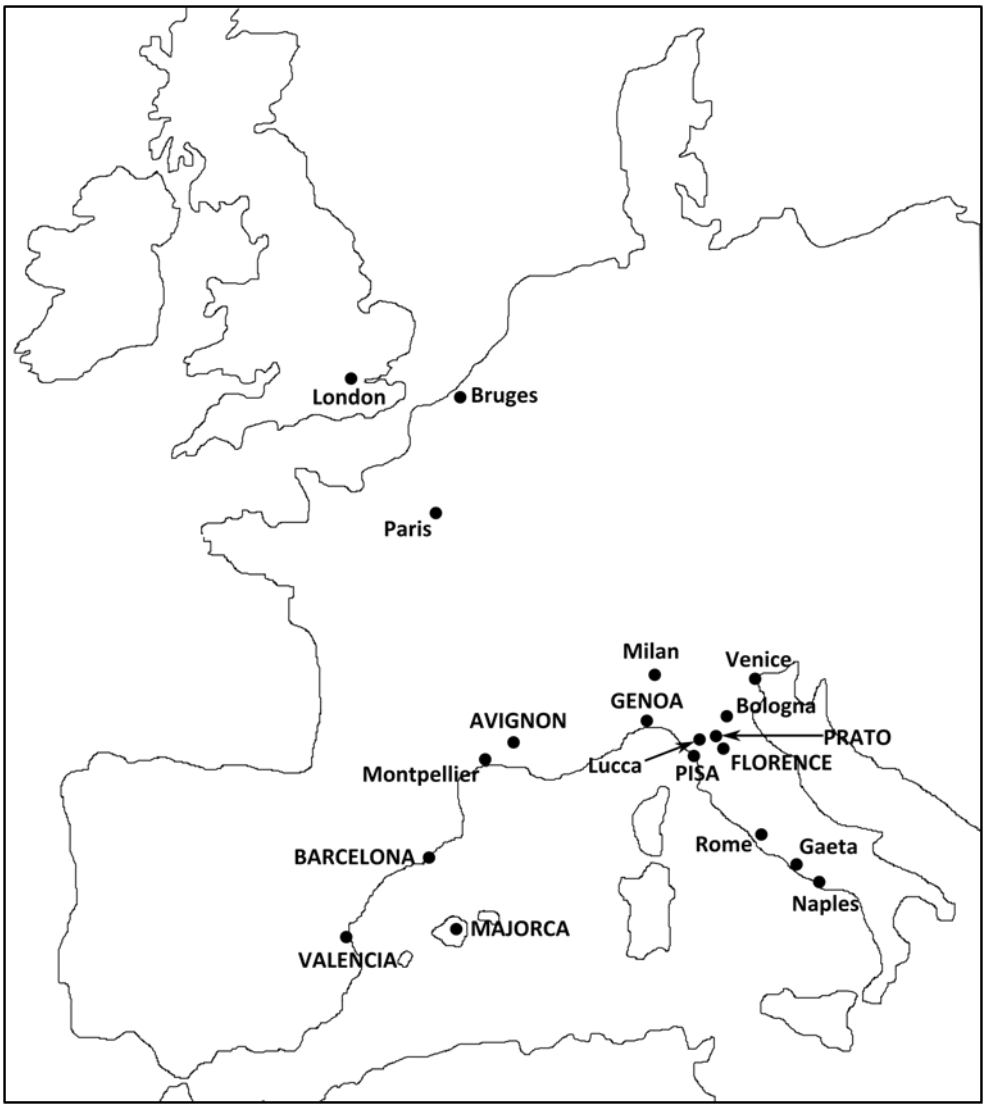
Medieval Foreign Exchange dataset: Notes and guidance

The exchange rate data has been collected from the business letters surviving in the archive of Francesco di Marco Datini, 'the merchant of Prato'. Datini was a successful merchant and between c.1383 and his death in 1411 he oversaw an international trading, industrial and financial operation. Datini opened branches in Florence, Prato, Pisa, Genoa, Avignon, Barcelona, Valencia and Majorca. He also correspondent with merchants in many other cities, including Venice, Bologna and Milan, Rome, Gaeta and Naples, Montpellier, and Paris, Bruges and London. Some idea of the breadth of Datini's connections can be gleaned from the map below.When Datini died without direct heirs, he bequeathed his estate to fund a hospital, the *Ospedale degli Innocenti* – and his business records were preserved in its archives until they were rediscovered in the nineteenth century. The Datini archive contains nearly 600 account books and 150,000 items of correspondence and documents. A major recent project has made many of these letters available to view online at http://datini.archiviodistato.prato.it/.



The Datini letters are a Since successful FX trading involved predicting the future movements of exchange rates, the merchant who had better and more up-to-date information about exchange rates in other banking centres enjoyed an advantage over his uninformed peers. For this reason, when writing to their correspondents in foreign centres, merchants often listed the current market exchange rates at the end of their commercial letters. These rates were probably collected from the bill brokers that arranged deals in each centre. They can be seen as forerunners of the exchange rate currents printed from the sixteenth century onwards which ultimately developed into the modern financial press. The use of exchange rates from commercial correspondence has two main advantages. First, merchants wrote frequently to their correspondents (on a weekly or even daily basis) and often had correspondents in several different financial centres. This provides a greater depth and higher frequency of data than relying on the evidence of actual transactions. Second, the use of market rates may have stripped out some of the idiosyncratic factors that may have influenced the exchange rates used in particular transactions. This makes the data more useful for comparative purposes. In fact, where it is possible to compare the rates used in actual transactions with those quoted in merchants' letters, they are usually the same or very similar.

The current medieval FX project collected the exchange rates quoted at Florence, Genoa, London, Naples and Paris from the original letters. We also incorporate the rates for Barcelona and Bruges collected by Raymond de Roover, Elena Cecchi Aste for Gaeta, Luciana Frangioni for Milan and Reinhold Mueller for Venice. Note that we have extended the dataset for Bruges and corrected some of the rates given for Venice.

The exchange rates at each centre are listed in the appendix along with the method by which the rate was quoted. As far as practicable, we have tried to remain as close as possible to the original method of quotation, except where it was necessary to standardise for reasons of intelligibility or comparability.

Methods of quotation

These medieval business letters are not easy sources to use. Just like FX traders today, the medieval merchants developed their own conventions and terms to describe the exchange rates. It is thus vital to understand the different ways in which exchange rates were quoted by merchants during the middle ages.

There were two main methods of quotation:

1. rates were quoted as 'uncertain for certain', that is as a variable number of units of currency A per fixed unit of currency B.
2. In the second, rates were quoted as a percentage better or worse than par, reflecting the fact that most gold coins were based on a common model, either the florin of Florence or the ducat of Venice, and so had a similar intrinsic metallic content.

For example, the exchange rate between Florence and Venice was quoted in terms of an uncertain number of Florentine *lira*, *soldi* and *denari affiorino* (for convoluted historical reasons, one Florentine florin was equal to 29 *soldi affiorino* – and thus 348 *denari*) per one *lira di grossi* (equivalent to 10 Venetian ducats). During the period of the Datini letters, the exchange rate moved

between about 14 *lira* 10 *soldi affiorino* and 15 *lira* 16 *soldi affiorino* or 3,480 *denari* to 3,792 *denari affiorino*. Day to day rates were quoted down to a single *denari affiorino*, although they generally moved in increments of two, four or six *denari*.[1] Thus, a rise in the quoted exchange rate reflects an increase in the value of currency B (which gave certain) but a decrease in the value of currency A (which gave uncertain). Conversely a fall would mean that currency A was appreciating in value while B was falling.

The second method quoted rates as a percentage better (*meglio*) or worse (*peggio*) than par.[2] If, for example, the rate at Florence for the Genoese florin was at par, then 100 Florentine florins were equal to 100 Genoese florins. If the rate was five better, then the same 100 Florentine florins would be worth 105 Genoese florins. However, if the rate was five worse, then the buyer would have to pay 105 Florentine florins to receive 100 Genoese – not that 100 Florentine florins would equal 95 Genoese.[3] This method of quotation seems counter-intuitive but in fact it had a significant benefit. If the rate at Florence was five worse and that at Genoa was six better, then the merchant could quickly calculate the spread between the two rates by deducting the worse rate from the better. In this case, the spread would have been one per cent. In fact, this is similar to the first method with the stronger currency effectively giving 'certain' and the weaker currency 'uncertain'. However, it could give rise to problems in cases where the exchange rate moved from better to worse. For this reason, we have converted all par rates in our dataset to a number of foreign coins per 100 local coins.

In addition, in practice there were a number of complicating factors. One of these was the use of 'imaginary' moneys of account. For instance, although exchange rates with Genoa and Milan were expressed in terms of the gold Genoese florin and the gold Milanese ducat respectively, in fact these gold coins represented a fixed number of local silver coins. The Genoese florin was equal to 25 silver soldi and the Milanese ducat to 32 silver soldi imperiali. Similarly, by the end of the fourteenth century, the French gold franc was used to refer to the silver *livre tournois*. In such cases, when the local silver coinage was debased or enhanced, this caused the exchange rates to move even though they were nominally based on the gold coin.

Bruges presents by far the most convoluted situation and requires more detailed treatment. In general, letters from Bruges quoted exchange rates in terms of a variable number of silver groats per foreign coin (i.e. Bruges gave uncertain). The two exceptions were Barcelona and London, both of which gave 'uncertain' to Bruges, although even here the former rate was expressed in terms of an *écu* of 22 groats whereas the latter used an *écu* of 24 groats. Merchants at Barcelona and London used the same method as above. For rates quoted outside of Bruges, however, there was a great variety of different methods and they changed over time. In Paris, Genoa, and Florence, rates were expressed as a percentage better or worse than par. Moreover, the imaginary coin used in these

[1] This exchange rate was sometimes quoted as a percentage better or worse than par, where par was taken as ten lira affiorino (3,480d) to one lira di grossi. Such cases have been converted into pence afforino per lira di grossi.

[2] Note that some writers used *meglio*/*peggio questi* meaning that these (i.e. the local currency) was trading better/worse than par, while other writers used *meglio*/*peggio quelli* meaning that those (i.e. the foreign currency) was trading better/worse than par. Obviously these have opposite meanings and the shorthand employed by the merchants is not always as clear as might be hoped.

[3] Mueller unfortunately confuses this issue in his dataset of Venetian exchange rates. For the correct interpretation, see Heers (1961, p.78). We have corrected Mueller's figures in our rates at Venice.

rates was not the same and changed over time. Initially, they seem to use a *réal* of 24 groats but this seems to have been changed to a franc of 42 groats after the devaluation of 1386, before settling at the franc of 33 groats after the devaluation of 1389. From 1411, after another re-valuation of the currency, merchants at Florence finally adopted the system used in Bruges and quoted the rate in terms of groats per florin. For this reason, in our dataset we have converted all such rates into groats per unit of foreign currency.

Other conventions

There are a number of other particular conventions used in the letters that may need explanation. Some rates were described as 'bocie' – meaning that they were estimated rather than based on actual transactions.

Sometimes the writer provided a range of values, using in the form '*x in y*'. These probably mean that the rate moved from *x* to *y* during the day or was in the course of doing so. In most cases, *y* was greater than *x* but not invariably. The writer might also specify that the rate reported was for buyers (*datore*) or sellers (*prenditore*) of bills – or give two rates, one for buyers and the other for sellers. In such cases, we have given the mid-point of the two rates in our dataset.

Exchange rates could change during the course of the day – one reason why the writers left the rates blank until immediately before sending the letter. On occasion, the writer will specify precisely when the letter was sent but usually this information is not given. Where we have multiple observations on the same date, we therefore calculate the average of each different value. This was adopted because often one writer might send several letters to different correspondents at one time on the same day, while another writer only sent one letter at a different time on that day. Taking a simple average of all observations would over-weight duplicates. However, this does not make a significant difference to the final figures.

Spreadsheets

The data is presented in two spreadsheets:

1. **FX_dataset_observations** provides the standardised rates for each individual observation at each centre. If there were multiple letters sent on the same day, each is recorded separately. It also gives a reference for the source of the observation.
2. **FX_dataset_consolidated** provides mean average rates for all the currency pairs on a daily, weekly and monthly basis.

Appendix 1: financial centres, currency pairs and methods of quotation

Code	Centre	Pair	Quotation method
BarAvi	Barcelona	Avignon	Pence of Barcelona per papal franc
BarBru	Barcelona	Bruges	Pence of Barcelona per ecu of 22 groats
BarFlo	Barcelona	Florence	Pence of Barcelona per florin di suggello
BarGen	Barcelona	Genoa	Pence of Barcelona per Genoese florin of 25 soldi
BarMaj	Barcelona	Majorca	Pence of Barcelona per Majorcan real
BarMon	Barcelona	Montpellier	Pence of Barcelona per franc
BarPis	Barcelona	Pisa	Pence of Barcelona per Pisan florin
BarVen	Barcelona	Venice	Pence of Barcelona per Venetian ducat
BruBar	Bruges	Barcelona	Pence of Barcelona per ecu of 22 groats
BruGen	Bruges	Genoa	Groats per Genoese florin of 25 soldi
BruLon	Bruges	London	Pence sterling per ecu of 24 groats
BruPar	Bruges	Paris	Groats per livre tournois
BruPis	Bruges	Pisa	Groats per Pisan florin
BruVen	Bruges	Venice	Groats per Venetian ducat
FloAvi	Florence	Avignon	Papal florins per 100 florins di suggello
FloBar	Florence	Barcelona	Pence of Barcelona per florin di suggello
FloBol	Florence	Bologna	Bolognese ducats per 100 florins di suggello
FloBru	Florence	Bruges	Groats per florin di suggello
FloGae	Florence	Gaeta	Carlini per 5 florins di suggello
FloGen	Florence	Genoa	Groats per florin of 25 soldi
FloLon	Florence	London	Pence sterling per florin di suggello
FloLuc	Florence	Lucca	Lucchese florins per 100 florins di suggello
FloMon	Florence	Montpellier	Francs per 100 florins di suggello
FloNap	Florence	Naples	Carlini per 5 florins di suggello
FloPar	Florence	Paris	Livre tournois per 100 florins di suggello
FloPer	Florence	Perugia	Par between florin and florin
FloPis	Florence	Pisa	Pisan florins per 100 florins di suggello
FloRom	Florence	Rome	Cameral florins per 100 florins di suggello
FloVal	Florence	Valencia	Pence of Valencia per florin di suggello
FloVen	Florence	Venice	Pence affiorino per lira di grossi of 10 ducats
GaeGen	Gaeta	Genoa	Pence of Genoa per gold uncia
GaeFlo	Gaeta	Florence	Carlini per 5 florins di suggello
GenAvi	Genoa	Avignon	Papal florins per 100 Genoese florins of 25 soldi
GenBar	Genoa	Barcelona	Pence of Barcelona per florin of 25 soldi
GenBol	Genoa	Bologna	Bolognese ducats per 100 Genoese florins of 25 soldi
GenBru	Genoa	Bruges	Groats per florin of 25 soldi
GenFlo	Genoa	Florence	Florins di suggello per 100 Genoese florins of 25 soldi
GenGae	Genoa	Gaeta	Pence of Genoa per gold uncia
GenLon	Genoa	London	Pence sterling per Genoese florin of 25 soldi
GenLuc	Genoa	Lucca	Lucchese florins per 100 Genoese florins of 25 soldi
GenMil	Genoa	Milan	Milanese ducats of 32 soldi imperiali per 100 Genoese florins of 25 soldi

GenMon	Genoa	Montpellier	Florins per 100 Genoese florins of 25 soldi
GenNap	Genoa	Naples	Pence of Genoa per gold uncia
GenPal	Genoa	Palermo	Sicilian florins (of 10 carlini) per 100 Genoese florins of 25 soldi
GenPar	Genoa	Paris	Livre tournois per 100 Genoese florins of 25 soldi
GenPis	Genoa	Pisa	Pisan florins per 100 Genoese florins of 25 soldi
GenRom	Genoa	Rome	Cameral florins per 100 Genoese florins of 25 soldi
GenVal	Genoa	Valencia	Pence of Valencia per Genoese florin of 25 soldi
GenVen	Genoa	Venice	Venetian ducats per 100 Genoese florins of 25 soldi
LonBru	London	Bruges	Pence sterling per ecu of 24 groats
LonGen	London	Genoa	Pence sterling per Genoese florin of 25 soldi
LonVen	London	Venice	Pence sterling per Venetian ducat
MilBru	Milan	Bruges	Francs per 100 Milanese ducats of 32 soldi imperiali
MilGen	Milan	Genoa	Genoese florins of 25 soldi per 100 Milanese ducats of 32 soldi imperiali
MilPar	Milan	Paris	Francs per 100 Milanese ducats of 32 soldi imperiali
MilPis	Milan	Pisa	Pisan florins per 100 Milanese ducats of 32 soldi imperiali
MilVen	Milan	Venice	Venetian ducats per 100 Milanese ducats of 32 soldi imperiali
NapFlo	Naples	Florence	Carlini per 5 florins di suggello
NapGen	Naples	Genoa	Pence of Genoa per gold uncia
NapPal	Naples	Palermo	Carlini per 5 florins of 10 carlini
NapPis	Naples	Pisa	Carlini per 5 Pisan florins
ParAvi	Paris	Avignon	Papal francs per 100 livre tournois
ParBru	Paris	Bruges	Groats per livre tournois
ParGen	Paris	Genoa	Genoese florins of 25 soldi per 100 livre tournois
ParLuc	Paris	Lucca	Lucchese florins per 100 livre tournois
ParMon	Paris	Montpellier	Francs per 100 livre tournois
ParPis	Paris	Pisa	Pisan florins per 100 livre tournois
ParVen	Paris	Venice	Venetian ducats per 100 livre tournois
VenBar	Venice	Barcelona	Pence of Barcelona per Venetian ducat
VenBol	Venice	Bologna	Bolognese ducats per 100 Venetian ducats
VenBru	Venice	Bruges	Groats per Venetian ducat
VenFlo	Venice	Florence	Pence affiorino per lira di grossi of 10 ducats
VenGen	Venice	Genoa	Genoese florins of 25 soldi per 100 Venetian ducats
VenLon	Venice	London	Pence sterling per Venetian ducat
VenLuc	Venice	Lucca	Lucchese florins per 100 Venetian ducats
VenMil	Venice	Milan	Milanese ducats of 32 soldi imperiali per 100 Venetian ducats
VenPar	Venice	Paris	Grossi of Venice per livre tournois
VenPis	Venice	Pisa	Pisan florins per 100 Venetian ducats
VenRom	Venice	Rome	Cameral florins per 100 Venetian ducats