

Chicago Fed Letter

Foreign exchange trading and settlement: Past and present

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Since 1989, global foreign exchange turnover (and settlements) has more than tripled, to just over \$2 trillion per day. This article expands upon a January 2005 *Chicago Fed Letter* that described broad clearing and settlement principles, and focuses more specifically on foreign exchange settlement practices, past and present.

Once currencies were free to seek their own economic values, banks quickly realized that FX trading rooms were potential profit centers.

In the 1970s, foreign exchange (FX) trading emerged as a significant line of business for large, internationally active financial institutions. Prior to the mid-1970s, the true commercial need to convert demand deposit account balances from one currency to another was related to import/export transactions that involved letters of credit, and FX rates for any currency tended to be fixed, pegged to another currency, or otherwise contained within predefined target ranges. During the 1970s, FX rates began to float freely; once currencies were free to seek their own economic values, banks quickly realized that FX trading rooms were potential profit centers. More importantly, the methods by which trading counterparties today deliver the currency sold, and receive the contra-currency purchased, are *far* better and safer than the methods under which FX trades settled in the 1970s and 1980s.

The basics

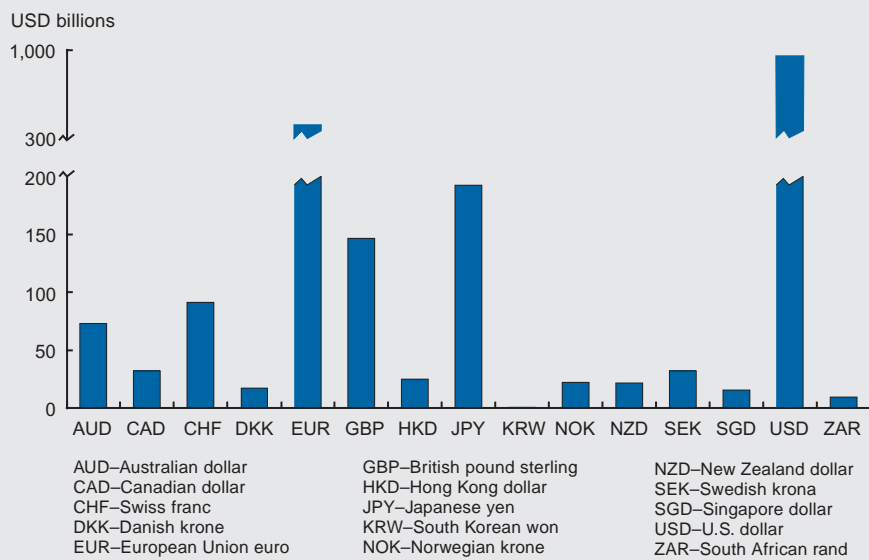
In the 1970s, there were many more European currencies than there are today. Traveling from one European country to another or conducting business in a variety of European countries required that one had sufficient quantities of the proper currencies of all these countries. Imagine traveling from Texas to California, passing through New Mexico and Arizona, with each requiring its own “state” currency. Today, the

so-called eurozone (comprising 25 member states of the European Union) has a single currency, the euro, which is the second most dominant (traded) currency in the world behind the U.S. dollar.

An FX trade, by definition, involves two currencies, the currency sold and the currency purchased, for example, selling U.S. dollars (USD)¹ and buying British pounds sterling (GBP). Foreign exchange transactions always involve both a trade date and a settlement date. The latter is typically called a *value date*—the forward banking day common to both countries² on which both parties to the transaction will pay the currency amount they are obligated to pay with the full expectation that they will receive the currency amount that they are entitled to receive.

Foreign exchange trades typically settle according to standardized settlement conventions, e.g., “for spot” or in two business days; for 30, 60, or 90 calendar days forward; and on the Wednesday following the third Monday of March, June, September, and December.³ Although most FX is traded for spot, many FX transactions are negotiated either well before the planned settlement date (usually to lock in the rate of exchange in advance) or just before the date of a well-anticipated commercial transaction (if fixing the rate of exchange in advance is not a priority).

1. CLS average daily values, March 2005



NOTES: The average daily value of South Korean won was 0.45 billion U.S. dollars; the currency's value is not represented due to scaling.

SOURCE: CLS Bank International.

Finally, there is the issue of temporal risk. Depending on the countries involved, the actual payment of the currency sold and receipt of the contra-currency received will almost certainly occur at different times (but on the same day) and could occur as much as 14 hours apart.

“Trust me” FX settlement

In the early 1970s, the trading of FX was dominated by very large international banks. Settlement payments were made on trust that the contra-currency would be remitted by the counterparty on the proper value date. Banks were accustomed to quantifying and limiting risk exposures to each other, and the trading and ultimate settlement of FX transactions involved such exposures. As there were then no techniques that might have ameliorated the temporal and principal risks associated with FX settlements, those risks were recognized for what they were and addressed by the trading and settlement limits that banks set for each other.⁴

This “trust me” system of settling FX transactions worked fairly well until June 26, 1974. On that Wednesday, German banking authorities shut down Bankhaus Herstatt at the close of the German business day. It was not, however,

the close of the global financial day. In New York, where the majority of the USD sides of FX transactions settled through the Clearing House Interbank Payments System (CHIPS),⁵ it was only late morning (six hours behind Germany). Foreign exchange settlements involving German deutsche marks (DEM) were allowed to be processed (by the bank regulators) through the end of the German banking day. At the close of the German banking day, German banking authorities stopped all of Herstatt’s banking activities. The Chase Manhattan Bank, Herstatt’s USD correspondent bank, stopped sending dollar payments on behalf of Herstatt through CHIPS. Other banks that had entered into FX contracts to sell DEM (and any other currency versus the dollar) and receive USD suddenly realized that they had already paid the DEM to Herstatt and now stood to receive no USD in return. The trust me system essentially came apart at the seams. This is a real life example of why 100% of the principal of an FX transaction is at risk on the value date.

First improvements

In a crude way, the International Monetary Market (IMM), a division of the Chicago Mercantile Exchange, initially

began to protect itself from “Herstatt risk” by requiring that buyers of maturing foreign currency futures contracts remit their USD to the exchange one or two days before the settlement date.⁶ This early asymmetric approach at least eliminated Herstatt risk for the buyers of FX (sellers of USD). In March 1977, the IMM implemented the first *payment versus payment* methodology⁷ for delivering FX on maturing futures contracts.

Sellers of foreign currency were instructed to deliver their foreign currency into the IMM’s indigenous foreign currency delivery accounts. Sellers making good delivery were paid their USD from Chicago; those that failed to make good delivery were not. Dollars so withheld constituted cash collateral that secured any foreign currency overdrafts in non-dollar accounts at the IMM’s bank.⁸ Principal risk associated with the settlement of FX was thus eliminated.⁹

In 1990, the Society for Worldwide Interbank Financial Telecommunication (SWIFT)¹⁰ inaugurated its FX trade confirmation comparison service, Accord. This additional value-added service automated much of the back-office processing of FX trades, provided running settlement exposures to counterparties by currency and value date, and optionally created the additional SWIFT messages to cause FX payments to be made on the appropriate value date. SWIFT’s Accord later became the “front end” to the CLS (Continuous Linked Settlement) Bank International (discussed later).

In March 1996, the Bank for International Settlements (BIS) published the Allsopp Report,¹¹ a sobering insight into the magnitude of the daily settlements among the 80 largest banks in the world and the risk mitigation tools they were using. In many cases, the risk of FX settlements of a single large international bank to a single counterparty often exceeded the capital of the bank.

That October, the U.S. Federal Reserve announced that its Fedwire funds transfer service (Fedwire) would open at 12:30 a.m. eastern time, starting on December 8, 1997. This meant that, for the first time, Fedwire and all other

major national payment systems would have common operating hours. Other central banks made minor adjustments to their respective settlement deadlines, removing virtually all remaining obstacles for the emergence of a potential private sector solution that could provide true payment versus payment settlement of the world's FX transactions (without principal risk).

Today, on average, slightly over \$2 trillion of FX transactions settle every business day without principal risk.

At the annual SWIFT international banking operations seminar (Sibos), held in Florence, Italy, in 1996, a consortium of approximately 20 banks announced that it would expend significant resources to develop a simultaneous payment versus payment methodology to settle FX transactions. This methodology would become known as CLS, for Continuous Linked Settlement.¹² This consortium of banks also announced that its members expected to use SWIFT's Accord for CLS's "front end."¹³

21st century methodology

CLS Bank International commenced operations of its CLS service on September 9, 2002. The CLS system makes every payment individually by simultaneously transferring, across its own books, the currency sold and the currency purchased. Because the system queues transactions in the optimal order to be processed (meaning the order that minimizes the clearing participants' actual funding requirements), the amount of actual funding required of CLS clearing participants is only about 2% of the gross amount of settlements. Clearing participants are required to remit currency payments to the CLS accounts maintained at central banks by a specific time.

The CLS process is designed to take advantage of the overlapping hours of the national payments systems of the relevant currencies to fund the multilaterally netted settlement obligations (pay-ins) necessary to extinguish the

provisional credit extended by CLS Bank International to its clearing participants.

Today, on average, slightly over \$2 trillion of FX transactions settle every business day without principal risk. That is, CLS does not guarantee that the counterparty with which a party elects to do an FX transaction will necessarily complete it, or complete it with proper value.

Rather, CLS represents that if a party delivers its FX properly, it will receive the contra-currency (if the counterparty delivers it properly) or the FX payment will be returned (if the counterparty fails to deliver its contra-currency). Thus, the Herstatt risk has been eliminated, although counterparty operational performance exposure remains.

Figure 1 shows the proportion of the currencies that settle through CLS. It should be noted that the U.S. dollar (USD) and the euro (EUR) dominate the FX markets. The Japanese yen (JPY), British pound sterling (GBP), and the Swiss franc (CHF) are also highly traded currencies.

Conclusion

In the 1970s, the trading of FX emerged from a little known moneychanging operation, usually associated with the letter of credit departments of large international banks, to a major line of business for many of these banks. Telecommunications have evolved from 300 baud Edward R. Murrow-esque teletype machines to electronic trading screens with near instantaneous response times. SWIFT, itself created in the early 1970s, has emerged as the network of choice for banks to exchange (transmit) FX trade confirmations and to send payment instructions that ultimately settle such trades (most likely through CLS). The trust me method of settling FX transactions with all of its inherent risks is almost history.¹⁴ It is appropriate, given the explosive growth in global capital

markets in general and foreign exchange in particular, that today's modern financial system can settle every day (on average) 170,000 transactions, the approximate equivalent of \$2 trillion¹⁵ of FX transactions, without principal risk.

¹ International currency codes are always three characters—the first two describe the country of origin (usually in the language of that country) and the last character describes the name of the currency.

² Foreign currency transactions can only be entered to settle on business (banking) dates common to both countries. While European and North American banking holidays often coincide, this is not the case with holidays in the Middle East, Asia, and Africa. The process of determining value dates for FX transactions is precise.

³ These four dates are IMM (International Monetary Market) dates—the settlement dates for all FX futures contracts traded on the International Monetary Market, a division of the Chicago Mercantile Exchange, and on the FINEX (Financial Instrument Exchange) division of the New York Board of Trade. An inordinate amount of FX transactions and financial derivatives contracts (traded on and off organized markets) also intentionally settle on these four dates. Futures-related FX deliveries currently average approximately \$50 billion; OTC (over-the-counter) derivatives that settle on these dates are many multiples of that.

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⁴ In addition, many banks' support systems at the time did not have the capacity to recognize the risk offsetting characteristics of unmatured purchases and sales of the same currencies. Thus, the assumed replacement value (5%–10%) of all open FX contracts often more than covered the true replacement exposures of an entire portfolio of forward FX trades.

⁵ In 1974, CHIPS settled dollar transactions in next day funds. Payments for value today were multilaterally netted as though they were made, and clearing participants having an obligation to make payment did so the *following morning* in same day funds (hence, the term next day funds). This convention continued until October 1, 1981, when CHIPS clearing participants began to settle their respective net funding obligations at the end of the business day in same day funds.

⁶ Buyers of European currencies were required to post 100% of the purchase price on the third Monday of March, June, September, and December. Buyers of Canadian dollars and Mexican pesos were required to post their payments in full on Tuesdays. Buyers of foreign currency were paid interest on their deposits. This limited the IMM clearinghouse's risk exposure to buyers of foreign currency.

⁷ Granted, the payment of USD occurred on a different date than the payment of the foreign currency.

⁸ Because buyers of foreign currency were required to pay their dollars one or two days in advance, buyers were known to be "good." Accordingly, the IMM paid FX to the buyers in anticipation of receipt from the sellers. Any shortfalls were collateralized with the USD that were then not remitted to sellers that failed to deliver FX properly. Errant transactions, although few, usually came in a day or two late; then and only then did the sellers receive their USD. In the early 1980s, The Options Clearing Corporation implemented a nearly identical system to settle options on FX.

⁹ Today, currency futures contracts traded on the IMM that are also eligible to settle through CLS Bank International do so. CLS Bank International is chartered as an Edge Act corporation, or as a U.S. corporation that is allowed only to engage in international banking or other financial transactions related to international business; it is supervised by the Federal Reserve. CLS Bank International's main operations center is in London with backup facilities in the U.S. It is a privately owned bank, designed to transfer ownership of currency pairs simultaneously.

¹⁰ SWIFT was created in the early 1970s and is owned by the largest banks in the world. Its primary product is a highly secure "store and forward" network that allows banks and other financial services companies to send standardized messages to effect payments and settle trades.

¹¹ Bank for International Settlements, Committee on Payment and Settlement Systems, 1996, "Settlement risk in foreign exchange transactions," report, Basel, Switzerland, March.

¹² See Gabriele Galati, 2002, "Settlement risk in foreign exchange markets and CLS Bank," *BIS Quarterly Review*, December, pp. 55–65.

¹³ Clearing and settlement systems have "front ends" and "back ends." A front end is made up of the hardware, software, and communications links by which clearing organizations receive and compare trade data. A clearing organization's back end refers to the transmission of settlement transactions to settlement banks and/or securities depositories.

¹⁴ Herstatt risk is still present in settlements of currencies not currently supported by CLS.

¹⁵ Peak daily settlement through CLS was the equivalent to \$3.684 trillion.