Earl wants to buy 100 Euros for $100 in 1 month.

Loan rate = 3% per month

Current Euro exchange rate: 1 Euro = $1.05

Current rate: $1.05

Rate will go up or down 5% at the end of the month.

$1.1053 < 1.1605

If the rate goes up, Beth has to pay $16.05 (100 x 1.1605)

$5.00 (100 x 1.05)

Bank rate and Euro uptick and downtick factors are unchanged.

Exercise: Use "prices got hedge" to figure out Beth's hedging portfolio.

Prices now $11.52. Find x and y. X = Euros, Y = Bank loan

X = (Option difference/Euro difference) = (11.605 - 5.00) / 1.1053 - 1.05 = 100

\[
x = 100, y = 99.01
\]

dx = y = unknown

x = 11.52

Convert Euros to dollars 100 x (1.05/1.1053)

y = 110.53 - 11.52 = 99.01

Check answer using equations from slide 12. Substitute new numbers.

1.1605 x - 1.01 y = 11.05

x = 1.01 y = 11.52

1.05 x - 1.01 y = 5

x = 110.53 - 99.01 = 11.52
Fred wants to buy 100 Euros for $100 2 months from now.

Exchange rate: 1 Euro = $1.00/1.05 = $1.0526
Bank rate = 1% per month

\[ \frac{1.05}{.95} \xrightarrow{\text{1 month}} \frac{1.05}{1.00} \xrightarrow{\text{1.052}} \frac{1.05}{.95} \xrightarrow{\text{1.052}} \frac{1.05}{1.00} \xrightarrow{\text{1.052}} \frac{1.05}{.95} \xrightarrow{\text{1.052}} \frac{1.05}{1.00} \xrightarrow{\text{1.052}} \frac{1.05}{.95} \xrightarrow{\text{1.052}} \frac{1.05}{1.00} \]

Cathy pays Beth $11.52
Cathy pays Alice $2.97

\[ \frac{60\%}{.40\%} \xrightarrow{\text{1 month}} \frac{16.05}{2.97} \xrightarrow{\text{1 month}} \frac{16.05}{2.97} \xrightarrow{\text{1 month}} \frac{16.05}{2.97} \xrightarrow{\text{1 month}} \frac{16.05}{2.97} \]

Expected pay off after 2 months:
\[ (0.36 \times 16.05) + (0.48 \times 5.00) \times (1.16) = 8.18 = 8.02 \]

Slides 29
Using "prices get hedge" figure out Cathy's hedging portfolio.

Pricer knows $8.02 = ? \quad x - y = ?

\[ x = \frac{\text{option difference}}{\text{Euro difference}} = \frac{11.52 - 2.97}{1.05} = 81.23 \text{ Euros} \]

Convert $x \rightarrow \text{dollars} (81.23 \times \frac{1.05}{.95}) = 85.51$

$85.51 - 8.02 = 77.49 \quad y$
Cathy's hedging portfolio is:

$85.51$ in dollars
$81.23$ Euros $77.49$ Bank Loan