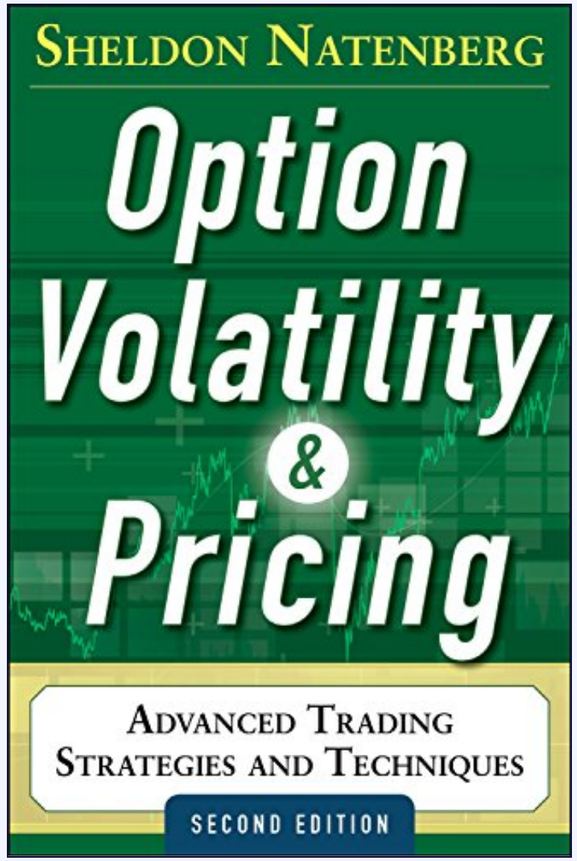
VolSignals

VolStudies

Chapter 1 Financial Contracts

VolStudies | Option Volatility & Pricing

Chapter 1 — Financial Contracts



1

Financial Contracts

My friend Jerry lives in a small town, the same town in which he was born and raised. Because Jerry's parents are no longer alive and many of his friends have left, he is seriously thinking of packing up and moving to a larger city. However, Jerry recently heard that there is a plan to build a major highway that will pass very close to his hometown. Because the highway is likely to bring new life to the town, Jerry is reconsidering his decision to move away. It has also occurred to Jerry that the highway may bring new business opportunities.

For many years, Jerry's family was in the restaurant business, and Jerry is thinking of building a restaurant at the main intersection leading from the highway into town. If Jerry does decide to build the restaurant, he will need to acquire land along the highway. Fortunately, Jerry has located a plot of land, currently owned by Farmer Smith, that is ideally suited for the restaurant. Because the land does not seem to be in use, Jerry is hoping that Farmer Smith might be willing to sell it.

If Farmer Smith is indeed willing to sell, how can Jerry acquire the land on which to build his restaurant? First, Jerry must find out how much Farmer Smith wants for the land. Let's say $100,000. If Jerry thinks that the price is reasonable, he can agree to pay this amount and, in return, take ownership of the land. In this case, Jerry and Farmer Smith will have entered into a *spot* or *cash transaction*.

In a cash transaction, both parties agree on terms, followed immediately by an exchange of money for goods. The trading of stock on an exchange is usually considered to be a cash transaction: the buyer and seller agree on the price, the buyer pays the seller, and the seller delivers the stock. The actions essentially take place simultaneously. (Admittedly, on most stock exchanges, there is a settlement period between the time the price is agreed on and the time the stock is actually delivered and payment is made. However, the settlement period is relatively short, so for practical purposes most traders consider this a cash transaction.)

However, it has also occurred to Jerry that it will probably take several years to build the highway. Because Jerry wants the opening of his restaurant

1

VolSignals

- Contract Types
- Buying and Selling
- Notional Value of a Forward Contract
- Settlement Procedures
- Market Integrity

Contract Types

Cash / "Spot" transactions

These are generally the most familiar to us

...when you hear "spot price" - think "now / cash transaction"

Forward Contracts

*Agreement on terms **now** (commitment)*

*-but actual exchange of interests takes place **later***

Contractually bound to transact on the settlement date

Tradeoffs include interest considerations, storage or insurance costs

Contract Types

Futures Contracts

*Are basically **forward contracts** which have been standardized to enable netting and central clearing.*
This REMOVES counterparty risk arising from bilateral agreements and enables greater visibility over aggregate risk exposure w/in the system

Specifications for futures contracts typically include:

- *Underlying Qty (Contract Multiplier)*
- *Price / quote increments*
- *Trading hours*
- *Settlement / Delivery date & procedures*

Contract Types

Options

KEY difference with options = "right, but NOT the obligation"
The option OWNER pays for the asymmetry-
Contractually, he or she is able to participate in gains while avoiding negative outcomes- this is not free (options command a premium)

Contract specs include:

- *Type (Call / Put)*
- *Underlying & Multiplier*
- *Strike Price (Exercise Price)*
- *Type (American vs European)*
- *Expiration Date (aka 'Maturity' or 'Settlement Date')*

Buying and Selling

“Long” and “Short”

*You don’t *need* to own something in order to sell it…*

…you can “open” a position by buying (long) or selling (short),

“Closing” is simply reversing the trade to exit your position.

In this context, “closing” is specific to the exact contract

Generally- an open futures or options position can be closed OR held into settlement

Notional Value of a Forward Contract

Notional / Nominal Value does NOT refer to the dollars-exchanged

General Case

Notional value of a contract = Price x Contract Multiplier
Notional value of a position = Price x Contract Multiplier x Qty Held

Notional values enable comparison of different assets & determination of hedge ratios

Often going to encounter "Notional Delta" / "Notional Gamma" in this domain-

*Concept of notional is akin to asking yourself- "IF in order to have *this* exposure, I HAD TO pay cash for a position in the underlying itself…*
how much would that cost?
What would that position be worth at current prices?

Settlement Procedures

Defined by the exchange on a contract-by-contract basis, these rules govern the way the contracts are traded AND how their terminal value is assessed during settlement once the contract expires, and the open interest is retired.

You'll most often hear me reference ES Futures…

View the settlement procedures for this contract at the link below.

CME Group's Settlement Procedures (E-Mini S&P500 Futures):
https://cmegroupclientsite.atlassian.net/wiki/spaces/EPICSANDBOX/pages/46141539/E-Mini+Standard+and+Poors+500+Futures

Settlement Procedures

Important to understand the difference between stock/options and futures settlement conventions-

Stock/Options transactions involve cash exchanged UP front. Buyer pays- seller receives.
Owner of stock does not "realize" gains attributable to stock movement UNTIL stock is sold.

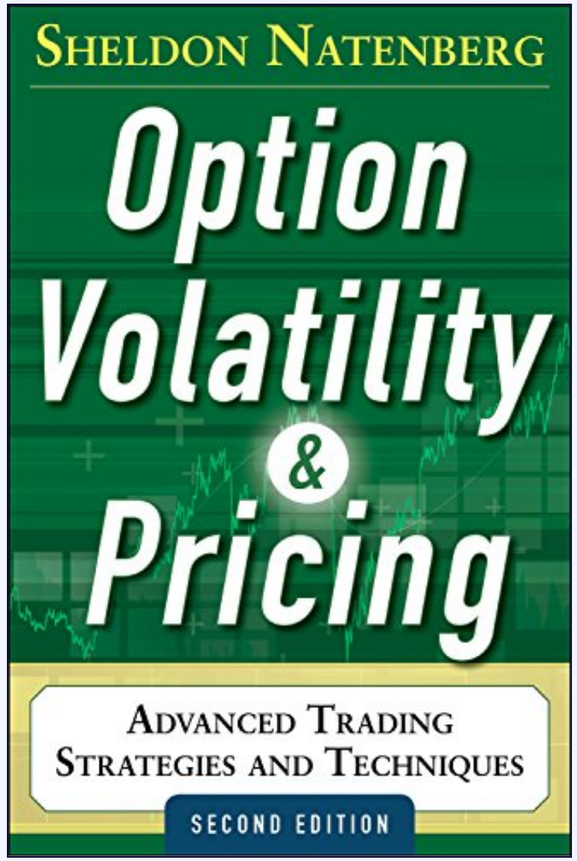
Futures- on the other hand- involve NO up front cash exchange relating to ownership interest.
Instead, an initial margin payment is made in order to enter into a long OR short position, and must be maintained above a certain level to remain in the trade.

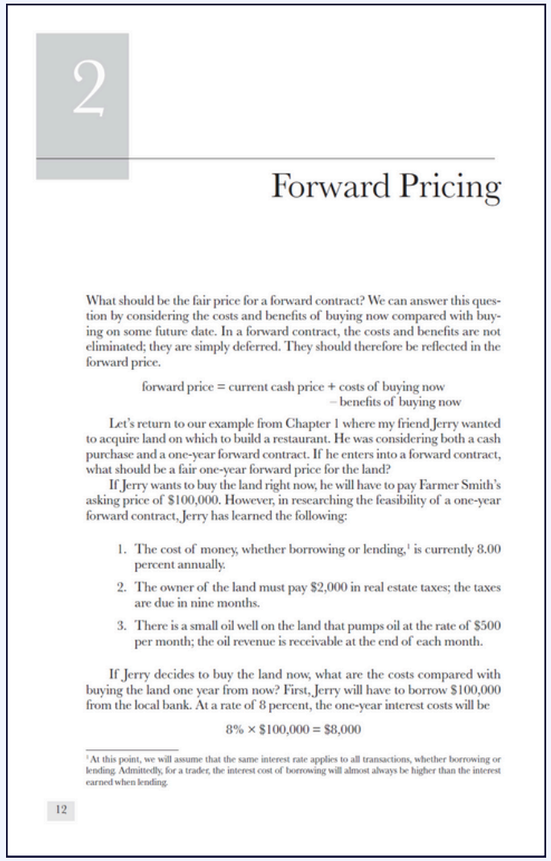
Each day- the futures contract settles according to its daily procedure- and cash flows in or out of your margin account accordingly… ie, no cash up front- but realized PNL daily. Margin returned when position closed or contract settles.

Index futures products tend to be "cash-settled"

VolStudies | Option Volatility & Pricing

Next up...





2

Forward Pricing

What should be the fair price for a forward contract? We can answer this question by considering the costs and benefits of buying now compared with buying on some future date. In a forward contract, the costs and benefits are not eliminated; they are simply deferred. They should therefore be reflected in the forward price.

forward price = current cash price + costs of buying now
– benefits of buying now

Let's return to our example from Chapter 1 where my friend Jerry wanted to acquire land on which to build a restaurant. He was considering both a cash purchase and a one-year forward contract. If he enters into a forward contract, what should be a fair one-year forward price for the land?

If Jerry wants to buy the land right now, he will have to pay Farmer Smith's asking price of $100,000. However, in researching the feasibility of a one-year forward contract, Jerry has learned the following:

1. The cost of money, whether borrowing or lending,[1] is currently 8.00 percent annually.
2. The owner of the land must pay $2,000 in real estate taxes; the taxes are due in nine months.
3. There is a small oil well on the land that pumps oil at the rate of $500 per month; the oil revenue is receivable at the end of each month.

If Jerry decides to buy the land now, what are the costs compared with buying the land one year from now? First, Jerry will have to borrow $100,000 from the local bank. At a rate of 8 percent, the one-year interest costs will be

8% × $100,000 = $8,000

[1] At this point, we will assume that the same interest rate applies to all transactions, whether borrowing or lending. Admittedly, for a trader, the interest cost of borrowing will almost always be higher than the interest earned when lending.

12

Chapter 2 — Forward Pricing

VolSignals

VolSignals

VolStudies