Learning Options with a Real Bank Stock (FRCB)

Calls, Puts, and Time – Explained for Beginners

Big Picture: What Are We Doing?

In this mini–story we follow a **real bank stock**, FRCB, and a simple imaginary trader.

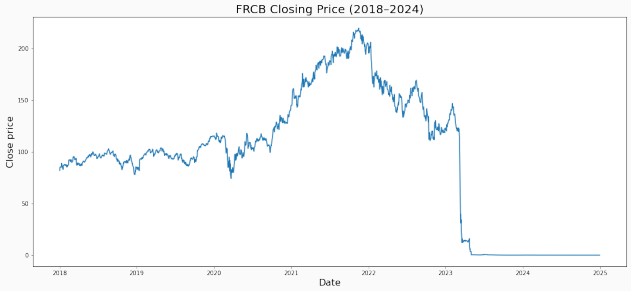
Our trader, in the year **2019**:

- Buys a **call option** on FRCB.
- Buys a **put option** on FRCB.
- Sells options on FRCB (acts like the **insurance company**).

We use real price data and look at:

- How FRCB moves over time.
- How **values** of calls and puts change with time.
- How the trader's **profit and loss** changes day by day, for different **expiry dates**.

FRCB 2018–2024: The Bank's Story in One Picture



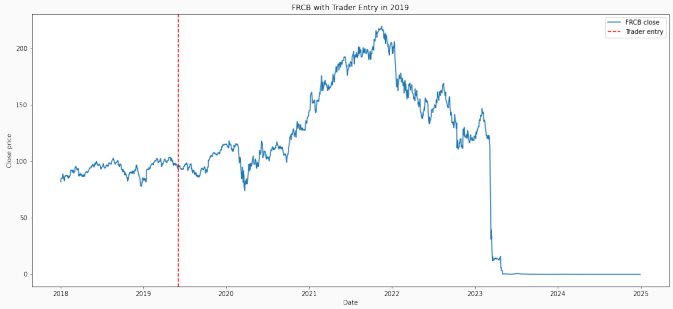
This is FRCB's daily closing price from **2018 to 2024**.

Rough story:

- For a long time, the stock moves up and down but is still **alive and trading**.
- Later, as the regional banking stress appears, the price **collapses** toward zero.

We will not try to predict anything. We only use this as a **playground** to understand options.

Our Trader Freezes Time in 2019



Imagine we stand in the past, in **2019**.

On an entry day in mid-2019:

- FRCB is trading at some price S_{entry}.
- We do not know the future, but now (in 2024) we can **look back** and see what happened afterwards.

On that entry day our trader:

- Buys a call.
- Buys a put.
- Sells options.

What is an Option?

An **option** is like a special ticket on a stock:

- It is a **contract** between two people.
- It talks about:
  - A stock (here FRCB).
  - A **strike price** K (a target price).
  - An **expiry date** (a deadline).
- The ticket gives a right to the **buyer**. The seller is promising to honour that right.

The buyer pays a **premium** (price of the ticket) *today*. The seller **collects** this premium.

Long vs Short: Buyer vs Seller

Two sides of every option:

- **Long** (the buyer):
  - Pays a premium now.
  - Hopes something good happens before expiry.
  - Risk is limited: you can lose at most the premium.
- **Short** (the seller):
  - Receives the premium now.
  - Hopes "nothing too crazy" happens.
  - Risk can be large: if the move is big in the wrong direction, losses can explode.

Intuition:

- The **buyer** buys *insurance* or a lottery ticket.
- The **seller** becomes the *insurance company*.

Call Option: A Ticket to Buy

A **call option** gives the **right to buy** the stock at price K on expiry (or before, depending on style).

For a single share at expiry price S_T:

$$\text{Call payoff} = \max(S_T - K, 0).$$

- If $S_T > K$: the call is **in the money**, payoff is $S_T - K$ (good for the buyer).
- If $S_T \leq K$: the call is **worthless**, payoff $= 0$.

Long call (buyer):

- Pays a premium now.
- Hopes the stock goes **up a lot**.

Short call (seller):

- Receives the premium now.
- Hopes the stock does **not** go too high.

Put Option: A Ticket to Sell

A **put option** gives the **right to sell** the stock at price K on expiry.

For a single share at expiry price S_T:

$$\text{Put payoff} = \max(K - S_T, 0).$$

- If $S_T < K$: the put is **in the money**, payoff is $K - S_T$ (good for the buyer).
- If $S_T \geq K$: the put is **worthless**, payoff $= 0$.

Long put (buyer):

- Pays a premium now.
- Hopes the stock goes **down a lot** (insurance).

Short put (seller):

- Receives premium now.
- Hopes the stock does **not crash**.

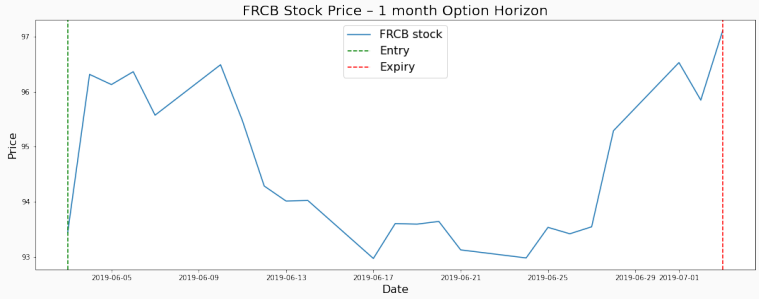
On Entry Day in 2019: What We Fix

On our chosen entry day in **2019** for FRCB:

- We observe the price S_{entry}.
- We set **strike** $K = S_{\text{entry}}$ (at-the-money options).
- We consider three option **expiries**:
  - About **1 month** later.
  - About **6 months** later.
  - About **1 year** later.
- For each expiry, we imagine:
  - Buying 1 call (long call).
  - Buying 1 put (long put).
  - Selling 1 call (short call).
  - Selling 1 put (short put).

We then follow the real FRCB path and see how the **values** and **P&L** evolve over time.

Short Horizon (1 Month): Stock Path

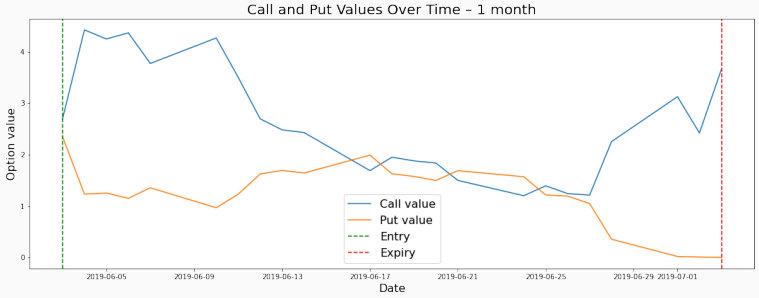


Over about **1 month** after entry:

- The stock may move, but there is not a lot of time.
- Any big surprise must happen **quickly**.

Intuition: A 1-month option is like a *ticket that expires very soon*. Every day matters.

Short Horizon (1 Month): Option Values



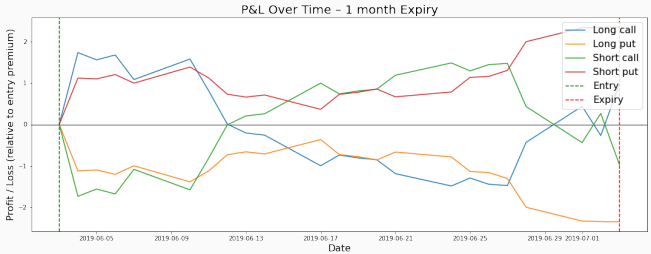
The plot shows the **model values** of:

- The **call** (bet on upside).
- The **put** (bet on downside).

Typical pattern for a short expiry:

- If price does not move much, both call and put values tend to **melt** as time passes.
- This melting is called **time decay** (theta).

Short Horizon (1 Month): Profit and Loss

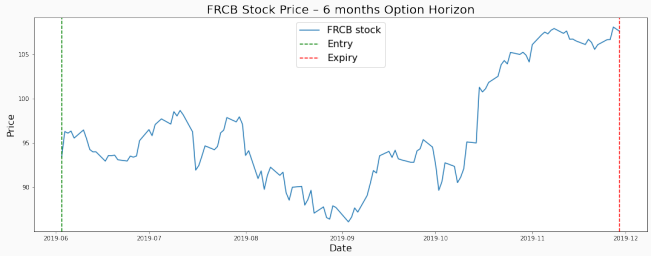


Four lines tell four stories:

- **Long call**: wins only if price jumps up fast.
- **Long put**: wins only if price drops quickly.
- **Short call**: collects premium if price does not explode up.
- **Short put**: collects premium if price does not crash.

With just 1 month, time is the enemy for **buyers**. Time is the friend of **sellers**, unless a big move arrives.

Medium Horizon (6 Months): Stock Path



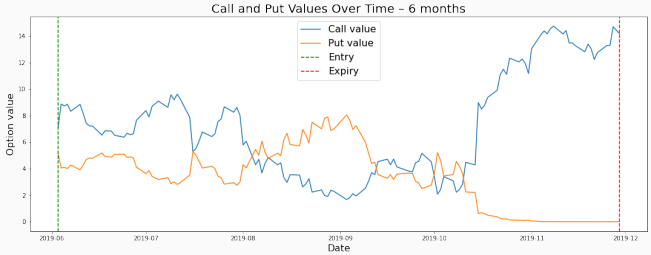
Over about **6 months**, FRCB has more time to wiggle:

- There may be trends up or down.
- News and events have time to appear.

A 6-month option is like a reservation that lasts longer:

- More time for something big to happen.
- More **uncertainty** $\Rightarrow$ higher premium at entry.

Medium Horizon (6 Months): Option Values

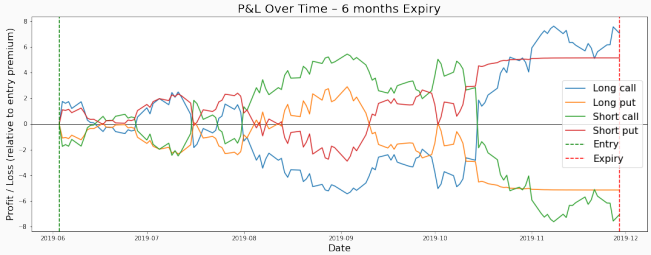


For a 6-month option:

- At entry, both call and put are worth **more** than in the 1-month case.
- As time passes:
  - If the stock drifts up, the call may keep more value.
  - If the stock drifts down, the put may shine.

Time decay is slower than in 1 month, but it still **eats away** value if nothing dramatic happens.

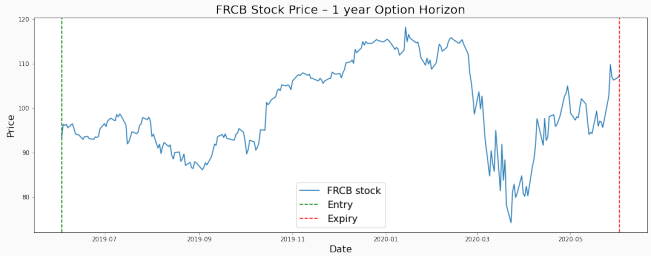
Medium Horizon (6 Months): Profit and Loss



For 6 months:

- **Long call / put**:
  - Have more time to be right.
  - But if moves are small, they slowly lose their premium.
- **Short call / put**:
  - Slowly earn the premium if price stays in a "normal" zone.
  - Suffer if the stock makes a strong move against them.

Long Horizon (1 Year): Stock Path

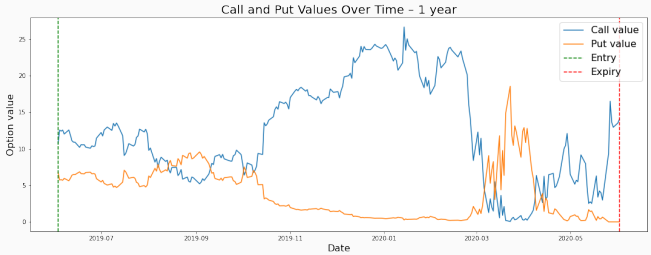


Over about **1 year** after our 2019 entry, FRCB has an entire year of ups and downs.

A 1-year option:

- Starts with the **highest premium** (most time).
- Gives the buyer the longest time window for big moves.

Long Horizon (1 Year): Option Values

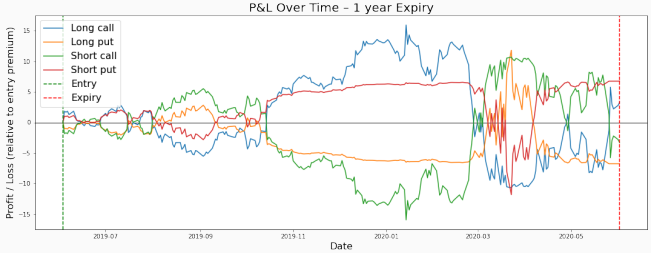


For the 1-year horizon:

- Both call and put begin with significant value (lots of time).
- As months pass:
  - If price trends upward, call holds value better.
  - If price trends downward, put becomes more valuable.
  - If price goes sideways, both slowly melt.

Time decay is slower but very real: by the end of the year, an option that never got "its big move" is worth very little.

Long Horizon (1 Year): Profit and Loss



1-year P&L highlights the core trade-off:

- **Buyers** (long call/put):
  - Pay more premium.
  - Need a meaningful move (up or down) within the year to come out ahead.
- **Sellers** (short call/put):
  - Earn more premium to start.
  - But stay exposed for a long time: a late big move can still hurt them.

Putting It All Together

In this FRCB example we saw:

- **Long call**: pays premium, hopes for a big rise in FRCB.
- **Long put**: pays premium, hopes for a big fall (insurance).
- **Short call**: collects premium, fears a big rally.
- **Short put**: collects premium, fears a big crash.

Across **1 month**, **6 months**, and **1 year**:

- More time $\Rightarrow$ higher initial premium.
- If FRCB does not move much, option buyers lose their premium slowly and sellers keep it.
- If FRCB makes a strong move:
  - The option in the right direction (call for up, put for down) can become very valuable.
  - The seller on the wrong side pays for it.

Key message for beginners: options are tools for *shaping risk in time*. You can use them to *bet*, or to *protect*, or to *earn premium* — but always with a clear understanding of **who loses if the big move comes**.