FX Column: What is a Currency Option

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Traders, structurers, quants and risk managers, who deal with options for a long time, can react quite differently when asked by other not in this community what is a actually a currency option. One doesn’t ask such a question if you deal with options all the time and options have become part of our life and sometimes even our dreams. So how about an option being simply a derivative with a non-negative payoff? Or a vanilla option is a contract with payoff

$$\max\ [\varphi(S_T - K), 0],$$

where the variable φ takes the value +1 for a call and +1 for a put.

It gets tricky when lawyers get involved. For example, if a client has authorized a bank to trade on Foreign Exchange and Currency Option Transactions, and then finds KIKO TARFs and correlation swaps in his portfolio by surprise and sues the bank, then a court (see Figure 1) will take over and decide what a currency option is and our commonly used payoff formulas become irrelevant.

Figure 1: Royal Court of Justice in London

Definition of Currency Option

Let us start with a definition of a currency option: A **Currency Option Transaction** means a transaction entitling the Buyer, upon Exercise, to purchase from the Seller at the Strike Price a specified quantity of Call Currency and to sell to the Seller at the Strike Price a specified quantity of Put Currency.

The is really the FX – 101 I have been trying to disseminate, see Figure 2. Sometimes we need to go back to the basics and forget the models and all the financial mathematics.

Figure 2: FX 1001

The definition is taken from the 1998 FX and Currency Option Definitions published by the **International Swaps and Derivatives Association (ISDA)** in 1998[1]. This definition was the result of a process of standardization of currency options in the industry and is now widely accepted. Note that the key feature of an option is that the holder has a right to exercise. The definition also demonstrates clearly that calls and puts are equivalent, i.e. a call on one currency is always a put on the other currency. The definition is designed for a treasurer, where an actual cashflow of two currency is triggered upon exercise. The definition also shows that the terms *derivative* and *option* are *not* synonyms. Derivative is a much wider term for financial transactions that depend on an underlying traded instrument. Derivatives include forwards, swaps, options, and exotic options. But not any derivative is also an option. For a currency option there is always a holder, the Buyer after buying the option, equipped with the right to exercise, and upon exercise a cash flow of pre-specified two currencies is triggered.

[1] ISDA: Foreign Exchange Transactions and Currency Option Definitions. 1998.

Anything outside this definition does not constitute a currency option. I highly recommend reading the 1998 ISDA definitions. It is a text using legal language, but it does make all the terms around Foreign Exchange (FX) Transactions – referring to spot and forward transactions - and Currency Options very clear and is the benchmark in the industry. It covers only put and call options, options that are typically referred to as *vanilla* options, because they are the most common and simple products. The definition allows for different exercise styles: European for exercise permitted only at maturity, American for exercise permitted at any time between inception and maturity, as well as Bermudan for exercise permitted as finitely many pre-specified points in time. Usually, FX options are European. If you don't mention anything, they are understood to be of European exercise style. Features like cash settlement are possible: in this case one would have to make the Call Currency Amount the net payoff and the Put Currency Amount equal to zero. There are a number of exotic options that still fit into this framework: in particular, barrier options. Whilst they have special features not covered by the 1998 ISDA Definitions, they still can be considered Currency Option Transactions. However, Variance Swaps, Volatility Swaps, Correlation Swaps, Combination of Options, Structured Products, Target Forwards, just to mention a few obvious transactions, do not constitute Currency Option Transactions.

Classification of One-Touch Contracts

I have been asked once, whether a one-touch contract is an option[2]. At first glance my reaction was that it is an option, because again, it is a derivative with a non-negative payoff. However, when going back to ISDA's 1998 FX and Currency Option Definitions, it appeared that there are two ways to view the one-touch:

- **Right to Receive:** One can squeeze the one-touch into ISDA's 1998 FX and Currency Option Definitions and set the Call Currency Amount equal to the one-touch notional, the Put Currency Amount equal to zero, with American style. Considering the option as a right to exercise would not work here, because the holder would always exercise immediately and claim his Call Currency Amount. Therefore, one must additionally agree on cash settlement and on a spot reference to define clearly in which case the option will be automatically exercised. Once I think about the legal terms, it is no longer that obvious that the one-touch is actually a currency option.

- **Obligation to Pay:** Indeed, an alternative way to consider the one-touch as a legal contract is to confirm it as an obligation of the seller to pay a fixed amount in case of a barrier event. Such deal confirmations have been used and clearly take the one-touch outside the class of currency options.

This doesn't really matter for the financial engineer, trader or structurer, and if you find this subtle distinction irrelevant, then fair enough. However, it matters for clients who have agreed to trade only currency options and forwards. A payment obligation is clearly not in this set.

[2] Wystup, U. FX Options and Structured Products 2nd Edition, Wiley 2017.

Target Forwards

Target Forwards have been trading and popular in currency markets for at least 15 years[3]. Since a Target Forward (TARF) is an agreement on a series of future cash flows in two currencies, it is possible to think of a TARF as a variant of a cross currency swap. Unlike in a standard crossie, there is no exchange of notionals in the beginning and the end; furthermore, the interest rates are fixed rather than fixing derived. Frequencies are usually significantly shorter in a TARF. And there are overall conditions on the target profit and features like puttability, which refers to the right to close out the TARF at pre-specified conditions. Therefore, one way to seek product approval internally in a bank is to view the TARF as a crossie with special features or exotic crossie. This view may also enable the market participants to book the TARF in an existing system. Special features may not be reflected properly, leave alone valuation and risk figures. But never mind. Gotta get the deal done and worry about the nitty-gritty details later -- probably not good advice in nowadays' compliance-dominated environment. In my view a TARF does not constitute a currency option, as the holder does not have a right to exercise, in fact, it isn't even clear who the holder is. The mere existence of a vega exposure is not enough to make a TARF an option[4].

In Summary

- An option must contain a feature constituting a right to exercise for the holder.
- Option and derivative are not synonyms.
- Sometimes judges rather than quants or traders decide what an option is.
- Add the ISDA Definitions to your bed-time reading list.

[3] Wystup, U. KIKO TARN revival in Asia, FX Column in Wilmott Volume 2020, Issue 107, May 2020, p. 12-19.

[4] Financial Times reports on 22 April 2013 "Deutsche Bank versus Vik battle begins" https://www.ft.com/content/eed5091a-ab4c-11e2-ac71-00144feabdc0 where the classification of TARFs was one of the legal questions.