

Discussion

Michael Narayan

The paper “The Information Content of Canadian Dollar Futures Options” is an interesting academic exercise in attempting to extract information about market participants’ expectations. However, placed in the context of the real world, several of the authors’ assumptions about the use of these options prices must be evaluated for validity. I will address the following:

- using the forward exchange rates as an indication of market expectations of appreciation or depreciation of the Canadian dollar;
- using exchange-traded futures options, rather than over-the-counter (OTC) options, for the purpose of extracting information and market expectations;
- using longer-dated options rather than shorter-dated ones to yield “good” information.

I will then outline some suggestions and concerns about extracting information from options prices in general, including but not limited to options traded on exchanges.

Forward Exchange Rates

The paper leans heavily on the assumption that the forward price represents an expectation of the spot exchange rate at some known future point in time, and that the spot rate tends to “drift” towards this rate. This is patently false. The forward exchange rate is merely the future value of the current spot exchange rate, taking into account the cost of carry of the two

respective currencies. As a result, it is instead the forward exchange rate that converges towards the spot rate as time passes.

This forward exchange rate may be exactly determined by using covered interest arbitrage. The current spot rate and the domestic and foreign interest rates are known, and so the forward exchange rate can be calculated. This implies that the forward exchange rate is dependent on the spot and respective interest rates and is therefore not specifically determined by the market. If this were not the case, and the forward exchange rate was determined by the market, it would imply that either the spot or one or both of the interest rates would be dependent on the forward rate. Stated another way, if market sentiment swung from positive to negative, the forward rate should move from being discount to the spot rate to premium to the spot rate. All else being equal (i.e., spot and U.S. rates), Canadian rates would have to move from being below U.S. rates to above them, in order to satisfy the forward interest arbitrage relation. This may involve a move of several hundred basis points. As a market practitioner, I can assure you that this does not happen in the real world.

In fact, a case may be made that the discount or premium of the forward exchange rate relative to the spot rate (and its size) provides a disincentive for a trade in the direction of the forward price. This is because the premium or discount of the forward rate represents the carrying cost of holding a position. A short U.S.-dollar (long Canadian-dollar) position when the forward rate is discounted to the spot rate (supposedly implying a stronger Canadian dollar and weaker U.S. dollar) would cost the holder of the position the difference between the two interest rates. Over the life of the position, it will cost roughly the amount of the forward discount, requiring the spot rate to trade to at least the forward rate for the trade to be profitable. If the spot rate remains constant, the carrying cost of the position will result in a loss. Conversely, a trader who holds a long U.S.-dollar (short Canadian-dollar) position with the above conditions will earn the implied carrying cost, resulting in a profitable trade if it matures at, or above, the discounted forward price.

The current state of the Japanese yen provides an example of this situation. Very few people are expecting the yen to appreciate. However, the forward exchange rate trades at a significant discount to the spot rate because of the interest rate differential. In this case, the size of this discount allows long U.S.-dollar (short Japanese-yen) positions to be profitable, even in some cases of yen appreciation.

With regard to the Canadian dollar, the forward rates changed from positive to negative in March 1996. This was a result of a lower Canadian yield curve relative to the United States. Though the Canadian dollar rallied from about 1.3600 at that time to 1.3265 in November 1996, it has

subsequently fallen to about 1.4500. During the entire period, the forward rates have remained discounted to the spot rate. Clearly, the forward rate is not related to the market's expectation of the future exchange rate.

Use of Exchange-Traded Futures Options

Exchange-traded futures options represent a fraction of the entire currency options market. The high transaction costs associated with the product, along with the large bid–offer spreads and lack of liquidity prevent all but the most nimble options traders from participating in this market. Given the fact that most currency options trading takes place in the OTC market, and that most players pay scant attention to activity on the floor, one should be skeptical of any information or conclusions derived from this data, particularly information derived in the higher-order distribution moments (i.e., skew and kurtosis).

The primary market for trading currency options is the interbank OTC market. As Levin, Mc Manus, and Watt point out, exchange-traded options account for only a fraction of the total notional amount of options traded. Use of exchange-traded options is generally limited to market participants making small trades—typically retail investors and speculators, and those lacking sufficient credit to transact their business with OTC market-makers. This latter issue of credit, along with the aforementioned transaction costs, causes a wide bid–offer spread, which the market-taker must cross. As these infrequent trades tend to be quite small, generally less than C\$10 million (less than US\$7 million), they are usually ignored by participants in the OTC market, where transactions often range from US\$20 million to US\$100 million.

An example of how these two markets are different can be seen by examining 3-month at-the-money forward straddles. These are quoted in the OTC market in volatility terms and on the exchange in price terms. In the OTC market, this option would be quoted about one-tenth of a per cent wide (between bid and offer) on US\$50 to 100 million. This translates to about 3 percentage points on an exchange-price basis. However, on the exchange, it is not unusual to see a 10- or even 15-point-wide price with difficulty finding a market on more than 100 contracts (about C\$20 million or US\$14 million). This is equivalent to a volatility spread of between 0.4 and 0.6 per cent! Clearly, this yields a very high margin of error.

In general, the limited number of strikes and maturities, along with the low transaction volumes, make exchange-traded Canadian dollar options unsuitable for use in any meaningful analysis other than that of broad volatility trends.

Option Maturities

In their conclusions, Levin, Mc Manus, and Watt give the precondition that “the futures option not be too close to maturity, since as the option nears maturity the implied volatility of the option will fall.” This need not be the case. There are several instances where the implied and historic volatilities of short-dated options are much higher than those of longer-dated options. Examples of this include periods of high actual or perceived volatility, which can occur after events such as large moves or wide ranges, dates of economic releases, dates of national and economic significance, and dates (and strikes) of large-option expiries.

Market participants generally believe that spot movement is somewhat autocorrelated. A large move or a wide range on one day will be followed by a large move or wide range on the next. Thus, days of high volatility tend to be clustered, as are days of low volatility. Therefore, even though the Canadian dollar may be recovering after trading at historic lows and implied volatilities of long-dated options are softening, short-dated options may remain highly volatile, or even trade higher.

The potential for large moves is perceived (and observed) to be greater on days of economic data releases (such as the CPI or unemployment rate) and around dates of economic and national significance, such as budgets, elections, and referendums. As these dates approach, short-dated options expiring around these dates are generally more volatile than longer-dated options expiring after these events. A perfect example of this is the Quebec referendum. The day before the referendum, overnight options were being quoted with implied volatilities above 50 per cent, whereas 1-month options were quoted around 15 per cent. This had to do with the expectation of a large move in either direction as a result of the referendum.

Furthermore, prior to large-option expiries, supply–demand imbalances often push up short-term volatilities, as players scramble to cover their positions or hedges—particularly when a supply of options has been taken out of the professional market by end users. Arguably, short-dated option volatilities in these cases give a clear picture of the perceived risk of immediate market moves. This is because players are more inclined to cover positions that are perceived to have a greater probability of being in-the-money than those that are out-of-the-money.

Use of the OTC Market

While there are several problems with the analysis of exchange-traded options, some information can be extracted from options traded in the OTC market. The greater liquidity, the variety of options (in both strikes and

maturities), the lower transaction costs, and the narrow bid–offer spreads make this a more informative market to use, with fewer measurement errors.

The most fruitful area of options analysis for the Bank of Canada is the OTC-defined volatility surface. This is created using the various strikes and maturities traded. The volatility surface provides a broad picture of the expected volatility of the Canadian dollar and periods of perceived high or low risk. It should be noted that risk is not simply the potential for spot to trade at or through a particular level, but rather the expected cost of hedging in the vicinity of the strike. In the case of short-dated options, traders are concerned about hedging their time decay (Θ) and delta hedge profiles (Γ). In the case of long-dated options, traders are concerned about their exposure to volatility (Λ) and interest rates (ρ). The shape of the volatility surface will generally reflect the perceived risk of the market. This should help alert the Bank to potential volatility as a result of its actions.

As with exchange-traded options, care must be exercised in over-interpreting information extracted from OTC options, as several factors cause day-to-day distortions in the shape of the volatility surface. The recent popularity of exotic options is one such factor. In order to hedge the various exposures (Δ , Γ , Λ , Θ , and ρ) arising from such options, players use “vanilla” options of varying strikes and maturities to approximate the local behaviour of these exotics. If several traders have similar positions, they may have similar option hedges. As a result, these options may have higher or lower volatilities than options around them.

Conclusions

As a market participant, I believe that OTC-traded options, rather than exchange-traded options, should be used in extracting market information and expectations. Further, the volatility surface defined by these options is probably the most useful information that can be derived. Lastly, any information derived from options prices should be used cautiously, as daily distortions can cause measurement errors.