

FX Domain – Kick-start for Testers

A brief introduction to key FX elements.

Discussion Document by

Mark Crowther, Principle Test Architect

Tien Hua, Senior Test Analyst

Table of Contents

Introduction	3
Conventions in the document.....	3
Feedback and Comments	3
What is FX?	4
<i>In Summary</i>	4
Key Concepts	5
Currency Pairs	5
Currency Abbreviations	5
Identifying Currencies in a Pair	5
Precedence of a Currency.....	6
Major Pairs	6
Cross Pairs.....	7
<i>In Summary</i>	7
FX Products	8
Tenors	8
Vanilla FX Product.....	9
Spot	9
Derivative FX Products.....	9
Forward	10
Future	10
Option	10
Swap.....	10
<i>In Summary</i>	11
References and Sources	12

Introduction

As a competent test professional you'll know that fundamentally you can test in any domain. That domain could be travel, healthcare, engineering, retail, etc. and of course finance. Ultimately we can say with sincerity, it's all software testing and the skills and knowledge of our profession that we possess, apply no matter what the domain.

However, there are two very real caveats with this perspective that will limit our effectiveness in a given domain until overcome:

- We will initially lack understanding of the testing challenges in the domain, thereby limiting our application of contextually relevant testing techniques and approaches
- The domain will have unique vocabulary and concepts that must be understood if we are to translate its meaning and communicate effectively

Once we address these caveats we will understand the unique testing needs of the domain in a contextually relevant way and be able to communicate with our colleagues effectively.

This paper is intended to provide a Kickstart to the knowledge and understanding of testers who are expanding their area of practice into the Finance domain. Specifically it focuses on the specialist area of Foreign Exchange (FX), though much of what is discussed will apply outside of that area. However, the assumption is the tester is in a role related to testing FX services.

Conventions in the document

New terms and concepts - Throughout the paper a broad range of terms and concepts are introduced. These are highlighted in blue and bold on first introduction e.g., **Forward**, within the text. Where the term is used again but we wanted to highlight its relevance, it will be shown in **bold** so it stands out, further use will then be in a plain font. Occasionally we've been a little sneaky and used the term but not highlighted it, so when it's used later it should more familiar.

Alternate resources - As with all communication, our descriptions or definitions may not be complete or clear enough for you to gain a thorough understanding of what's presented. For each main concept we also provide links to alternate resources such as Wikipedia and other websites. You are encouraged to visit them to get another take on the material and assist your learning.

Feedback and Comments

Your thoughts, feedback, corrects, etc. are always welcome. Please find us on LinkedIn or via the website and be sure to name the paper or site content you are referring to.

Kind Regards from, Mark Crowther & Tien Hua

What is FX?

Within the Finance domain there are many areas of specialisation that a tester may choose to focus on and gain a level of expertise in. For example, if we consider areas such as Equities and Commodities or Retail and Commercial banking, they are complex enough in themselves to warrant specialisation. Yet being an interconnected part of the finance domain no area can be looked at in isolation. The area we focus on in this paper is **Foreign Exchange**, also referred to as **ForeEx** or just **FX** for short, that's the term we'll use throughout this paper.

FX at its simplest level is the business of changing one type of currency for another. If you've ever been on holiday and exchanged your UK Pounds or US Dollars for Euros for your trip to Paris or Yen for your holiday in Tokyo, then you've been directly involved in the **Retail** side of the FX market. You'll no doubt have even looked at what the **Exchange Rate** was to make sure you got the best deal when you bought your currency.

Sometimes we get involved in retail FX a little less directly. For example, most of us have bought something online where the price was quoted in US Dollars or Euros, but we paid in UK Pounds.

The most basic **product** in the area of FX then is this immediate exchange of one currency for another. Many of us do these exchanges without really thinking we're involved in the FX market, but both can still be considered an FX trade done on the **Spot**, where the exchange of two currencies was involved, in consideration of **Exchange Rates**.

Interestingly this simple, straightforward **product** (think product and service) kind of FX trade would be called a **Vanilla** product in the finance domain.

As we'll discover and as you've probably seen on the news these last years, the finance world takes this uncomplicated vanilla FX product and makes things a lot more exotic by deriving other forms of FX products from it. Just to cover the basics above we've used nine terms. It'll be no surprise then that to explain these exotic derivatives of our simple FX exchange, there's also a whole bunch of new terms and concepts added into the mix.

In Summary

- *At the most basic level FX is simply the exchange of two currencies, one for the other*
- *Most of us have been involved in the retail FX market, buying our holiday money*
- *There are many domain specific terms and definitions that apply and which have a specific meaning which we need to understand as it differs from everyday use*
- *The finance market takes the simple exchange of two currencies and derives other more exotic products from it, adding complexity that we also need to understand*

Key Concepts

Before moving on to discuss the more complex products the FX market produces, we need to cover off some key concepts and in so doing expand our domain specific vocabulary. With these in mind things should make a little more sense and we can use the correct terms we'll need when we're working with customers.

Currency Pairs

As trading FX involves trading one currency for another, clearly we'll always be referring to a given pair of currencies when we write about or describe an FX trade. This **Currency Pair** might be the UK Pound and the US Dollar or perhaps the US Dollar and the Swiss Franc, maybe even the UK Pound and the Japanese Yen, as per our holiday money example above.

Allowing for some legal restrictions or limitations the FX market might impose, you can pair and trade any currency with any other you choose. However, there are some pairs that are more common than others and there are some conventions when writing them out or describing them, which we need to know about.

Currency Abbreviations

Every currency has a three letter abbreviation to uniquely identify it. It's essential that we are familiar with the abbreviations for the most commonly used pairs and know where to look for the rest. To make things easier, all abbreviations are defined by an international standard and are used the same way throughout the world. Here are some examples of three letter abbreviations for well-known currencies:

USD – United States Dollar	AUD – Australian Dollar
GBP – Great Britain Pound [^]	CAD – Canadian Dollar
EUR – Euro	JPY – Japanese Yen

[^] Also referred to as just 'British Pound' and 'Pound Sterling'

The standard that defines these abbreviations is "ISO 4217:2008 'Codes for the representation of currencies and funds". If you want a copy of the standard you'll need to buy it. However, our trusty friend Wikipedia has a more than sufficient article that covers all we need to know for most of our testing tasks. (http://en.wikipedia.org/wiki/ISO_4217) and you can get a list from XE.com too (<http://www.xe.com/iso4217.php>).

Please make sure, that if you're testing something to meet a regulatory standard or commissioning a new system, you should ask the client to get a copy of the standard to test against. Do not test against Wikipedia articles or 'everybody just knows that' statements where there is a regulatory or compliance need. Buy the standard from the ISO organisation for '140 CHF', what currency is that?

Identifying Currencies in a Pair

When referring to each of the currencies in a pair, we can refer to them as being **Currency 1** and **Currency 2** or more simply **CCY1** and **CCY2**. Whenever we write out a **currency pair**, where we know both currencies, the convention is to write them out using their abbreviations, e.g. EUR/USD, USD/CHF, etc. Where we only know one of the currencies we would be free to write, CCY1/USD or perhaps USD/CCY2.

While we're addressing how to name and label each of the currencies in a pair, this is a convenient point to mention another name for **CCY1** and **CCY2**. These are the often used names of **Base Currency** for CCY1 and **Counter Currency** for CCY2. In conversation, you're more likely to hear these terms being used when questions about a pair are raised. CCY1 and CCY2 are just labels, whereas **Base Currency** and **Counter Currency** are names that have a more complete meaning.

Just in case you've heard of it, Counter Currency is also sometimes called **Quote Currency**. This has to do with **Direct** and **Indirect Quotes** but is a complexity we don't need to worry about here. Link for the studios; (<http://www.investopedia.com/ask/answers/06/eurusd.asp#axzz2E6kWVJ86>)

Precedence of a Currency

For each of the currency pairs one in the pair has **Precedence** over the other when we write out the pair. This precedence has been negotiated and decided generally by convention, but also by organisations such as the European Central Bank. Therefore, when writing out or describing a currency pair in some way we need to stick to the established conventions.

Here are some examples to illustrate how Precedence works:

- If the currency pair is USD and JPY, then USD has precedence (USD/JPY)
- If the currency pair is EUR and USD, then EUR has precedence (EUR/USD)
- If the currency pair is GBP and USD, then GBP has precedence (GBP/USD)

As you'll see, at first glance it's not really obvious why or when one currency has precedence over another. As a general rule the order of precedence for any pair that has the following currencies, is in this sequence: **EUR > GBP > AUD > NZD > USD > CAD > CHF > JPY**.

Remember, this is only a general convention and might change, e.g. when considering **Direct Quotes** or **Indirect Quotes** as alluded to above. Applying the rule means that when a currency trade involves EUR and some other currency, e.g. GBP, JPY, etc. then EUR always has precedence. If the trade involves GBP, but NOT the EUR, then GBP has precedence, if the pair has USD, but NOT EUR, GBP, AUD or NZD then USD has precedence.

Major Pairs

Depending on where you read about them and what the criteria being applied is, there are roughly four or six **Major Pairs** or just **Majors** for short. These are the most widely traded pairs and it's said that they account for 90% of all trades on the FX market.

The six pairs, written showing the correct order of precedence for each currency in the pair are:

- EUR/USD, GBP/USD, USD/JPY, USD/CHF, USD/CAD, AUD/USD

In some literature AUD/USD, USD/CAD and NZD/USD are referred to as the **Commodity Pairs**, being associated with countries that have a high volume of commodities or other natural resources. Also, GBP/USD is referred to as a '**Cable**' trade, alluding to the transatlantic telephone cable between the UK and US. Good to know but slightly outside of the scope of this paper so we'll leave these and other amusing facts for the reader to learn more about.

Cross Pairs

As there are many currency pairs than just the **Majors** we need another name for them and that is **Cross Pairs**, also referred to as **Cross Currency**. These **Cross Pairs** are a little more specific than just any other pair that isn't a Major. In fact Cross Pairs are any pair that doesn't have the USD as either a Base or Counter Currency.

In Summary

- *All currencies have a standard three letter abbreviation that must be used correctly to avoid confusion as to which currency is being referred to*
- *When writing out a currency pair or referring to it in conversation we have the labels CCY1 and CCY2 or the names Base Currency and Counter Currency which can be used*
- *Certain currencies take Precedence over others when part of a pair. It's important to ensure Precedence is observed whenever we refer to a Currency Pair*
- *The two main groups of Currency Pairs are the Major Pairs and Cross Pairs. As a rule of thumb, the Cross pairs do NOT have the USD as either the Base or Counter Currency*

FX Products

In the first section of this paper we discussed the idea of a simple one for one currency trade being referred to as a **Vanilla** product. As this Vanilla product is bought and sold as a simple trade executed and completed there and then, we can refer to it as an **Outright** trade. However, this example was given in context of a retail customer, we need to consider what it looks like to the commercial market. An **Outright** trade can be either a Spot or a Forward trade, discussed in the following sections.

In the previous section we also suggested there were some more exotic types of FX products derived from this and in this section we'll cover the four most common. These exotic, more complex products are collectively called FX **Derivatives**, being as they are derived from our simple **FX Vanilla product**.

Strictly speaking there is no Vanilla FX 'product' in the retail market, just a service of currency exchange that's provided for a fee. However, if there are **Derivative FX Products** in the commercial market, we'd expect there to be a simpler form from which they're derived. For the purposes of modelling our FX world at a simple level then, we'll use the term **Vanilla FX Product** as the start point for discussing FX Derivatives.

A further note regarding naming conventions, FX Products are also referred to as **FX Instruments** in the finance domain. However, in this paper we'll stick to calling them FX products.

Tenors

A **Tenor** is a measure of either the initial term length or amount of time left for a trade to run. For example, when executing FX trades we can specify the date on which we would like the transaction to start and if applicable, when it will end. The date when a transaction starts is commonly referred to as the **Value date** or **Start date**, and the date when the transaction ends is referred to as the **Maturity date** or **End date**.

In FX trading, there is a standardised way of specifying the **Value date** and **Maturity date**. These are: **TODAY, TOM, SPOT, 1W, 2W, 3W, 1M, 2M, 3M, 4M, 5M, 6M, 7M, 8M, 9M, 10M, 11M, 1Y, 15M, 18M, 2Y, 3Y, 4Y, 5Y**

With these, defining a Tenor is reasonably straight forward. A Tenor of **TODAY** means the trade is settled today, a Tenor of **TOM** means the Value date is today and the Maturity date is tomorrow. Refer to 'Spot' below to see how Settlement Dates and Tenors work together.

In the **Money Markets (MM)**, there are a few additional Tenors and a difference in how the **End date** Tenor is calculated. **MM** also has **1D, 2D, 3D** Tenors for the End date. The End date tenor in MM is calculated differently from FX - while FX End date Tenors are relative to the Spot date, MM End date Tenors are relative to the **Start date**.

Vanilla FX Product

When considering the commercial FX market, there are some minor complexities and rules applied even to the simplest exchange. The process and rules that are applied make our one and only, **Vanilla FX Product** called the **Foreign Exchange Spot** or **FX Spot** or simply **Spot** for short.

Spot

Just like the retail exchange of one currency for another, the **FX Spot** is exactly the same in the commercial world, just with the addition of **Settlement Dates**.

From the date an FX Spot trade is executed, the amount of time allowed to complete payment for and delivery of the currencies being exchanged, allows the **Settlement Date** to be calculated. The settlement date is typically two business days from the date of the transaction. As a form of shorthand this is written as: **T + 2**

- Transaction Date + Settlement Period = Settlement Date

As with most things in the FX domain, there are exceptions. Two examples are USD/CAD and AUD/USD pairs which have a **T + 1** settlement period. Refer back to 'Tenors' above to see how Settlement Dates and Tenors work together.

Despite enquiries directed to the likes of the Bank of England, London Stock Exchange and New York Fed, we didn't find out what organisation or group decided these differences exist. It appears they are merely conventions adopted by the market. If any reader can tell us 'who says' settlement periods are as they are, please let us know!

Derivative FX Products

In the commercial market it may not always be the best strategy to buy currency only at the moment it's needed. Most FX Spot trades are reactive and tactical, short terms actions to address some currency shortfall, to take advantage of a sudden fluctuation or to get currency in hand for some reasonably immediate trade.

To overcome the limitation of using just the FX Spot, other products have been derived from it. Each of the **Derivatives** exists to address specific needs a business may have at certain times.

In this section we'll work through the structure of four Derivatives, so as to understand the fundamentals of how they work. From a tester's perspective, these products as part of an application we're testing can be where the real testing risks start to get introduced. It will be easy to envisage how errors with their set-up in our application, data produced and used or interactions with external systems can cause serious and costly bugs to appear.

The four most common types of FX Derivative products are: **Forward**, **Future**, **Option** and **Swap**. To define at a high level what a Derivative is, we can think of it as a **Contract** whose value is dependent on or derived from the value of some underlying asset. The asset in our case is the currencies that are being traded.

Forward

In simple terms, a **Forward** is a **Contract** between two parties to exchange currencies at a) an agreed point in the future and, b) at a rate agreed on today. You'll recall this differs from our FX Spot which is an agreement to exchange currencies today, subject to the settlement period.

A Forward is referred to as a **Non-Standardised** contract and is traded **Over the Counter (OTC)**, not on an **Exchange**. This allows the two parties to negotiate their own terms for the contract.

Future

A **Future** contract is very similar to a Forward, in that it is a contract between two parties to exchange currencies of an agreed quantity and price, at some agreed point in the future.

The main difference between a Forward and Future is that the Future Contract is negotiated via an Exchange, not as an OTC trade. As such, the Future is a **Standardised** contract, being subject to the rules of the **Exchange** and regulations of the Market.

Option

An **Option** gives the owner the option, but not the obligation, to exercise an FX exchange on an agreed amount of currency for an agreed rate, at an agreed time in the future. This is different than our Forward or Future, where the contract *requires* the exchange to take place at the specified future date.

There are a number of **Option Styles** but the two most common are:

- **American:** the Option can be exercised on any trading day, on or before expiration
- **European:** the Option can only be exercised on the expiration date

With an Option it's possible to buy up to the contract amount in a series of smaller transactions called **Drawdowns**.

A variation on the basic Option is the **Time Option**, where the option is focused on when to exercise the trade and is not an option to choose to trade or not.

Swap

A **Swap** is an FX transaction that involves the simultaneous purchase of one currency and sale of another with two different value dates. It can be viewed as having 2 FX Outright trades in one execution (typically a Spot and Forward trade). Each of this two part buy and sell activity is referred to as a **Leg** and a Swap has two **legs**:

- A Near Leg which is typically Spot
- A Far Leg which will be the reverse trade of the Near Leg

In an Even Swap the amount of currency bought and sold in each leg matches and so the buy and sell values cancel each other out. An Uneven Swap is a Swap but the amount in the Near Leg and Far Leg are different.

In Summary

- *A Forward is an OTC contract between two parties to exchange an agreed amount of currency at an agreed future date*
- *A Future is similar to a Forward, but it's a standardised contract and so traded on an Exchange*
- *An Option gives the owner the option, but not the obligation, to exercise an FX exchange on an agreed amount of currency, for an agreed rate, at an agreed time in the future*
- *A Swap is an FX transaction that involves the simultaneous purchase of one currency and sale of another with two different value dates*

References and Sources

- <http://coghlancapital.com/fxprimer>
- <http://financetrainingcourse.com/education/derivatives-pricing/>
- http://en.wikipedia.org/wiki/Foreign_exchange_spot
- <http://www.ikonfx.com/what-is-forex>
- <http://www.tradersexchange.com/resources/currencyguide.html>
- <http://www.group30.org/publications.shtml#c>
- <http://thismatter.com/money/forex/foreign-currency-market.htm>
- <http://financetrainingcourse.com/education/derivatives-pricing/>
- http://en.wikipedia.org/wiki/Option_style
- <http://www.optiontradingtips.com/options101/option-style.html>
- <http://www.lloydsbankwholesale.com/uploadedFiles/Take%20A%20Closer%20Look%20web%20brochure.pdf>