

FX and FXO markets

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Market Convention - spot

SPOT EURUSD SELL EUR 1.08 44₉ 0.1 BUY EUR 1.08 45₀ SP 06 Mar 24 EUR 1m BUY ORDER SELL ORDER	SPOT USDCNH SELL USD 7.20 85₄ 0.2 BUY USD 7.20 85₆ SP 06 Mar 24 USD 1m BUY ORDER SELL ORDER
SPOT GBPUSD SELL GBP 1.26 66₄ 0.3 BUY GBP 1.26 66₇ SP 06 Mar 24 GBP 1m BUY ORDER SELL ORDER	SPOT USDHKD SELL USD 7.82 75₈ 1 BUY USD 7.82 76₈ SP 06 Mar 24 USD 1m BUY ORDER SELL ORDER
SPOT AUDUSD SELL AUD 0.65 26₅ 0.3 BUY AUD 0.65 26₈ SP 06 Mar 24 AUD 1m BUY ORDER SELL ORDER	SPOT USDSGD SELL USD 1.34 40₉ 0.8 BUY USD 1.34 41₇ SP 06 Mar 24 USD 1m BUY ORDER SELL ORDER
SPOT USDJPY SELL USD 150. 13₃ 0.2 BUY USD 150. 13₅ SP 06 Mar 24 USD 1m BUY ORDER SELL ORDER	SPOT USDTHB SELL USD 35. 79₉ 0.7 BUY USD 35. 80₆ SP 06 Mar 24 USD 1m BUY ORDER SELL ORDER

Bid

Offer

USDJPY rate: 150.134 means.. 1mio USD
= 150.134 mio JPY, deliver on 6 mar
2024 (today is 4 Mar)

150.133: bid (where I can sell USD)
150.135: offer (where I can buy USD)

Now if I go ask a bank: USDJPY in 1mio,
bank trader will quote: 150.133/135...
he means..

-If I want to buy 1mio USD agst JPY, I
need to pay 150.135×1 mio of JPY;

-if I want to sell 1mio USD agst JPY, I can
receive 150.133×1 mio of JPY

Currency	Nicknames
EURUSD	Euro
GBPUSD	Cable
AUDUSD	Aussie
NZDUSD	Kiwi
USDJPY	Dollar Yen
USDCHF	Dollar Swiss
USDCAD	Dollar CAD / Loonie
USDHKD	Dollar Hongki / TT
USDCNH	Dollar China/CNH
USDSGD	Dollar Sin
USDTHB	Dollar Baht

Question: if I buy 10mio USDJPY
when trader quotes 149/149.01,
and sell at 150/150.01, what is
my pnl in USD?

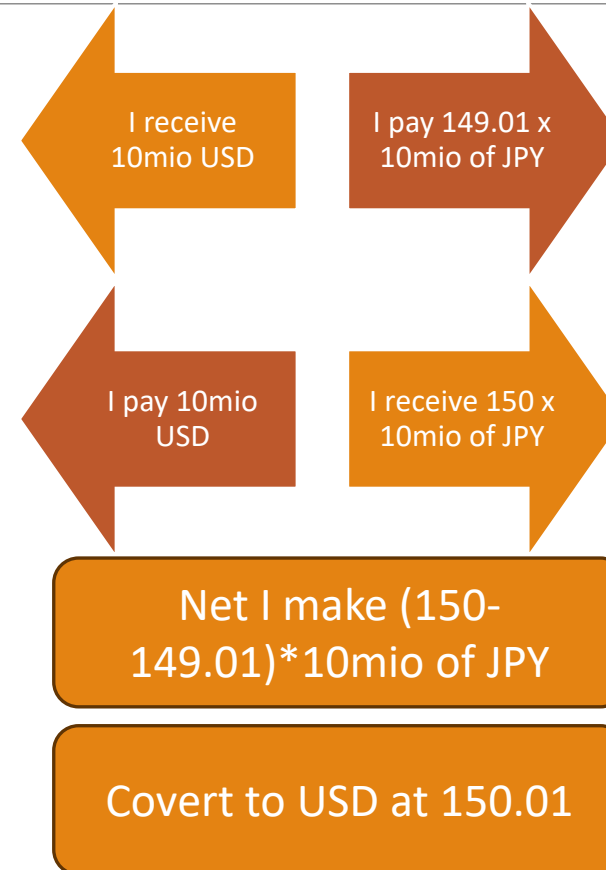
Market Conventions - spot

Question:

if I buy 10mio USDJPY when trader quotes 149/149.01, and sell at 150/150.01 on the same day, what is my pnl in USD?

Answer:

$10\text{mio} \times (150 - 149.01) / 150.01 = 65,995.60 \text{ USD}$



Market Conventions – Forward / FX Swap

Question, I have 10mio USD, I want to buy a property in Japan in 3month, but I want to lock in the FX rates today at 150.193/150.195
(USD IR ~5.3%, JPY IR ~0%), can I ask bank that we trade today but deliver 3month later?

Answer is .. Yes, but we need to adjust for IR differential, because.. You are receiving USD IR for 3 month..

FWD USDJPY			
SELL USD	150.193	150.195	BUY USD
	148.07193	148.07890	
	-212.107	-211.610	
	0.697		
3M	06 Jun 24	USD	1m
BUY ORDER		SELL ORDER	

Spot price

Forward price

Swap points (Adjustment)

Spot	Swap	X	Custom	Forward	...	+		
EURUSD	USDJPY	USD	GBPUSD	USDCNH	AUDUSD	USDCAD	USDCHF	EURGBP
Nr. Tenor	Far Tenor ↑	Amount	Bid		Ask			
SP	--	1m	BID	150.185	150.187	ASK		
TD	TOM	1m	BID	START RFS	START RFS	ASK	⋮	
TOM	SP	1m	BID	-2.312	-2.301	ASK	⋮	
SP	S+1	1m	BID	-2.315	-2.309	ASK	⋮	
SP	IMM1	1m	BID	-34.870	-34.683	ASK	⋮	
SP	1M	1m	BID	-77.691	-77.514	ASK	⋮	
SP	2M	1m	BID	-144.483	-144.149	ASK	⋮	
SP	3M	1m	BID	-212.106	-211.609	ASK	⋮	
SP	6M	1m	BID	-411.147	-409.986	ASK	⋮	
SP	9M	1m	BID	-593.680	-591.417	ASK	⋮	
SP	1Y	1m	BID	-766.660	-762.867	ASK	⋮	

Trading Strategies – Carry trade

Question: I buy 3month USDJPY forward at 148.07890. If 3mth later spot doesn't move (spot 150.193/195), do I make money?

Yes.. But remember that your assumption is that spot market doesn't move..

It's great idea but can be improved:

1. RV (short USDMXN, long USDJPY both 3month forward?)
2. Diversification (short USDMXN/ZAR/HUF, long USDJPY/TWD/CNH with suitable risk allocation)

Both discretionary / quant portfolio managers are looking at this strategy. Idea is to find a portfolio with stable spot risk + positive carry



Goldman Sachs FX Carry Strategy Index
Source: Bloomberg

Risk Management – by trade

Plan your trade with take profit / stop loss levels before you can enter a trade

-Take profit order: I want to sell higher than / buy lower than current market

-Stop loss orders: I want to buy when market goes higher to certain level/sell when market goes to lower level

With pnl calculation, you can plan how much \$ you want to risk for a trade (and expected risk/reward)

SPOT		USDJPY	
SELL USD	150.	BUY USD	150.
30₁		30₃	
0.2		0.2	
SP	06 Mar 24	USD	1m
BUY ORDER		SELL ORDER	
Order Type: Take Profit			
BUY		1m	USD
Limit (J.P. Morgan)		150.	00₀
SUBMIT BUY ORDER			
CLOSE		OPEN TICKET	

SPOT		USDJPY	
SELL USD	150.	BUY USD	150.
31₁		31₃	
0.2		0.2	
SP	06 Mar 24	USD	1m
BUY ORDER		SELL ORDER	
Order Type: Stop Loss			
BUY		1m	USD
Trigger Level (JPM Bid)		150.	90₀
Execution Side		JPM Ask	
SUBMIT BUY ORDER			
CLOSE		OPEN TICKET	

Risk Management – by portfolio (VaR)

VaR – Value at Risk, a useful method to manage your portfolio risk

In practice, 95% VaR roughly means what can be loss for my worst day of a month

Currency	Exposure (in mio)
USDJPY	0
AUDUSD	10
EURUSD	10
USDCNH	20
USDMXN	0
VaR (kUSD, 100d 95%)	121

- Now back to carry strategies we mentioned earlier.. Which portfolio to do prefer as a carry trade?

FWD USDJPY				FWD USDMXN			
SELL USD	150.375	BUY USD	150.377	SELL USD	17.0070	BUY USD	17.0102
148.25151		148.25848		17.2212669		17.2867555	
-212.349		-211.852		+2142.669		+2765.555	
3M	06 Jun 24	USD	1m	3M	06 Jun 24	USD	100
BUY ORDER		SELL ORDER		BUY ORDER		SELL ORDER	

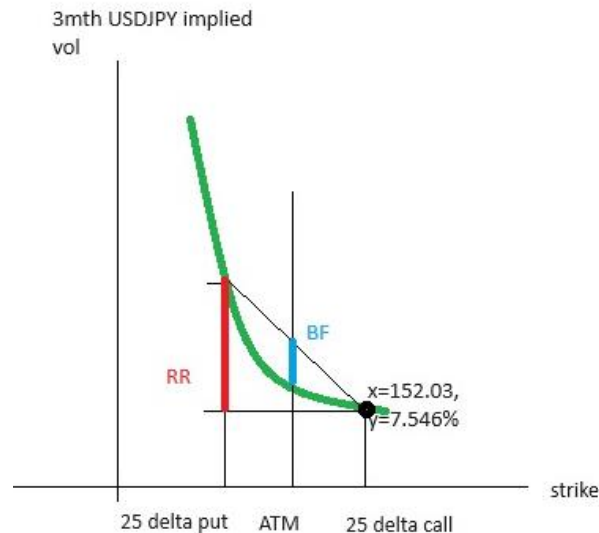
	Potfolio 1	Potfolio 2
Currency	Exposure (in mio)	Exposure (in mio)
USDJPY	10	7
AUDUSD	0	0
EURUSD	0	0
USDCNH	0	0
USDMXN	0	-4
VaR (kUSD, 100d 95%)	37	37

For same amount of spot risk, carry for..

portfolio 1: $2.12/150.38 * 10\text{mio} = 140,98 \text{ USD}$

portfolio 2: $2.12/150.38 * 7\text{mio} + 0.2454/17.0086 * 4\text{mio} = 156,395 \text{ USD}$

FX Options markets



- $RR\ x = Call\ x - Put\ x$
- $Fly\ x = 0.5(Call\ x + Put\ x) - ATM$

$$Call\ x = ATM + 0.5\ RR\ x + Fly\ x$$

$$Put\ x = ATM - 0.5\ RR\ x + Fly\ x$$

I want to price a 25 delta call, what is market implied vol?
 $7.915 + 0.5 * (-1.293) + 0.292 = 7.56$

$$C = N(d_1)S_t - N(d_2)Ke^{-rt}$$

$$\text{where } d_1 = \frac{\ln \frac{S_t}{K} + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$$

$$\text{and } d_2 = d_1 - \sigma\sqrt{t}$$

C = call option price

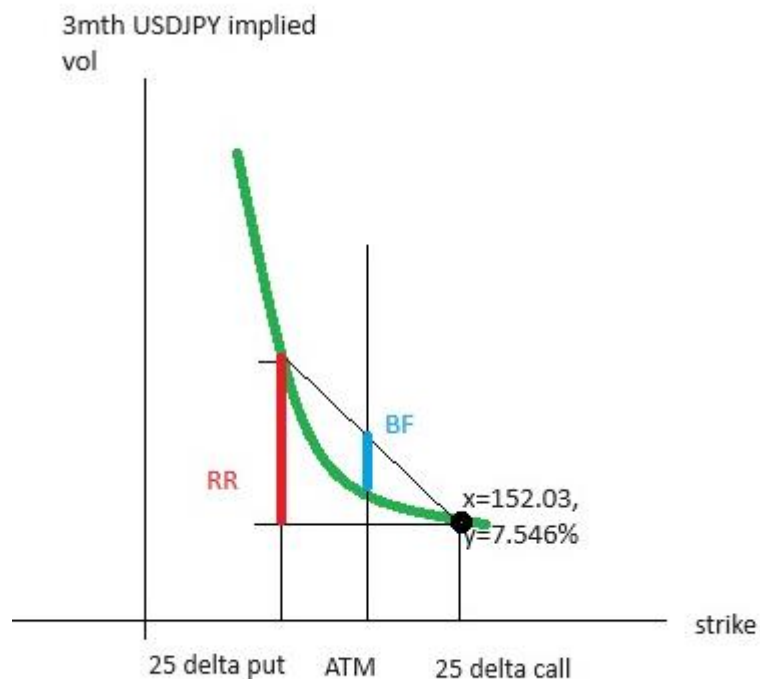
N = CDF of the normal distribution

S_t = spot price of an asset

K = strike price

USDJPY Currency			90) Asset ▾		91) Actions ▾		92) Settings ▾				
Bloomberg BGN ▾			Offshore ▾				Weekdays				
1) Vol Table		2) 3D Surface		3) Term		4) Smile		5) Dep and Fwd Rates		6) Contribution Met	
Format		<input checked="" type="radio"/> RR/BF <input type="radio"/> Put/Call		Side		<input type="radio"/> Bid/Ask		<input checked="" type="radio"/> Mid/Spread			
Exp	ATM		25D RR		25D BF		10D RR		10D BF		
	Mid	Spread	Mid	Spread	Mid	Spread	Mid	Spread	Mid	Spread	
1D	6.750	3.200	-1.705	2.240	0.655	1.600	-3.155	3.840	0.885	2.560	
1W	6.605	1.150	-1.127	0.805	0.268	0.575	-2.115	1.380	0.835	0.920	
2W	6.745	0.800	-1.235	0.560	0.240	0.400	-2.350	0.960	0.865	0.640	
3W	7.280	0.550	-1.335	0.380	0.265	0.270	-2.522	0.655	0.845	0.440	
1M	7.783	0.325	-1.550	0.230	0.283	0.165	-2.975	0.390	0.910	0.260	
2M	8.067	0.325	-1.468	0.225	0.278	0.165	-2.750	0.390	0.910	0.260	
3M	7.915	0.240	-1.293	0.165	0.292	0.115	-2.472	0.285	0.930	0.190	
4M	8.112	0.255	-1.110	0.180	0.292	0.125	-2.120	0.300	0.925	0.200	
5M	8.214	0.269	-0.987	0.189	0.294	0.133	-1.932	0.319	0.967	0.213	
6M	8.262	0.285	-0.900	0.200	0.297	0.145	-1.783	0.345	0.980	0.230	
9M	8.597	0.385	-0.620	0.270	0.313	0.195	-1.167	0.465	1.070	0.310	
1Y	8.560	0.300	-0.475	0.210	0.350	0.150	-0.865	0.360	1.160	0.240	

FX Options markets



OVML USDJPY EU 143.95P 06/04/24 N1M				U 148.25C 06/04/24 N1M				EU 152.03C 06/04/24 N1M			
		Strategy 1 ▾				Strategy 1 ▾				Strategy 1 ▾	
		Leg 1 ▾				Leg 1 ▾				Leg 1 ▾	
Price Date		03/04/24 ▢ 15:42		03/04/24 ▢ 15:42		03/04/24 ▢ 15:42		03/04/24 ▢ 15:42		03/04/24 ▢ 15:42	
Asset		USDJPY		USDJPY		USDJPY		USDJPY		USDJPY	
Spot		Mid ▾ 150.37		Mid ▾ 150.37		Mid ▾ 150.37		Mid ▾ 150.37		Mid ▾ 150.37	
Style		European ▾ Vanilla ▾		European ▾ Vanilla ▾		European ▾ Vanilla ▾		European ▾ Vanilla ▾		European ▾ Vanilla ▾	
Direction		Client buys ▾ Physical ▾		Client buys ▾ Physical ▾		Client buys ▾ Physical ▾		Client buys ▾ Physical ▾		Client buys ▾ Physical ▾	
Call/Put		USD ▾ Put ▾		USD ▾ Call ▾		USD ▾ Call ▾		USD ▾ Call ▾		USD ▾ Call ▾	
Expiry		3 months ▾ 06/04/24 ▢		3 months ▾ 06/04/24 ▢		3 months ▾ 06/04/24 ▢		3 months ▾ 06/04/24 ▢		3 months ▾ 06/04/24 ▢	
Delivery		NY 10:00 ▾ 06/06/24 ▢		NY 10:00 ▾ 06/06/24 ▢		NY 10:00 ▾ 06/06/24 ▢		NY 10:00 ▾ 06/06/24 ▢		NY 10:00 ▾ 06/06/24 ▢	
Strike		143.95 2.90% OTMF		148.25 ATMF		148.25 ATMF		152.03 2.55% OTMF		152.03 2.55% OTMF	
Notional		USD ▾ 1,000,000.00		USD ▾ 1,000,000.00		USD ▾ 1,000,000.00		USD ▾ 1,000,000.00		USD ▾ 1,000,000.00	
Model		Black-Scholes ▾		Black-Scholes ▾		Black-Scholes ▾		Black-Scholes ▾		Black-Scholes ▾	
More Market Data		↻		↻		↻		↻		↻	
Vol BGN ↻		8.839%/8.839%		7.882%/7.882%		7.882%/7.882%		7.546%/7.546%		7.546%/7.546%	
Vol Spread		0.000%		0.000%		0.000%		0.000%		0.000%	
Points BGN ↻		Mid ▾ -212.15		Mid ▾ -212.15		Mid ▾ -212.15		Mid ▾ -212.15		Mid ▾ -212.15	
Forward		Mid ▾ 148.25...		Mid ▾ 148.25...		Mid ▾ 148.25...		Mid ▾ 148.25...		Mid ▾ 148.25...	
USD Depo USD SOFR ↻		Mid ▾ 5.323...%		Mid ▾ 5.323...%		Mid ▾ 5.323...%		Mid ▾ 5.323...%		Mid ▾ 5.323...%	
JPY Depo Implied ↻		Mid ▾ -0.273...%		Mid ▾ -0.273...%		Mid ▾ -0.273...%		Mid ▾ -0.273...%		Mid ▾ -0.273...%	
Greeks		▢		▢		▢		▢		▢	
Gamma		USD ▾ 70,159.33		USD ▾ 99,446.96		USD ▾ 99,446.96		USD ▾ 84,335.67		USD ▾ 84,335.67	
Vega		1,563.04		1,975.63		1,975.63		1,604.12		1,604.12	
Results											
Price % USD ▾		0.6563% P		1.5573% P		1.5573% P		0.5738% P		0.5738% P	
Premium USD ▾		6,563.23 P		15,573.27 P		15,573.27 P		5,738.25 P		5,738.25 P	
Prem Date		03/06/24 ▢		03/06/24 ▢		03/06/24 ▢		03/06/24 ▢		03/06/24 ▢	
Delta Spot ▾		-25.0000%		48.5503%		48.5503%		25.0000%		25.0000%	
Hedge		250,000.42		-485,503.29		-485,503.29		-249,999.67		-249,999.67	

25 delta put is more expensive than 25 delta call, because RR is towards downside

FX Options markets – Delta and Vega

OVML USDJPY EU 152.03C 06/04/24 N1M			
		Strategy 1	
		Leg 1	
Price Date	03/04/24 15:42		
Asset	USDJPY		
Spot	Mid	150.37	
Style	European	Vanilla	
Direction	Client buys	Physical	
Call/Put	USD	Call	
Expiry	3 months	06/04/24	
Delivery	NY 10:00	06/06/24	
Strike	152.03	2.55% OTMF	
Notional	USD	1,000,000.00	
Model	Black-Scholes		
More Market Data			
Vol	BGN	7.561%/7.561%	
Vol Spread		0.000%	
Points	BGN	Mid	-212.15
Forward		Mid	148.25...
USD Depo	USD SOFR	Mid	5.323...%
JPY Depo	Implied	Mid	-0.273...%
Greeks			
Gamma		USD	84,233.90
Vega			1,605.41
Results			
Price	% USD	0.5761% P	
Premium	USD	5.761.37 P	
Prem Date		03/06/24	
Delta	Spot	25.0374%	
Hedge		-250.373.60	

OVML USDJPY EU 152.03C 06/04/24 N1M			
		Strategy 1 ▾	
		Leg 1 ▾	
Price Date	03/04/24		15:42
Asset	USDJPY		
Spot	Mid ▾	150.52	
Style	European ▾	Vanilla ▾	
Direction	Client buys ▾	Physical ▾	
Call/Put	USD ▾	Call ▾	
Expiry	3 months ▾	06/04/24	
Delivery	NY 10:00 ▾	06/06/24	
Strike	152.03	2.45% OTMF	
Notional	USD ▾	1,000,000.00	
Model	Black-Scholes		
More Market Data		↻	
Vol	BGN	↻	7.561%/7.561%
Vol Spread			0.000%
Points	BGN	↻	Mid ▾ -212.15
Forward		↻	Mid ▾ 148.40...
USD Depo	USD SOFR	↻	Mid ▾ 5.323...%
JPY Depo	Implied	↻	Mid ▾ -0.267...%
Greeks		■	
Gamma		USD ▾	85,665.13
Vega			1,632.59
Results			
Price	% USD ▾	0.6018% P	
Premium	USD ▾	6,018.08 P	
Prem Date		03/06/24	
Delta	Spot ▾	25.8696%	
Hedge		-258,696.05	

Spot higher by 0.1%, option price higher by around 250k
 $\text{delta} \times 0.1\% = 250 \text{ USD}$

Implied vol by 1%, option price higher by around $1685 \times 1 = 1685 \text{ USD}$

OVML USDJPY EU 152.03C 06/04/24 N1M			
		Strategy 1	
		Leg 1	
Price Date	03/04/24		15:42
Asset	USDJPY		
Spot	Mid	150.37	
Style	European	Vanilla	
Direction	Client buys	Physical	
Call/Put	USD	Call	
Expiry	3 months	06/04/24	
Delivery	NY 10:00	06/06/24	
Strike	152.03	2.55% OTMF	
Notional	USD	1,000,000.00	
Model	Black-Scholes		
More Market Data			
Vol	BGN	8.561%/8.561%	
Vol Spread	0.000%		
Points	BGN	Mid	-212.15
Forward		Mid	148.25...
USD Depo	USD SOFR	Mid	5.323...%
JPY Depo	Implied	Mid	-0.273...%
Greeks			
Gamma	USD	78,084.36	
Vega	1,684.94		
Results			
Price	% USD	0.7408% P	
Premium	USD	7,407.99 P	
Prem Date	03/06/24		
Delta	Spot	27.4944%	
Hedge	-274,944.23		

FX Options markets – Evaluate an option

Shall I buy an USDJPY option with 7.561 vol?

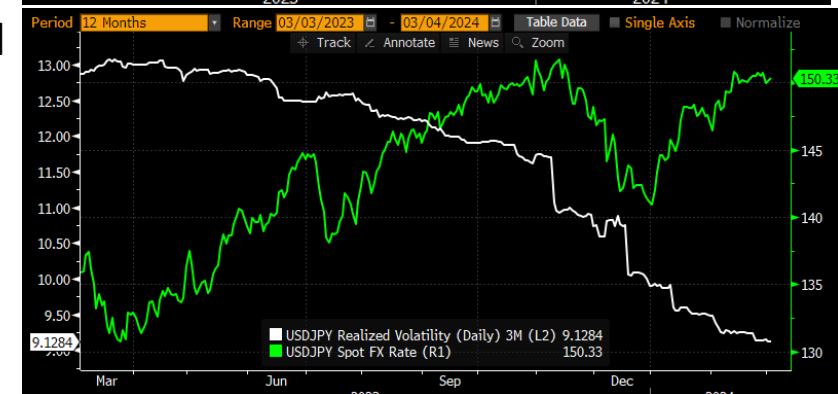
OVML USDJPY 2L B EU 148.25C,148.25P 06/04/24 N1M																			
Strategy 1																			
Leg 1																			
Leg 2																			
Price Date	03/04/24			15:42															
Asset	USDJPY			USDJPY			USDJPY												
Spot	Mid	150.37			150.37			150.37											
Style	European			Vanilla			European			Vanilla									
Direction	Client buys			Physical			Client buys			Physical									
Call/Put	USD			USD			Call			Put									
Expiry	3 months			3 months			06/04/24			3 months			06/04/24						
Delivery	NY 10:00			NY 10:00			06/06/24			NY 10:00			06/06/24						
Strike				Forward			148.25			ATMF			148.25			ATMF			
Notional	USD			USD			1,000,000.00			USD			1,000,000.00						
Model							Black-Scholes			Black-Scholes									
More Market Data																			
Vol	BGN				7.561%/7.561%			7.561%/7.561%											
Vol Spread				0.000%			0.000%												
Points	BGN	Mid				-212.15			-212.15										
Forward	Mid				148.25...			148.25...											
USD Depo	USD SOFR	Mid				5.323...%			5.323...%										
JPY Depo	Implied	Mid				-0.273...%			-0.273...%										
Greeks																			
Gamma	USD	207,332.49			USD	103,666.24			USD	103,666.24									
Vega	3.951.31			1.975.66			1.975.66												
Results																			
Price	USD	2.9879% P			1.4940% P			1.4940% P											
Premium	USD	29,879.47 P			14,939.74 P			14,939.74 P											
Prem Date	03/06/24			03/06/24			03/06/24												
Delta	Spot	-1.4940%			48.5820%			-50.0760%											
Hedge	14,939.74			-485,820.05			500,759.79												

Last but not least.. Both above are past price action, while implied vol is price for future.
View is most important

1. Breakeven



2. Realized vol



FX Options markets – Some interview tricks

$$V_C = V_P \approx \frac{1}{\sqrt{2\pi}} S \times \sigma \sqrt{T}.$$

Straddle price above USDJPY = $V_c + V_p$
 $= 2 \times 1/(2/3.14)^{0.5} \times 150.37 \times 7.561\%$
 $\times 0.25^{0.5} = 4.54 \text{ JPY per USD}$
 notional = 3.02%

OVML USDJPY 2L B EU 148.25C,148.25P 06/04/24 N1M													
Strategy 1													
Leg 1													
Leg 2													
Price Date		03/04/24		15:42									
Asset		USDJPY		USDJPY		USDJPY		USDJPY					
Spot		Mid		150.37		150.37		150.37					
Style				European		Vanilla		European		Vanilla			
Direction		Client buys		Physical		Client buys		Physical		Client buys		Physical	
Call/Put		USD				USD		Call		USD		Put	
Expiry		3 months				3 months		06/04/24		3 months		06/04/24	
Delivery		NY 10:00				NY 10:00		06/06/24		NY 10:00		06/06/24	
Strike				Forward		148.25		ATMF		148.25		ATMF	
Notional		USD				USD		1,000,000.00		USD		1,000,000.00	
Model						Black-Scholes				Black-Scholes			
More Market Data													
Vol		BGN				7.561%/7.561%				7.561%/7.561%			
Vol Spread						0.000%				0.000%			
Points		BGN		Mid		-212.15				-212.15			
Forward				Mid		148.25...				148.25...			
USD Depo		USD SOFR		Mid		5.323...%				5.323...%			
JPY Depo		Implied		Mid		-0.273...%				-0.273...%			
Greeks													
Gamma		USD		207,332.49		USD		103,666.24		USD		103,666.24	
Vega				3,951.31				1,975.66				1,975.66	
Results													
Price		\$ USD		2.9879% P				1.4940% P				1.4940% P	
Premium		USD		29,879.47 P				14,939.74 P				14,939.74 P	
Prem Date				03/06/24				03/06/24				03/06/24	
Delta		Spot		-1.4940%				48.5820%				-50.0760%	
Hedge				14,939.74				-485,820.05				500,759.79	

FX Options markets – Some interview tricks

A trader is short a one touch option, but there is only digital trading in the market. How can he hedge this One Touch short?

Assume flat vol surface (RR=BF=0), IR for both ccy is 0.

He is short 1mio\$ of 3mth USDJPY 160, if market touches 160 within next 3month, he will have to pay 1mio \$ to client..

OVML USDJPY 2L B 160.00C B160.0000 06/04/24 N1M									
		Strategy 1				Leg 1		Leg 2	
Price Date		03/04/24 15:42							
Asset		USDJPY		USDJPY		USDJPY		USDJPY	
Spot	Mid	150.37		150.37		150.37		150.37	
Style		One Touch		Digital					
Payment		Pay on expiry							
Direction		Client buys		Client buys		Client buys			
Call/Put	USD	Call		USD		USD		Call	
Expiry	3 months	3 months		06/04/24		3 months		06/04/24	
Delivery	NY 10:00	NY 10:00		06/06/24		NY 10:00		06/06/24	
Strike		Forward				160.00		6.40% OTMF	
Notional	USD	USD		1,000,000.00		USD		1,000,000.00	
Barrier Dir.		Up & In		Up & In					
Barrier Level		160.0000		6.40% OTMS					
Window Start		03/04/24							
Window End		06/04/24							
Model		Vanna-Volga		Vanna-Volga					
More Market Data									
ATM Vol	BGN	8.000%		8.000%		8.000%		8.000%	
ATM 2-way Vol		8.000%/8.000%		8.000%/8.000%		8.000%/8.000%		8.000%/8.000%	
ATM Vol Sprd		0.000%		0.000%		0.000%		0.000%	
25D RR USD C-P		0.000%		0.000%		0.000%		0.000%	
25D BF		0.000%		0.000%		0.000%		0.000%	
Points	Implied	Mid		0.00		0.00		0.00	
Forward		Mid		150.37		150.37		150.37	
USD Depo	USD SOFR	Mid		0.000%		0.000%		0.000%	
JPY Depo	JPY vs.	Mid		0.000%		0.000%		0.000%	
Greeks									
Gamma	USD	3,582,252.48		USD		2,377,758.07		USD	
Vega		72,537.69		48,149.90		24,387.79			
Results									
Price	% USD	22.4626% P		14.3553% P		8.1073% P			
Premium	USD	224,626.25 P		143,553.03 P		81,073.23 P			
Prem Date		03/06/24		03/06/24		03/06/24			
SLV Prem	Calculate								
Delta	Spot	935.1720%		621.3113%		313.8607%			
Hedge		-9,351,719.91		-6,213,112.90		-3,138,607.00			

Questions

Thank you!