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Fed Funds Binary Options

The CBOT has introduced binary options on Fed Funds target rates to complement their existing complex of futures and options focused on FOMC rate decisions. Like other money market futures the original contracts languished without a critical mass for several years, but emergency stimulus after 2001 led to a rate of just 1%, dramatically highlighting the need to hedge Fed rate decisions. The latest tightening cycle has also been plagued by deviations between the effective and target Fed Funds rates, which is the one aspect of the original contracts that introduces uncertainty into their pricing. The new binary options have the target Fed Funds rate as their underlying risk and eliminate the biggest source of uncertainty in the original futures and options contracts.

Fed Funds futures have traded for many years, and they settle to 100 less the average effective Fed Funds rate for the month. Traditionally there has been very little difference between the effective and target Fed Funds rates and it is the job of the manager of the Federal Reserve Bank of New York System Open Market Account (SOMA) to keep the two in line. SOMA most often trades repo or reverse repo agreements to raise or decrease the supply of nonborrowed reserves available within the banking system. Figure 1 illustrates that over the past year and a half, there have sometimes been substantial differences between the average effective and target rates for months with FOMC meetings. For example, the difference for the August 2005 contract was 5.4 basis points, which could lead to a 26% difference in the implied probability of a rate hike! What kind of confidence could we have in predicting Fed Funds target rates when the effective rate implies probabilities of a future hike between 38% or 64%, depending on how we account for this difference?

Fed Funds binary options take a different tack, and their prices directly imply probabilities of changes to the target rate. Unlike traditional options where the intrinsic value is the difference between the strike and market prices, binary options only have two payoffs: zero or \$1,000. Contracts are priced between 0 and 100, with each point representing \$10. In this way a price of 40 means that a trader is willing to pay \$400 for an option that will pay off either zero or \$1,000. Of course, \$400 is only a fair price if one believes there is a 40% chance that the option will payoff in-the-money. With binary options, prices *are* probabilities. Will these contracts ever replace the original Fed Funds futures and options complex? Not likely, but they will undoubtedly supplement it.

Binary or not, these are still options, which require payment or receipt of premium when the trade is initiated, unlike futures contracts where the only transfer of money is the initial margin when a trade is initiated. The ability to assume long or short positions without a significant equity position will keep trading in the original contracts lively. Also, Fed Funds futures are often used to hedge Treasury repo rates, which have more to do with the effective rather than target rate. What appears to be a liability for one group of users actually benefits another group, which is the hallmark of good contract design. It is likely that the new options will deepen liquidity in the complex as a whole.

Figure 1. Effective less target FF rate since 2005

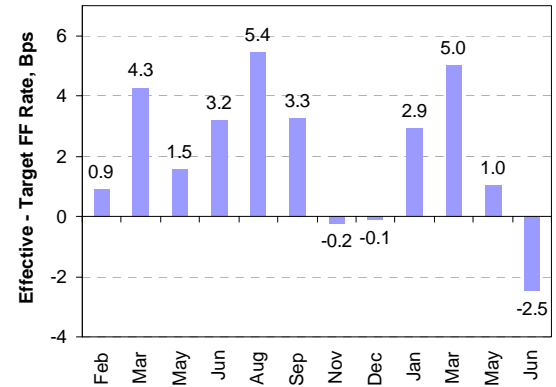


Figure 2. Current FF futures implied rate hikes

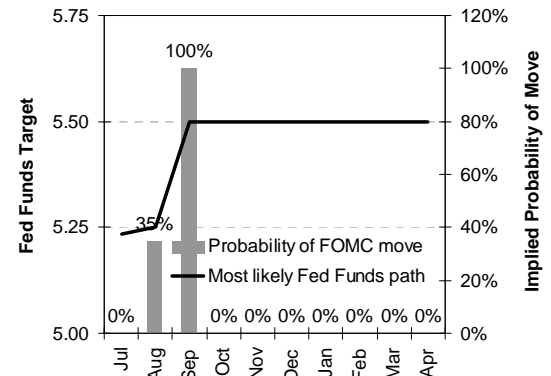


Figure 3. Current FF binary option prices

Type	Strike	Rate	Settle, 7/28
August			
Put	94.750	5.250	25
Put	94.625	5.375	25
Call	94.625	5.375	75
Call	94.500	5.500	75
September			
Put	94.625	5.375	38

Binary options allow users to directly observe the probability of different size rate moves. For example, if the 94.50 and 94.25 strike puts are trading at 60 and 25, this implies a 60% chance of the Fed target hitting *at least* 5.50% and a 25% chance of the rate hitting 5.75%.

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