

Bond Futures Calendar Spread Trading

Part 1 - Introduction

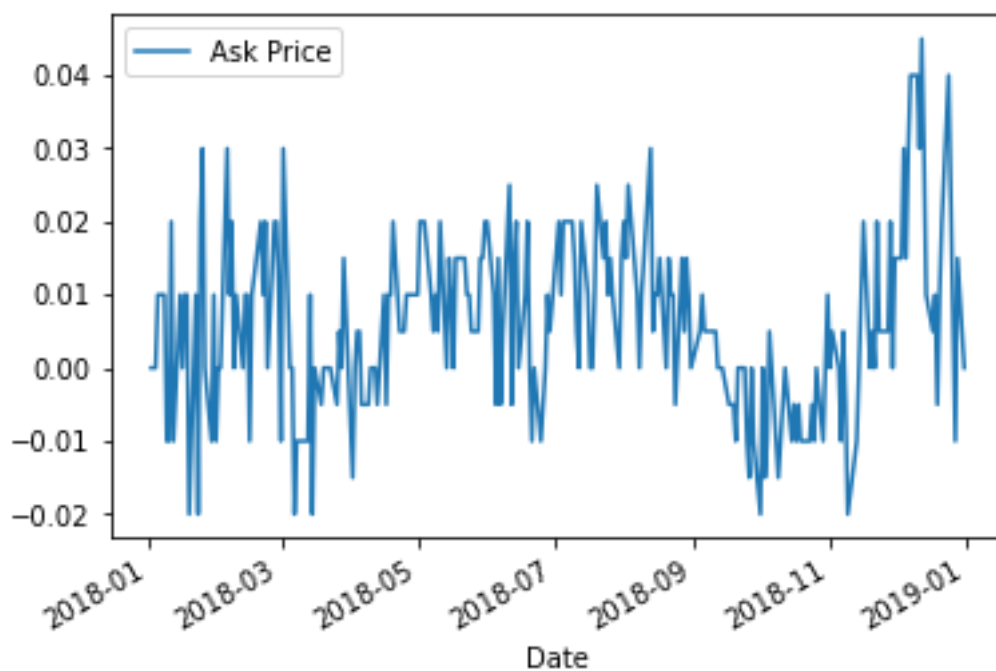
Let's talk about some serious strategy. Introducing... the bond futures calendar spread trading.

Summary: We build a market neutral synthetic asset using 3 or more bond futures.

Eg. $1*BF_A - 3*BF_B + 3*BF_C - 1*BF_D$

Where BF stands for Bond futures and A, B, C and D stands for the different futures expirations.

We call this synthetic structure a double butterfly (and no, it has nothing to do with an option butterfly).



The above is the resulting price of our double butterfly.

Wait what? What are expirations and what are futures?

Okay that was the teaser, here is the long answer:

Let's start with some basics about bonds and futures. We will give you just enough to get started for now.

What are bonds (summarised version)

Bonds are also known as fixed income. There are 2 main kinds of bonds, government bonds and corporate bonds.

When you buy a government bond, you are lending money to the government for yearly interests.

When you buy a corporate bond, you are lending money to a corporation for yearly interests.

Your bond's interest rate payout is fixed. Thus, when a country's interest rate (this is the benchmark interest rate targeted by a country's central bank) goes up, your bond's price drops as it is not as attractive anymore.

The metric to measure how sensitive a bond price is to the relevant country's interest rate is known as duration.

Think of duration as market beta, but for bonds and not stocks. More on duration later.

More info here:

- Government bonds - <https://www.investopedia.com/terms/b/bond.asp>
- Corporate bonds - https://en.wikipedia.org/wiki/Corporate_bond
- Duration (basic) - <https://www.investopedia.com/terms/d/duration.asp>
- Duration (intermediate) - <https://www.investopedia.com/articles/bonds/08/duration-convexity.asp>

What are futures (summarised version)

Official definition: A future is an obligation to buy or sell an asset at a certain price and time.

This means that a future contract will dictate that Trader X will buy Asset A at Price B from Trader Y at Time C.

Asset A is known as the underlying asset, also known as the spot. (We will use the terms, underlying asset and spot interchangeably.)

Price B is the price of the future.

If you buy a coffee future contract, which expires in 6 months, at \$105, it is an obligation to buy the underlying coffee product at \$105 in 6 months' time. The trader who sold you that same future at \$105 is obliged to sell you the underlying coffee product at \$105 in 6 months' time.

Thus, you can think of a future as a product whose price is dependent on its underlying asset.

Expirations

Futures have expiration dates. The name of the future will include the expiration month and year.

Eg. The Three-month Canadian Bankers' Acceptance Futures shortname is BAX.

BAXU19 means that this BAX contract expires on September 2019.

BAXH22 means that this BAX contract expires on March 2022.

The letters U and H represents the month. The numbers represent the year.

How do I know what month the letters in the name refers to? Refer to this list.

Month Codes	
Code	Month
F	January
G	February
H	March
J	April
K	May
M	June
N	July
Q	August
U	September
V	October
X	November
Z	December

This month code is standardised across all futures products (bonds and other asset classes).

Once the futures expire, 2 things can happen.

- 1) Exchange of goods - If you bought a coffee future, you are now obliged to receive physical coffee from the seller of that futures. Congrats you are screwed.
- 2) Cash-settled futures - Some futures don't require physical delivery of goods. You pay (or get paid) the difference between the current underlying price and the price previously agreed upon.

Let's use the previously example where the trade happened at \$105 and assume that the coffee future is cash-settled. If prices today are at \$110, then the buyer of that future profited \$5 from the seller. The seller will pay the buyer \$5 when the future expires and be done with it.

Rollover

Most futures traders don't let their contract expire. They close their position before expiration.

If they want to continue the trade past the expiration date, they then reopen the same position for the later contract.

Eg. If my long BAXZ19 is expiring next week, then I will close this position and buy a BAXH20 contract.

For BAX, the contract expiration happens quarterly on March, June, September and December.

Thus, after BAXZ19, the next one is BAXH20. The one after that is BAXM20 and so on.

Contango and backwardation

The price of the future is correlated with its underlying asset, but they are rarely the same.

If the price of the future is above that of its underlying asset, the future is said to be in contango.

If the price of the future is below that of its underlying asset, the future is said to be in normal backwardation (or commonly known as just backwardation).

At the time of the future expiration, the price of the future is the same as the underlying asset as the future needs to be physically or cash-settled.

Reasons for contango

- Increasing future demand for the underlying
 - With higher future demand, the future contract which settles in a later date, will be more in demand. More demand leads to more buyers and a higher price for the futures.
- Sudden increase in supply of the underlying
 - More supply leads to lower current spot price.
- Cost of storing of the underlying asset is positive
 - If the underlying needs a place to be stored, there is a cost associated with this storage. Eg. If our coffee future expires 6 months later, there is a "theoretical" storage cost to hold the physical coffee for 6 months. This causes the future price to be slightly higher than the spot.

Reasons for backwardation

- Decreasing future demand for the underlying
 - With lower future demand, the future contract which settles in a later date, will be less in demand. Less demand leads to less buyers and a lower price.
- Sudden decrease in supply of the underlying
 - Less supply leads to higher current spot price.
- Cost of storage is negative (i.e. the is interest to be earned by storing the goods)
 - Sometimes the stored goods can produce positive yield for the person who holds the goods. This is known as convenience yield. Eg. Holding oil might help one profit when there is a sudden supply crash or he can use it in some production process.

Resources

More on futures:

- <https://www.investopedia.com/terms/f/futures.asp>
- <https://www.investopedia.com/terms/f/futurescontract.asp>

More on contango and backwardation:

- <https://www.danielstrading.com/2017/04/03/differences-contango-normal-backwardation-commodity-futures>

Common Futures Strategies

Common strategies specific to futures:

- Spreading a future and its underlying asset
 - For mispricing
 - To take advantage of the contango or backwardation
- Spreading 2 similar futures that is listed in different exchanges
- Spreading futures of different expiries (this is what we will do!)
- Spreading futures of different expiries and assets to form a mean reverting synthetic asset
- Running a futures rollover strategy. Rolling futures into the next expiry with a profit
- Spreading unregulated futures

Common strategies not specific to futures, but can be done with futures:

- Trading futures directionally and for leverage. This is known as trading in an outright manner.
- Trading futures because the trader has no access to the underlying
 - Because the underlying is not tradeable. Eg. Temperature futures
 - Because the trader has geo-political limitations