

Chapter 10 **Currency Risk and Rollover Risk**

When a bank lends in a foreign currency, the bank typically needs to borrow in that currency, too. Even if it can borrow easily in the domestic currency, insufficient *funding liquidity* in a foreign currency can undermine the health of a bank.¹ In the crisis of 2007-09, systemic risks arising from foreign currency intermediation compelled many central banks to cooperate in new and expanded ways to prevent a global financial meltdown (core principle 5).

Banks face *currency risk* if they borrow in one currency and lend in another. That is, they have made a bet on the direction currencies will move. If the currency in which they made the loan appreciates relative to the currency in which they have borrowed, they benefit. If the opposite occurs, then they lose. The larger the mismatch between the volume of lending and borrowing in a currency, the greater the currency risk. Currency risk can be compared to *maturity risk* that we learned about in studying the yield curve (see Chapter 7): the greater the mismatch between the maturity of a bank's lending and borrowing, the greater its maturity risk.

In practice, large international banks often experience temporary currency mismatches. To limit the risks that accompany these mismatches, banks that lend in a foreign currency will try to borrow in the same currency. But because bank loans usually have a longer maturity than bank borrowings, instead of the risk of the currency mismatch, banks will face the risk that funding liquidity in the foreign currency will dry up.

The potential shortage of funding liquidity is often called *rollover risk*, because it may be difficult or impossible for a bank to "roll over" its short-term borrowing. If a bank cannot roll over its borrowing in a foreign currency, it must either sell the foreign assets or accept increased currency risk by borrowing domestically. In an extreme crisis, even these options may prove unavailable, putting the bank's survival at risk.

A simple balance sheet of a hypothetical Japanese bank helps to illustrate these currency and rollover risks (see Figure 1). The bank borrowed short term in yen and dollars, and made long-term loans in both currencies. The bank has a currency mismatch of \$100 million, equal to the gap between its lending and borrowing in the foreign currency. At an initial exchange rate of ¥100/US\$, this gap equals ¥10 billion. What is the bank's currency risk? If the yen appreciates to ¥99/US\$, the bank loses ¥100 million. If the yen depreciates to ¥101/US\$, the bank gains ¥100 million. In addition to this dollar currency risk, the bank also has rollover risk in dollars. If it cannot roll over its short-term dollar borrowing, the bank must pay

¹ We defined funding liquidity in the Chapter 2 module, Liquidity Risk and the Crisis of 2007-09, as the ease with which a financial institution can borrow to purchase assets or to hold assets previously acquired.

back the \$100 million by borrowing in yen (adding to currency risk) or by selling dollar loans.

Figure 1. Simple Balance Sheet of an Imaginary Japanese Bank (Initial Exchange Rate of ¥100/US\$)

Assets	Liabilities
<u>Long Term</u>	<u>Short Term</u>
¥10 billion	¥20 billion
US\$200 million	US\$100 million

Currency and Rollover Risk in the Financial Crisis. When lending dried up in the interbank market during the financial crisis (see the Chapter 3 module: Interbank Lending), many foreign banks that had borrowed dollars faced massive rollover risk. The problem was so widespread (at least in some countries) that it posed a systemic threat.

From a policy perspective, the problem was not just to create an adequate supply of dollar liquidity, but to deliver that liquidity where it was needed. Only the central bank of the United States can create dollars, but the U.S. central bank has limited information about the foreign banks that need dollar liquidity. Rather than lend dollars directly in large quantities on a sustained basis to many foreign private banks, the U.S. central bank arranged a series of extraordinary dollar swap contracts with foreign central banks. Over time, ten foreign central banks undertook large dollar swaps with the U.S. Federal Reserve.

These swap contracts provided the foreign central banks with U.S. dollars that they could lend on to their domestic banking systems. In order to prevent a systemic crisis, the foreign central banks accepted the risk of lending to their domestic banks in a foreign currency (U.S. dollars). The resulting division of labor between central banks allocated the responsibility of monitoring the safety of private foreign banks to those who knew them best (their own central banks), rather than to the U.S. Federal Reserve. The foreign central banks also bore the currency risk.

While currency swaps between central banks have existed for decades, their breadth and scale in the financial crisis of 2007-09 were unprecedented. Central bank provision of liquidity during the crisis broke new ground in other ways, too, as policymakers expanded the range of counterparties with whom they transacted, the type and maturities of assets purchased, and the varieties of collateral accepted. In this context, what is most special about the central bank swap arrangements is the extraordinary international cooperation that they highlight. These voluntary agreements underscore the common desire of policymakers across many countries to safeguard financial stability (core principle 5).