

Forward Rate Agreements (FRAs)

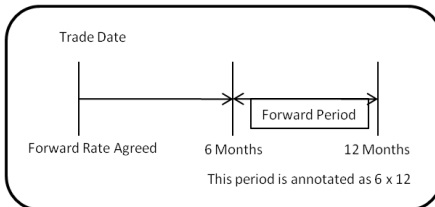
Rates

101

Forward Rate Agreements (FRAs) offer borrowers or investors protection against adverse interest rate movements.

They can be done in most currencies and maturities, require no cash upfront and have little counterparty risk.

Here's How It Works:



Imagine a company has a floating rate loan. It pays 6 month Libor.

It can either lock in future rates with its lender or ask a third party, maybe another house bank, to provide protection.

Today, the Trade Date, it locks in the rate of interest in six months time...for a six month period.

Let's say that rate is 5%.

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Points Of Interest

- **Flexible interest risk tool**
- **No cash needed upfront**
- **Minimal counterparty risk**
- **Available in most currencies**
- **Can be done with any acceptable bank counterparty**
- **Use to hedge risk or take a view**

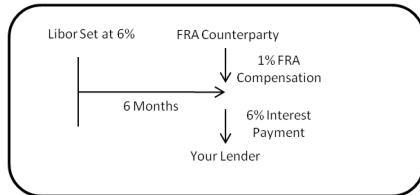
As Time Goes By.....

Six months have passed since you did the trade.

You observe Libor and see it is now 6%!

The bad news is that you will have to pay 6% on your loan. The good news is that you had an agreement that you would be compensated if rates went above 5%.

So you will get 1% in compensation.



In an ideal world, you would receive your FRA compensation on the same day as you paid your interest on your loan.

If only life were that simple.....



When Payment Is Made....

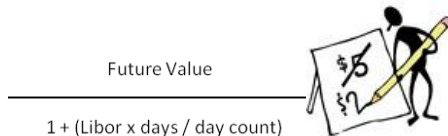
When Libor is set, the amount of compensation becomes clear. We do not wait until the end of the period to make the pay-

ment. Instead it is paid immediately. This means it has to be discounted back to its present value. This is



So How Do We Calculate The Payment?

We use the Libor rate to discount. Always remember the day count convention for the Libor. So USD would use actual/360 and GBP would use actual/365.



FRA Quotes

FRAs are typically quoted to cover 3 or 6 month periods. You can do different periods but it is not common.

You might see a quote like this: 1.68% - 1.71%.

If you want protection against rates rising, you BUY the FRA.

If you want protection against rates falling, you SELL the FRA.

Banks and market-makers make their money from this bid-offer spread.

There is no other premium to be paid, as with options.

Unlike futures, there is no margin call.

Here's how they look:

EURO FRAs	
1x4	0.9435
3x6	1.0090
6x9	1.0550
9x12	1.1135
1x7	1.1690
3x9	1.2080
6x12	1.2505
12x18	1.3730

Two Way Payments

Imagine you *sell* an FRA at 1.68% and Libor ends up *lower* than this. Then you will receive compensation.

If Libor ends up *above* this rate, then you pay

compensation.

The net effect is that have locked in a Libor rate of 1.68%.

"Payments can go either way."



Taking A View

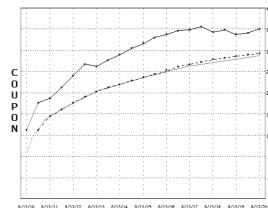
You do not need to have a loan or investment to use an FRA.

If the market thinks rates will rise quickly but you disagree, what can you do?

You can buy an option—for a premium.

You can buy a future—with margin payments

Or....sell an FRA



Hedge Against Rising Rates

I have a 6 month rollover on my £ 5mm loan happening in 3 months' time.

I lock this in by buying an FRA at 2%.

3 months go by. Libor is now 2.5% for this 182 day period.

What is my compensation under the FRA?

We look at the difference between the agreed Forward Rate (F) and where Libor set (L).

We then discount this difference back to a present value:

$$£5 \text{ mm} \times (2.5\% - 2.0\%) \times 182/365$$

$$\frac{1 + (0.025 \times 182/365)}$$

The final payment is

$$\frac{£12,465.75}{1.012466}$$

$$= £12,312.27$$

$$1.012466$$



Convexity

Look at the example above.

What would have happened if rates had *fallen* to 1.5%.

In this case I would have to pay out 0.5%.

But is the discounted pay-

ment still £12,312.27?

No. We are now discounting our future value at a rate of 1.5%, which means it will have a higher present value.

In this case, £12,373.21.

“Convexity is reflected when we discount the payment at different rates.”

The Good News / Bad News Bit

No margin

Flexible dates

Flexible amounts

Easy to understand

No underlying position is needed



Credit risk

Slightly less liquid than futures





Let's Try A Few.....

Turbo Asset Management (TAM) has invested in a US\$10 mm Floating Rate Note. It pays 3 month Libor + 1%.


TAM is worried that interest rates are about to fall sharply and wants to lock in the Libor rate for the next period.




 The 3x6 FRA is quoted 1.50% - 1.53%.

 Will TAM buy or sell the FRA and at what rate?

TAM will sell the FRA at 1.50%

 3 Months go by. TAM looks at 3 month Libor (92 days) which has now fallen to 1.25%.

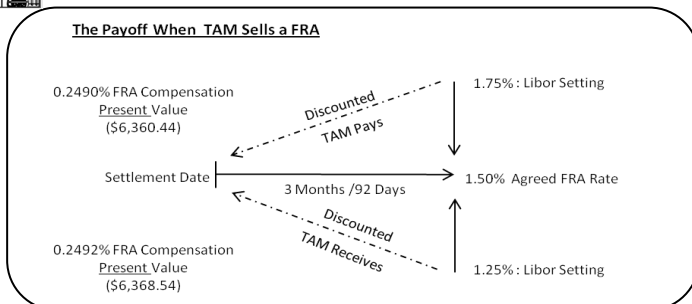
 TAM will receive compensation under the FRA. How much will this come to?

$$\frac{\$10 \text{ mm} \times (1.5\% - 1.25\%) \times 92/360}{1 + (0.0125 \times 92/360)} = \$6,388.89$$

$$\frac{\$6,388.89}{1.003194} = \$6,368.55$$



Let's see what would have happened if rates moved either up or down by 25 bps



Forward Rate Agreements

Let's Try A Few.....

Bull Oil Production (BOP) has borrowed via a US\$10 mm syndicated loan. It pays 3 month Libor + 1%.

BOP is worried that interest rates are about to rise sharply and wants to lock in the Libor rate for the next period.

The 3x6 FRA is quoted 1.50% - 1.53%.



Will BOP buy or sell the FRA and at what rate?



BOP will buy the FRA at 1.53%



3 Months go by. BOP looks at 3 month Libor (92 days) which has now risen to 1.78%.



BOP will receive compensation under the FRA. How much will this come to?

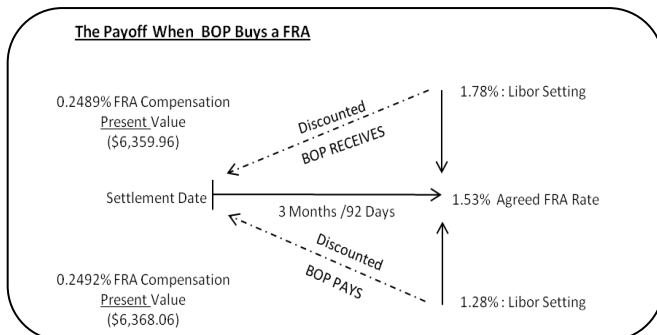


$$\frac{\$10 \text{ mm} \times (1.53\% - 1.78\%) \times 92/360}{1 + (0.0178 \times 92/360)} = \$6,359.96$$

1.004549

What would have happened if rates had fallen to 1.28%?

Then BOP would have paid out \$6,368.06



Forward Rate Agreements

Now For You To Do The Work!



1. Supersub Sandwiches has borrowed € 15 mm at 6 month Euribor + 50 bps. It is concerned about rising interest rates. It is quoted 6 x 12 FRA rates of 3.22% - 3.24%.



Supersub decides to enter into an FRA.

a) Will Supersub sell the FRA at 3.22% or buy the FRA at 3.24%?

b) If 6 month (182) Euribor fixes at 3.65%, will Supersub receive or pay out under its FRA agreement?

c) What will be the amount of compensation paid?



2. Bandit Investment believes that Sterling interest rates will stay low. Yet the market believes rates will rise quote sharply.

Bandit decides to put its view into practice by entering into a £ 10 mm 3 x 6 FRA. It is quoted 2.25% - 2.26%.

a) Will Bandit sell the FRA at 2.25% or buy the FRA at 2.26%?

b) If 3 month (91 days) Sterling Libor fixes at 2.45%, will Bandit receive or pay out under its FRA agreement?

c) What will be the amount of compensation paid?



3. Accra Oil Corporation is expecting to receive \$20 mm in one month. It plans to keep the cash for three months before disbursing the funds into a new project.

Concerned about possible falling rates, Accra oil enters into a 1 x 4 FRA. The bank quotes 0.90% - 0.93%.

a) Will Accra Oil sell the FRA at 0.90% or buy the FRA at 0.93%?

b) If 3 month (92 days) US Dollar Libor fixes at 0.85%, will Accra Oil receive or pay out under its FRA agreement?

c) What will be the amount of compensation paid?

Here Are the Answers!



1. A) Supersub will buy the FRA at 3.24%.
B) Supersub will receive the difference between the Forward Rate it has agreed, 3.24%, and where the floating index (Euribor) set, 3.65%
C) Supersub receives 0.41% (i.e. 3.65% - 3.24%) for this 182 day period. This is €20,727.78 without discounting (€10 mm x 0.41% x 182/360).



Using a discounting function of 1.018453 (i.e. $1 + (0.0365 \times 182/360)$), we have a present value compensation amount of € 20,352.22



2. A) Bandit will sell the FRA at 2.25%.
B) Bandit will pay the difference between the Forward Rate it has agreed, 2.25%, and where the floating index (Libor) set, 2.45%
C) Bandit pays 0.20% (i.e. 2.45% - 2.25%) for this 91 day period. This is £4,986.30 without discounting (£ 10 mm x 0.20% x 91/365). Note the daycount is 365 for Sterling.

Using a discounting function of 1.006108 (i.e. $1 + (0.0245 \times 91/365)$), we have a present value compensation amount of £ 4,956.03



3. A) Accra Oil will sell the FRA at 0.90%.
B) Accra Oil will receive the difference between the Forward Rate it has agreed, 0.90%, and where the floating index (Libor) set, 0.85%
C) Accra Oil receives 0.05% (i.e. 0.90% - 0.85%) for this 92 day period. This is \$2,555.56 without discounting (\$20 mm x 0.05% x 92/360).

Using a discounting function of 1.002172 (i.e. $1 + (0.0085 \times 92/360)$), we have a present value compensation amount of \$2,550.02

Notes

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