The USDX is quite unique among currency indices in its fixed composition. It has changed once since its 1973 introduction, and that was when the euro was launched in January 1999, replacing a number of European currencies. The net representation of the European legacy currencies in the USDX remained fixed at 57.6%.

By contrast, the Federal Reserve’s trade-weighted dollar index changes annually to reflect prior-year developments. Because the Federal Reserve is not in the business of licensing economic indicators for commercial purposes, this after-the-fact index is unsuitable for trading purposes. The relative weights of the two indices are shown on the next page.

Yet for all of the differences in weighting and composition, the ICE USDX futures contract and cash index matches the Federal Reserve’s trade-weighted index of major currencies very closely. Its r2, or percentage of variance explained, is .933 with the deviations occurring in four distinct periods. The first, 1978-1981, was a period when the dollar was especially weak against the major currencies. The next two, 1984-1985 and 2000-2002, occurred when the dollar was especially strong against the major currencies. The fourth divergence began as Europe’s sovereign credit problems moved to the forefront in 2009 and continued throughout calendar 2011. The Federal Reserve’s broad trade-weighted index, which includes minor currencies, is displayed for reference purposes.
The value of the ICE USDX is underscored by its stability in the face of changing trade weights over time. The Federal Reserve has indices for total trade weights and for import and export weights. The post-1973 history of the total trade weight series is dominated by the rise of Mexico and especially China as trading partners of the U.S., at the expense of Japan and Canada.

If we divide total weights into import and export weights, the increasing role of China and Mexico become even more apparent on the import side, as has the role of Mexico vis-à-vis Japan on the export side. China is becoming increasingly important as a customer for U.S. exports as well. Currencies are only a partial explanation for changes in trade weights. Other factors such as labor costs, resource endowments and changes in national economic growth rates following changes in internal political systems can be far more important than currencies in determining a nation’s trade patterns.

The twin deficits

If trade flows do not drive the ICE USDX or vice-versa, do the U.S. federal and current account deficits, the so-called twin deficits? Not as much as the dollar’s many detractors would like to believe. The current account deficit as a percentage of GDP expanded in two great episodes, the first half of the 1980s and 1998-2006. Both expansions led the decline of the ICE USDX by 24 months. However, the narrowing of the current account deficit between 1988 and 1991 produced no
rally in the ICE USDX, and the huge rally in the ICE USDX between 1980 and 1985 occurred independently of the current account deficit. A relationship should work both ways for it to be causal.

**THE USDX AND THE CURRENT ACCOUNT DEFICIT**

The analysis breaks down for the federal budget as a percentage of GDP too. The federal deficit has led the ICE USDX by 12 months since the early 1990s, but the relationship was precisely the opposite in the early 1980s. As economic relationships are not allowed to reverse if they are in fact causal, we have to look elsewhere. Nobel laureate Robert Mundell would offer a simple explanation: The combination of fiscal stimulus and monetary discipline in the early 1980s propelled the ICE USDX higher, while lax monetary policies after 2001 and especially after the 2008 financial crisis pushed the ICE USDX lower.

**INTEREST RATE EXPECTATIONS**

The primary driver of all currency movements is differential interest rate expectations. While many traders can get by on a day-to-day basis thinking they are buying a currency with a long position in a currency future, they really are borrowing the dollar to lend in another currency. The process of covered interest arbitrage involves,

in the case of the euro:
1. Borrow USD
2. Sell USD and buy EUR at prevailing spot rate
3. Lend EUR
4. Unwind the trade in the forward market

As the principal instrument in the currency market is a three-month non-deliverable forward, the key forward-looking interest rate differential at the trade’s unwind is the forward rate between six and nine months. This forward rate divided by the nine-month rate produces a forward rate ratio (FRR6,9) that is greater than 1.00 when the LIBOR curve is positively sloped and below 1.00 when it is inverted. The difference between two FRR6,9 numbers tends to lead the spot currency rate by irregular intervals centering on three months when the currencies are allowed to trade freely. These lead-times became erratic following the 2008 financial crisis and the widespread adoption of near-0% interest rates and quantitative easing in key countries.

The expected interest rate differential between the U.S. dollar and the weighted sum of the USDX’ six FRR6,9 moved to an unnaturally steep discount during and after the 2008 financial crisis as few believed the U.S. would keep its short-term interest rates so low for such a long period of time.

**RELATIVE ASSET RETURNS**

A third component of currency movements is relative returns on assets. Money is attracted to capital markets offering better forward-looking returns. The weighted performance of the six dollar index component national stock markets relative to the U.S. leads the USDX, inversely, by three months on average. As the six national stock markets advance (decline) relative to the U.S., the USDX falls (rises) with a three-month lag.
IF MANAGERS DECIDED TO HEDGE DOLLAR RISK, THE ICE USDX FUTURES AND OPTIONS ARE AN EFFECTIVE MEANS OF DOING SO. THE SIX COMPONENTS OF THE ICE USDX INDEX HAVE A SURPRISINGLY LOW CORRELATION OF RETURNS WITH EACH OTHER, AS SHOWN IN THE TABLE BELOW. THIS MAKES THE ICE USDX AN EFFECTIVE BROAD HEDGE AS OPPOSED TO, SAY, SIMPLY TRADING THE EURO OR THE YEN. THE CELLS HIGHLIGHTED IN RED ARE THE ONLY CURRENCY PAIRS RELATED CLOSELY ENOUGH TO EACH OTHER TO CONSTITUTE A BONA FIDE HEDGE UNDER FAS 133.

<table>
<thead>
<tr>
<th>Currency</th>
<th>USDX</th>
<th>EUR</th>
<th>JPY</th>
<th>GBP</th>
<th>CAD</th>
<th>CHF</th>
<th>SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Euro</td>
<td>-0.938</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yen</td>
<td>-0.391</td>
<td>0.257</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pound</td>
<td>-0.763</td>
<td>0.653</td>
<td>0.153</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian Dollar</td>
<td>-0.485</td>
<td>0.449</td>
<td>-0.952</td>
<td>0.426</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swiss Franc</td>
<td>-0.810</td>
<td>0.919</td>
<td>0.378</td>
<td>0.537</td>
<td>0.290</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Swedish Krona</td>
<td>-0.796</td>
<td>0.833</td>
<td>0.145</td>
<td>0.602</td>
<td>0.519</td>
<td>0.645</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Source: Bloomberg

ACTIVE CURRENCY MANAGEMENT: THE BARCLAY CURRENCY TRADERS INDEX

Because hedging decisions are made ex-ante, the only question to be asked is whether the total return differential on a ICE USDX-hedged position offset changes in the unhedged portfolio. Between January 1999 and December 2011, the average annual total return on ICE USDX futures was -1.66%. The average annual returns on the unhedged and hedged global bond portfolios were 3.82% and 2.55%, respectively, a difference of 1.17% per annum. As the return differential on the two bond portfolios was less than the decline on the hedge instrument, we must conclude the ICE USDX futures were a very effective hedge instrument. We can reach the same conclusion for the MSCI equity portfolios. Here the average annual returns for the unhedged and hedged portfolios were 2.98% and 1.39%, respectively, a difference of 1.59% per annum.
ICE U.S. DOLLAR INDEX FUTURES

The principal trading advantage of ICE USDX futures (in addition to their intrinsic economic characteristics), is their low cost, liquidity and transparency. Instead of paying bid-ask spreads on six separate currencies, an investor can go long or short the global FX market using ICE USDX futures.

ICE USDX futures are settled physically in the component currencies. Contract specifications are:

**ICE FUTURES U.S. U.S. DOLLAR INDEX FUTURES SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Hours</th>
<th>0800 Eastern Standard Time to 1500 (Closing period 1459-1500)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>DX</td>
</tr>
<tr>
<td>Size</td>
<td>$1,000 * Index Value</td>
</tr>
<tr>
<td>Quotation</td>
<td>USDX points calculated to three decimal points</td>
</tr>
<tr>
<td>Contract Cycle</td>
<td>Mar-Jun-Sep-Dec quarterly expiration cycle</td>
</tr>
<tr>
<td>Minimum Fluctuation (&quot;tick&quot;)</td>
<td>0.005 = $5</td>
</tr>
<tr>
<td>Strike Intervals</td>
<td>Physical delivery of six component currencies in their respective weights on third Wednesday of the expiration month.</td>
</tr>
<tr>
<td>Final Settlement</td>
<td>None</td>
</tr>
<tr>
<td>Daily Price Limit</td>
<td>None</td>
</tr>
<tr>
<td>Last Trading Day</td>
<td>Two Fridays before third Wednesday of expiring contract month.</td>
</tr>
</tbody>
</table>
TRADING ICE FUTURES U.S. DOLLAR INDEX FUTURES AND OPTIONS

Futures markets exist for the purposes of price discovery and risk transfer. Price discovery requires buyers and sellers to meet in a competitive marketplace; prices resulting from each transaction signal to other traders what a given commodity might be worth.

Anyone approved by a clearing member or futures commission merchant can participate in the price discovery process, regardless of their participation in the currency trading business. A market participant who is not in the currency trading business will be classified as a non-commercial or speculative trader. A market participant active in the business will be classified as a commercial trader or hedging trader. For a speculator, the price discovery trade is simple and straightforward; if you believe the ICE USDX will rise, you “go long” a futures contract; if you believe the ICE USDX will fall, you “go short” a futures contract.

These same market views can be expressed in options as well. If you believe the ICE USDX will rise, you can buy a call option, sell a put option or engage in a large number of spread trades tailored to your specific price view and risk acceptance. If you believe the ICE USDX will fall, you can buy a put option, sell a call option or engage in a different set of spread trades. A long call (put) option is the right, but not the obligation, to go long (short) the underlying future at the strike price at or by expiration. A short call (put) option is the obligation to deliver (take delivery) of the underlying future at or by the expiration if that option is exercised. In a futures trade, you and the counterparty to your trade will post initial or original margin with your futures commission merchant or clearing member. Minimum margins are set by ICE Futures U.S., and your futures commission merchant may require additional funds. Margin schedule

There are no margin requirements for long option positions. Margin requirements for short option positions vary according to the relationship between the option strike price and the futures price. If the market moves in your favor - higher for a long position (or commitment to take delivery of the ICE USDX’s components or to offset the contract by selling it prior to delivery), or lower for a short position (or commitment to deliver the ICE USDX components or to offset the contract by buying it prior to delivery) - the equity in your account will increase. You may withdraw these funds down to the “maintenance margin” level, depending on your account agreement.

If the market moves adversely - lower for a long position or higher for a short position - your futures commission merchant will require you to post additional funds, called variation margin, to sustain your maintenance margin level. These “margin calls” assure both your futures commission merchant and ICE Clear U.S., the exchange clearing house, you can perform according to your contractual commitment. All futures accounts are marked-to-market daily, and participants deficient in margin obligations may have positions liquidated involuntarily.

As the designated clearing house, ICE Clear U.S. serves as the counterparty to every futures contract traded on ICE Futures U.S. The clearing house clears trades matched by ICE Futures U.S. and guarantees performance in delivery even if a trader defaults.

What do the financial flows look like in a futures trade? Let’s say a five-contract December futures position is initiated at 75.00 and the market rises to 75.50 on the following trading day.

• For the long position, the gain is:
  5 contracts x [75.50 - 75.00]/contract x $10 per .01 ICE USDX point = $2,500

• For the short position, the loss is equal and opposite:
  5 contracts x [75.00 - 75.50]/contract x $10 per .01 ICE USDX point = -$2,500

If we reverse the price path, we reverse the gains and losses. Let’s change the starting price to 76.75 and have the market decline to 75.35 the next day.

• For the long position, the loss is:
  5 contracts x [75.35 - 76.75]/contract x $10 per .01 ICE USDX point = -$7,000

• For the short position, the gain is equal and opposite:
  5 contracts x [76.75 - 75.35]/contract x $10 per .01 ICE USDX point = $7,000

Options traders see the same directional profit and loss profiles relative to price, but the actual profit and loss is subject to a range of additional factors, including market volatility, time to expiration, interest rates and the relationship between the current futures price and the option’s strike price.

RISK TRANSFER

Risk transfer is the second purpose of a futures market. Any holder of dollar-denominated assets or receiver of future dollar payments can seek protection in the futures markets. These participants are long the market and can offset risk by going short a futures contract. Any dollar-domiciled holder of foreign currency assets, or any party liable for future dollar payments, is short the market and can offset risk by going long a futures contract. The mechanics and financial flows are identical to those outlined above. An importer at risk to the dollar falling can acquire a financial asset, the short futures position, which will rise in value as the market declines. The opposite is true for an exporter at risk to the dollar rising; a long futures position will rise in value as the market rises.
Nothing in the above discussion of hedging tells you when or at what price to hedge. This is one of the reasons options are valuable to hedgers. While the importer may wish to have downside protection or a price floor, that same importer probably wants to participate in any future increases in the exchange value of the dollar. The exporter concerned about a decline in the dollar between now and the time he expects to be able to receive payment in early December could buy a December 75.00 put option, which is the right, but not the obligation, to receive a short position in a December future at 75.00 for 0.405, or $405. The purchased put guarantees the importer the right to sell the December future for an effective price of 74.595 (the 75.00 strike price less the premium paid of 0.405). This right gives him protection if the ICE USDX weakens by the expiry of the December option, but at the same time preserves his ability to profit should the ICE USDX strengthen over the period.

The exporter wishing to cap the rate of foreign currency payments but not be exposed to margin calls if the price continues to rise can do an opposite trade and buy a December call option, which is the right, but not the obligation, to receive a long position in a December future at 75.00 for 2.175 or approximately $2,175. The purchased call gives the exporter the right to buy the December future at 77.175 (again, the strike price of 75 plus the 2.175 points paid), offering protection against an unfavorable firming of the dollar while preserving the ability to take advantage if the dollar weakens.

It should be noted that the risk profile for sellers of options is dramatically different than for buyers of options. For buyers, the risk of an option is limited to the premium or purchase price paid to buy the option. For sellers, the risk profile is unknown and can be potentially quite large. Options can become complex very quickly, with trading influenced by variables including time remaining to expiration, the volatility of the commodity, short-term interest rates and a host of expected movements collectively called “the Greeks.”
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