Module 4

Corporate Financial Decision-Making for Value Creation

Using Forwards and Futures to Manage Risk (Commitment can be a double-edged sword!)

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The (fictional) setup

On 1 January 2014, Judy, the COO of Kellogg's, wakes up to a corn price of $7.50 a bushel.

Judy looks at their inventory of corn – and realizes that they are going to need to go back into the market and buy a whole lot of corn at the end of March:

- In terms of their March exposure Kellogg's has a **short** position in corn (i.e. they want it but don't yet have it).

The risk Kellogg's faces is that the price of corn may be much higher by March 31.

The (fictional) setup

That same morning, a corn farmer, Frank, awakes and starts thinking about the crop that he expects will be ready for market at the end of March:

- In terms of his March exposure – the farmer has a **long** position in corn (i.e. they will own it but want to sell it).

The risk Frank faces is that the price of corn will be much lower by the end of March.

The solution

So Judy contacts Frank and they enter into a contractual agreement relating to the trading of corn at the end of March.

This is a **forward contract** and will contain the following specifications:

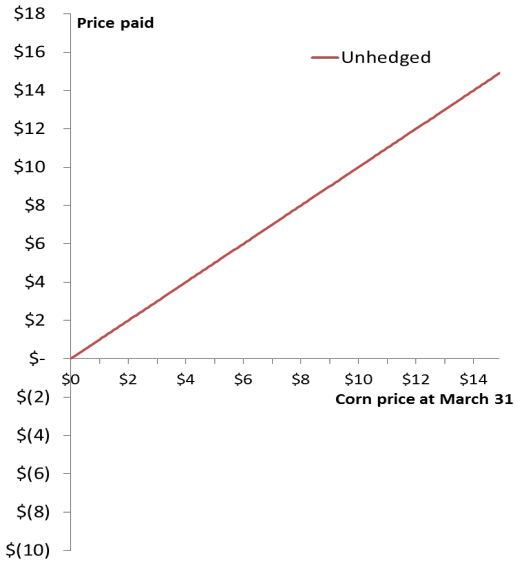
1. Price – known as a **forward price** expressed on a standardized unit basis (e.g. per bushel)
2. Quantity – the amount exchanged
3. Quality – the precise quality of the corn delivered
4. Delivery details – precisely where and when the delivery is to take place.

Judy and Frank negotiate a price of $8 per bushel.

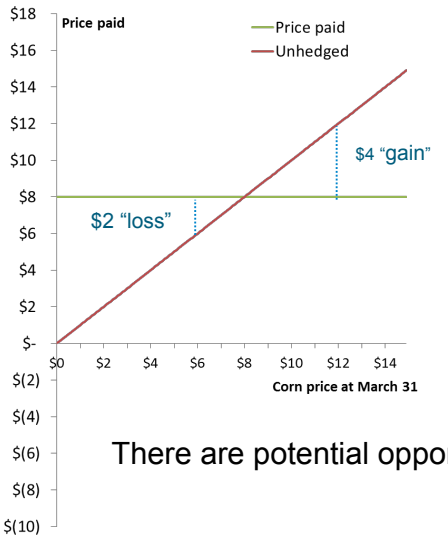
The exposure: Unhedged

From Judy's point of view – let's have a look at what she has been able to do with the forward contract:

- In the absence of any hedging at all – Kellogg's will have to pay whatever the prevailing price is in the **spot** commodity market as at March 31
- If we lock in a forward price of $8… *What happens if the price at March 31 is $6? What about if it was $12?*



The exposure: Hedged with forwards



There are potential opportunity costs…

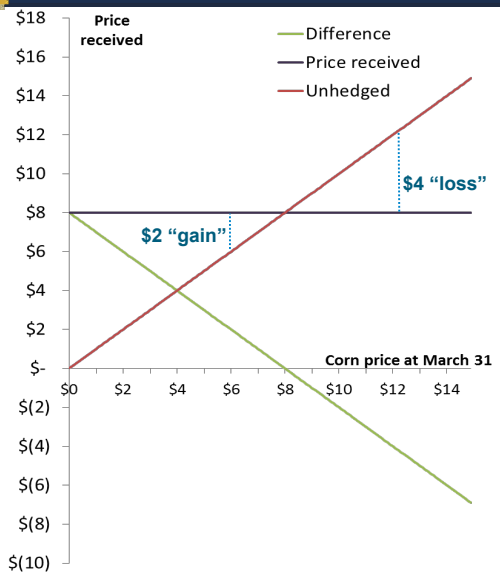
The exposure: Hedged with forwards

- The “difference” is the payoff from Judy’s position in the forward contract.
- Recall that Judy was “short” in the spot market?
- To hedge this position – she agreed to buy the corn in the future.
- We call this a **long** position in the forward contract.

But what about Farmer Frank?

The exposure: Hedged with forwards

- For Farmer Frank – the vertical axis represents the price *received* for his corn.
- Note that – as for Judy – the unhedged price received simply matches the spot price of corn on 31 March.
- Recall though that Frank was “long” in the underlying asset: corn.
- To hedge this, he has taken a “short” position in a corn forward contract – which simply means he has agreed to sell at a future date at a pre-specified price.
- The payoff to the “short” forward position is the reverse of the payoff to the “long” forward position.



A twist in the tale…

- So let's assume that Judy and Frank enter into the forward contract at 11:00 am on January 1st.
- Over the next couple of months prices rise steadily owing to unexpected demand from Europe…
- By 18th March 2014 corn has risen to $20 a bushel…

How is Judy sleeping?

Introducing futures markets

Agree to buy at $8 →

← Agree to sell at $8

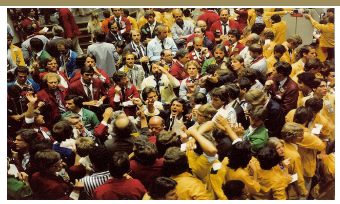
But they are each concerned about counterparty risk…

The natural response to this is to build in a risk premium such that:

- Judy is only willing to pay, say, $7, and
- Frank is demanding at least, say, $9…

This will reduce the efficiency of the market…

Introducing futures markets



Agree to buy at $8

Agree to sell at $8

Key characteristics of futures markets

The futures exchange takes on the counterparty risk for all contracts.

To protect itself – it does two things:

1. **Initial Deposit (Margin)**
   - Every buyer (Judy) and seller (Frank) of a futures contract is required to lodge an initial deposit of cash into an account
   - As the value of the buyer/seller's position changes – funds are either deducted from or added to the account
     - This process is known as "marking to market" and will generally occur at the end of each day.
2. **Margin Calls**
   - If the cash account falls below a certain level – the exchange will require additional funds to be deposited
     - This is known as a "margin call."

Futures market: Demonstration

Let's assume that the futures exchange requires a $1 deposit on corn contracts:

Date	Settlement price March 2014 contract
1 January	$7.90
2 January	$8.10
3 January	$8.50
4 January	$8.70

Date	Margin account
1 January (11:00 am)	$1
1 January	$0.90
2 January	$1.10
3 January	$1.50
4 January	$1.70

Date	Margin account
1 January (11:00 am)	$1
1 January	$1.10
2 January	$0.90
3 January	$0.50
4 January	$0.30

Summary

- Forward contracts provide the ability to lock in buying and selling prices for future delivery.
- While there is no up-front cost associated with a forward contract – there is an *potential opportunity cost* that may be incurred.
- Futures contracts are standardized forward contracts that are traded on an exchange.
- To protect itself an exchange will enforce a system involving deposits, margins and marking to market.

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