	2%	50%	0%	?	?
	USD				4%		100%		?

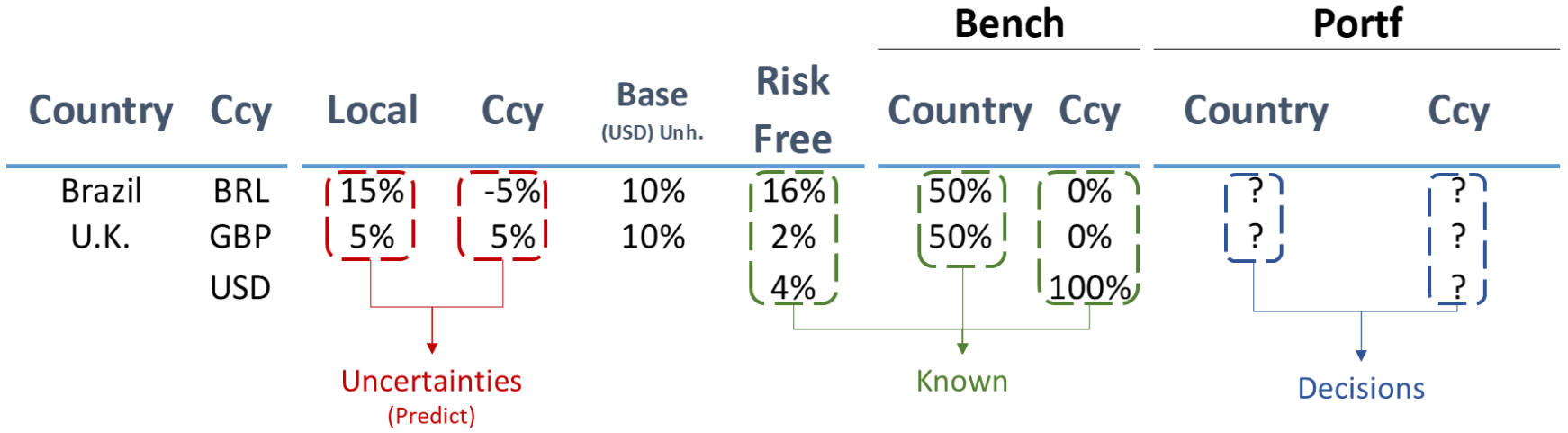
Uncertainty (Predict)

Known

Policy
Fully hedged
(Benchmark)

What is your strategy ?

1. Country Allocation
2. Currency Allocation



Country Allocation

Currency Allocation

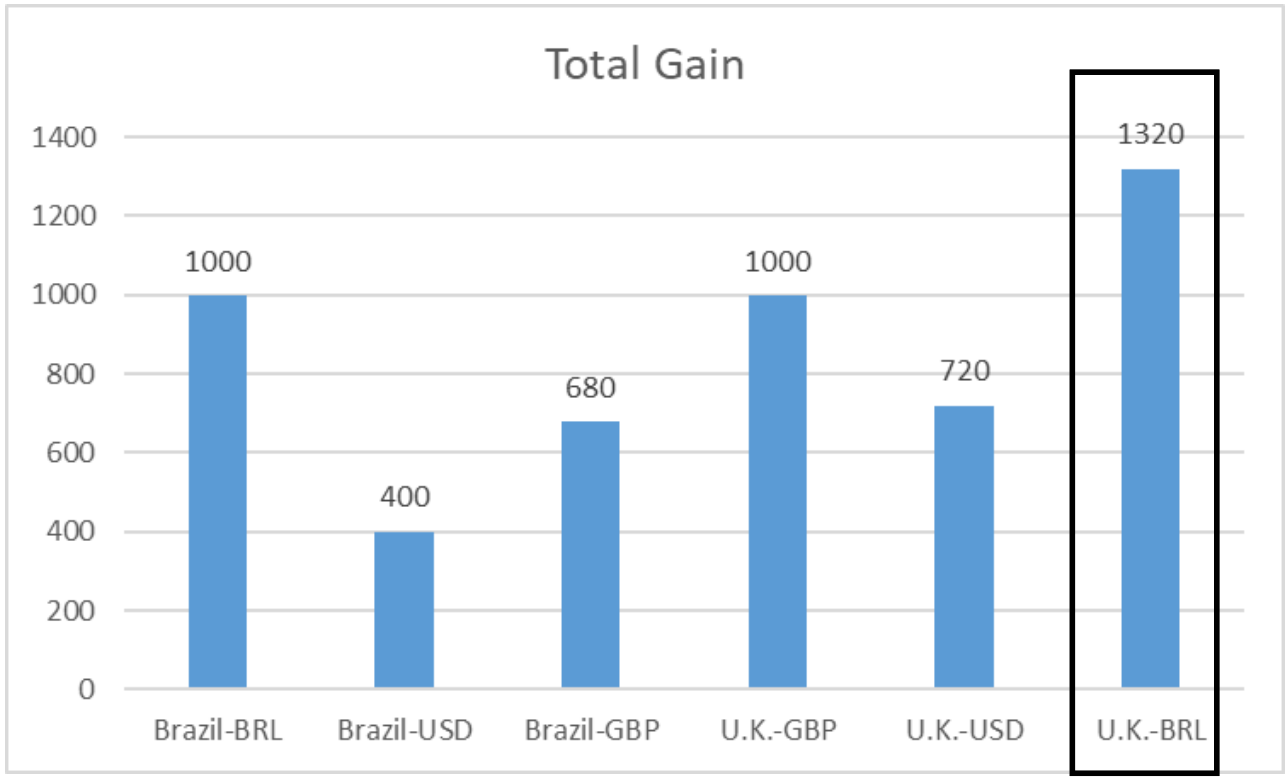
What are the best strategies?

100% Brazil	A	1	100% BRL
100% U.K.	B	2	100% GBP
		3	100% USD

100% Brazil
- Brazil-BRL: Unhedged
  - Keep BRL
- Brazil-USD: Hedged
  - Sell BRL Buy USD
- Brazil-GBP:
  - Sell BRL Buy USD
  - Sell USD Buy GBP

100% U.K
- U.K-BRL:
  - Sell GBP Buy USD
  - Sell USD Buy BRL
- U.K-USD: Hedged
  - Sell BRL Buy USD
- U.K-GBP: Unhedged
  - Keep BRL

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free	Loc-Rf	Cc+Rf	Bench Country	Bench Ccy	Portf Country	Portf Ccy
Brazil	BRL	15%	-5%	10%	16%	-1%	**11%**	50%	0%	0%	100%
U.K.	GBP	5%	5%	10%	2%	**3%**	7%	50%	0%	100%	0%
	USD				4%				100%		0%



Best Strategy

Country Allocation

Overweight U.K. Equities

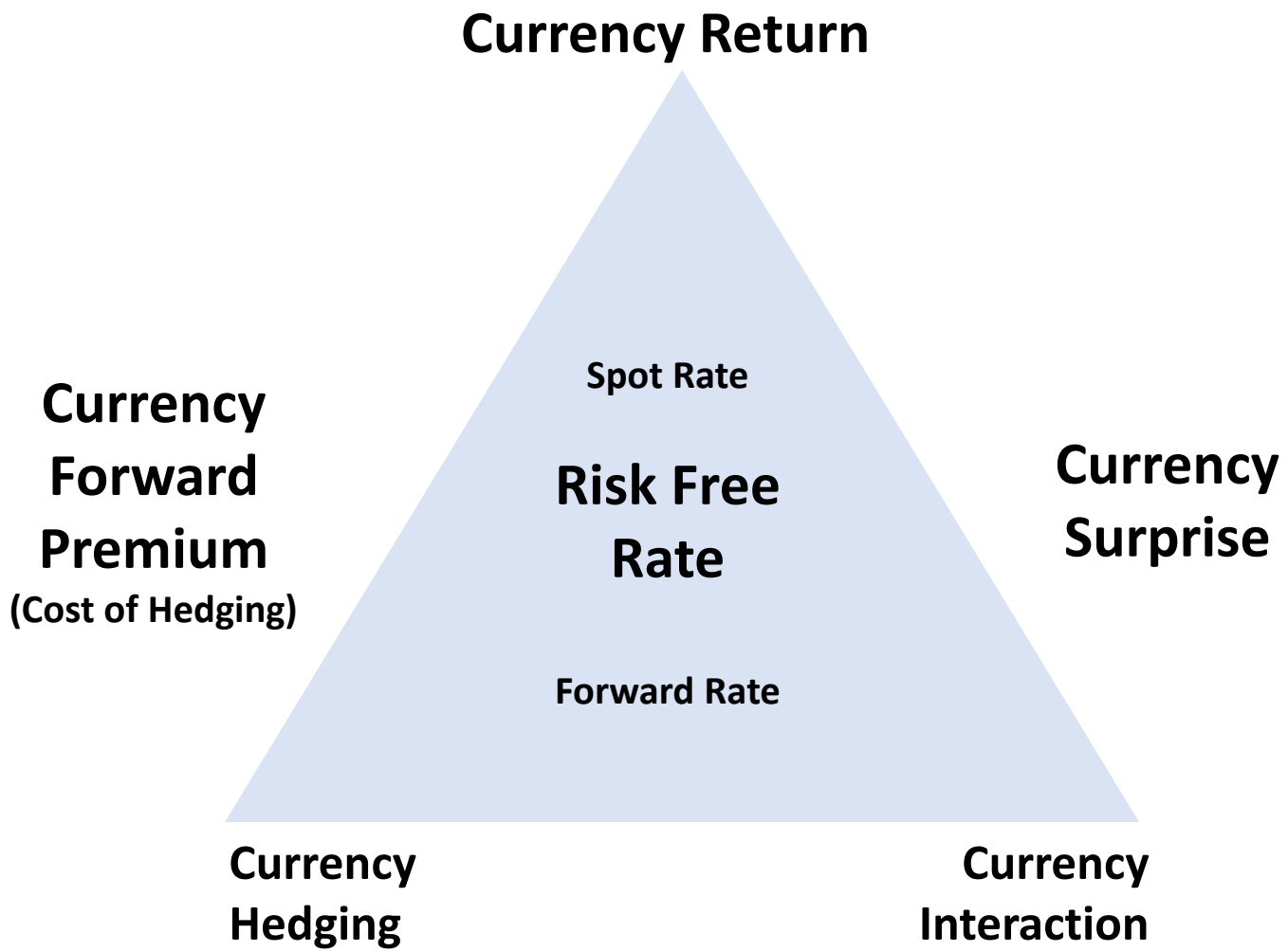
Currency Allocation

Overweight Brazilian Real (BRL)

How can we convey this story with Attribution?

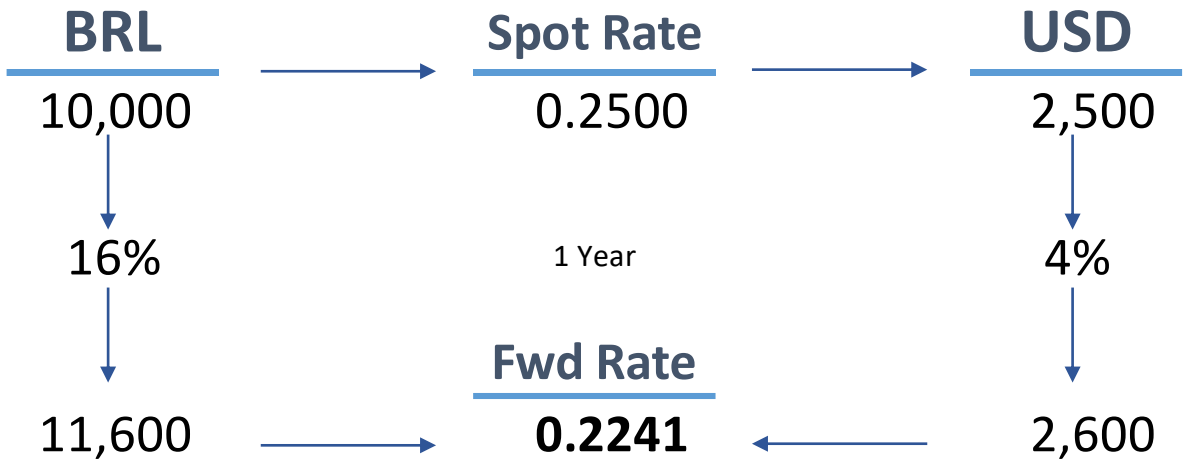
Can conventional Brinson-Fachler do?

Must Understand some Concepts



Calculating Forward Rates

Using Interest Rate Parity Theory

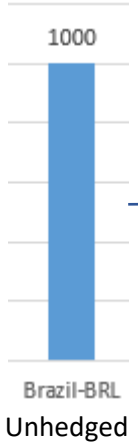


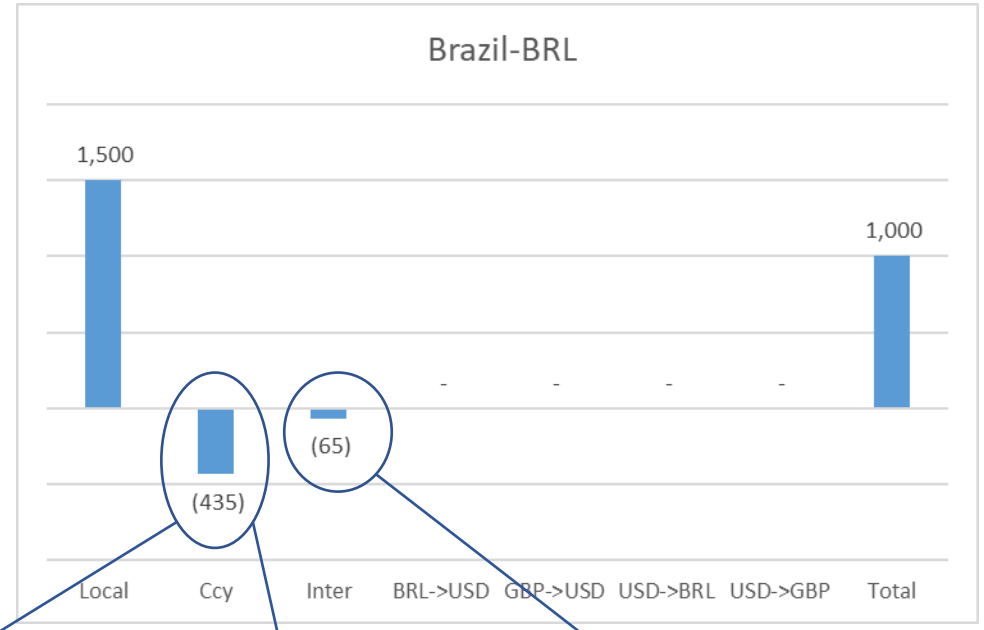
$$F_0 = S_0 \times \frac{1 + RF_B}{1 + RF_L} = 0.25 \times \frac{1 + .04}{1.16} = 0.2241$$

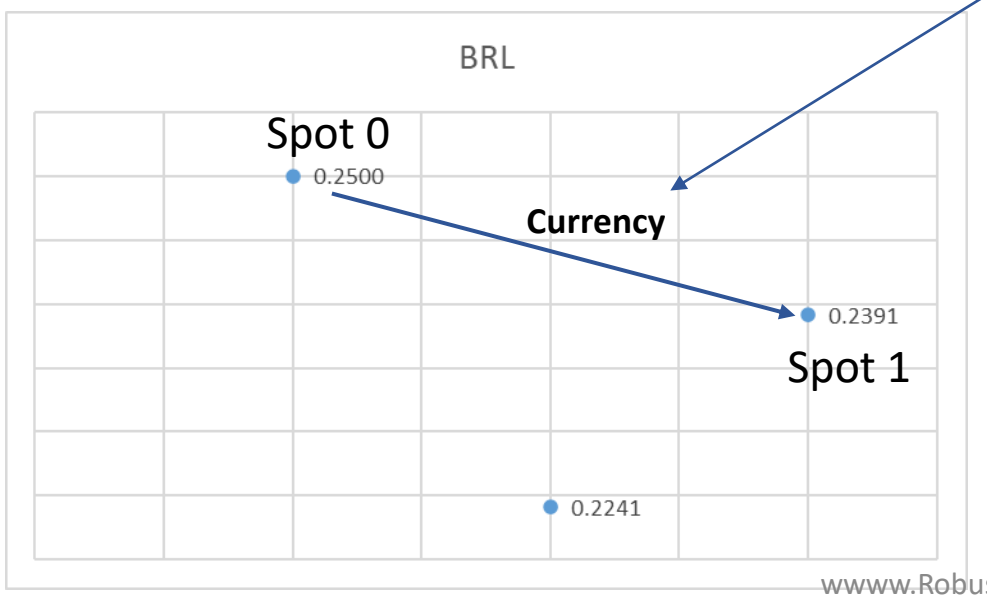
Cost of hedging = Cost a premium when **Risk Free Rate > Home**

Brazil-BRL (Unhedged)

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free
Brazil	BRL	15%	-5%	10%	16%







$(S_1 - S_0) \times MV_0^{Loc}$

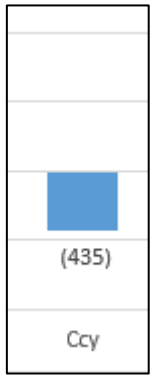
Currency

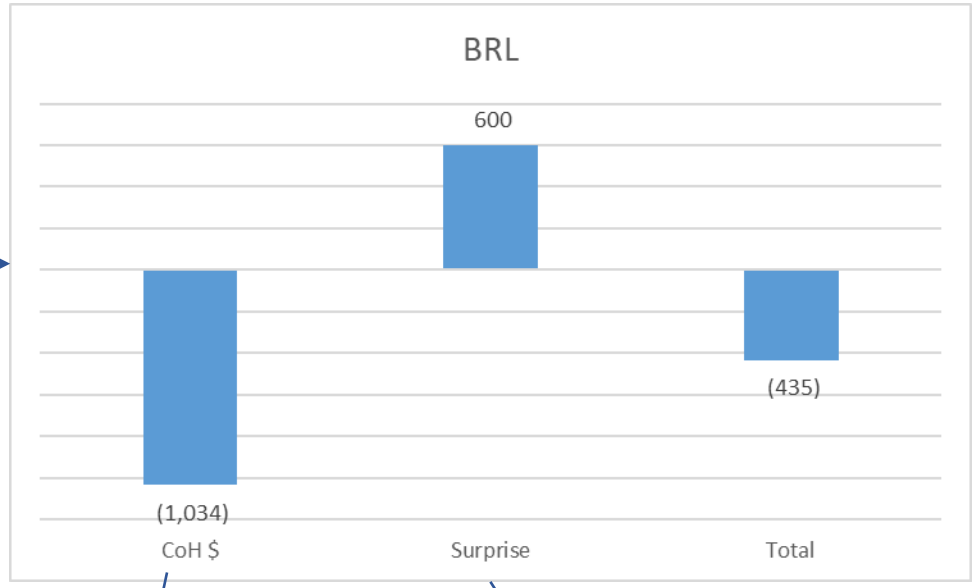
$(S_1 - S_0) \times \$E_{0..1}^{Loc}$

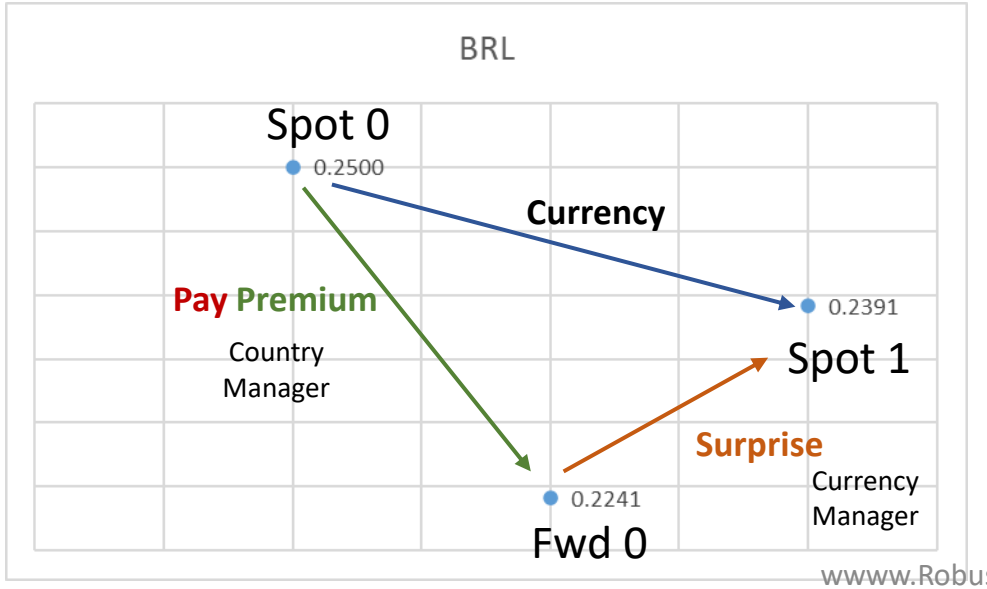
Interaction

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free
Brazil	BRL	15%	-5%	10%	16%

BRL







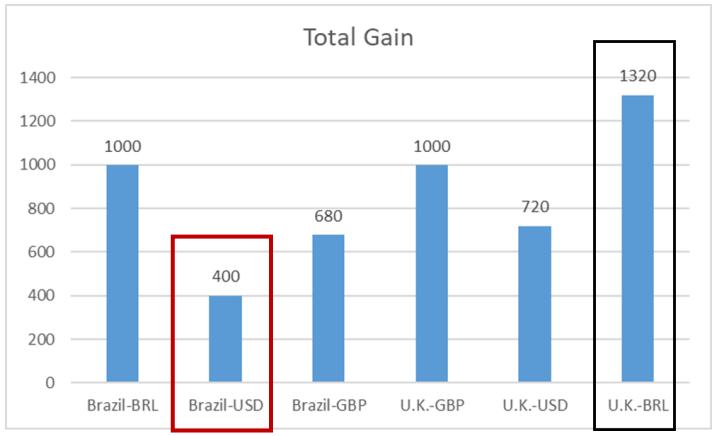
$(S_1 - S_0) \times MV_1^{Loc}$

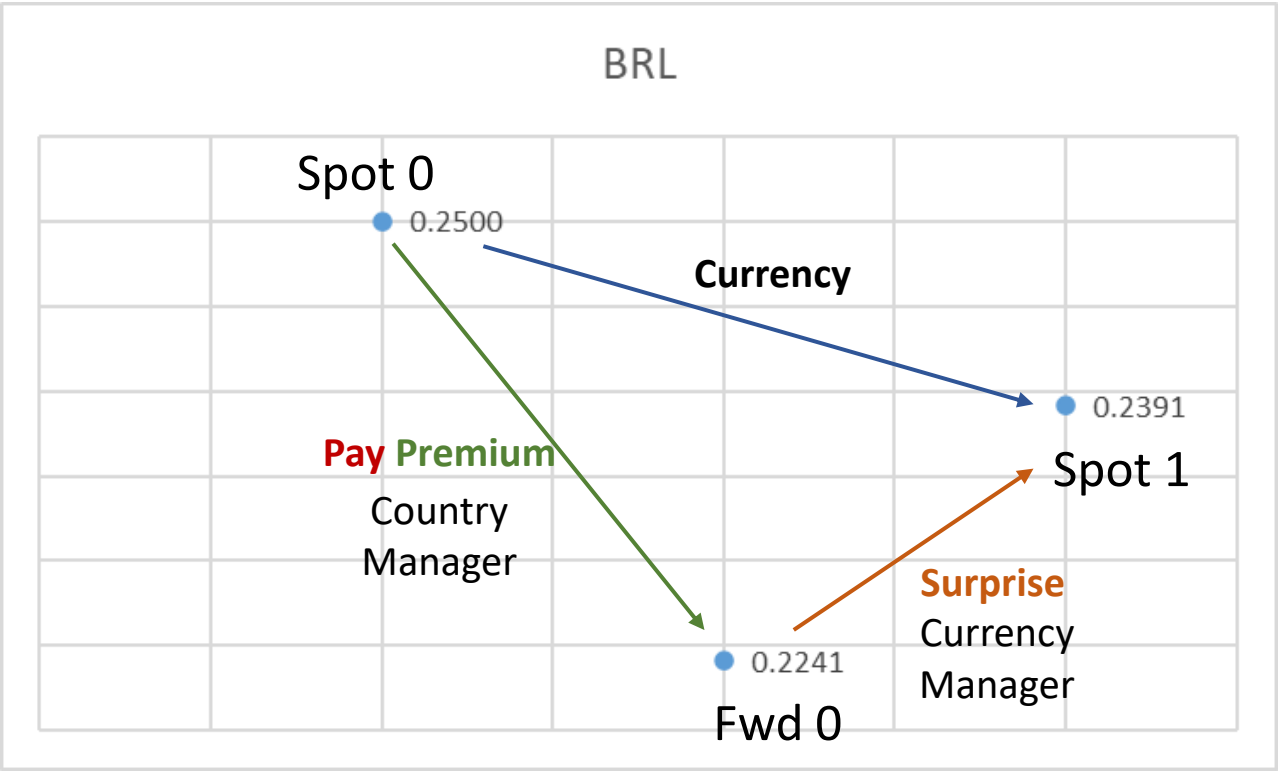
$(F_0 - S_0) \times MV_1^{Loc}$

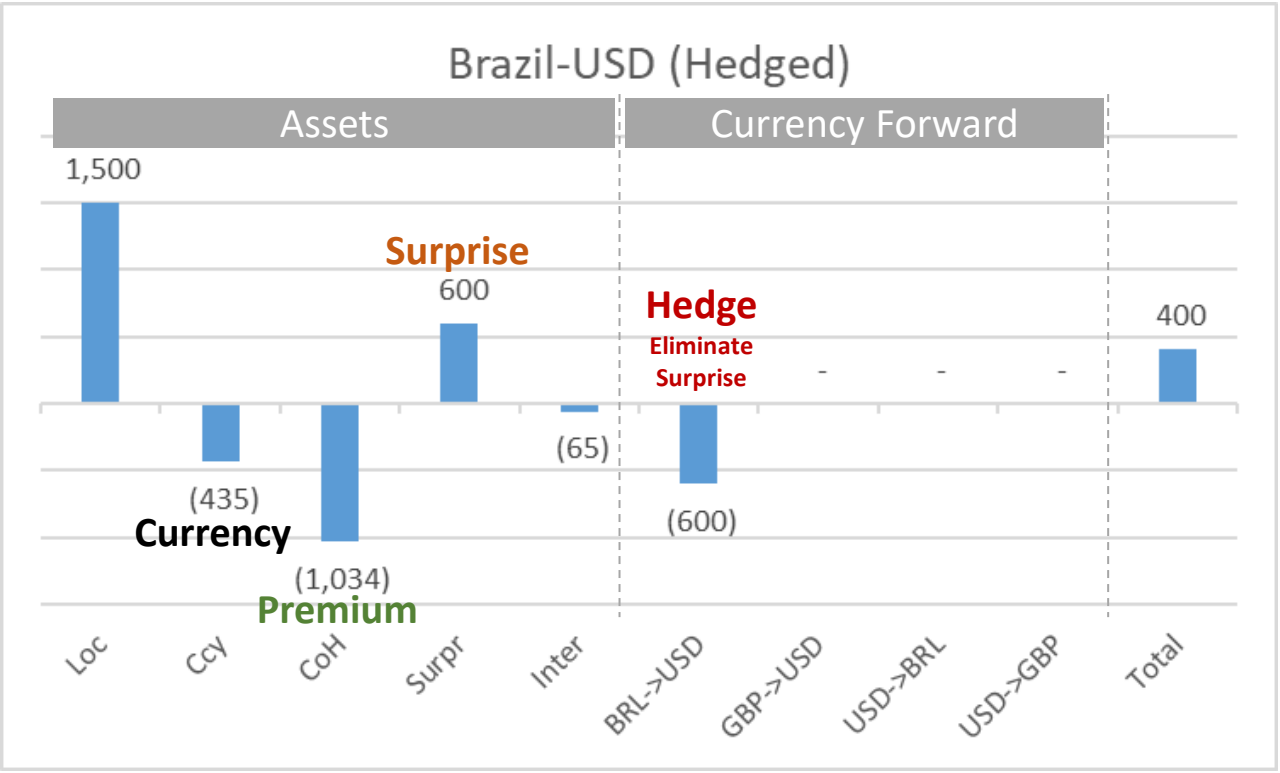
$(S_1 - F_0) \times MV_1^{Loc}$

Good Surprise
+ But not good enough to compensate the cost of hedging
= Still loose on currency (435)

Country	Ccy	RF
Brazil	BRL	16%
	USD	4%

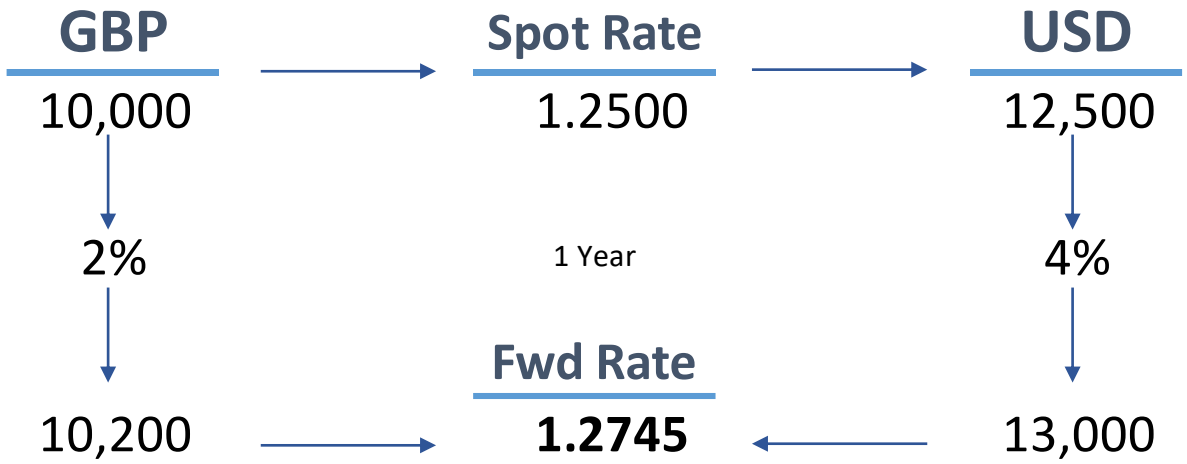






Calculating Forward Rates

Using Interest Rate Parity Theory



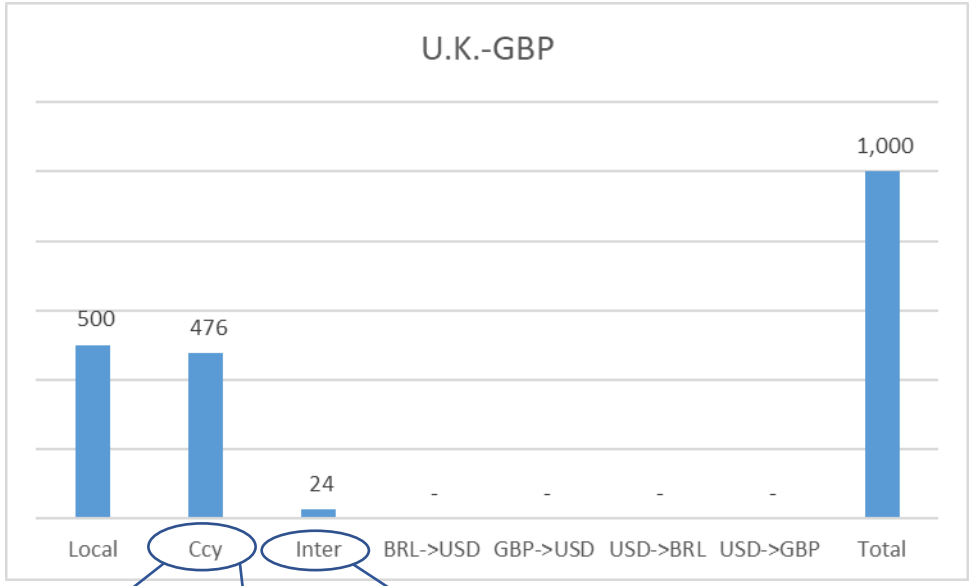
$$F_0 = S_0 \times \frac{1 + RF_B}{1 + RF_L} = 1.25 \times \frac{1 + .04}{1.02} = 1.2745$$

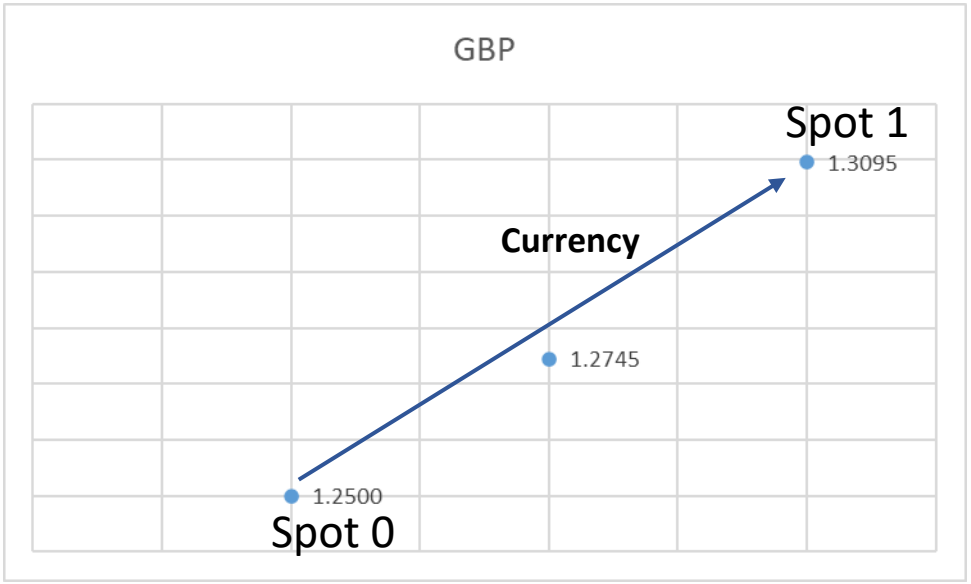
Cost of hedging = Earn a premium when **Risk Free Rate < Home**

U.K. GBP (Unhedged)

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free
U.K.	GBP	5%	5%	10%	2%

Unhedged





$(S_1 - S_0) \times MV_0^{Loc}$

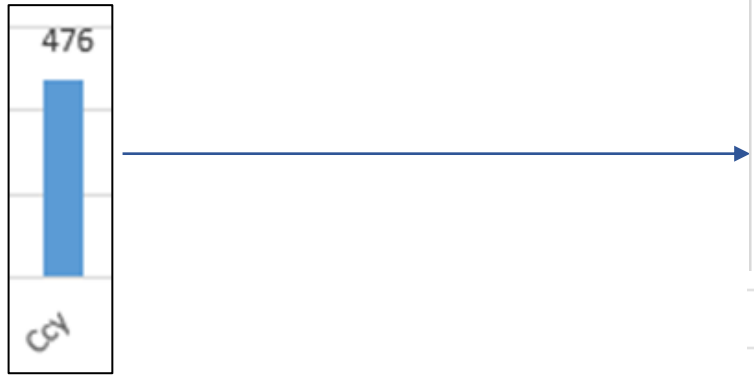
Currency

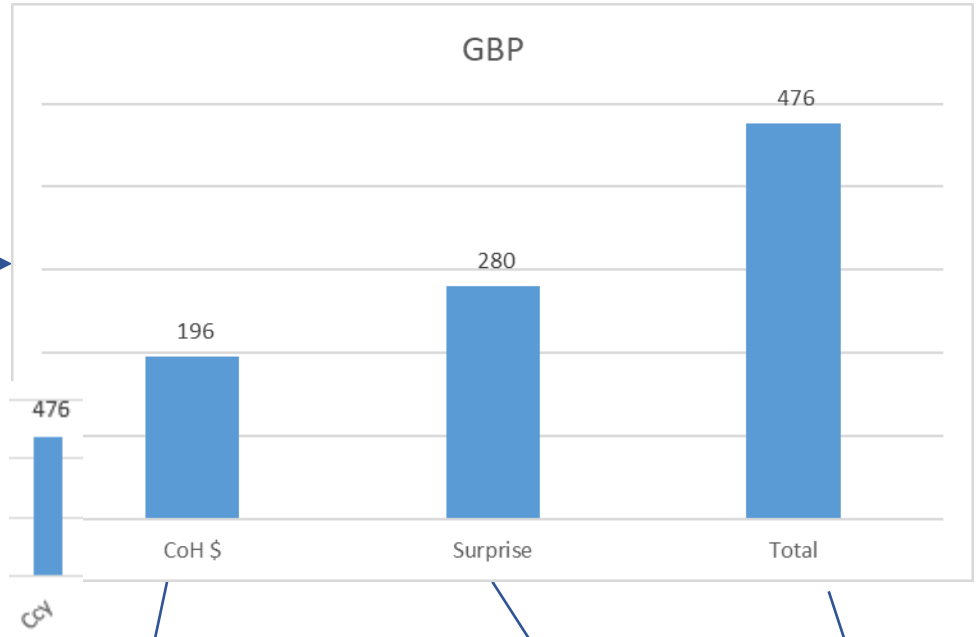
$(S_1 - S_0) \times \$E_{0..1}^{Loc}$

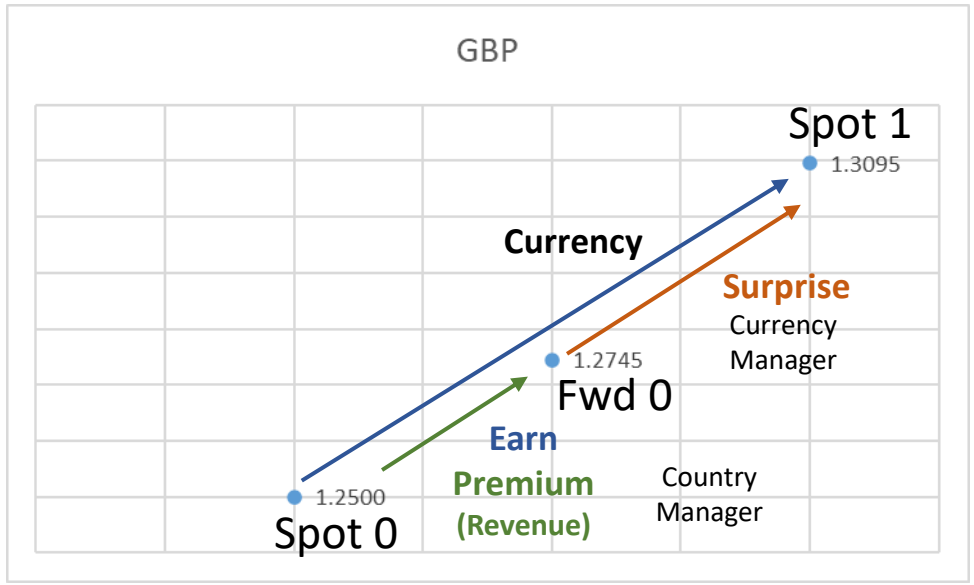
Interaction

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free
U.K.	GBP	5%	5%	10%	2%

GBP







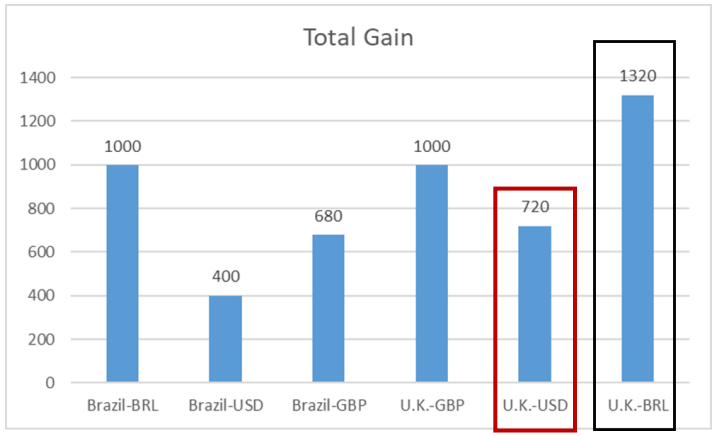
$(S_1 - S_0) \times MV_1^{Loc}$

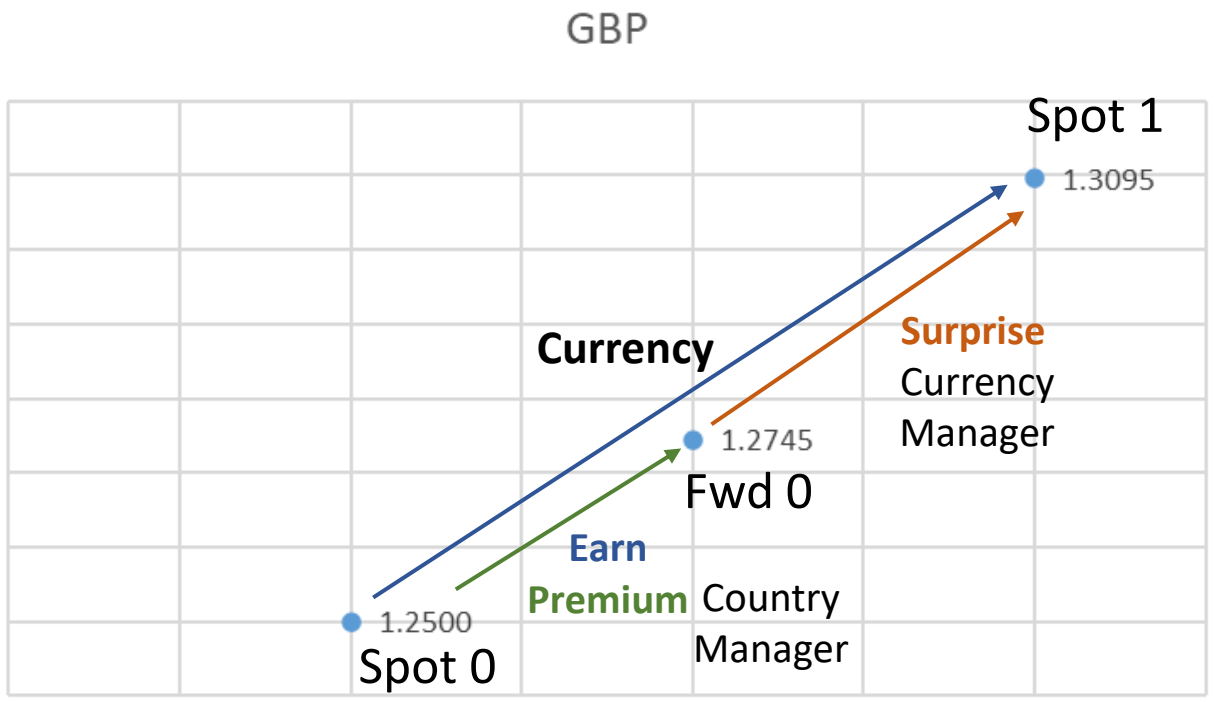
$(F_0 - S_0) \times MV_1^{Loc}$

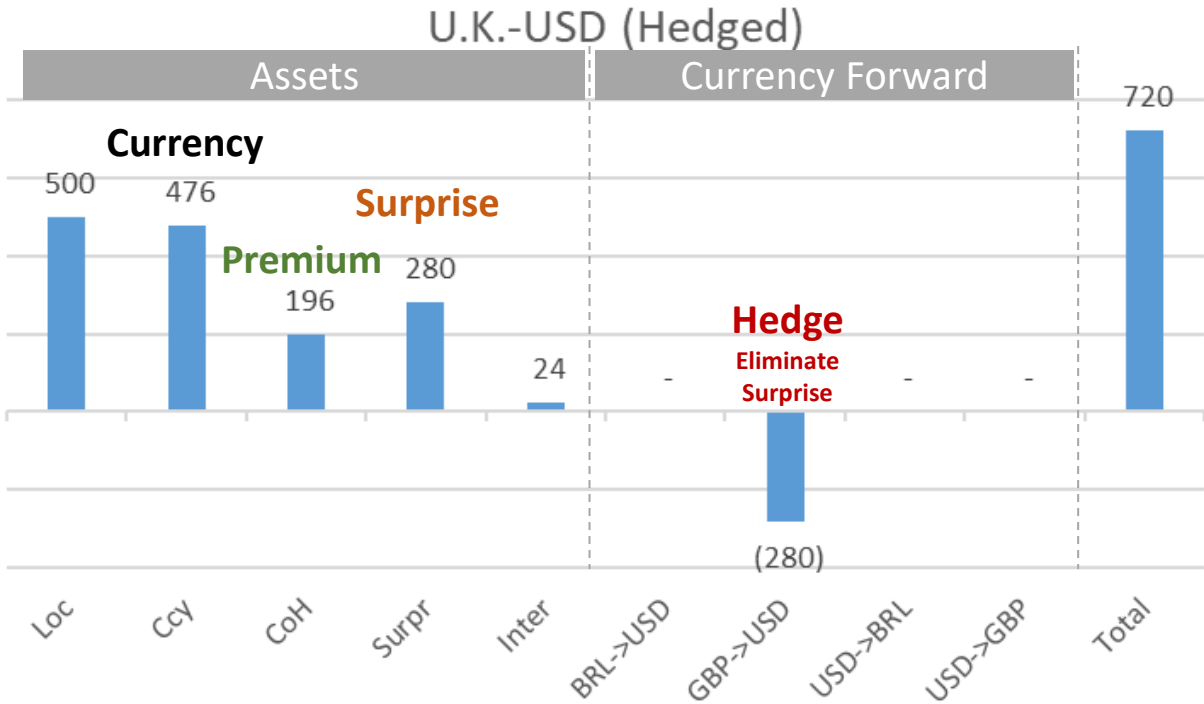
$(S_1 - F_0) \times MV_1^{Loc}$

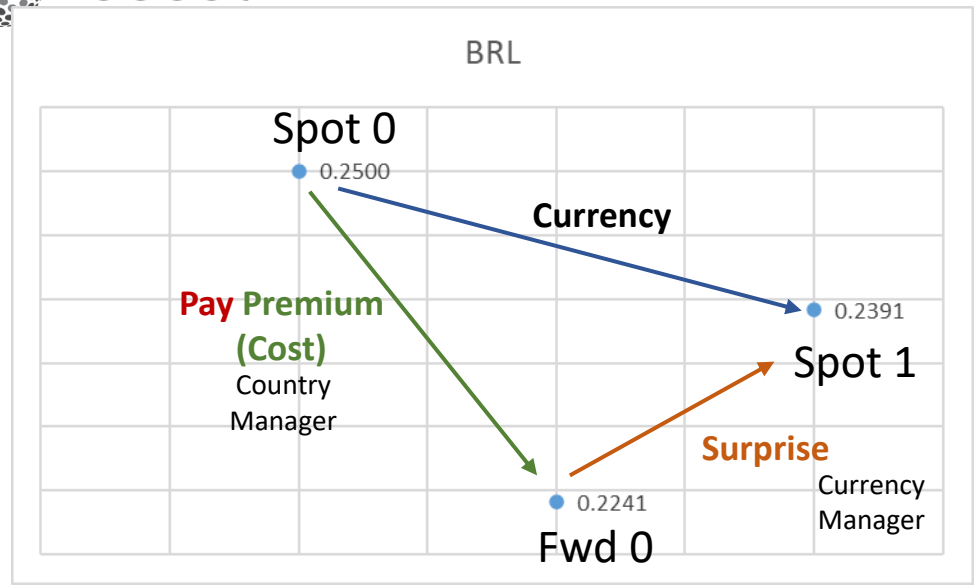
Small Surprise
+ Receive Premium

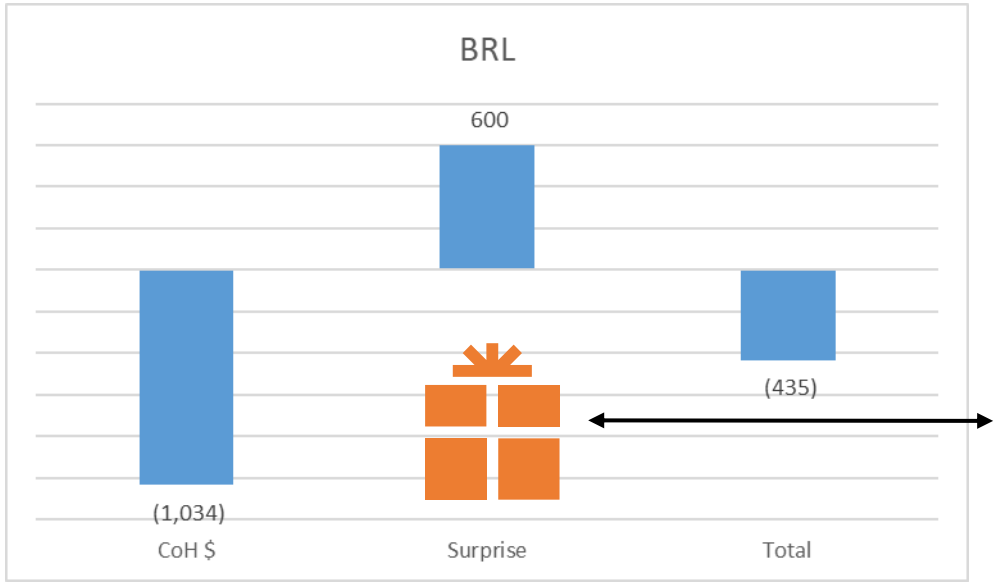
Country	Ccy	RF
U.K.	GBP	2%
	USD	4%



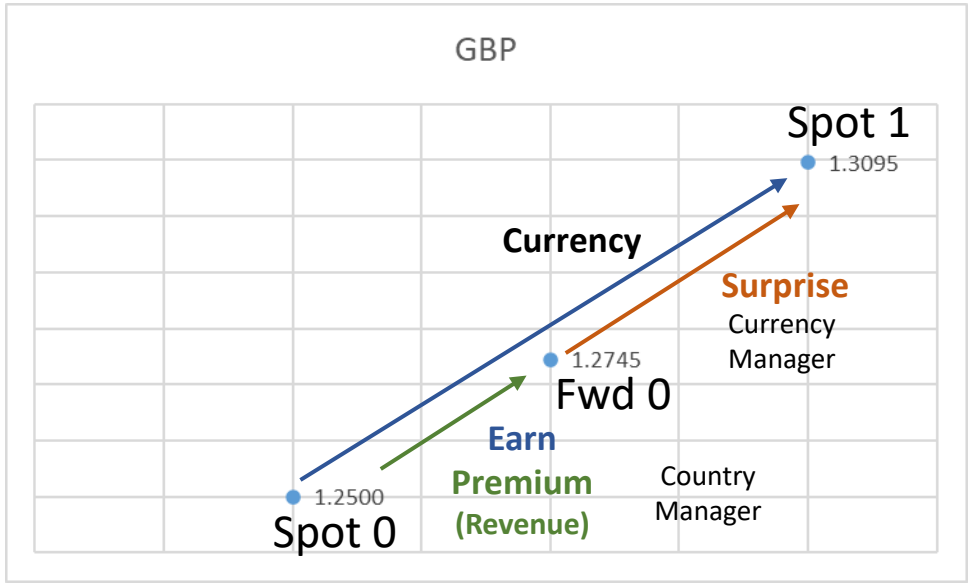


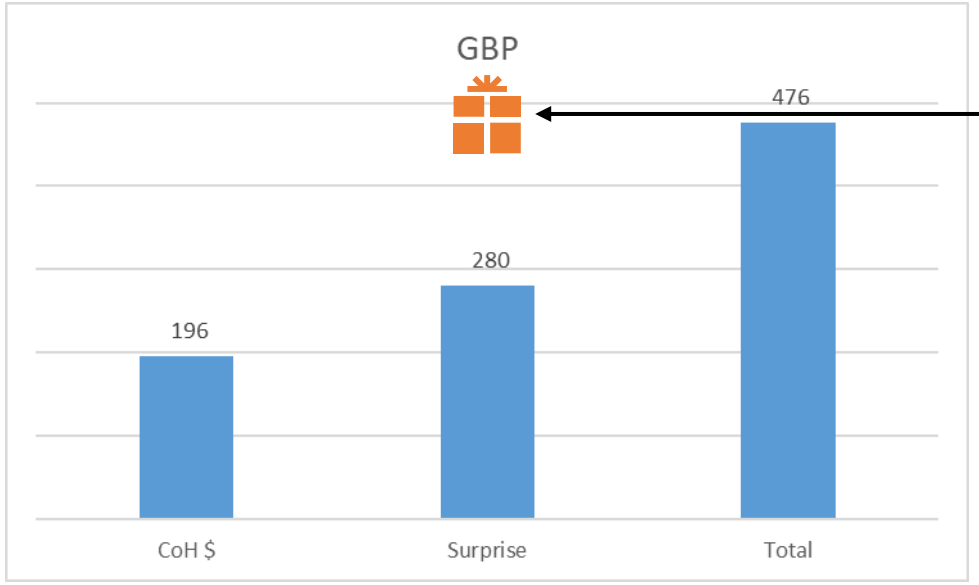


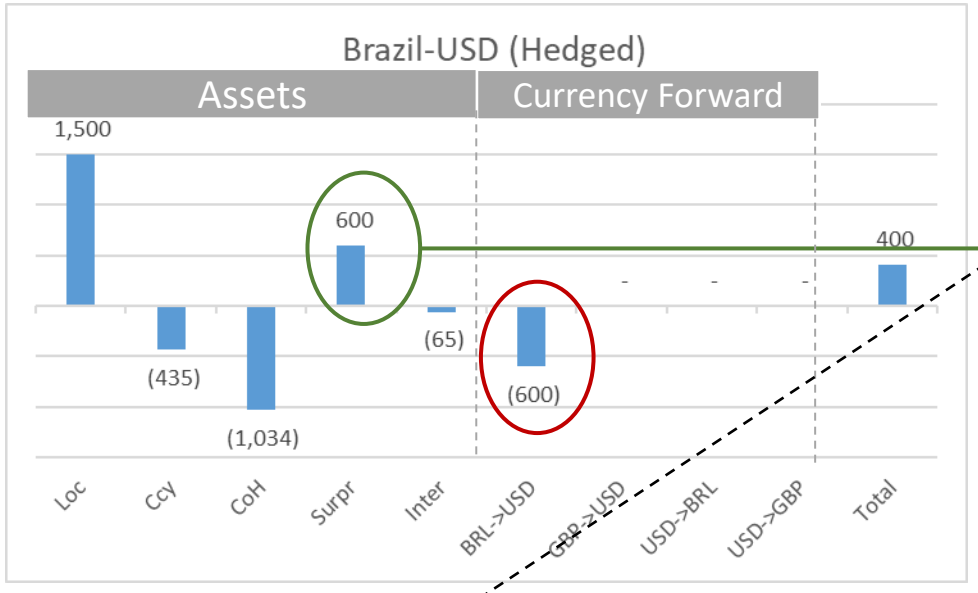


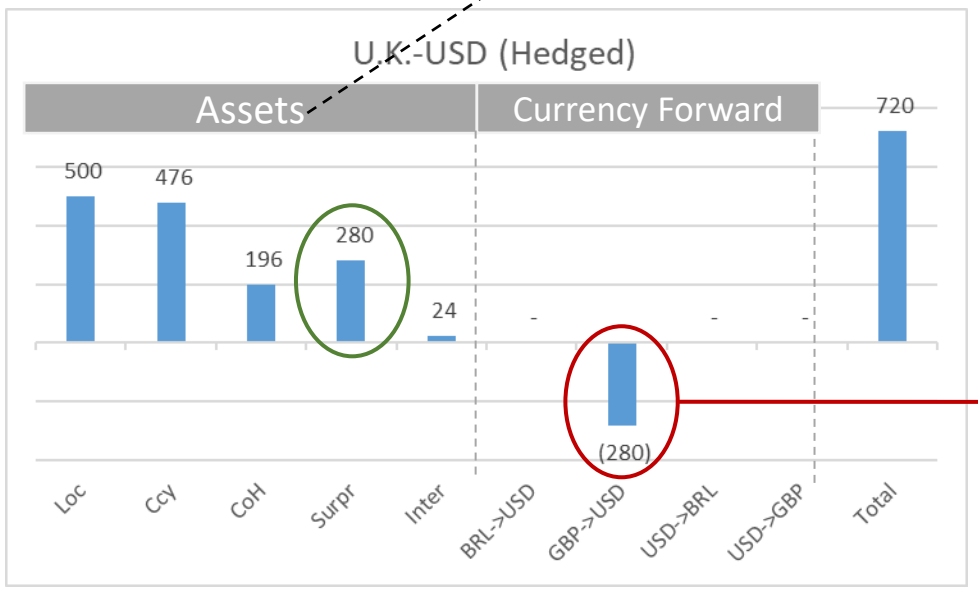


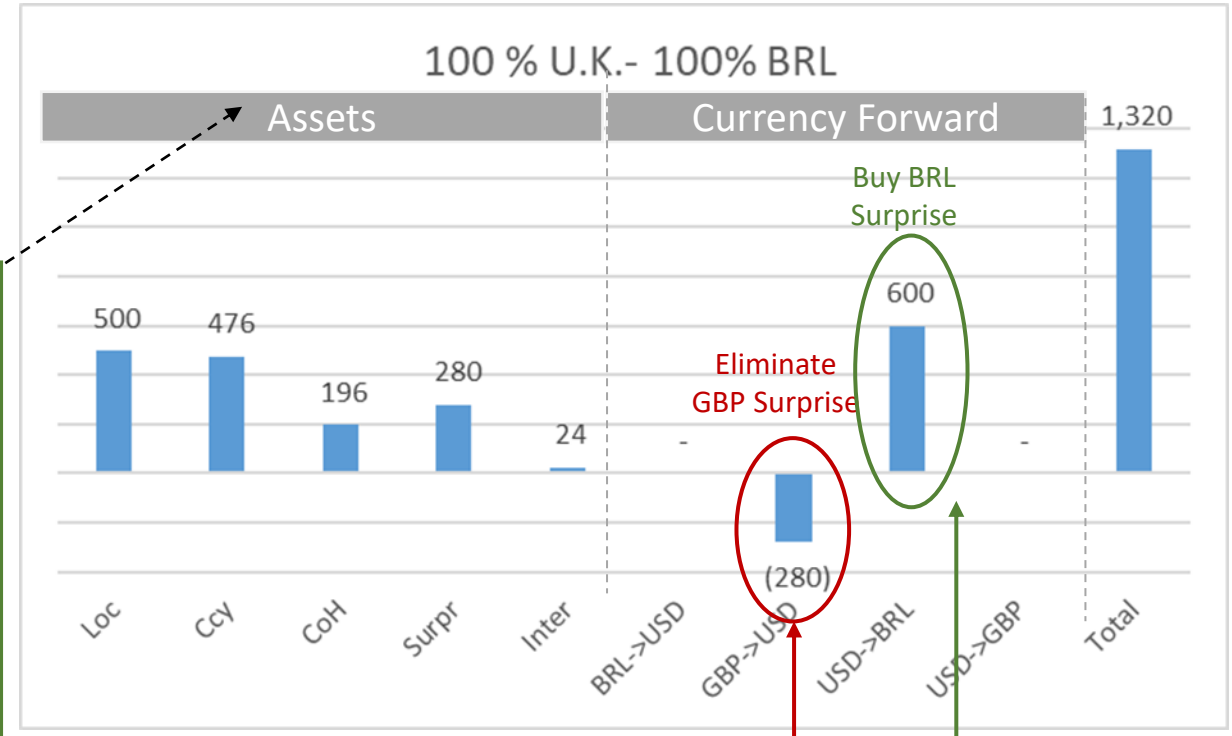
What if we could exchange a "small" surprise for a "bigger" surprise?





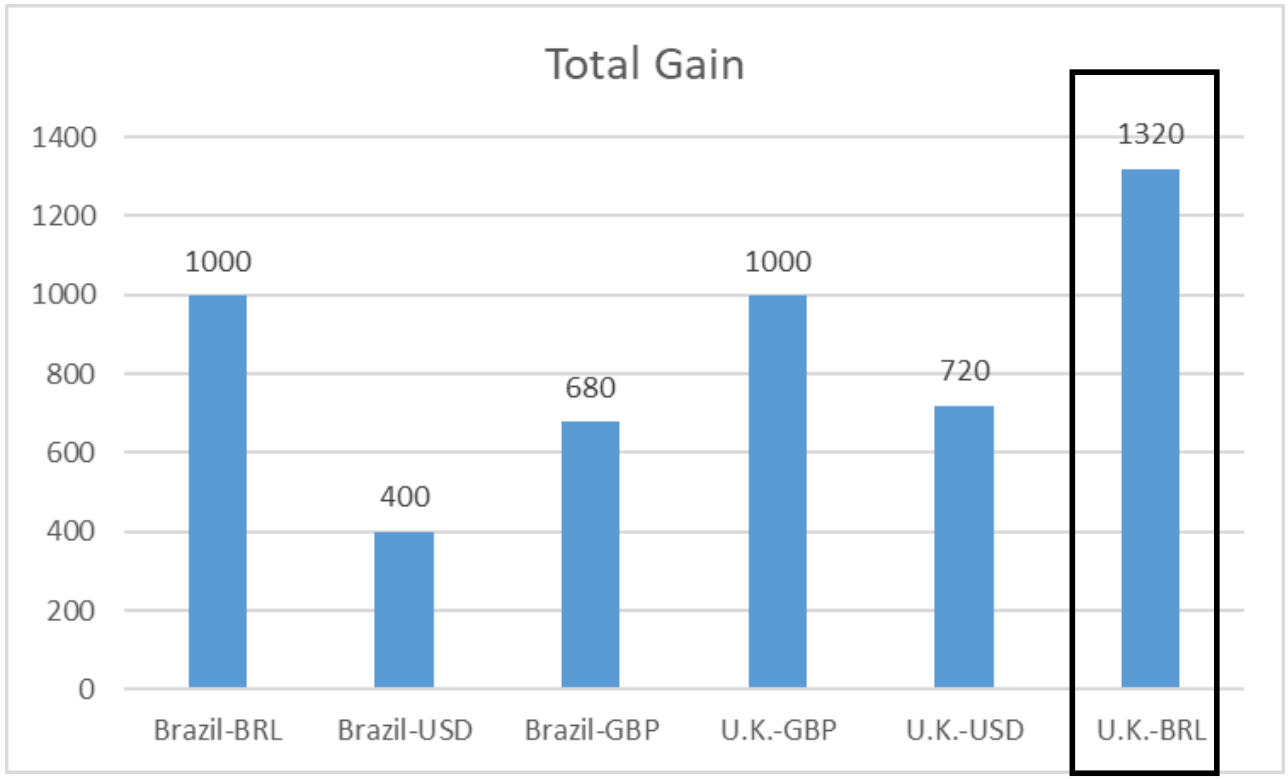






	Value		@ Fwd 0	@ Spot 1	Gain	
Buy	40,000	BRL	0.224138	0.23913	600	**Get** the Surprise
Sell	(8,000)	GBP	1.27451	1.309524	(280)	**Eliminate** the Surprise

Country	Ccy	Local	Ccy	Base (USD) Unh.	Risk Free	Loc-Rf	Cc+Rf	Bench Country	Bench Ccy	Portf Country	Portf Ccy
Brazil	BRL	15%	-5%	10%	16%	-1%	**11%**	50%	0%	0%	100%
U.K.	GBP	5%	5%	10%	2%	**3%**	7%	50%	0%	100%	0%
	USD				4%				100%		0%



Best Strategy

Country Allocation

Overweight U.K. Equities

Currency Allocation

Overweight Brazilian Real (BRL)

What Attribution Methodology convey this story?

Can conventional Brinson-Fachler do?

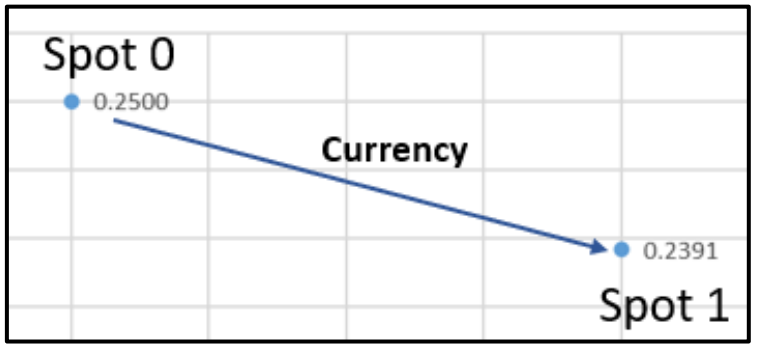
Naive Currency Decomposition Approach

(as described by Carl Bacon) does not account for the cost-of-hedging

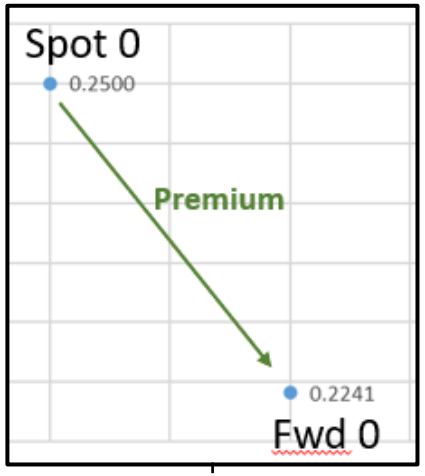
Base Return = Local Return + Currency Return

Local Return → Country Allocation

Currency Return → Currency Allocation



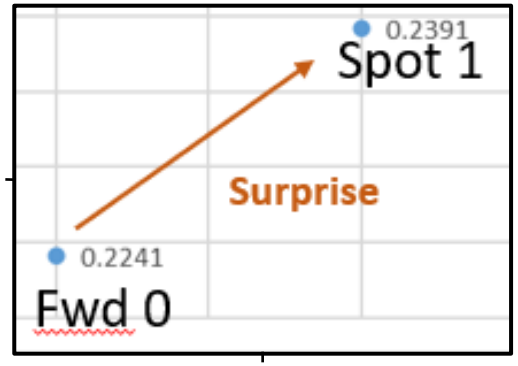
Ankrim-Hensel suggested breaking currency return into **Forward Premium** and **Currency Surprise**.



Base Return = Local Return + Forward Premium - Forward Premium + Currency Return

Local Return + Forward Premium → Country Allocation

Forward Premium + Currency Return → Currency Allocation



Karnosky-Singer suggest looking at local return in **Excess of Risk Free Rate**

Base Return = Local Return - Risk Free Rate + Risk Free Rate + Currency Return

Local Return - Risk Free Rate → Country Allocation

Risk Free Rate + Currency Return → Currency Allocation

Attribution Scenario

Best Strategy = Overweight U.K. Equities
Overweight Brazilian Real (BRL)

Weight			Naïve				Karnosky- Singer			
			Local ROR		Ccy ROR		Local ROR - Rf		Ccy ROR + Rf	
			Local		**Currency**		**Local**		**Currency**	
Portf	**Bench**	**Country**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**
60%	40%	Brazil	15.0%	1.2%	-5.0%	-1.2%	-1.00%	-0.5%	11.00%	0.5%
40%	60%	U.K.	5.0%	0.8%	5.0%	-0.8%	3.00%	-0.3%	7.00%	0.3%
				2.00%		-2.00%		-0.80%		0.80%

Expectations

Bad Country Allocation — **Good** Currency Allocation

Good Country Allocation — Bad Currency Allocation

Contradicts Expectations

Bad Country Allocation — **Good** Currency Allocation

Concurs with Expectations

Story:

COUNTRY ALLOCATION: Overweighting Brazilian Equities **retracted** value because it was too expensive to hedge. Even though the local return made up for the cost of hedging (466), it underperformed compared with GBP local return plus the premium received for hedging (696).

CURRENCY ALLOCATION: The manager remained passive (did not engaged in currency forwards). Therefore, leaving Brazilian Real (BRL) overweighted **added** value because there was a better surprise for BRL.

Karnosky- Singer vs Ankrim-Hensel

Use Risk Free Rate **Use Forward Premium**

Both produce results that concur with expectation
Produce different results
Results are of same magnitude and direction
Why are they different ? Can make them equivalent ?

$$\text{CoH} = \frac{RF_B - RF_L}{1 + RL}$$

Assume hedging Begin Value

← **Ankrim-Hensel Equivalent** ← $CoH = RF_B - RF_L$

Assume hedging Begin Value
Indexed @ Risk Free Rate

$$CoH = \frac{F_0 - S_0}{S_0}$$

Assume hedging Begin Value

$$CoH = \frac{F_0 - S_0}{S_0} \times (1 + RF_L)$$

Assume hedging Begin Value
Indexed @ Risk Free Rate

Weight			Karnosky- Singer				Ankrim-Hensel				Ankrim-Hensel*			
			Local ROR - Rf		Ccy ROR + Rf		Local ROR + CoH		Ccy ROR - CoH		Local ROR + CoH*		Ccy ROR - CoH*	
			Local		**Currency**		**Local**		**Currency**		**Local**		**Currency**	
Portf	**Bench**	**Country**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**	**ROR**	**Alloc**
60%	40%	Brazil	-1.00%	-0.5%	11.00%	0.5%	4.66%	-0.3%	5.34%	0.3%	3.00%	-0.5%	7.00%	0.5%
40%	60%	U.K.	3.00%	-0.3%	7.00%	0.3%	6.96%	-0.2%	3.04%	0.2%	7.00%	-0.3%	3.00%	0.3%
				-0.80%		0.80%		-0.46%		0.46%		-0.80%		0.80%

Expectations

Bad Country Allocation — **Good** Currency Allocation

Bad Country Allocation — **Good** Currency Allocation

Concurs with Expectations

Bad Country Allocation — **Good** Currency Allocation

Concurs with Expectations

Bad Country Allocation — **Good** Currency Allocation

Concurs with Expectations

Ankrim-Hensel uses Forward rates

Karnosky-Singer uses Risk Free Rates

Assume hedging Begin Value

Assume hedging Begin Value Indexed @ Risk Free Rate

BRL

$$\text{CoH} = \frac{F_0 - S_0}{S_0} = \frac{0.2241 - 0.25}{0.25} = -14.34\%$$

$$CoH = \frac{F_0 - S_0}{S_0} \times (1 + RF_L) = \frac{0.2241 - 0.20}{0.25} \times (1.16) = -12\%$$

$$-12\% = RF_B - RF_L = 4\% - 16\% = CoH$$

$$-14.34\% = \frac{RF_B - RF_L}{1 + RL} = \frac{4\% - 16\%}{1.16} = CoH$$

GBP

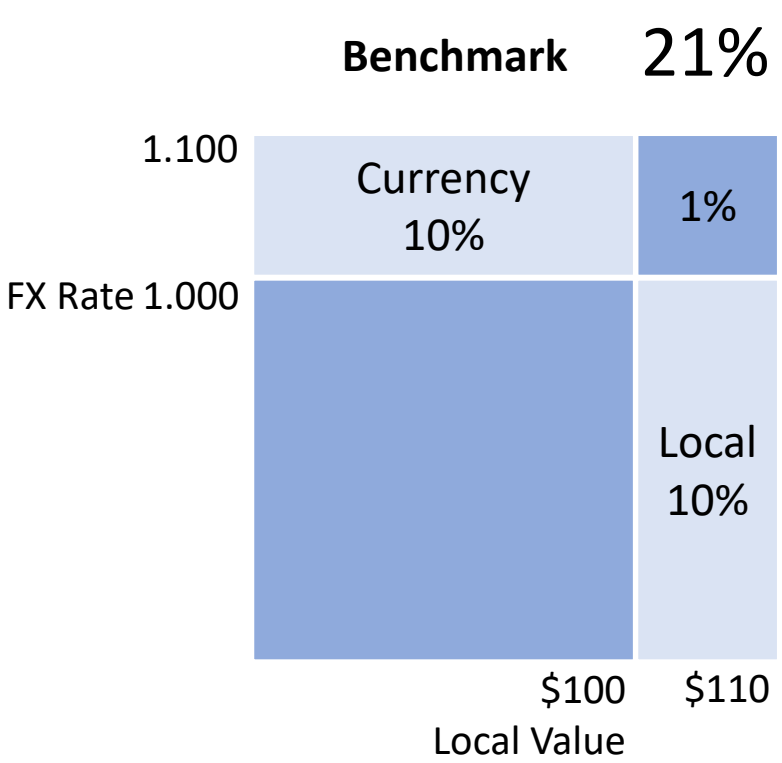
$$CoH = \frac{F_0 - S_0}{S_0} = \frac{1.2745 - 1.25}{1.25} = 1.96\%$$

$$CoH = \frac{F_0 - S_0}{S_0} \times (1 + RF_L) = \frac{1.2745 - 1.25}{1.25} \times (1.02) = 2\%$$

$$2\% = RF_B - RF_L = 4\% - 2\% = CoH$$

$$1.96\% = \frac{RF_B - RF_L}{1 + RL} = \frac{4\% - 2\%}{1.02} = \text{CoH}$$

Why Split Interaction?

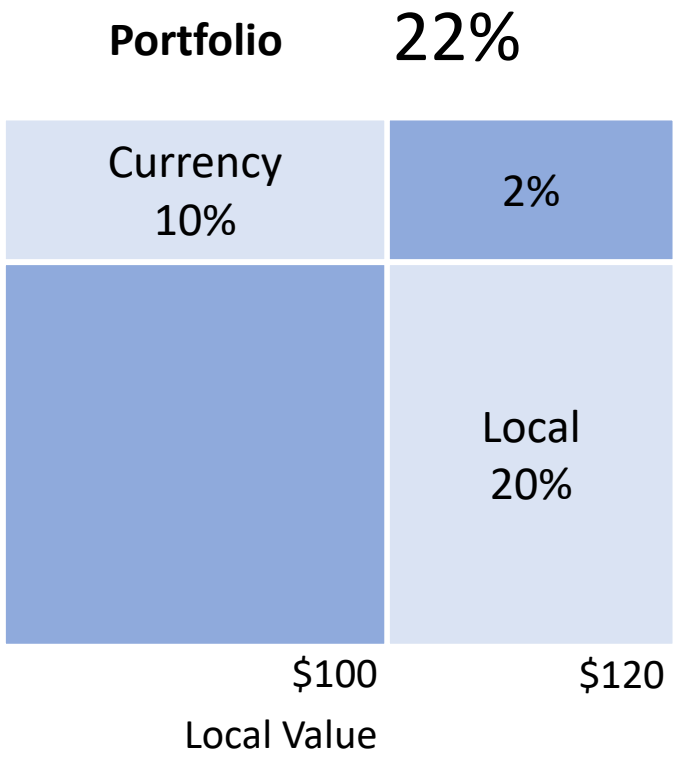


Combine Interaction

10%	Local	20%
11%	Currency	12%
21%	Base	32%

Separate Interaction

10%	Local	20%
10%	Currency	10%
1%	Interaction	2%
21%	Base	32%



Naive

P0701
TotalReturn Annualized
01-Jan-21 to 31-Dec-21

Powered by Robust Technologies -			Base (USD)						Local				Currency		Interaction		Currency Hedge		
Issuer	Invested First	Invested Last	Begin Market Value	End Market Value	Cash Flows	$ Earned	Weight	Time Weighted Return	Local Ccy	$ Earned	$ Earned (Base)	Time Weighted Return	$ Earned (Base)	TW Return	$ Earned (Base)	TW Return	Cost of Hedging Return	Local TWROR + CoH	Currency TWROR - CoH
P0701	1-Jan-21	31-Dec-21	10,000	11,000	-	1,000	100.00%	10.00%		-	1,100	11.00%	-70	-0.70%	-30	-0.30%	-5.42%	5.58%	4.72%
Assets BRL	1-Jan-21	31-Dec-21	6,000	6,600	-	600	60.00%	10.00%	BRL	3,600	900	15.00%	-261	-4.35%	-39	-0.65%	-10.34%	4.66%	6.00%
Assets GBP	1-Jan-21	31-Dec-21	4,000	4,400	-	400	40.00%	10.00%	GBP	160	200	5.00%	190	4.76%	10	0.24%	1.96%	6.96%	2.80%

B0701
TotalReturn Annualized
01-Jan-21 to 31-Dec-21

Powered by Robust Technologies -			Base (USD)						Local				Currency		Interaction		Currency Hedge		
Issuer	Invested First	Invested Last	Begin Market Value	End Market Value	Cash Flows	$ Earned	Weight	Time Weighted Return	Local Ccy	$ Earned	$ Earned (Base)	Time Weighted Return	$ Earned (Base)	TW Return	$ Earned (Base)	TW Return	Cost of Hedging Return	Local TWROR + CoH	Currency TWROR - CoH
B0701	1-Jan-21	31-Dec-21	10,000	11,000	-	1,000	100.00%	10.00%		-	900	9.00%	112	1.12%	-12	-0.12%	-2.96%	6.04%	4.08%
Assets BRL	1-Jan-21	31-Dec-21	4,000	4,400	-	400	40.00%	10.00%	BRL	2,400	600	15.00%	-174	-4.35%	-26	-0.65%	-10.34%	4.66%	6.00%
Assets GBP	1-Jan-21	31-Dec-21	6,000	6,600	-	600	60.00%	10.00%	GBP	240	300	5.00%	286	4.76%	14	0.24%	1.96%	6.96%	2.80%

Powere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
P0701	10.00%	1,000	11.00%	1,100	-0.70%	-70	-0.30%	-30
B0701	10.00%	1,000	9.00%	900	1.12%	112	-0.12%	-12
Excess	-	-	2.00%	200	-1.82%	-182	-0.18%	-18

Country Allocation **Good**

Bad Currency Allocation

Contradicts Expectations

Ankrim-Hensel

P0701
TotalReturn Annualized
01-Jan-21 to 31-Dec-21

Powered by Robust Technologies -			Base (USD)						Local				Currency		Interaction		Currency Hedge		
Issuer	Invested First	Invested Last	Begin Market Value	End Market Value	Cash Flows	$ Earned	Weight	Time Weighted Return	Local Ccy	$ Earned	$ Earned (Base)	Time Weighted Return	$ Earned (Base)	TW Return	$ Earned (Base)	TW Return	Cost of Hedging Return	Local TWROR + CoH	Currency TWROR - CoH
P0701	1-Jan-21	31-Dec-21	10,000	11,000	-	1,000	100.00%	10.00%		-	1,100	11.00%	-70	-0.70%	-30	-0.30%	-5.42%	5.58%	4.72%
Assets BRL	1-Jan-21	31-Dec-21	6,000	6,600	-	600	60.00%	10.00%	BRL	3,600	900	15.00%	-261	-4.35%	-39	-0.65%	-10.34%	4.66%	6.00%
Assets GBP	1-Jan-21	31-Dec-21	4,000	4,400	-	400	40.00%	10.00%	GBP	160	200	5.00%	190	4.76%	10	0.24%	1.96%	6.96%	2.80%

B0701
TotalReturn Annualized
01-Jan-21 to 31-Dec-21

Powered by Robust Technologies -			Base (USD)						Local				Currency		Interaction		Currency Hedge		
Issuer	Invested First	Invested Last	Begin Market Value	End Market Value	Cash Flows	$ Earned	Weight	Time Weighted Return	Local Ccy	$ Earned	$ Earned (Base)	Time Weighted Return	$ Earned (Base)	TW Return	$ Earned (Base)	TW Return	Cost of Hedging Return	Local TWROR + CoH	Currency TWROR - CoH
B0701	1-Jan-21	31-Dec-21	10,000	11,000	-	1,000	100.00%	10.00%		-	900	9.00%	112	1.12%	-12	-0.12%	-2.96%	6.04%	4.08%
Assets BRL	1-Jan-21	31-Dec-21	4,000	4,400	-	400	40.00%	10.00%	BRL	2,400	600	15.00%	-174	-4.35%	-26	-0.65%	-10.34%	4.66%	6.00%
Assets GBP	1-Jan-21	31-Dec-21	6,000	6,600	-	600	60.00%	10.00%	GBP	240	300	5.00%	286	4.76%	14	0.24%	1.96%	6.96%	2.80%

Powere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
P0701	10.00%	1,000	5.58%	558	4.72%	472	-0.30%	-30
B0701	10.00%	1,000	6.04%	604	4.08%	408	-0.12%	-12
Excess	-	-	-0.46%	-46	0.64%	64	-0.18%	-18

Country Allocation **Bad**

Good Currency Allocation

Concurs with Expectations

Country Allocation (AH)

Powere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
P0701	10.00%	1,000	5.58%	558	4.72%	472	-0.30%	-30
B0701	10.00%	1,000	6.04%	604	4.08%	408	-0.12%	-12
Excess	-	-	-0.46%	-46	0.64%	64	-0.18%	-18

Hedge Return

Powered by RoI	Portfolio			Benchmark			Excess			Allocation		Selection		Total	
Issuer	Return	Weight	$ Earned	Return	Weight	$ Earned	Return	Weight	$ Earned	Arith.	$ Earned	Arith.	$ Earned	Arith.	$ Earned
TotalReturn	5.58%	100.00%	558	6.04%	100.00%	604	-0.46%	-	-46	-0.46%	-46	-	-0	-0.46%	-46
Assets BRL	4.66%	60.00%	279	4.66%	40.00%	186	-	20.00%	93	-0.28%	-28	-0.00%	-0	-0.28%	-28
Assets GBP	6.96%	40.00%	278	6.96%	60.00%	418	-	-20.00%	-139	-0.18%	-18	-	0	-0.18%	-18

Bad Country Allocation

Concurs with Expectations

Story:

COUNTRY ALLOCATION: Overweighting Brazilian Equities **retracted** value because it was too expensive to hedge. Even though the local return made up for the cost of hedging (466), it underperformed compared with GBP local return plus the premium received for hedging (696).

Currency Allocation (AH)

Powere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
P0701	10.00%	1,000	5.58%	558	4.72%	472	-0.30%	-30
B0701	10.00%	1,000	6.04%	604	4.08%	408	-0.12%	-12
Excess	-	-	-0.46%	-46	0.64%	64	-0.18%	-18

Currency Surprise Return

Powered by Robus	Portfolio			Benchmark			Excess			Allocation		Selection		Total	
Issuer	Return	Weight	$ Earned	Return	Weight	$ Earned	Return	Weight	$ Earned	Arith.	$ Earned	Arith.	$ Earned	Arith.	$ Earned
TotalReturn	4.72%	100.00%	472	4.08%	100.00%	408	0.64%	-	64	0.64%	64	-	-0	0.64%	64
Brazilian real	6.00%	60.00%	360	6.00%	40.00%	240	-	20.00%	120	0.38%	38	-0.00%	-0	0.38%	38
Pound sterling	2.80%	40.00%	112	2.80%	60.00%	168	-	-20.00%	-56	0.26%	26	-	-0	0.26%	26

Good Currency Allocation

No Selection (Currency timing) Surprise is the same Portfolio vs Benchmark

Concurs with Expectations

Story:

CURRENCY ALLOCATION: The manager remained passive (did not engaged in currency forwards). Therefore, leaving Brazilian Real (BRL) overweighted **added** value because there was a better surprise for BRL.

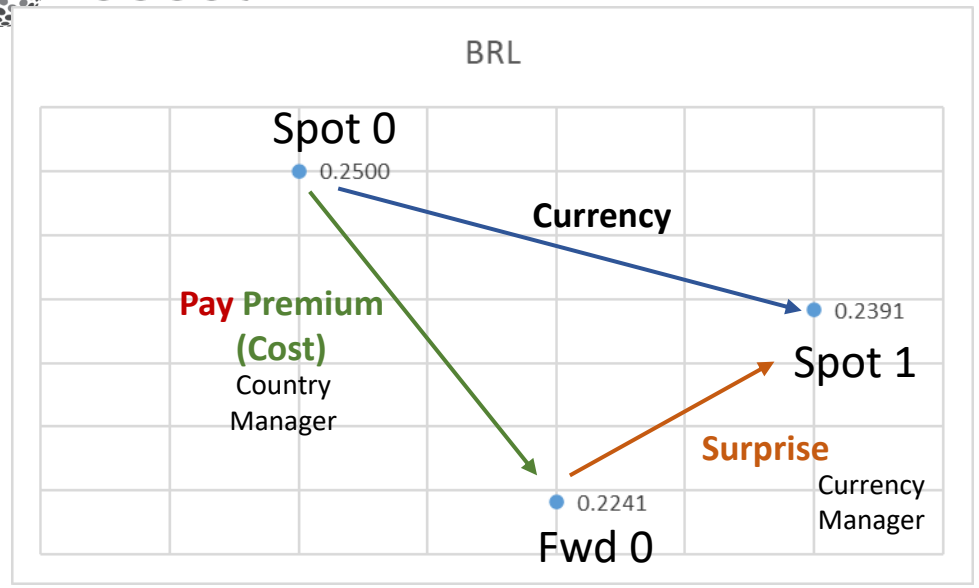
Active Currency Overlay Management

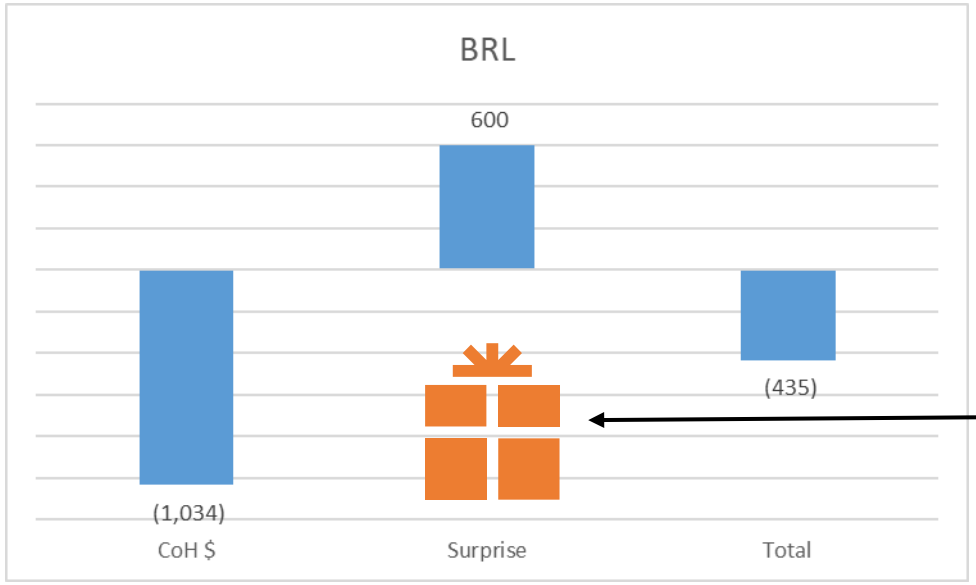
- So far, there were no currency forwards in the portfolio
- We applied the Policy (100% Hedged).
- Now let's add some active currency management decisions.
- **What was the best strategy for the currency manager? 100% BRL**

								Bench		Portf	
Country	**Ccy**	**Local**	**Ccy**	**Base** (USD) Unh.	**Risk Free**	**Loc-Rf**	**Cc+Rf**	**Country**	**Ccy**	**Country**	**Ccy**
Brazil	BRL	15%	-5%	10%	16%	-1%	**11%**	50%	0%	0%	100%
U.K.	GBP	5%	5%	10%	2%	**3%**	7%	50%	0%	100%	0%
	USD				4%				100%		0%

Why BRL is the
Best Strategy ?

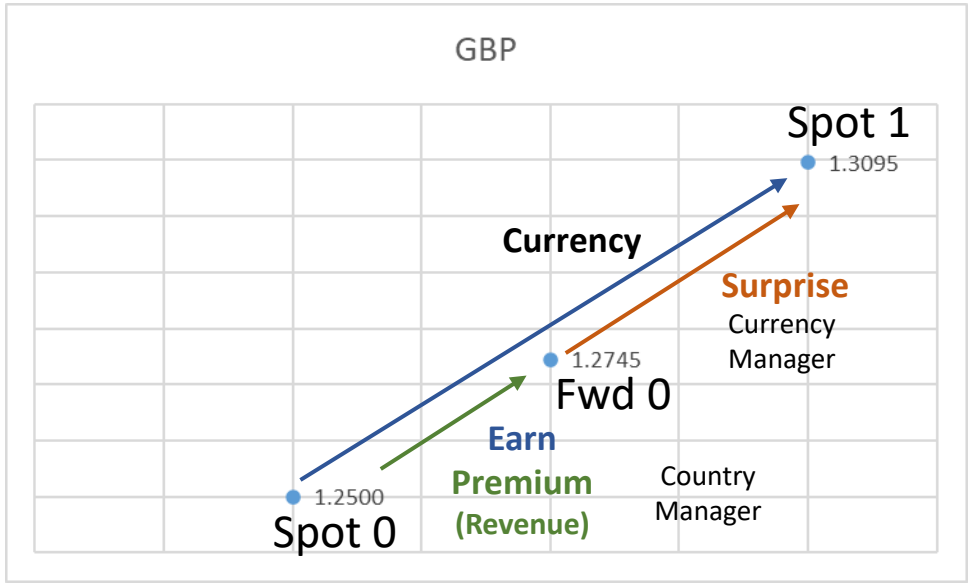
Because it offers the
Best Surprise

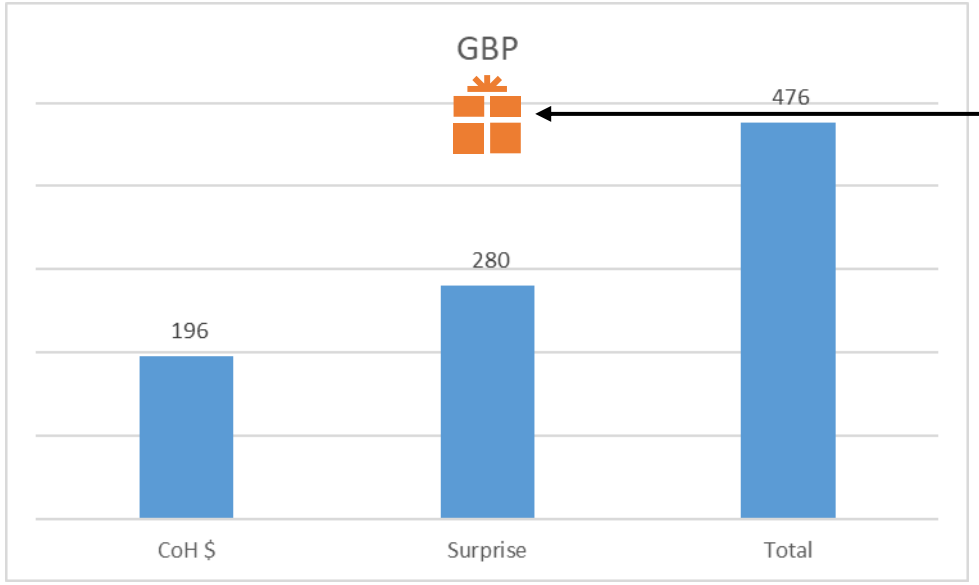


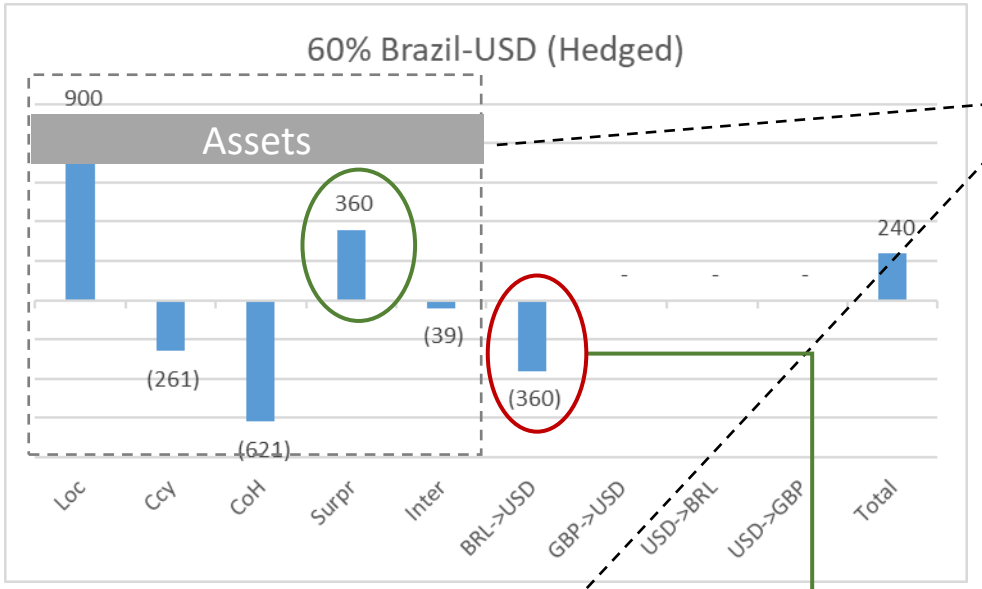


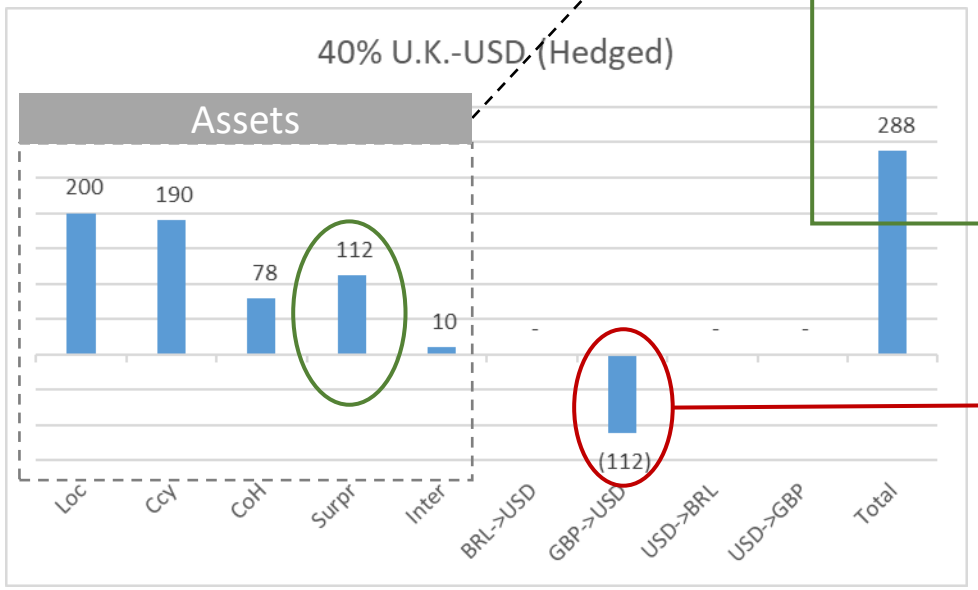
Active Decision

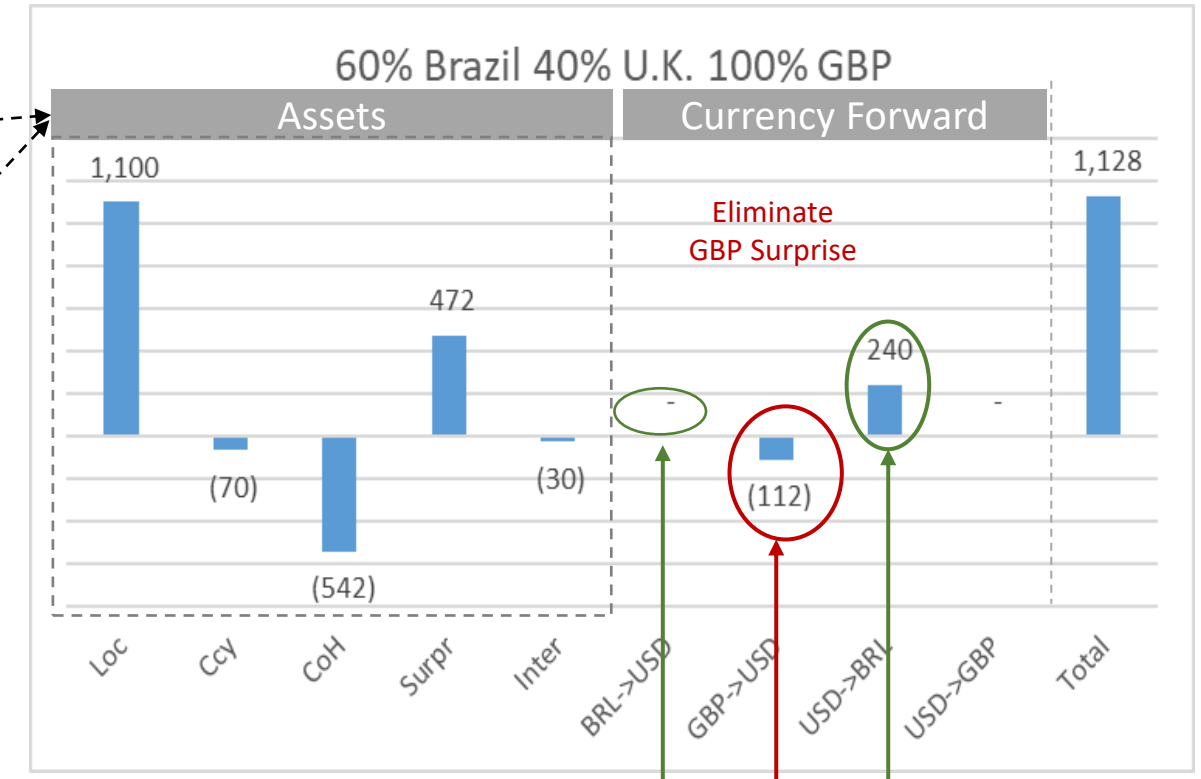
Trade a "small" surprise for a "bigger" surprise?











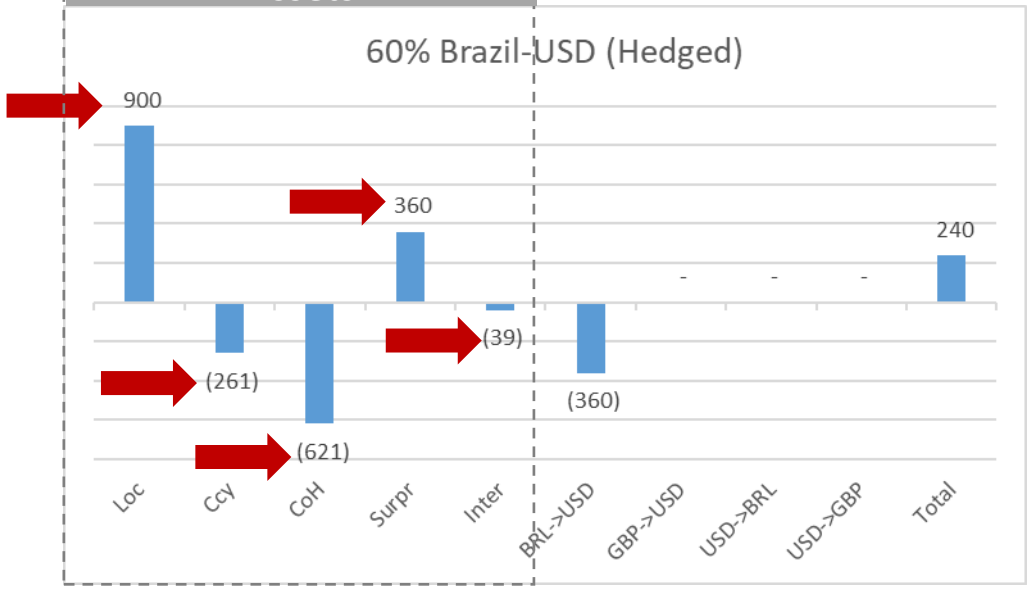
Keep BRL Surprise

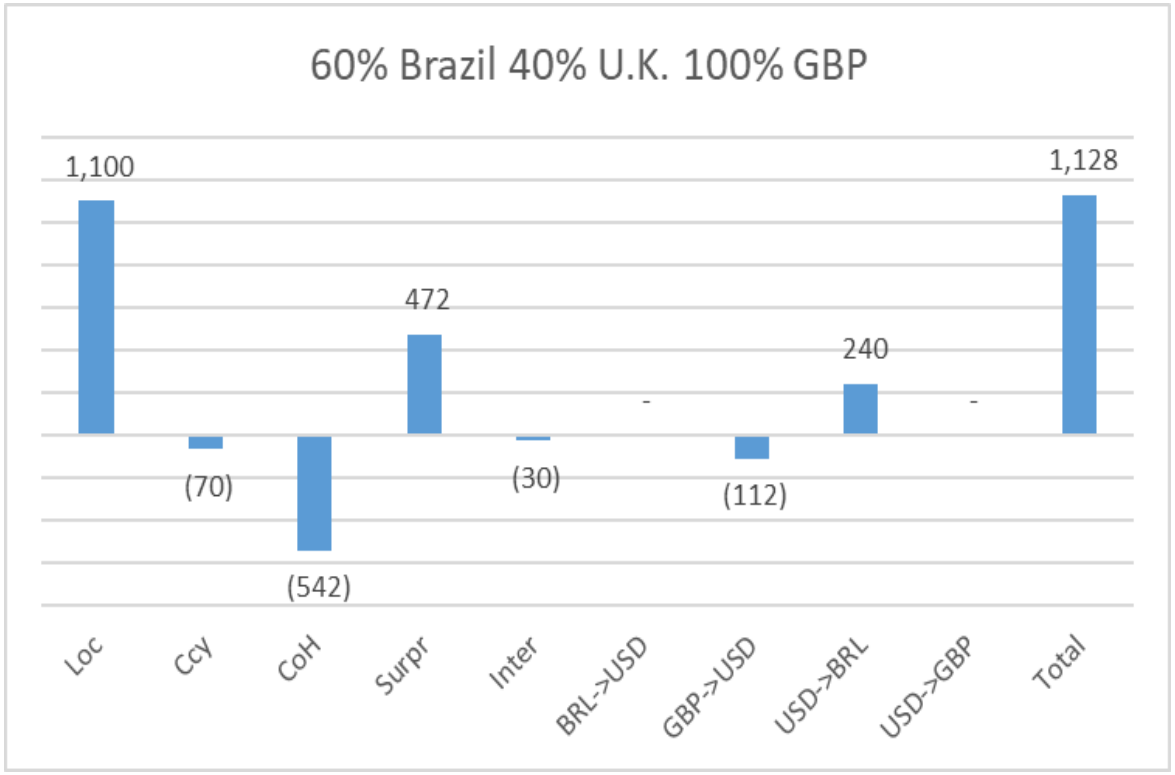
	Value		@ Fwd 0	@ Spot 1	Gain	
Buy	16,000	BRL	0.224138	0.23913	240	Buy more Surprise
Sell	(3,200)	GBP	1.27451	1.309524	(112)	Eliminate Surprise

Brazil-USD	$	240
U.K.-USD	$	288
Total	**$**	**528**
Strategy	$	1,128
Added Value	**$**	**600**

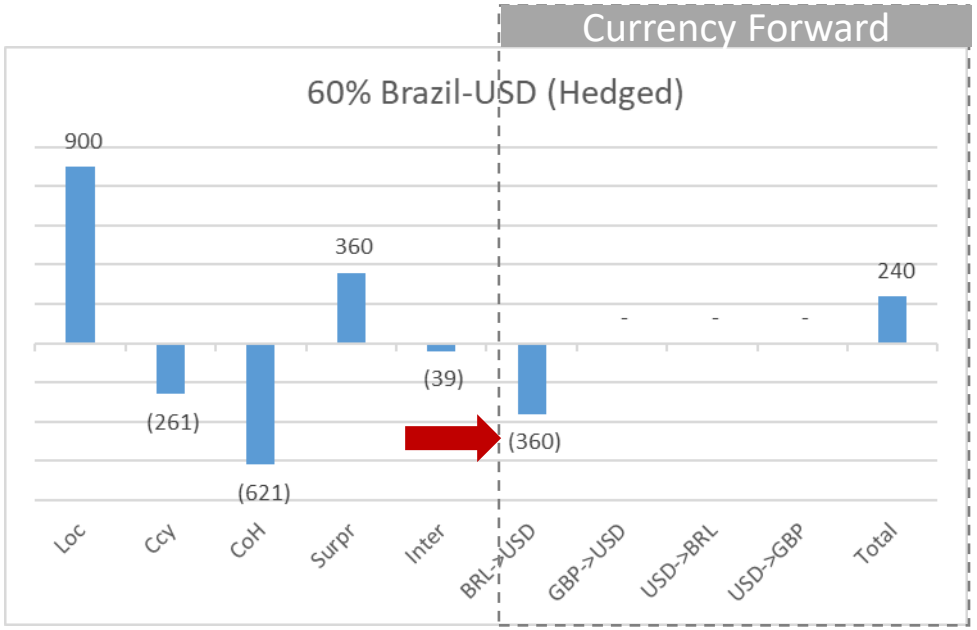
robust TECHNOLOGIES

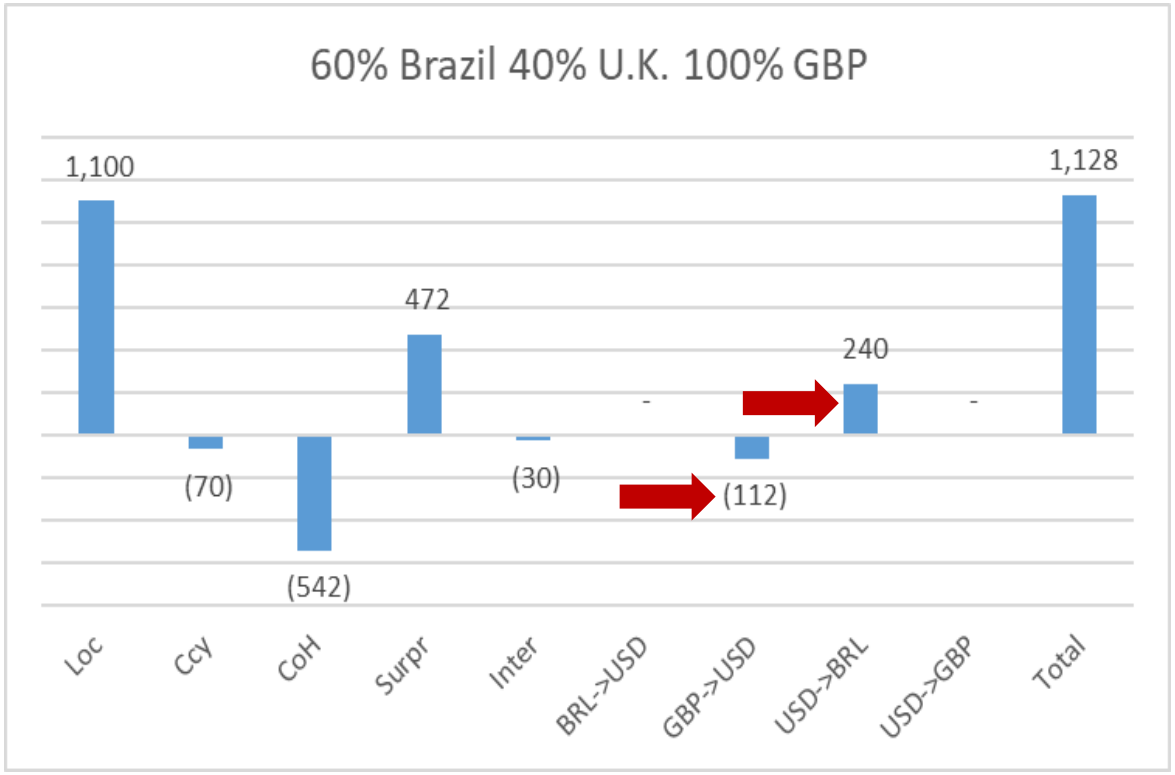
Assets



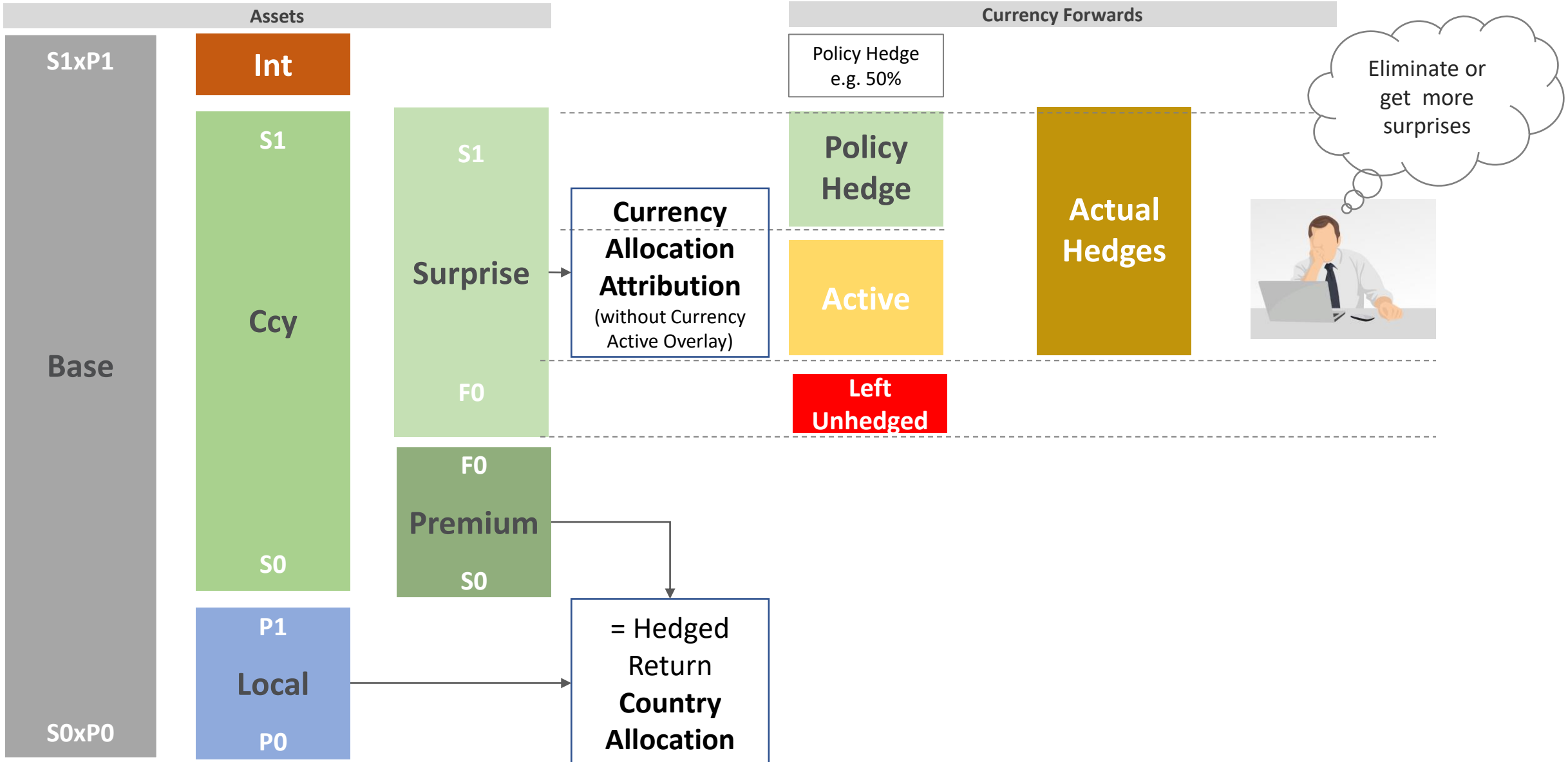


Powered by Robust Tech			Base(USD)			Local			Currency			Interaction			Premium			Surprise		
Ccy	Begin Market Value	Weight	Time Weighted Return	TW Contri-bution	$ Earned	Time Weighted Return	TW Contri-bution	$ Earned (Base)	TW Return	TW Contrib	$ Earned (Base)	TW Return	TW Contrib	$ Earned (Base)	TW Return	TW Contrib	$ Earned (Base)	TW Return	TW Contrib	$ Earned (Base)
	-	100.00%	10.00%	10.00%	1,000	11.00%	11.00%	1,100	-0.70%	-0.70%	-70	-0.30%	-0.30%	-30	-5.42%	-5.42%	-542	4.72%	4.72%	472
BRL	24,000	60.00%	10.00%	6.00%	600	15.00%	9.00%	900	[illegible]%	-2.61%	-261	[illegible]%	-0.39%	-39	[illegible]4%	-6.21%	-621	[illegible]0%	3.60%	360
GBP	3,200	40.00%	10.00%	4.00%	400	5.00%	2.00%	200	4.76%	1.90%	190	0.24%	0.10%	10	1.96%	0.78%	78	2.80%	1.12%	112
USD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Powered by Robust Tech			Policy Hedge				Actual Ccy Fwds			Active Ccy Fwds			Remain Unhedged Ccy		
Ccy	Begin Market Value	Weight	Ratio	Return	Contrib	$ Earned	Return	Contrib	$ Earned	Return	Contrib	$ Earned	Return	Contrib	$ Earned
	-	100.00%	100.00%	-4.72%	-4.72%	-472	1.28%	1.28%	128	6.00%	6.00%	600	-6.00%	-6.00%	-600
BRL	24,000	60.00%	100.00%	-6.00%	-3.60%	-360	%	2.40%	240	%	6.00%	600	-10.00%	-6.00%	-600
GBP	3,200	40.00%	100.00%	-2.80%	-1.12%	-112	%	-1.12%	-112	%	0.00%	0	-0.00%	-0.00%	-0
USD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

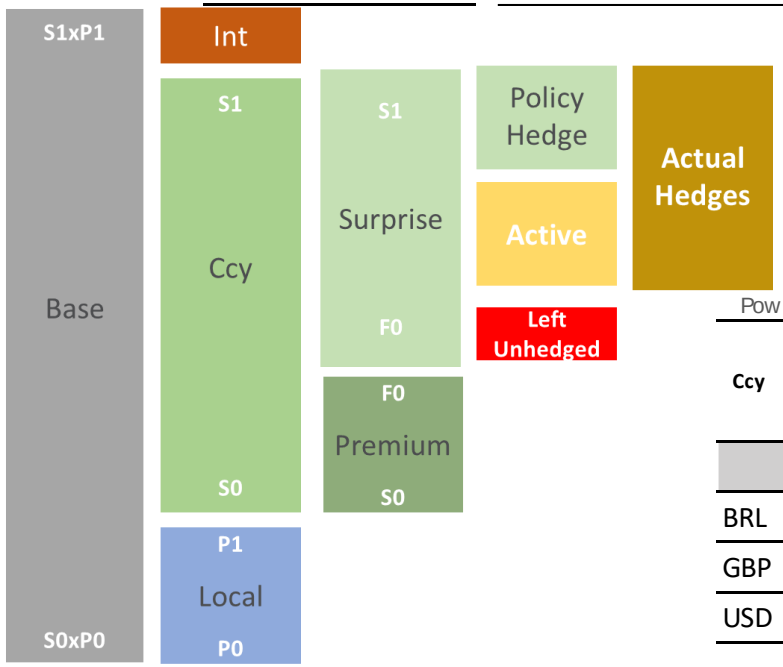

Assets
Currency Forwards
S1xP1
Int
S1
Ccy
S0
Base
S0xP0
P1
Local
P0
S1
Surprise
F0
F0
Premium
S0
Currency Allocation Attribution
(without Currency Active Overlay)
= Hedged Return Country Allocation
Policy Hedge e.g. 50%
Policy Hedge
Active
Left Unhedged
Actual Hedges
Eliminate or get more surprises

robust TECHNOLOGIES

Assets

Powered by Robust Tech

Ccy	Begin Market Value	Weight	Base(USD) Time Weighted Return	Base(USD) TW Contri-bution	Base(USD) $ Earned	Local Time Weighted Return	Local TW Contri-bution	Local $ Earned (Base)	Currency TW Return	Currency TW Contrib	Currency $ Earned (Base)	Interaction TW Return	Interaction TW Contrib	Interaction $ Earned (Base)	Premium TW Return	Premium TW Contrib	Premium $ Earned (Base)	Surprise TW Return	Surprise TW Contrib	Surprise $ Earned (Base)
	-	100.00%	10.00%	10.00%	1,000	11.00%	11.00%	1,100	-0.70%	-0.70%	-70	-0.30%	-0.30%	-30	-5.42%	-5.42%	-542	4.72%	4.72%	472
BRL	24,000	60.00%	10.00%	6.00%	600	15.00%	9.00%	900	-4.35%	-2.61%	-261	-0.65%	-0.39%	-39	-10.34%	-6.21%	-621	6.00%	3.60%	360
GBP	3,200	40.00%	10.00%	4.00%	400	5.00%	2.00%	200	4.76%	1.90%	190	0.24%	0.10%	10	1.96%	0.78%	78	2.80%	1.12%	112
USD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Currency Forwards

Powered by Robust Tech

Ccy	Begin Market Value	Weight	Policy Hedge Ratio	Policy Hedge Return	Policy Hedge Contrib	Policy Hedge $ Earned	Actual Ccy Fwds Return	Actual Ccy Fwds Contrib	Actual Ccy Fwds $ Earned	Active Ccy Fwds Return	Active Ccy Fwds Contrib	Active Ccy Fwds $ Earned	Remain Unhedged Ccy Return	Remain Unhedged Ccy Contrib	Remain Unhedged Ccy $ Earned
	-	100.00%	100.00%	-4.72%	-4.72%	-472	1.28%	1.28%	128	6.00%	6.00%	600	-6.00%	-6.00%	-600
BRL	24,000	60.00%	100.00%	-6.00%	-3.60%	-360	4.00%	2.40%	240	10.00%	6.00%	600	-10.00%	-6.00%	-600
GBP	3,200	40.00%	100.00%	-2.80%	-1.12%	-112	-2.80%	-1.12%	-112	0.00%	0.00%	0	-0.00%	-0.00%	-0
USD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Currency Allocation - Policy Hedge

Without Currency Forwards

Powere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
P0701	10.00%	1,000	5.58%	558	4.72%	472	-0.30%	-30
B0701	10.00%	1,000	6.04%	604	4.08%	408	-0.12%	-12
Excess	-	-	-0.46%	-46	0.64%	64	-0.18%	-18

Currency Allocation – Currency Overlay

With Currency Forwards

Pow ere	Base		Local		Currency		Interaction	
Issuer	Return	$ Earned	Return	$ Earned	Return	$ Earned	Return	$ Earned
A0701	11.28%	1,128	5.58%	558	6.00%	600	-0.30%	-30
B0701	10.00%	1,000	6.04%	604	4.08%	408	-0.12%	-12
Excess	1.28%	128	-0.46%	-46	1.92%	192	-0.18%	-18

Better
Long BRL / Short GBP
Get BRL Surprise
Eliminate GBP Surprise

Concurs with Expectations

A0701 vs B0701
2021-12-31
AH Currency Allocation

Pow ered by Robust Techr	Portfolio			Benchmark			Allocation		Selection		Total	
Issuer	Return	Weight	$ Earned	Return	Weight	$ Earned	Arith.	$ Earned	Arith.	$ Earned	Arith.	$ Earned
TotalReturn	6.00%	100.00%	600	4.08%	100.00%	408	1.65%	165	0.27%	27	1.92%	192
Brazilian real	6.26%	95.86%	600	6.00%	40.00%	240	1.07%	107	0.25%	25	1.32%	132
Pound sterling	100.00%	-0.78%	0	2.80%	60.00%	168	0.78%	78	0.02%	2	0.80%	80
United States dollar	-	4.92%	-	-	-	-	-0.20%	-20	-	-	-0.20%	-20

RECAP Currency Forward ?

- Typically used to hedge foreign assets
  - Protect (immunize) from exchange rate fluctuations
  - Active currency overlay strategies (increase or decrease currency positions)
- They are 2-leg instruments:
  - Short leg (Sell foreign currency)
  - Long leg (Buy base currency)
- Sell/Buy at a:
  - Pre-determined date → Forward date
  - Pre-determined rate → Forward rate

The forward rate is known ahead of time.
It is not a prediction of what the exchange rate will be in the future.
It is established from differential of risk free rates between 2 countries

RECAP Cost of hedging

If you hedge investments in countries with…		Forward Premium	
Lower risk-free rates	→	Earn you a premium	U.K.: 2% vs USA: 4%
Higher risk-free rates	→	Pay you a premium	BR: 16% vs USA: 4%

Premium:

- Is known in advanced
- should be **attributed** to the **country allocation** decision
- should **not** be **attributed** to the **currency allocation** decision

Recap

- Purpose of performance and attribution is to “tell a story”.
- Look at the past performance and explain what happened.
- Identify and quantify the good/bad investment management decisions.
- With enough evidence to support “the **correctness** of the story”.

Global multi-currency portfolios

- Measuring impact of of currency is important
- Currency management
  - Reduce risk: Hedge against currency fluctuations
  - Add value opportunities: Benefit from currency variations
- Need proper framework to assess currency management
- Typical Brinson Frameworks convey limited information pertaining to currency management
- Applying KS or AH and how improves the Brinson frameworks.

Brian D. Singer and Denis S. Karnosky

- Global Asset Management and Performance Attribution
  - The Research Foundation of the Institute of Chartered Financial Analysts
  - February 1994
- The General Framework for Global Investment Management and Performance Attribution
  - The Journal of Portfolio Management
  - Winter 1995

Ernest M. Ankrim and Chris R. Hensel

- Multicurrency Performance Attribution
  - Financial Analyst Journal
  - March-April 1994

Questions ?
Comments !

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