



March 2008

UBS research focus

Currencies: a delicate imbalance

Unprecedented global imbalances will eventually adjust

Building inflation pressures may trigger a massive realignment

Sudden appreciation of pegged currencies impairs growth

A slower adjustment may further inflate existing asset bubbles

Risk of these imbalances is not reflected in financial markets

Warrants a more defensive posture and broader diversification

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Dear reader,

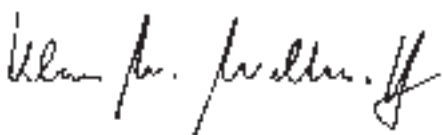
At present, the world's currencies are grossly out of alignment. Many are extremely overvalued, while others are wildly undervalued. The seeds were sown more than a decade ago, following the crisis in Asia, when many currencies were devalued to shore up internal finances. To bring balance to the region's economies and restore growth, central banks pegged their currencies at competitive rates versus the US dollar. This decision helped to extend a period of global economic prosperity brought about by the integration of an abundant pool of evermore productive labor in the region.

Fortunately, this period of strong economic growth was also associated with low inflation, low interest rates, real estate and commodities booms, and a huge windfall to oil-producing countries. As long as incomes ascended and inflation was contained, maintaining weak currencies seemed a good idea. The large imbalances remained concealed for the most part. Of course, economists warned time and again of the ballooning US current account deficit and the enormous growth of emerging market foreign exchange reserves. Predictably, politicians entered the fray grumbling about anti-competitive behavior and lost jobs.

Economists' warnings have seemed rather exaggerated, even shrill, as long as financial markets and economic growth maintain their upward paths. Yet we cannot ignore that these conditions are unsustainable. We do not know precisely when a correction may begin, nor its potential scale. And while we cannot point to a specific trigger, the currency market seems like a reasonable candidate.

Foreign exchange swings can reverberate through your investment portfolio. Buy foreign securities and you bear currency risk directly. Invest in multinational companies and you bear currency risk indirectly. If exchange rates move quickly enough, the shifts can have severe ramifications for economic growth, inflation, monetary policy, and fiscal policy. If this happens, then the very foundation for asset prices becomes shaky.

The imbalances in currency markets mirror the imbalances in global trade and capital flows. But more than just reflecting global conditions, currencies are also emitting some smoke signals these days that may warn of changes to the status quo. We take a close look at currency dynamics in this *UBS research focus*, and we offer some perspectives, not only on how to think about the adjustment mechanism, but also on how to protect your portfolio against the risk that these imbalances reflect.



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Currencies: a delicate imbalance

■ Misalignments in currency markets reflect global imbalances

Several emerging market currencies are either pegged to, or in a managed relationship with, the USD, especially the Chinese yuan, other major Asian currencies, and the currencies of the Gulf Cooperation Council. These countries have been characterized over the past several years by strong economic growth, high and increasing current account surpluses, enormous foreign exchange reserve accumulation, and buoyant financial and real estate markets. By the end of 2007, these same countries were also facing an acceleration of inflation.

■ Unprecedented global imbalances will eventually adjust

We argue that pegged currencies are likely to appreciate for several reasons, most notably to prevent a further increase in inflation pressures in these countries. Monetary policy officials might also find the cost of trying to prevent their foreign exchange inflows from entering the money supply (so-called monetary "sterilization") increasingly prohibitive. Geopolitical tensions, brought about by competitiveness concerns in countries with overvalued currencies, could also trigger a revaluation. The timing and the speed of appreciation are uncertain.

■ Sharp exchange rate realignment to pressure global growth

A sudden appreciation of pegged currencies would likely have negative consequences for the global economy. Ultimately, the structural realignment of production centers resulting from changes in competitiveness would take time to unfold and would likely result in a near-term reduction in global growth and an increase in inflation. A slower currency adjustment would allow asset bubbles and consumer price inflation to continue growing in countries with pegged currencies.

■ Risk of these imbalances is not reflected in financial markets

The threat of depegging and the risk of these imbalances are not reflected in the price of higher-risk assets, such as emerging market equities and real estate, and certain commodities, such as base metals and energy. Developed country bonds are poorly positioned for a potential increase in global inflation rates. And while developed country equity markets are not expensive on a historical basis, past comparisons may not be relevant during periods when the global risk premium is rising. Overall, we advise investors to remain alert to opportunities that might arise from a delayed adjustment, but to hold a broadly diversified and defensive portfolio that protects against the risks posed by these imbalances.

Chapter 1

Reflections on global imbalances

Andreas Höfert – Chief Global Economist

Reflections on global imbalances

“Only a fool would forecast exchange rates, though apparently there are quite a few who are happy to be given that description.”

– Mervyn King, Governor of the Bank of England

Why it is so difficult to forecast currencies?

Microeconomics textbooks usually begin with an analysis of the type of market that functions under perfect competition. Such a market is assumed to have:

- a large number of market participants who are too small to influence prices,
- completely homogeneous goods to exchange with each other, and
- information transparency; that is, new information is available to all participants at the same time.

Of course, these assumptions are so unrealistic that the concept of perfect competition serves merely as an abstract construct, a starting point to describe what happens in the real world.

But there is one market that approaches this ideal notion of perfect competition: the market for currencies, or foreign exchange. There are many participants, and most, but not all, are too small to impact prices (see box below for a discussion of the size of the currency market). The goods exchanged are currencies, which are completely homogeneous: each dollar is exactly the same as the next. Information is spread sufficiently fast so that the condition of transparency is broadly met. For example, it would be rather difficult to front-run the US dollar or to have insider knowledge on the Japanese yen.

In such a near-perfect market, forecasting, or at least explaining, exchange rate movements would appear to be an easy undertaking. Quite the opposite is true. While a tremendous amount of academic research has attempted to refine the theoretical foundations and models for explaining

The size of the currency market

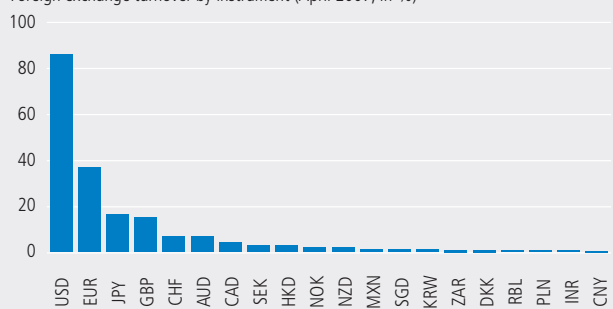
How big is the global foreign currency market? According to the Bank for International Settlements (BIS) the normal daily turnover of the foreign exchange market amounted to 3.2 trillion US dollars (USD) in April 2007. To try to apply a scale to that very large number, consider that the average daily world trade volume amounts to just USD 80 billion, according to the IMF. The USD boasts the lion's share of all transactions (see Fig. 1.1.) Over 86% of the world's foreign exchange transactions involve the USD as one of the two currencies traded. The euro (EUR) comes a distant second with just 37%. (The total of all currencies adds up to 200% because there are two currencies involved in each foreign exchange transaction.)

Moreover, the EURUSD currency pair alone represents 27% of all trades. The USD is traded against a currency other than the EUR 59% of the time, 10% of all transactions find the EUR being traded against a currency other than the USD, and only 4% of all foreign exchange transactions involve neither the USD nor the EUR. Even the Swiss franc (CHF), known for its

safe-haven status and low inflation, captures only 7% of worldwide foreign exchange transactions.

Fig. 1.1: Importance of currencies

Foreign exchange turnover by instrument (April 2007, in %)



Note: Total of all currencies adds up to 200% because there are two currencies involved in each foreign exchange transaction.
Source: BIS, UBS WMR

the behavior of foreign exchange markets, the empirical success of these models is dismal. So much so that Obstfeld and Rogoff (1996) acknowledge in their classic textbook on international macroeconomics that “the undeniable difficulties that international economists encounter in empirically explaining nominal exchange rate movements are an embarrassment.”

Rational expectations

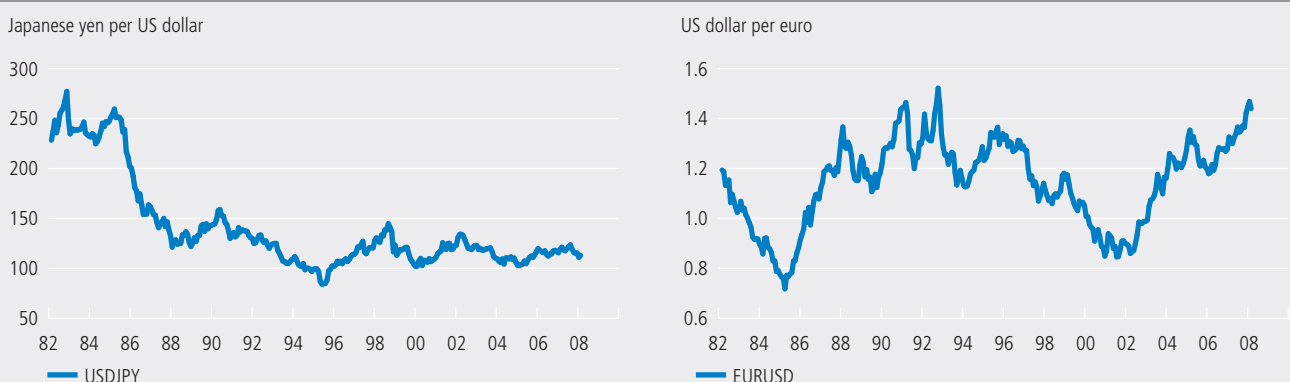
Modern exchange rate models, like all mainstream macroeconomic models, rely on the “rational expectations” hypothesis. This hypothesis states that all market participants take all available and relevant information into account and make no systematic errors in forecasting future variables. In this approach, exchange rates should reflect all relevant information about the fundamental variables that determine the value of a currency. If new information appears, it should be immediately incorporated into the valuation of the currency. The rational expectations hypothesis presumes that exchange rates move to reflect any changes in a currency’s valuation: otherwise, profit opportunities would go unexploited. Thus, movements in exchange rates should be observed only when the fundamental variables that underlie the valuation of a currency unexpectedly change.

In reality, however, large swings in exchange rates are often difficult to explain through unexpected changes in fundamentals (see Fig. 1.2). Consider, for instance, the more than 60% appreciation of the US dollar versus the Japanese yen (JPY) between April 1995 and April 1998 or the 70% appreciation of the EUR versus the USD between May 2001 and December 2007. (Data for the EUR prior to 1999 is derived from a GDP-weighted basket of the separate member countries’ exchange rates.)

The rational expectations models of currency behavior that were developed in the 1970s are able to explain the “overshoot” phenomenon – that is, the tendency of exchange rates to overreact to a change in fundamentals (Dornbusch, 1976). However, after more than a quarter of a century and numerous publications in academic journals, currency models still fail to explain the large and persistent departures of exchange rates from their fundamental values. Moreover, a strategy like the “carry trade,” discussed below, delivered systematic gains over long periods, blatantly contradicting the rational expectations hypothesis that states there should be no obvious profit and arbitrage opportunities in an ideal market.

The evident deficiencies of rational expectations models have led many economists to abandon this approach. Indeed, in a rather radical reaction, some argue now that fundamentals are actually irrelevant to exchange rate movements. The prevailing view today recognizes currencies as

Fig. 1.2: Large swings in currencies



Source: Thomson Financial, UBS WMR

unpredictable and behaving at best like a “random walk.” This essentially means that the exchange rate observed tomorrow is equal to the exchange rate today plus a random increment, which, given its essential randomness, cannot be forecast. While a random walk is consistent with the rational expectations framework, persistent large swings in currency markets and the ability of carry trade strategies to work over long periods of time remain unexplained.

Currencies and their many caprices

Throwing in the analytical towel might seem appealing, but it does not appear likely to happen any time soon. On the contrary, foreign exchange analysis itself appears to be a growth industry. With greater transparency among central banks during the past several years, an army of economists, analysts, central bank watchers, and general market pundits follow and forecast the high frequency economic data and offer learned commentary on the statements of senior central bankers and all manner of economic data. Surprising inflation data, an unforeseen interest rate movement, even some sharply drawn wording of a central banker – like the “strong vigilance” or “brutal movement” code words of European Central Bank President Jean-Claude Trichet – have an impact on the foreign exchange market.

With so much careful observation, and so much relevant data, why then are exchange rate movements so difficult to forecast?

The answer may be found in the simple fact that economic fundamentals matter for the currency market, but they do not always matter in the same way. For example, consider this (imaginary) newswire comment after a surprisingly strong inflation release:

“This morning, the US core consumer price index for November rose a hefty 0.7% over the prior month and 3.4% over the past year. Market participants had expected increases of only 0.2% and 2.7%, respectively. The US dollar **gained** 1% against the euro directly after the release, as market participants are now forecasting the Fed to increase interest rates by 50 basis points. This should be supportive of the US dollar, as investors are seeking investment opportunities in high-yielding currencies.”

Although fictional, it seems to be a rather plausible example, and, in fact, this is how the market has often reacted after inflation releases during the last two years. Now look at the next fictional newswire:

“This morning, the US core consumer price index for November rose a hefty 0.7% over the prior month and 3.4% over the past year. Market participants had expected increases of only 0.2% and 2.7%, respectively. The US dollar **lost** 1% against the euro directly after the release, as market participants are expressing strong concerns about the US inflation outlook. Even the revised forecast for the Fed, which is now expected to increase interest rates by 50 basis points, was unable to stem the negative sentiment surrounding the US dollar, which is continuing to slide against all major currencies.”

The second comment seems as plausible as the first. Although the inflation release is the same, the market reactions are completely different. Inflation erodes the value of a currency, so market participants appear to be acting quite rationally by selling it. The fact that the foreign exchange market could react in a completely opposite, but equally plausible, way to the same news item shows that we need more than just one all-encompassing model to explain exchange rate dynamics (see the box on page 14 for an explanation of how this phenomenon can be tracked in the real world).

Fashion models

Over the past couple of years, the apparent irrational behavior of currency markets has led economists to look to the disciplines of behavioral finance and “imperfect knowledge” economics to explain exchange rate movements. The new models share one element that may make them more realistic than previous, more abstract models: they explicitly acknowledge that the currency markets are driven by shifts in currency regimes and changes in perception. We like to say that the foreign exchange market is driven by fashion. There are times when market participants are concerned about trade deficits and times when they are not; times when they focus on carry trades and times when they do not; times when relative productivity takes center stage (remember the late 1990s and early 2000 when the USD was the reigning currency of the Tech stock bubble?) and times when it does not. The occasional global currency agreement orchestrated by governments, such as the Plaza or Louvre Accords, also dominates attention from time to time.

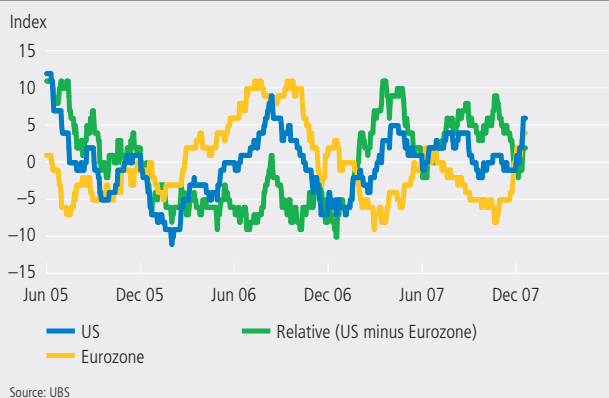
The art of successful currency investing demands, among other things, an ability to spot trends, particularly to recognize when fashions start to shift. The successful currency investor needs to note when the market’s focus shifts from one story (“Trade deficits are bad,” for example) to another (“High interest rates are good”). The shrewd investor knows when the new story will be replaced by the newer one. But is this really all there is to say?

Currencies follow relative inflation expectations, sometimes

UBS has computed an “inflation surprise” index since 2005 for both the US and the Eurozone, which adds 1 whenever market participants are surprised on the upside by an inflation release, and subtracts 1 whenever they are surprised on the downside. Fig. 1.3 shows these indices, as well as the relative index between the two. The relative inflation surprise index shows whether US inflation surprises more on the upside (a positive reading for the index) or the Eurozone (a negative reading for the index).

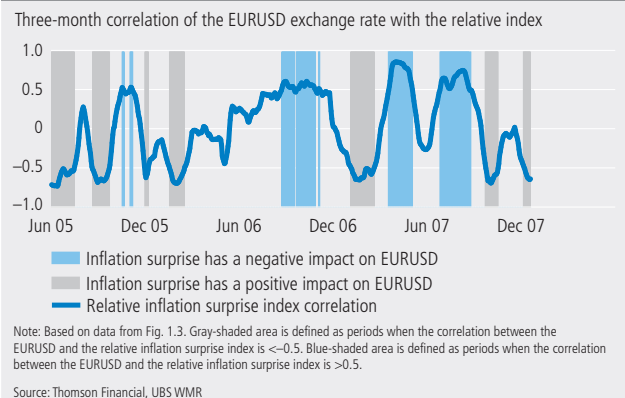
Fig. 1.4 shows the three-month correlation of the relative inflation surprise index with the EURUSD exchange rate. The gray-shaded areas are phases when an upside inflation surprise in either the US or the Eurozone had a negative impact on the currency, and the blue-shaded areas are phases when a similar upside inflation surprise had a positive impact on the currency.

Fig. 1.3: Inflation surprise index for the US and Eurozone



Source: UBS

Fig. 1.4: Inflation surprises harm and benefit currencies



Note: Based on data from Fig. 1.3. Gray-shaded area is defined as periods when the correlation between the EURUSD and the relative inflation surprise index is <-0.5. Blue-shaded area is defined as periods when the correlation between the EURUSD and the relative inflation surprise index is >0.5.

Source: Thomson Financial, UBS WMR

Purchasing power parity explained

Be assured, there is more to be said on the question of currencies than the story-of-the-month analysis. Economists can also assess whether a currency is expensive or not. To do this they use one of the workhorses of currency models: purchasing power parity (see Fig. 1.5). Purchasing power parity (PPP) is a measure of the relationship between the purchasing power of different currencies. It shows how many goods a unit of a specific currency can buy. One of the first significant contributions to this field of research came from British economist William Stanley Jevons (1835–1882), who formulated the Law of One Price, which is now summed up by the term “absolute purchasing power parity.” This theoretical exchange rate would ensure that the same goods cost the same everywhere. In the classical sense, this was the essential precondition for a market-clearing equilibrium, the point where supply equals demand.

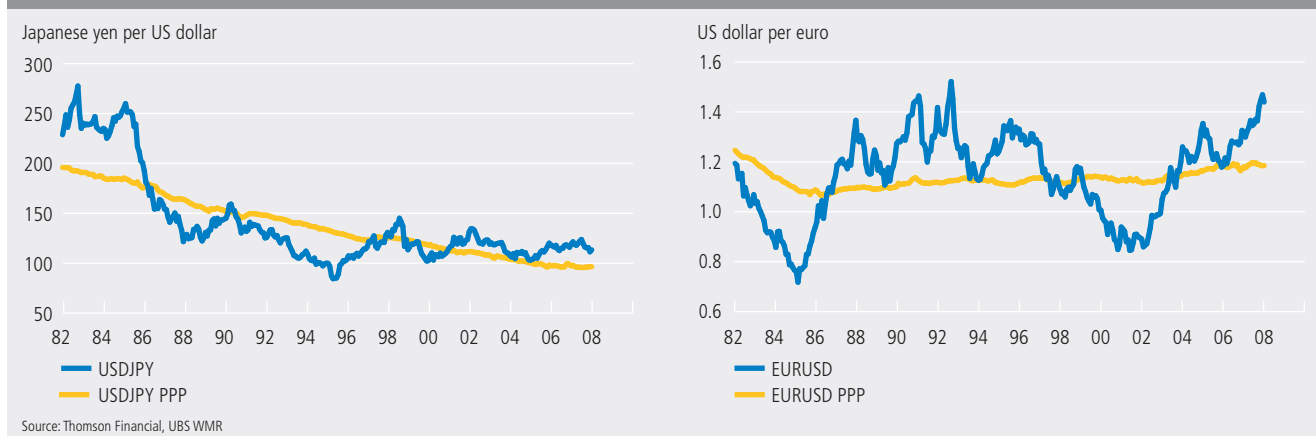
However, even Jevons defined the term “same goods” very narrowly: goods are only deemed to be the same in the absence of geographical, physical, temporal, and personnel differences, as well as in the presence of perfect information. In reality, no comparison between goods in different currency zones adheres to the strict criteria of a perfect market, which is why discrepancies from absolute purchasing power parity often arise.

One important objection to the Law of One Price approach is that the equalization of prices between two countries is imperfect. Different tax rates, barriers to trade, product differentiations, and diverse other factors distort the equalization of prices between tradable and non-tradable goods in a country and can thus frustrate an economy-wide equalization of prices. On the basis of this finding, Sweden’s Gustav Cassel (1866–1945) developed the theory of “relative purchasing power parity.”

This theory assumes that differences in inflation rates will be balanced out by changes in exchange rates. Relative purchasing power parity is thus a dynamic concept. In order to calculate parity, a long time horizon for inflation rates and exchange rates is necessary. In contrast, absolute purchasing power parity is a static concept, which compares the current goods prices between countries. The “Big Mac index,” published in the weekly magazine, *The Economist*, compares a uniform good, a broadly available hamburger, in diverse currencies (see box on page 16 for more discussion of the Big Mac index).

But for a broader overview of purchasing power parity, a comparison of economy-wide price indexes, such as the producer price or consumer price indexes, is more appropriate. Today, these indexes are maintained for all currency zones. In practice, however, a direct, absolute comparison is impossible because every country has its own method for collecting the

Fig. 1.5: Purchasing power parity



required data. For this reason, it is necessary to rely on the econometric estimates of purchasing power parity in the relative form, acknowledging that compromises must be made when determining absolute purchasing power parity. UBS WMR purchasing power parity estimates are based on the relative producer price levels of the countries whose exchange rates are analyzed.

Currency valuations at the end of 2007

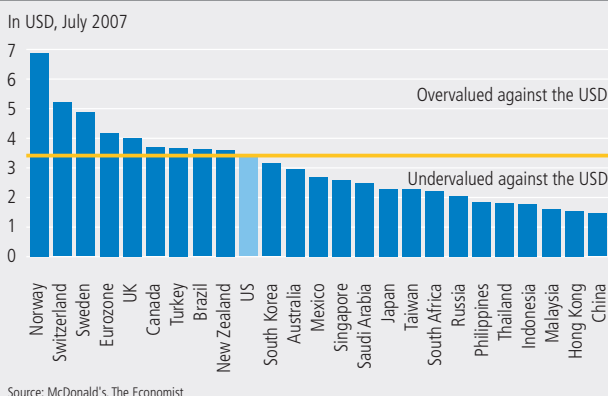
The “valuation gap” between two currencies refers to the difference between the actual value of an exchange rate and its equilibrium value as estimated by purchasing power parity. Fig. 1.7 shows the valuation gap, in percent, of the USD against the EUR (EURUSD), the USD against the JPY (JPYUSD), and the JPY against the EUR (EURJPY).

In December 2007, the EURUSD exchange rate stood at 1.44, while its purchasing power parity value was estimated at around 1.19. This results in a valuation gap of 21.5%, or, to put it differently, the EUR was 21.5% overvalued against the USD. Is this a lot? By definition, the average valuation gap should be zero. In 19 of the 312 months since January 1982, the EUR was overvalued by 21.5% or more against the USD; in 50 of those months, the USD was overvalued by 21.5% against the EUR. So despite its high level, the EURUSD exchange rate is still not extreme from a valuation perspective. However, a EURUSD exchange rate of 1.55 could be seen as a rare event. There has only been a valuation gap of 30% or more between the EUR and the USD for 6% of the time tracked. Extreme forecasts, like a EURUSD at 1.80, which would put the valuation gap between the two currencies at 50%, have not been seen in the last 25 years.

Should we swallow the Big Mac index?

To explain the valuation gap between currencies, *The Economist* magazine has published its Big Mac index since 1986. The index is a good example of how to measure absolute purchasing power parity. The rationale behind the index is quite simple: McDonald’s legendary burger is identical wherever it is sold. It is a homogeneous good and should therefore cost the same everywhere. If the price of the sandwich in one country differs from another when expressed in a common currency, then the exchange rate between the two countries is, de facto, misaligned. If a Big Mac costs USD 3.50 in the US and CHF 5.00 in Switzerland, then the equilibrium exchange rate should be CHF 1.43 per USD. If the market exchange rate is CHF 1.20 per USD, then the CHF is overvalued by 20% against the USD, according to the Big Mac index. Fig. 1.6 shows the USD price of a Big Mac in various countries.

Fig. 1.6: Price of a Big Mac



We hasten to note that, despite its simplicity, there are several flaws with this measure. Interestingly, one of the basic problems, though not the most important one, is the homogeneity assumption. McDonald’s reports that a Big Mac packs 540 calories in the US but only 464 calories in New Zealand. The burger contains 0.9 grams of salt in Australia, but 2.3 grams in Germany. It weighs 219 grams in South Korea but only 209 grams in Canada.

Besides these observations, there are some other reasons why prices of Big Macs might differ from country to country.

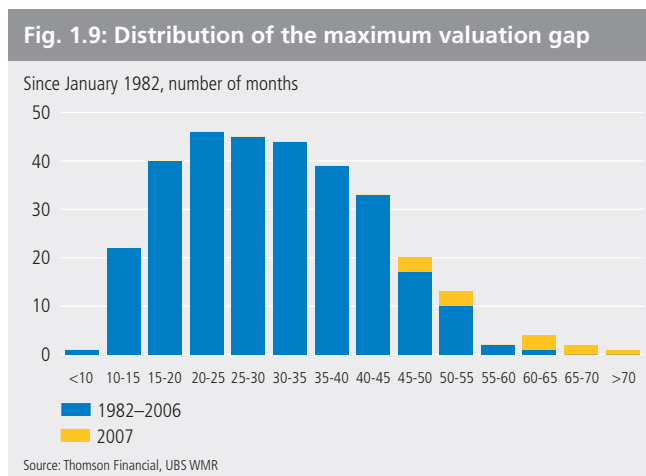
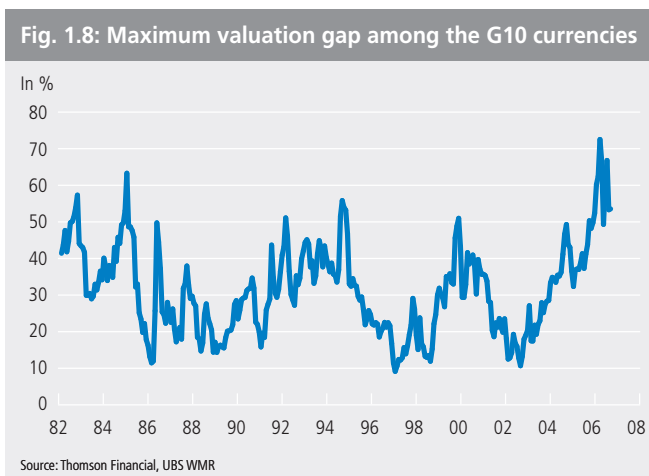
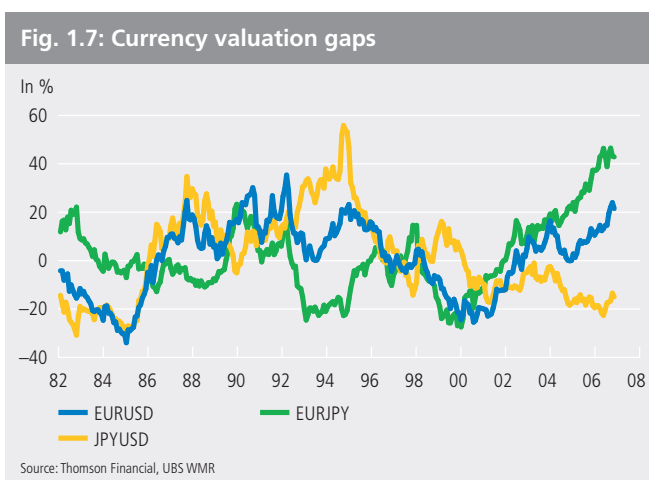
- One is related to differences in consumption taxes. If the value-added or sales tax in country A is 30% and country B does not have such a tax, then the source of the 30% mark-up is not in the bun.
- The prices of a Big Mac’s ingredients probably differ from country to country. The price of meat is much higher in Europe than in Latin America, for example, and import costs are not negligible. Therefore, the prices do not equalize.
- Even if the prices of the ingredients and the taxes were the same among the different countries, there could still be price differences due to the non-tradable nature of some of the cost components of the Big Mac. It is certainly more expensive to rent restaurant space in downtown Zurich than in central Manila. Labor costs in Norway are much higher than in China. According to our 2006 survey, *Prices and Earnings*, an average worker in Oslo earns more than ten times as much as a peer in Shanghai, which could explain much of the fivefold higher price of a Big Mac in Norway than in China.

Similarly, the JPY's valuation gap against the USD does not seem to be extreme. Back in December 2007, the USD was 17.6% overvalued against the JPY. Valuation gaps between the JPY and the USD of 17.6% or more have appeared in 127 of the 312 months since 1982.

Looking at the valuation gap between the EUR and the JPY over the past quarter-century, we see an overvaluation of 42.9% in December 2007, an extreme gap that has only appeared in seven of the past 312 months.

Fig. 1.8 shows the maximum valuation gap among the G10 currencies, which includes the US dollar, the euro, the Japanese yen, the British pound (GBP), the Swiss franc, the Canadian dollar (CAD), the Australian dollar (AUD), the New Zealand dollar (NZD), the Swedish krona (SEK), and the Norwegian krone (NOK). The maximum valuation gap is the valuation gap between the most overvalued currency and the most undervalued currency. Back in December 2007, the maximum valuation gap amounted to 53.5% and involved the AUD and the JPY. Fig. 1.9 shows the distribution of months according to the maximum valuation gap. The maximum valuation gap was at or above 53.5% in only 12 of the past 312 months, seven of them in the year 2007. We note that the most extreme valuation gap was registered in June 2007 between the NZD and the JPY at 72.5%.

This analysis shows that currency markets were at valuation extremes during 2007. In total, seven comparable peaks in the maximum valuation gap have materialized since January 1982, although not at this order of magnitude. Fig. 1.10 shows how the exchange rate between the most overvalued and the most undervalued currencies behaved during the 12 months before



and after each of these seven peaks. The corrections that unfolded in the 12 months post-peak were on average -21% and ranged between -6% and -39%. Fig. 1.11 compares the average behavior of the past peaks with the one observed in June 2007.

Since June 2007, there have already been some hefty corrections in the foreign exchange market. The most undervalued currency back then, the JPY, has rallied against most other G10 currencies. Nevertheless, past experience with extreme valuation levels suggests that the correction is still not over and that realignments towards purchasing power parity will continue in 2008.

What “carried” the currency market lately

The term “carry trade” flashed across the pages of almost every foreign exchange publication on a daily basis in 2007. The concept of the carry trade is quite simple: it is a strategy that consists of borrowing funds in a low-yielding currency (the sell side of this transaction) and investing this amount in a high-yielding currency (the purchase side of this transaction). The yield difference between the two currencies represents a gain if the exchange rate does not move to such an extent that it erases the interest rate differential. For example, taking on short-term (three-month) debt in JPY would have cost 0.9% annualized per year in December 2007. Investing this money in the Australian dollar would have earned a return of 7.3% per year based on three-month money market rates. This yielded an annualized gain of 6.4%, or the difference between the rate paid to borrow an amount and the rate earned on the invested amount.

But this is not the full story of carry trades. If this strategy is broadly adopted, then the price of the JPY will decline and the price of the AUD will go up. In other words, the AUD will appreciate against the JPY, leading to a further gain. This sounds like a money-spinner, but, as we all (should) know, there is no such thing as a free lunch, or a perpetual profit maker.

In carry trades, investors assume that the exchange rate will move in the direction that will at least not lose them money. While carry trades at times have been an important factor in exchange rate movements, they are surely not the only one. Other drivers can move against a carry trade position. For example, between 26 February and 5 March 2007, when financial markets were preoccupied with a stock market crash in China, the AUD lost more than 7% against the JPY. Between 8 and 16 August 2007, when the subprime crisis started to unfold, the AUD lost 13% against the JPY. In both cases, the yield difference of roughly 6% was no longer justified.

Carry trades enjoyed the favor of investors for three-and-a-half years, reflecting the robust appetite for risk that investors had. Fig. 1.12 plots one of the more

Fig. 1.10: Most over- and undervalued currencies

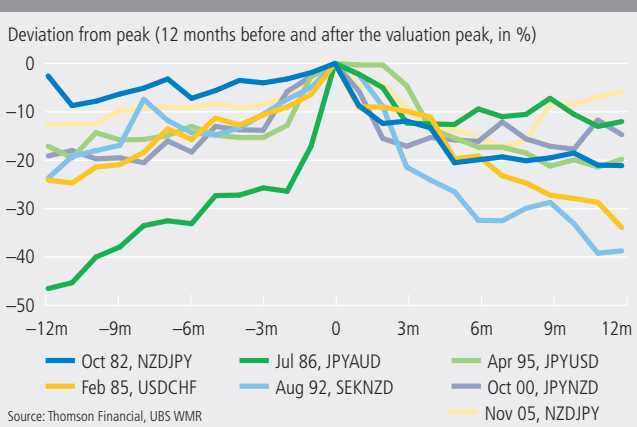
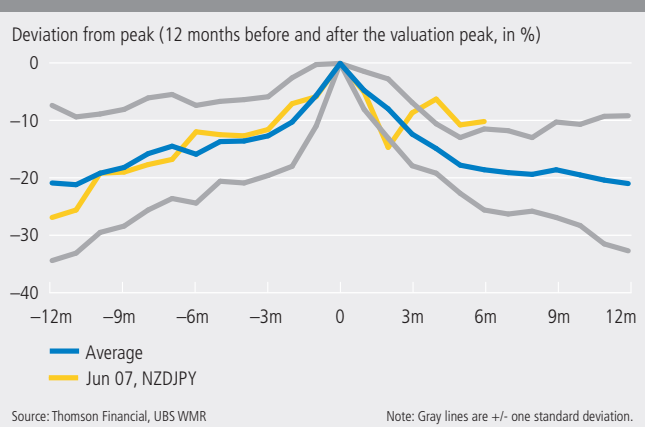


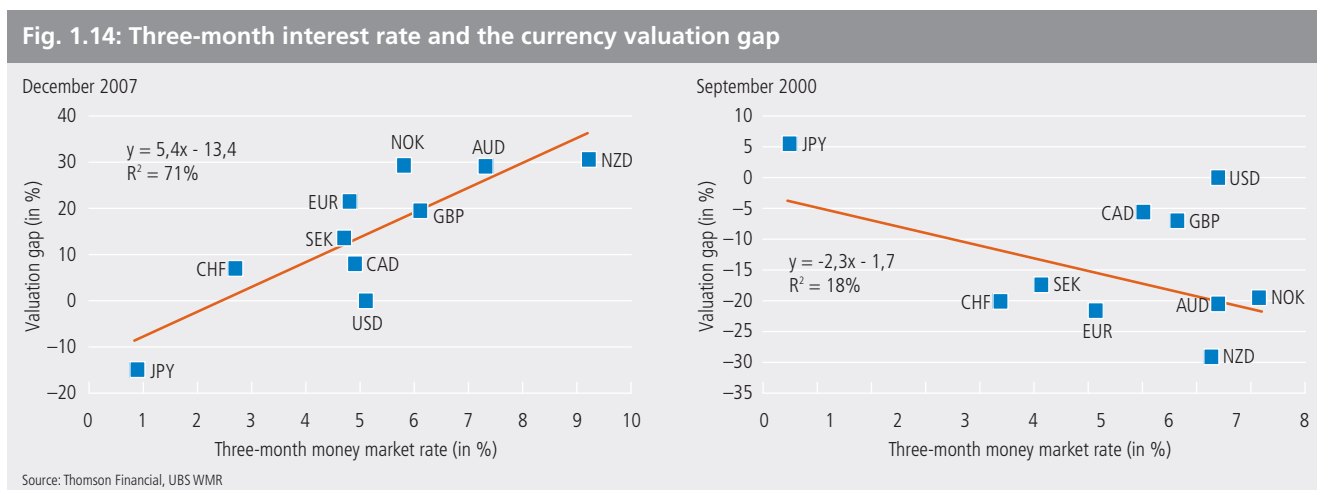
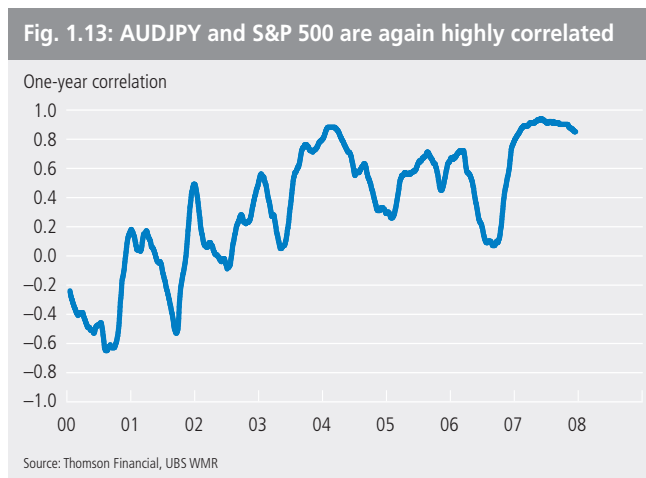
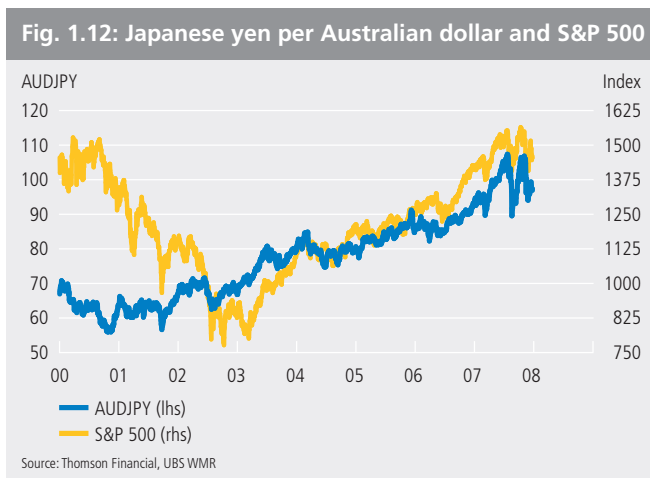
Fig. 1.11: Average of the seven peaks and June 2007 peak



favored carry trades – sell JPY and buy AUD (AUDJPY) – against the S&P 500 index. We note that both series are rather volatile and that, from a theoretical standpoint, a relationship between the exchange rate of two Pacific currencies and the US stock market is difficult to establish.

However, the yearly correlation, that is, the tendency of things to move in unison, stood at 85% at the end of 2007 (see Fig. 1.13). In June 2007, it was even as high as 94%. This indicates that the carry trade had become a good proxy for the risk appetite of investors. In this context, taking an anti-carry stance, which favors low-yielding currencies over high-yielding ones, has been a rather successful hedging strategy against equity exposure during the last two years. However, the fact that this correlation is not always significantly positive also shows that sometimes, even in a risk-friendly environment, carry trades do not work.

To see how well the carry trade strategy explains the valuation gap between different currencies, we perform a small linear regression between the three-month interest rate (as measured with interbank offered rates) and the valuation gap to the US dollar for the G10 currencies (see Fig. 1.14). In December 2007, short-term interest rates could explain 71% of the currency valuation gap, which is quite a strong relationship. The most undervalued currency, the JPY, had the lowest interest rates. Meanwhile, the two most overvalued currencies, the AUD and the NZD, had the highest interest rates. Moreover, the slope of the line had a positive value of 5.4, which means that for each one percentage point increase in interest rates in December 2007, a currency would have appreciated by 5.4% against its equilibrium (or PPP) value to the USD.



However, this has not always been the case. Fig. 1.14 also shows the circumstances that prevailed in September 2000. At that time, the ability of interest rates to explain currency valuation gaps was much lower, only 18%, and the relationship was negative with a slope of -2.3 .

Thus, the slope can vary over time. Sometimes, like in 2007, the misalignments of a currency against its equilibrium value can be explained by interest rate differentials and therefore by carry trades. Sometimes, like in 2000, carry trades cannot explain the imbalances within the currency market. The slopes of the regressions shown in Fig. 1.14 offer a good indication of how much carry trades can, or cannot, explain conditions in the currency markets. We have therefore constructed rolling regressions for each month since January 1982 for the basket of ten currencies under review (see Fig. 1.15).

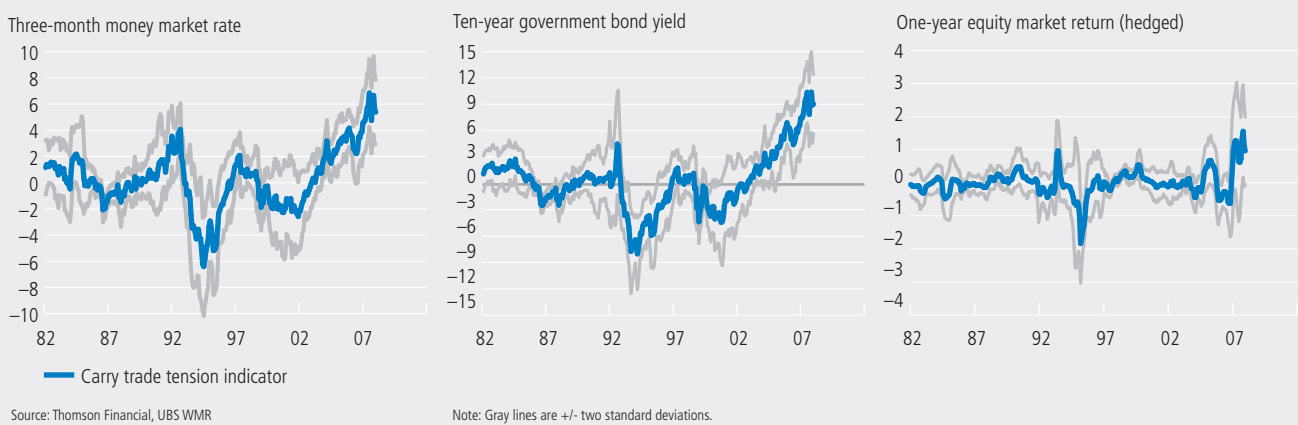
Fig. 1.15 also shows the same information estimated using the 10-year government bond yield and the respective stock market performance over the past year. The 10-year government bond yield seems to explain the valuation gap even better than the three-month money market rate.

We can see from Fig. 1.15 that the last time the carry-trade tension indicators were at positive extremes, although not as extreme as seen in 2007, was in August 1992. Thereafter, a hefty correction brought these indicators to negative extremes by the end of 1994. What caused this “unwinding” of carry trades? In 1988, Nigel Lawson, the Chancellor of the Exchequer in the UK under Prime Minister Margaret Thatcher, started the rather successful policy of shadowing the German mark to increase the credibility of the British pound. As a result, the British pound entered the European exchange rate mechanism (ERM) in 1990 at an overvalued level.

The costs of German unification pushed interest rates in Germany to very high levels, and by 1992 market participants became convinced that some realignment within the ERM was needed. The high German interest rates were incompatible with the business cycle of most other ERM participants, which had to have even higher interest rates to maintain parity.

By 8 September 1992, a first wave of speculative attacks on Scandinavian currencies forced the Finnish markka to devalue by 13% and produced overnight interest rates in Sweden of 24%. Two days later, the Italian lira came under attack. After large foreign exchange reserve losses at the Bank of Italy and sharp declines against the German mark, the lira left the ERM.

Fig. 1.15: Carry trade tension indicator



On 16 September, “Black Wednesday,” it was the British pound that came under attack. Despite lifting its overnight rate from 10% to 15% and spending the equivalent of GBP 6 billion of its foreign exchange reserves, the pound also had to leave the ERM and lost 15% against the German mark. Investor George Soros reportedly made a billion dollar profit on Black Wednesday by betting against the GBP. At the height of the crisis, overnight rates in Sweden peaked at 500% and in Ireland at 300%. Both Spain and Ireland had to reintroduce capital controls.

A random walk along a tightrope

Fifteen years later, it is our view that today’s currency misalignments can again be attributed to state intervention in the foreign exchange market. But this time around, it is not an artificially overvalued currency – as the GBP was in 1992 – that is the culprit, but rather an artificially undervalued currency, the JPY. In the last seven years, Japan has accumulated 560 billion US dollars in new foreign exchange reserves, to reach nearly USD 950 billion at the end of 2007 (see box on page 23 for a discussion of foreign exchange reserves).

This sharp accretion of reserves occurred mainly between 2001 and 2004, when Japanese authorities prevented the JPY from appreciating against the USD despite its evident undervaluation. These interventions gave market participant the impression that the JPY’s appreciation potential was capped, thus at least subjectively reducing the risk of using the JPY as a funding currency for carry trades. The reasoning ran as follows: borrow in JPY at very low interest rates without fear of an appreciation because the Japanese authorities would prevent it.

But the JPY is not alone in this regard. Several emerging market currencies are either pegged to, or in a managed relationship with, the USD, especially the Chinese yuan (CNY), and other major Asian currencies, and most of the currencies of the Gulf Cooperation Council (GCC), a trade bloc that includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. These countries have experienced strong economic growth in recent years that has led to massive current account surpluses and buoyant local equity markets.

By the end of 2007, inflation, with its attendant social consequences, began accelerating in these very same countries, threatening to undercut their substantial economic gains.

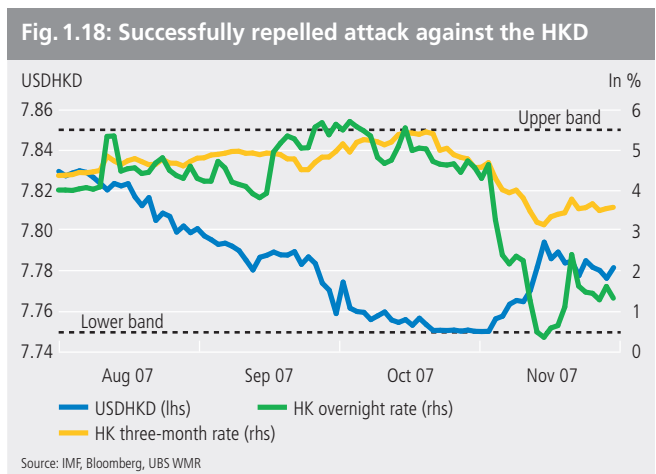
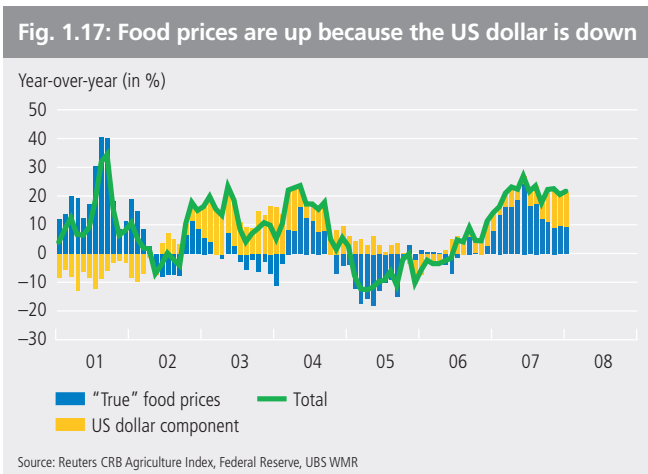
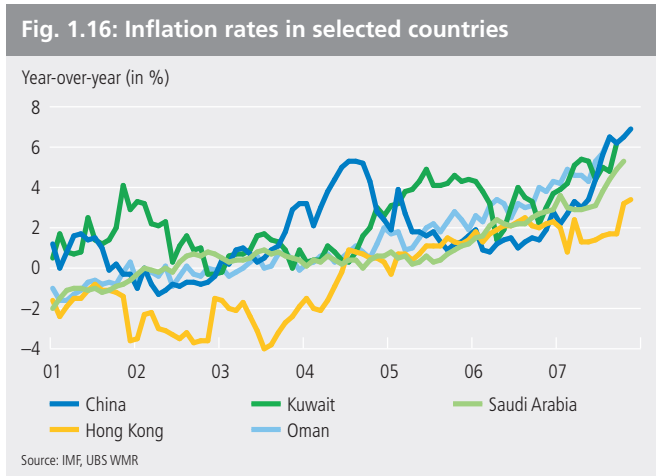
Take the situation in Russia as an example. A World Bank report (Anos-Casero et al., 2007) forecast inflation to accelerate to 11% in Russia by the end of 2007. According to the report, higher inflation is the result of rising world food prices and monetary factors. Large capital inflows are becoming an important source of reserve accumulation and money supply expansion, which is exerting upward pressure on the ruble. Because there are limited monetary instruments for sterilization and the current stance of monetary policy limits the pace of nominal exchange rate appreciation, controlling inflation pressures is becoming exceedingly difficult for policymakers.

This description could equally apply to countries like China, Saudi Arabia, and Hong Kong (see Fig. 1.16). It is true that while the bulk of the recent inflation increases is due to higher food and energy prices, core inflation, which excludes the most volatile components like food and energy prices, remains very low. But in China, some Gulf countries, and virtually all less developed countries, food is a significant part of household expenditures and thus a critical component in gauging changes in the price level. And the surge in food prices is not only caused by domestic factors. Some of it can be attributed to the rise in international food prices, which in turn is at least partly due to USD weakness (see Fig. 1.17).

Much as in 1992, market participants have started to attack the “pegged” undervalued currencies. One example is the Hong Kong Dollar (HKD). It is “floating” within a very narrow band of 7.75–7.85 against the US dollar and is managed by the Hong Kong Monetary Authority (HKMA). By the end of October 2007, the HKD had reached the lower band after a large rally in the Hong Kong stock market (see Fig. 1.18). To prevent the HKD from further appreciation, the HKMA had to lower the overnight rate from 4.6% at the end of October to 0.36% on 12 November 2007. This move successfully halted the HKD’s further appreciation and the attack was repelled.

Market participants can successfully attack an artificially overvalued currency, as George Soros did in 1992, because a central bank can only defend its currency to the extent that its foreign exchange reserves allow. An artificially undervalued currency, however, cannot be similarly attacked because the central bank has unlimited reserves: it holds the key to the mint. This defense only works as long as inflation remains under control.

The big question for all of the countries that align their currencies with the USD is: when will inflation worries start to outweigh the growth benefits of a managed currency? We believe that more managed-currency countries are starting to seriously ask this question. For this and other reasons, as we outline in chapter 2, we would not be surprised to see some realignment of currency pegs and some more rapid appreciation of managed currencies versus the USD.



Foreign exchange reserves

By the end of 2007, global foreign exchange reserves likely rose to USD 6 trillion (see Fig. 1.19), three times larger than they were at the beginning of 2002 and equal to about 50% of current US gross domestic product. Foreign exchange reserves increased most sharply in developing countries, particularly in Asia, in this period. China's foreign exchange reserves now account for almost one-quarter of the total; South Korea, Taiwan, Singapore, Malaysia, Thailand and Hong Kong for another 17%; Japan holds 15% of global currency reserves, with the remainder of the OECD countries holding less than 10%.

Some pundits argue that the USD will one day lose its status as the premier international reserve currency. They argue that central banks are increasingly diversifying their currency reserves and that some commodity exporters, especially oil-exporting countries, may switch from the USD to other currencies, most notably the EUR, for invoicing and denominating their trade. Data from the International Monetary Fund (IMF) would seem to confirm these shifts. With regard to "attributable reserves," or reserves declared in a specific currency, the IMF's COFER database (Currency Composition of Official Foreign Exchange Reserves) indicates that the USD's share fell from roughly 72% at the beginning of 2000 to 64% in the third quarter of 2007.

On the surface, it seems that there is merit to the argument that the USD is losing its preeminence as a reserve currency because central banks have been diversifying foreign exchange reserves in the last couple of years. But is it, really? The IMF measures currency reserves in a common currency, the US dollar. Therefore, the effect of the shifts in the value of currency reserves is not reflected in the reported reserve shares. When adjusted for exchange rate shifts, the dollar's share of world reserves is far more stable.

To illustrate, consider the reserve holdings of a fictitious central bank: in 2000, the central bank held USD 80 billion and EUR 20 billion as reserves, with a EURUSD exchange rate equal to 1.00. The value weights of these reserves were 80% for the USD and 20% for the EUR. In 2007, the reserves for this central bank were still USD 80 billion and EUR 20 billion, but the EURUSD exchange rate changed to 1.40. The new value weights would be 74% for the USD and 26% for the EUR. Moreover, while nothing has changed in the vaults of our fictitious central bank, the overall value of the foreign exchange reserves expressed in USD would have increased by 8%.

Our example demonstrates that exchange rate movements are important for determining whether a currency has gained or lost

weight in global foreign exchange reserve holdings. Fig. 1.20 shows the change in the relative weight of the USD in global foreign exchange reserves, as well as its share after accounting for exchange rate movements. Taking exchange rate movements into account, the case for the USD losing its stature is far less conclusive.

In fact, we do not believe that the position of the USD as the world's leading reserve currency will be seriously challenged for another decade or more. There have only been a few internationally dominant currencies throughout history. And it has generally taken a profound catalyst to topple a leading currency. The solidus, introduced by Roman emperor Constantine, was the dominant currency in the Mediterranean region for more than a thousand years, right up to Constantinople's fall to the Turks in 1453. Only after two World Wars and the emancipation of Britain's colonies did the GBP cede its status as the world's reserve currency to the USD.

It is not even especially clear which currency could really take the USD's place. While the most obvious choices would be the EUR and the CNY, both have their limitations. The eastward expansion of the European Union has added a further 75 million potential EUR users, thus bolstering the single currency's international status, but the EUR's latest appreciation belies a structural weakness. While it may be backed by an evermore credible central bank, the cacophony of Europe's politicians makes it clear that, unlike the USD, the EUR is not backed by a single, unified government. As long as rumors keep surfacing that one country or another might leave the Eurozone, the EUR cannot be a credible alternative to the USD. Moreover, even if the political and economic decision-making processes of the Eurozone grow more unified and consistent in future, we should not forget that Europe faces a demographic decline. Over the next 40 years, the US population is expected to add another 100 million people, roughly a 33% increase, according to the United Nations. At the same time, Europe will stagnate at best, with some important countries clearly shrinking in size.

It is also certain to be a long time before the CNY, which is still in a managed peg relationship with the USD, evolves into a serious rival. For this to happen, China must take on a much larger role in international finance. While the Chinese economy is growing at a breakneck pace, the Asian currency crisis ten years ago illustrates the sensitivity of emerging market economies to turmoil in financial markets.

Fig. 1.19: Global foreign exchange reserves

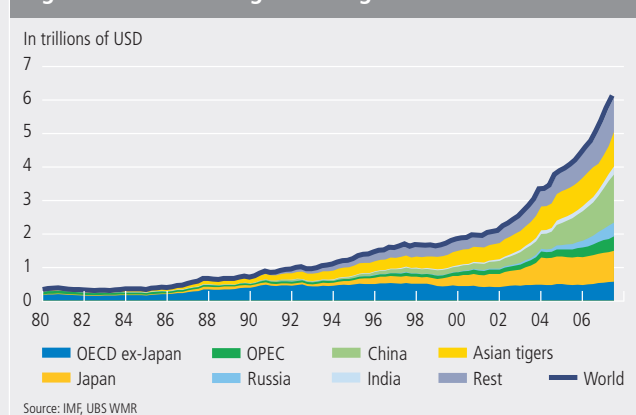
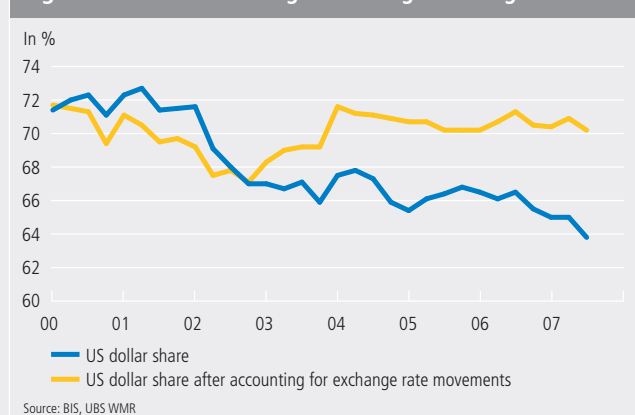


Fig. 1.20: Share of USD in global foreign exchange reserves



Chapter 2

A clash of currency regimes

Thomas Flury – Head Foreign Exchange Research

A clash of currency regimes

“The dollar cannot remain someone else’s problem. If we are not careful, monetary disarray could morph into economic war.”

– Nicolas Sarkozy, French President

Monetary disarray

In November 2007, French President Nicolas Sarkozy warned the US Congress that global financial imbalances had the potential to spark an economic war. Accurate or not, his words gave a new urgency to international monetary policy. Policymakers had previously only focused on trying to convince China to permit greater flexibility for the yuan. Sarkozy was the first high-ranking politician to state that the US was also complicit in causing global financial imbalances, and therefore should take measures to strengthen the US dollar. He was also the first to complain about the competitive disadvantage faced by Eurozone countries as a consequence of the closely monitored USD exchange rates in many Asian and emerging market countries.

The primary motivation for Sarkozy’s strong remarks was probably to bolster Europe’s competitive position. But was the threat of economic war simply a rhetorical flourish by a French politician who does not shy away from the spotlight? In our view, the enormous trade and capital account imbalances that prevail today are certainly capable of sparking international tensions. In that sense, Sarkozy’s sharp comments seem warranted. It is hardly surprising, then, that officials from other countries with strong currencies, such as Canada, have expressed their solidarity with the French president.

It is remarkable for a politician to try to improve industrial competitiveness by calling for a weaker currency – even after six years of EUR strength. Sarkozy’s call for a weaker EUR runs somewhat counter to the liberal foreign exchange policy of the European Central Bank. The ECB, which is an inflation-focused central bank, does not follow an explicit exchange rate target. As such, it will only intervene in the foreign exchange market in rare cases.

The US Federal Reserve, on the other hand, is not guided by an explicit inflation target, but rather, aims to promote maximum employment, stable prices, and moderate long-term interest rates. In fact, the US has no clear currency strategy. Following the US dollar’s recent sharp decline, officials employ a policy of ‘benign neglect’ not unlike its policy during the Bretton Woods era of fixed exchange rates (see box on page 30 for a discussion of Bretton Woods).

Fig. 2.1: Global imbalances are highest in a generation

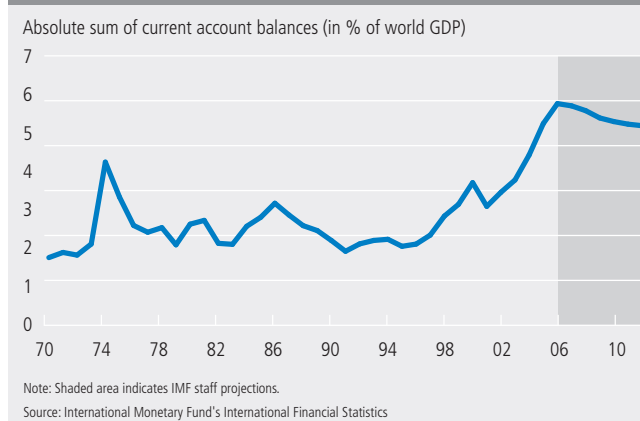
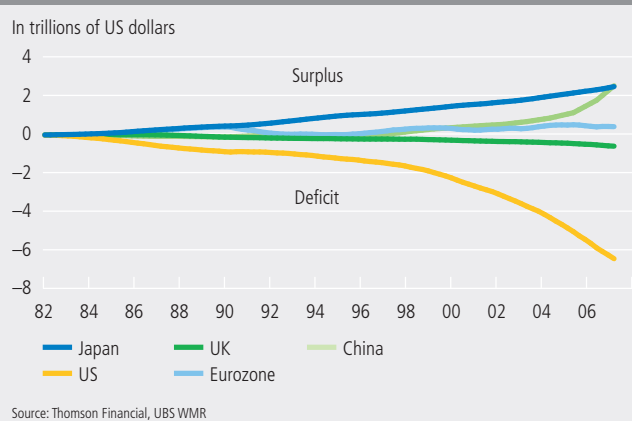


Fig. 2.2: Accumulated current account positions



This brings us to the other historic dimension of President Sarkozy's statement. He was the first top-ranking politician to compare today's foreign exchange imbalances with conditions that led to the breakdown of Bretton Woods. Before Bretton Woods' ultimate demise in 1973, Treasury Secretary John Connally famously told a European delegation that the dollar "is our currency, but your problem." When Sarkozy said, "the dollar cannot remain someone else's problem," the French president voiced his opinion that the US should adopt a more responsible currency policy. Transatlantic currency tensions were already evident in the late 1960s, when Charles de Gaulle branded America's ownership of the world's reserve currency and its ability to run government budget deficits as an "exorbitant privilege." In this light, President Sarkozy followed a time-honored tradition of French presidents warning of the potential danger that a weak greenback poses to the international monetary system.

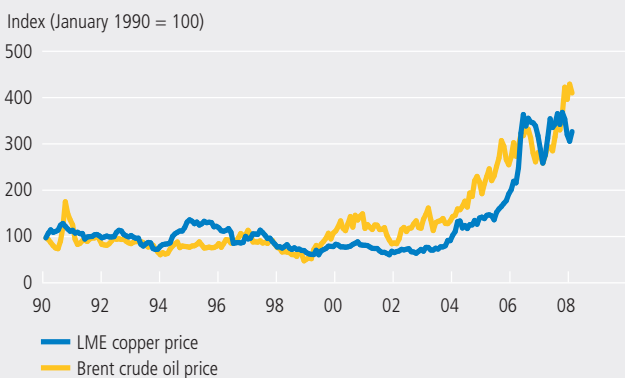
An uncomfortable coexistence of currency regimes

During the past several years the imbalances and the reduced competitiveness of some countries did not seriously threaten political or economic stability. All regions of the world benefited in various ways from global productivity gains. Economies everywhere grew steadily with little inflation, and neither politicians nor financial markets paid very much attention to the growing imbalances. In this environment, Sarkozy's statement about "economic war" may seem odd.

But global imbalances have become difficult to ignore (see Fig. 2.1 and Fig. 2.2). A steep decline in productivity or a sharp contraction in the supply of a critical natural resource could quickly lend more credibility to Sarkozy's statement. The rising inflation pressures in some rapidly growing emerging economies runs counter to the inflation-targeting goals of many advanced economies. Meanwhile, inflation-targeting countries must, at the same time, bear the consequences of their uncompetitive currencies. In medical terms, the patient may not be sick, but the immune system is seriously compromised.

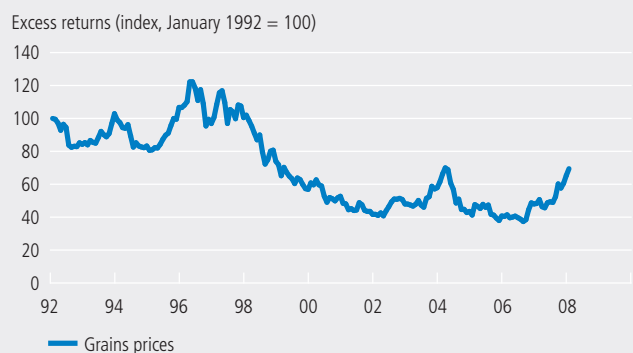
Many would quickly point to commodities as the principal source of inflation in the world economy, especially following the spikes in energy, base metals, and certain agricultural prices that accompanied the soaring growth rates in emerging markets (see Fig. 2.3 and Fig. 2.4). We would reply that commodity price moves should not be confused with inflation, however. They represent one-time shifts in relative prices in favor of commodities rather than an ongoing acceleration. Once commodity prices fully adjust to the prices of other goods and services, such as rents, health care, and

Fig. 2.3: Base metals and energy prices have soared



Source: Bloomberg, UBS WMR

Fig. 2.4: Grains prices also higher



Source: Bloomberg, UBS WMR

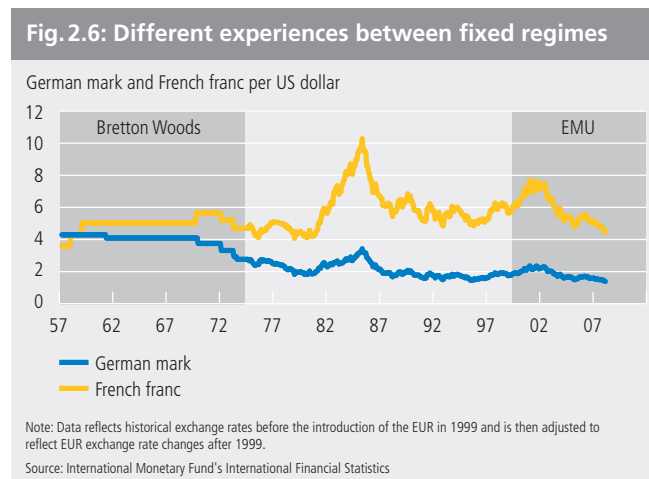
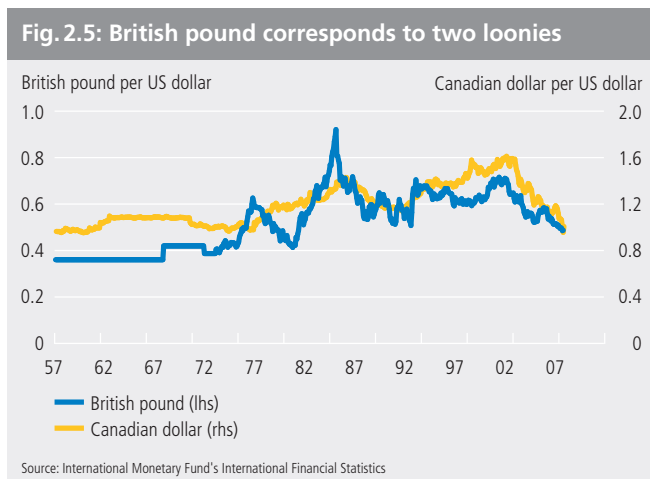
consumer electronics, commodity-induced price pressures will likely evaporate.

The real source of inflation, in our view, comes from the steady reserve accumulation of countries with a managed peg relationship to the USD. If allowed to swell a country's money supply, unrestrained accumulation of foreign exchange reserves can aggravate price pressures in the economy in much the same way as excessive government budget deficits do. In order to relieve inflation pressures, emerging market economies that tie their exchange rates closely to the USD may have to allow their currencies to appreciate more, thus slowing money supply growth and reserve accumulation.

Inflation is not the only fault line in global financial markets. In many countries that target inflation expectations as a policy tool, deflation has a greater potential to destabilize economic growth. Even though the IMF does not strictly classify the Eurozone, Japan, Switzerland, the UK, and the USD-bloc countries as inflation targeters, inflation is a dominant concern. Inflation targeting, which was first introduced in 1992 by Australia, seems to be a rather stable policy tool. In periods of overheating, the central bank raises interest rates to a level that lowers inflation expectations to within a targeted range. When the economy cools, the central bank then lowers interest rates to a level that generates growth and reflation expectations.

However, the loss of competitiveness imposed on advanced economies as a result of overvalued currencies has produced a clear policy among central banks: keep interest rates low enough to stabilize inflation expectations. This means that if interest rates are not low enough, the country runs the danger of deflation and recession. Here we identify the true challenge for inflation-targeting countries. During recessionary periods, central banks typically run out of traditional policy options. Once interest rates are close to zero, the central bank has to take unusual measures, like exchange rate intervention or asking the government to provide fiscal stimulus.

The EUR, GBP, AUD, CAD and NZD, as well as many other developed country currencies have appreciated to such an extent that any further appreciation can easily reinforce a deflationary or recessionary threat (see Fig. 2.5). To put this in more practical terms: a GBPUSD rate above 2.0 or a EURUSD rate above 1.5 might be easy to cope with in times of global prosperity. However, when growth falters, these countries might need support from a weaker and more competitive exchange rate. During such times, the prospect of Asian or Middle Eastern policymakers diversifying their currency reserves away from the USD could be painful.



Targeting growth or inflation

Two very different monetary systems and exchange rate policies, often called 'regimes', coexist uncomfortably in the globalized economy. Advanced economies mostly target inflation directly and use interest rates as the principal instrument of monetary policy. From here on, we will call them inflation targeters. Then there are the many emerging, rapidly growing economies that try to control their growth rates with an exchange rate that is closely tied to the USD. Over the past several years, many of these countries enjoyed tremendous growth and substantial increases in their currency reserves. From here on, we will refer to these countries as growth targeters.

Inflation targeters and growth targeters alike have enjoyed the recent prolonged period of prosperity and stability. During the past decade, however, imbalances have risen to unforeseen dimensions. The usual price that inflation-targeting countries pay for their policy is an overvalued currency combined with potential deflationary pressure. The price that growth targeters face for their stance is potential inflation.

We think current imbalances make the global economy vulnerable to a wide variety of shocks, and the currency market could well be one of the triggers. While an economic war may not be imminent, the longer that exchange rates depart from fair value, the higher the risk of financial conflict becomes. A modest exchange rate correction is likely, we think, and would ease tensions somewhat. For starters, many growth-targeting countries can tolerate greater exchange rate flexibility versus the USD. Their wish to

Bretton Woods and its aftermath: marriage versus cohabitation

The Bretton Woods agreement was a fixed exchange rate system that aimed to promote global growth after World War II. It began in 1944 and remained in force until 1973. The basic framework to control inflation and support economic stability was simple. The participating countries maintained a fixed exchange rate versus the USD, and the US promised to buy or sell gold at a fixed price of USD 35 per ounce. As a result, the USD assumed the role that gold had played under the international gold standard.

Bretton Woods can be seen as both a success and a failure. The system was successful because it promoted a period of stability and prosperity among the major economies during the post-war period. However, the system failed when the US altered the rules of the game and printed too much money to fund its growing budget deficit. In the end, the US was unable to keep the promise of gold conversion at USD 35 per ounce and Bretton Woods was abandoned.

In recent years, academics and market professionals have been discussing the similarities and differences between the current financial system and Bretton Woods. Fixed exchange rates helped countries like China, the smaller Asian countries, Russia, and many Latin American countries to stabilize their economies after a currency crisis in the 1990s. Many Middle Eastern oil producers also pegged their currencies to the USD. The USD pegs have enabled the US to maintain high levels of public and private consumption, which have been financed by the high savings rate of major emerging market countries. Meanwhile, many emerging market countries would have had a more difficult time attaining as high a growth rate without the US current account deficit.

The institutional framework of the Bretton Woods agreement and today's pegged and quasi-pegged exchange rates are completely different, in our view. For one thing, in times of economic and financial stress, we think the current system would react much more flexibly thanks to the following:

- **No formal agreement.** Today's currency regime, dubbed the "Revived Bretton Woods system" or "Bretton Woods II" is not based on a formal international agreement. There are no multinational rules to establish fixed or quasi-fixed exchange rates to the USD. Rather, it is comprised of a series of unilateral decisions.
- **No gold anchor and small exit costs.** Gold convertibility was a crucial element of the first Bretton Woods arrangement because it limited nominal US money supply growth. Also, leaving the arrangement would have been quite costly. Today, money supply growth is the decision of each country. In addition, exiting the arrangement would be far less expensive.
- **Emerging market core.** In the Bretton Woods system, a group of industrialized countries created the architecture of the global financial system independently. Today, the pegs exist among emerging markets, some of which employ capital controls to regulate the exchange rate.

Considering these very substantial differences, we think labeling today's arrangements "a revived Bretton Woods" conceals more than it reveals. Given the very loose institutional arrangements of the current managed pegs, a change to the present system could unfold rather quickly.

control inflation rather than growth is increasing. Meanwhile, we can envision a currency depreciation for many inflation-targeting countries in view of the current global economic slowdown.

How might such an adjustment unfold? What would be a reasonable pace for it? What are the potential consequences for the global economy? Are all countries and financial assets affected in the same way, or can we differentiate between the consequences? We address the first two questions in the remainder of this chapter and leave the third and fourth questions to later chapters.

The speed of past exchange rate moves

The most extreme exchange rate realignment in recent history took place in 1973, when the Bretton Woods system collapsed. This fixed exchange rate system came under immense pressure when the US printed so much money that they were unable to keep their promise to convert US dollars into gold at a fixed parity of USD 35 per ounce. The post-1973 realignment of the French franc, the German mark, the British pound, the Swiss franc, and many other currencies, was dramatic (see Fig. 2.6 on page 29). The events of 1973 demonstrate that exchange rates can remain misaligned for a long time before they correct, but once the correction starts, it can move quickly.

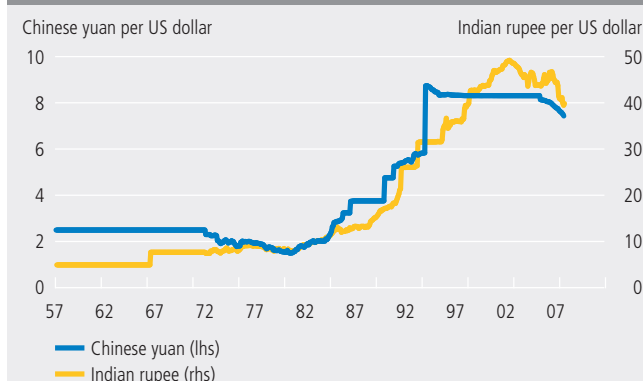
The current system of pegged and quasi-pegged exchange rates is often compared to the post-War Bretton Woods system. Thus, some observers think that a similar, spectacular realignment will hit currency markets like in 1973 (see box on page 30 for a discussion of Bretton Woods). However, there are many substantial differences between the Bretton Woods arrangement and the current unilateral decision of some countries to tie their exchange rate to the USD.

A survey of currency moves

What happened in 1973 and immediately thereafter offers little guidance for what might be in store for currencies in the coming years. Bretton Woods was a global fixed currency arrangement, and the exit costs were high. Slow to start, the correction led to its sudden collapse. This time, we are looking for a smoother adjustment path.

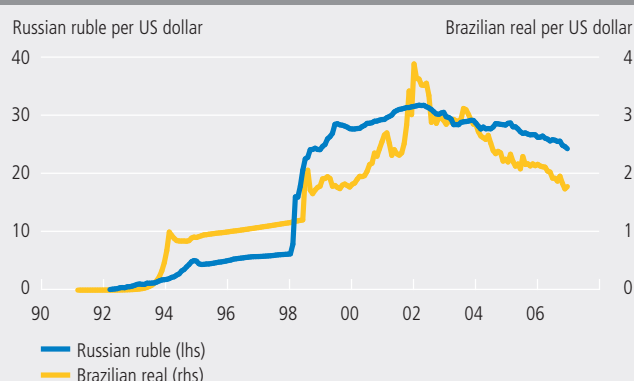
In order to get a feeling of both the scope and speed of currency movements, we tracked the behavior of the most frequently traded currencies versus the US dollar over the last 25 years (see Fig. 1.1 on page 11). For completeness, we also included the currencies of some of today's most important emerging economies, the BRICs, Brazil, Russia, India, and China (see Fig. 2.7 and Fig. 2.8.)

Fig. 2.7: Asian currencies are weaker but have stabilized



Source: International Monetary Fund's International Financial Statistics

Fig. 2.8: Emerging market currencies calming down



Source: International Monetary Fund's International Financial Statistics

We separated our group of countries according to the two currency regimes (see Fig. 2.9). The inflation-targeting countries are those that belonged to the group of industrialized nations when our survey started in 1982. The growth-targeting countries, simply put, did not belong to this group of industrialized countries in 1982. The growth-targeting countries had a greater incentive to promote growth because they were less developed than the inflation-targeting countries. The advanced economies, on the other hand, had more of an incentive to preserve wealth and therefore put a greater emphasis on inflation targeting.

How did these two groups of currencies behave? We identify five different bands of exchange rate changes and note how often such moves occur during different intervals (see Fig. 2.10 and Fig. 2.11). The growth-targeting countries tend to keep exchange rates fixed. In all periods observed, from monthly to yearly changes, moves of less than one percent were the most frequent. Meanwhile, the currencies of inflation-targeting countries were more likely to experience small changes as well, but within a higher band of

Fig. 2.9: Categories for ‘growth targeters’ and ‘inflation targeters’

	Developed countries in 1982	Current currency	ISO code
Inflation targeters	Australia	Australian dollar	AUD
	Canada	Canadian dollar	CAD
	France	euro	EUR
	Germany	euro	EUR
	Italy	euro	EUR
	Japan	Japanese yen	JPY
	Switzerland	Swiss franc	CHF
	United Kingdom	British pound	GBP
Growth targeters	Emerging markets in 1982	Current currency	ISO code
	Brazil	Brazilian real	BRL
	China	Chinese yuan	CNY
	Czech Republic	Czech koruna	CZK
	Hong Kong	Hong Kong dollar	HKD
	India	Indian rupee	INR
	Indonesia	Indonesian rupiah	IDR
	Kuwait	Kuwaiti dinar	KND
	Mexico	Mexican peso	MXN
	Poland	Polish zloty	PLN
	Russia	Russian ruble	RUB
	Saudi Arabia	Saudi riyal	SAR
	Singapore	Singapore dollar	SGD
	South Africa	South African rand	ZAR
	South Korea	South Korean won	KRW
	Thailand	Thai baht	THB
Turkey	Turkish new lira	TRY	
United Arab Emirates	UAE dirham	AED	

Source: UBS WMR

Note: Categorization is as of 1982, which is the starting point for our survey.

between 1–5%. In terms of major moves over six months, inflation targeters rarely saw their currencies shift by more than 20%, whereas such moves cannot be ruled out for growth-targeting countries.

The tendency to keep exchange rates fixed has clear consequences for these currencies, as a comparison of the two tables shows. The currencies of growth-targeting countries have a significantly higher percentage of extreme moves during all time horizons. On an annual basis, every fifth move is larger than 20%. For the inflation targeters, this occurs only once in every 12 moves. A semiannual comparison yields an even greater divergence between the two regime types: a strong exchange rate move during the next six months is typically 10–20% for an inflation-targeting country and very likely greater than 20% for a growth-targeting country.

Three cornerstones of expected currency adjustments

Now the question is, how could exchange rates move? Three cornerstones guide us through potential exchange rate outcomes.

- Exchange rates are far removed from their PPP equilibrium values.
- Currencies of growth-targeting countries are undervalued.
- Pressure on competitiveness limits further appreciation of presently overvalued developed country currencies.

With these cornerstones in mind, we have drawn up two scenarios that guide our next two chapters where we describe the economic and financial market consequences of possible currency adjustments. Fig. 2.12 shows a

Fig. 2.10: Frequency of currency moves in “growth-targeting” countries (in %)

Size of move*	m/m	q/q	6m/6m	y/y
0–1	60.8	43.6	35.4	28.7
1–5	28.8	33.2	30.9	23.7
5–10	6.2	10.6	12.6	15.7
10–20	2.2	6.5	9.4	12.0
>20	2.1	6.1	11.7	19.9

* In % versus USD.

Source: International Monetary Fund's International Financial Statistics, UBS WMR

Fig. 2.11: Frequency of currency moves in “inflation-targeting” countries (in %)

Size of move*	m/m	q/q	6m/6m	y/y
0–1	32.2	17.6	12.6	6.8
1–5	58.7	49.0	38.4	26.2
5–10	8.4	27.7	29.7	28.8
10–20	0.7	5.4	18.1	30.5
>20	0.0	0.2	1.1	7.8

* In % versus USD.

Source: International Monetary Fund's International Financial Statistics, UBS WMR

Fig. 2.12: Exchange rate scenarios

	Current	Business-as-usual	Change (in %)	Depegging	Change (in %)
EURUSD	1.47	1.34	–9	1.20	–18
USDJPY	108	102	–6	80	–26
GBPUSD	1.97	1.87	–5	1.70	–14
USDCHF	1.10	1.17	6	1.22	11
USDCNY	7.25	6.95	–4	5.50	–24

Source: UBS WMR

smaller and a larger adjustment of exchange rates towards equilibrium. The next sections of the present chapter discuss the reasons for these changes for the USD, the EUR, and the JPY separately.

Fragile USD against currencies of growth-targeting countries

With some notable exceptions, such as Argentina and Turkey, the current system of managed exchange rates has been remarkably stable over the past decade. This is remarkable precisely because the international monetary system and the USD have grown extremely fragile in this period. Many observers were already discussing the structural weakness of the USD in 2002 and 2003, predicting that the USD and the financial system in general were nearing a collapse. A significant further widening of the US current account and fiscal deficits, which require the US to issue more debt, could well lead to a rise in real and nominal interest rates and a corrective fall of the USD. This in turn could alter US spending and savings patterns and return them to more sustainable levels.

So far, no such sea change has occurred. Some see the current subprime crises as a shot across the bow, signaling the presence of something much larger and more dramatic on the horizon. But the world's financial markets and world economies have avoided both a sharp decline in the USD and a steep increase in real and nominal interest rates.

This leads us to the core question of this chapter: What conditions must emerge to provoke a collapse of pegged and quasi-pegged currency regimes? What are the potential alternative arteries for capital flows to reverse direction? In other words, we ask, when will international investors stop hoarding US assets and, by extension, make it more difficult for US private and state consumption to continue exceeding its current income?

A decline in Asian savings and central banks' reserve accumulation could be one potential catalyst for change. So far, the seemingly endless appetite of Asian central banks for US dollars has kept their currencies undervalued against the USD. In turn, this reserve accumulation has financed the massive US current account deficit. But in coming years we expect the focus of Asian central banks will shift from managing the USD exchange rate to other priorities, such as controlling inflation. Therefore, reduced reserve accumulation is a realistic prospect that could potentially hurt the USD.

Greater integration of Asian and Gulf Cooperation Council (GCC) financial markets with the rest of the world would also lift the demand for assets and currencies of countries with current account surpluses. Logically, as a next step of globalization, we can well imagine the financial markets of emerging economies growing significantly. Only deeper and broader financial markets can ensure an efficiently expanding pool of domestic investments for growth-targeting countries. And growth for these financial markets implies currency gains for these regions versus G7 currencies, including the USD.

These two potential changes could damage the USD beyond its current temporary cyclical weakness. Enhanced integration of Asia's financial markets seems inevitable, but it does not appear to be an urgent priority at present. Asia's financial markets are developing rather slowly under the watchful eyes of the authorities. For now, we see no trigger to encourage the authorities to liberalize their financial markets more quickly.

A decline in foreign exchange reserve accumulation by central banks seems reasonable. We would expect exchange rates to normalize as Asian and other central banks purchase fewer US dollars. With inflation on the increase in growth-targeting countries, we have to assume that, slowly but surely, their exchange rate priorities will shift to inflation targeting. And this shift should ultimately result in an appreciation of the currencies of

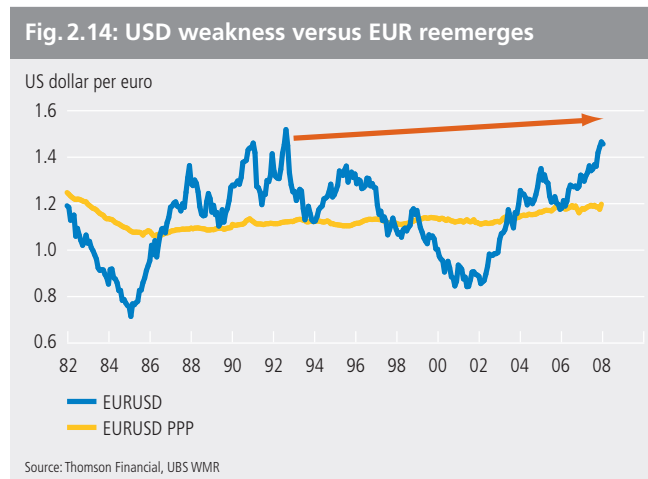
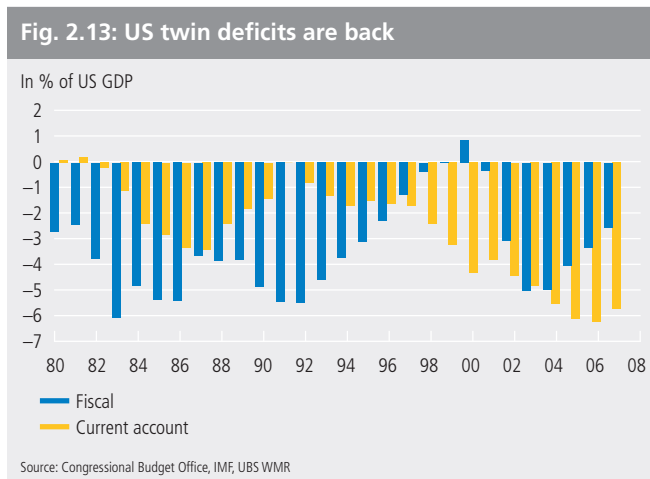
growth-targeting countries versus the USD and the EUR (please see the box on page 37 for a discussion of the potential exchange rate moves for the Chinese yuan).

Long-term EURUSD exchange rate

Our long-term view on the EURUSD exchange rate is built on the premise that the vast US current account deficit will burden the greenback for many years to come. Our reasoning is rather straightforward. The US has distributed so many assets globally during the past several years that any appreciation of the USD will find its very natural market-determined limit. This limit can be explained via the following example. At current exchange rates, central banks hold an average share of USD-denominated assets of about 65% of their foreign currency portfolios. The rest is divided among the EUR, the GBP, and other minor holdings. If the USD were to gain 10% versus the EUR and the GBP, the USD's share in these portfolios would rise to over 70% simply due to its appreciation. In light of the large US external deficit, we would expect central banks to sell the USD into such rallies. Therefore, the rise of the USD is limited over many years, in our view. While central banks are clearly not the only participants in the foreign exchange market, we expect that other market participants will collectively react in a similar fashion by taking profits on USD appreciation.

There is a useful historical example of this relationship. When the Reagan administration started its supply-side economic policies in the early 1980s, the USD appreciated strongly because the international community wanted to participate in the successes of US companies. Later, in the mid-1980s, the twin deficits and the distribution of US Treasury bonds started to weigh on the USD (see Fig. 2.13). It slid into undervalued territory and remained there until the late 1990s. Investors and central banks sold the USD into rallies, depreciating the USD to a point where European companies lost so much competitiveness that it hurt the region's growth. In general, the period from 1985 to 1998 witnessed hefty EURUSD exchange rate swings when the USD was in undervalued territory (see Fig. 2.14).

The EURUSD exchange rate is presently near the upper end of such a band. We would expect the EURUSD exchange rate to drop back towards PPP. Part of the reason for this stems from our view that Asian and other growth-targeting countries will need to allow their currencies to appreciate to counter rising inflation. This would limit their accumulation of foreign exchange reserves, which have been increasingly directed toward EUR-denominated assets. This EUR accumulation is part of the reason why the EUR has appreciated against the USD in recent years. Consequently, if growth-targeting countries were to slow their reserve accumulation, this trend would likely reverse and the EUR would weaken versus the USD. The



other central element of our forecast for a falling EURUSD exchange rate is that it would relieve pressure on Europe's fading competitiveness, especially in a period of economic weakness and financial market instability.

JPY has limited normalization potential

The JPY has remained strongly undervalued versus the EUR and the USD since the inception of Japan's low-interest-rate policy in the second half of the 1990s. Despite low interest rates and a weak exchange rate, Japan's economy has failed to recover completely from the financial crises of the 1990s. Economic growth and employment remain subdued, and the overall economy teeters at the brink of deflation. Under normal circumstances, we expect the JPY to appreciate modestly against the USD. However, a stronger appreciation of the USDJPY exchange rate to 80 is possible if: 1) Japanese monetary authorities aim to prevent a depreciation of the JPY against pegged currencies in the region, and 2) widespread unwinding of carry trades overwhelms interventionist attempts to keep the currency from appreciating.

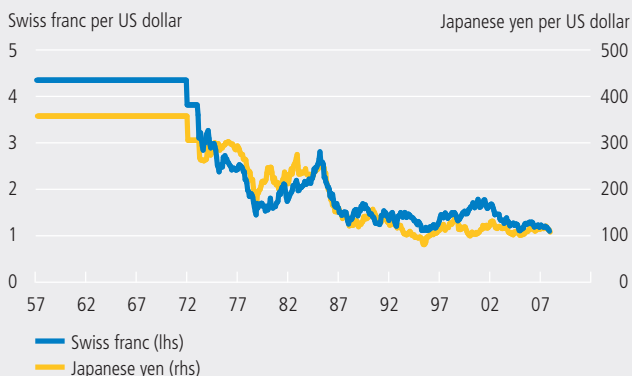
In historical terms, a strong appreciation would be a move to 60 JPY per USD (see Fig. 2.15 and Fig. 2.16). At 60, the JPY would be 30% overvalued against the USD, which was also the case in 1995 when the USDJPY exchange rate surprised with a brief drop below 80. In many respects, the Japanese authorities would need to allow their currency to appreciate just to keep the JPY in line with other currencies in the region. However, we cannot rule out the possibility of further exchange rate intervention to prevent an even steeper appreciation of the JPY.

Change from within

If currencies are indeed dominated by regime shifts, such as between growth and inflation targeting, then it is useful to identify the potential drivers of these shifts. Predicting currency moves is not easy, as we stated at the outset. However, success improves when currencies are at extremes and when an impending shift in fundamental drivers can be identified. The two currency regimes that today operate independently of one another are indeed mutually incompatible. Rising inflation pressures in one part of the world and a failure to compete on international markets in the other constitute a recipe for trouble, in our view.

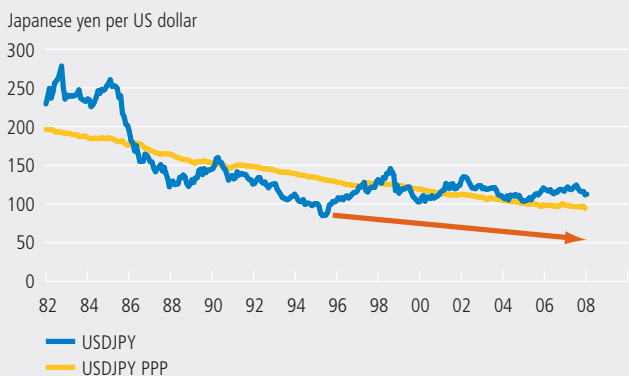
And we note the tendency for currency regimes to change quickly when they finally acknowledge new priorities. Using earlier shifts and PPP as guideposts, we have identified what we think is a probable set of exchange rate adjustments that may occur in the next few years. In the following pages, we endeavor to introduce our view of potential exchange rate changes into the global economic context using two related scenarios that differ according to the speed of the adjustment.

Fig. 2.15: CHF consistently corresponds to 100 JPY



Source: International Monetary Fund's International Financial Statistics

Fig. 2.16: Extreme valuation of 1995 is far from spot



Source: Thomson Financial, UBS WMR

What is a fair value for the CNY?

It is difficult to determine a fair value for the CNY. Historical price data is not reliable enough to calculate PPP values in the same way as for the major currency markets. Therefore, we have to use different measures to gauge the exchange rate's equilibrium level. Chinese authorities give little guidance in this respect. They steer the CNY against an undisclosed basket of currencies. So far, this policy has resulted in an appreciation of the CNY against the USD, but where it is leading is unknown.

When looking for equilibrium values that might put a brake on the current CNY appreciation, we find several interesting destinations (see Fig. 2.17). Jonathan Anderson, a UBS economist, estimated in early 2007 that the Chinese trade surplus would become more sustainable when the USDCNY exchange rate reached 5.5. This would certainly be a remarkable event because it would also imply that Chinese reserves stop growing. The political pressure on China to allow its currency to appreciate would surely fade. The only shortcoming of this scenario is that it is a dynamic one, based on relative changes in price levels and wages.

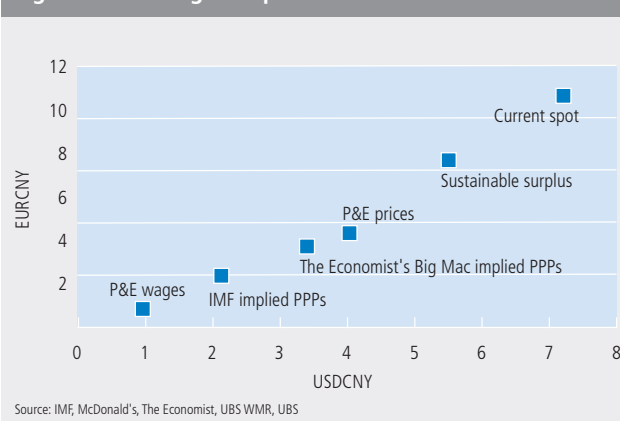
Since we have to assume that the Chinese authorities will try to resist a strong currency appreciation, we identify 5.5 as being the most extreme potential move. However, when we look at common equilibrium considerations, like equal prices, then the USDCNY exchange rate should be much lower.

The Economist magazine identifies purchasing power parity for a Big Mac at CNY 3.75. At a USDCNY exchange rate of 7.2, a Big Mac is much more expensive in New York than in Shanghai. However, as we explained in Chapter 1, there are several structural reasons why the Big Mac index may not be the best indicator of purchasing power parity.

The consumer prices section of the report, *Prices and Earnings (P&E)*, identifies a similar equilibrium at 4.35 CNY per USD. When wages are considered, which in real terms are much lower in China than in the US, the fair exchange rate should be even lower. According to the same report, an average Chinese worker needs to work about seven times longer to buy the same consumer basket as an average American. Using the USDCNY exchange rate that existed when *P&E* was published, the equilibrium level for real salaries would have been roughly 1 CNY per USD. The IMF also uses wages when it calculates PPP figures for GDP comparisons.

Price considerations may not offer much meaningful guidance for the near future. But seen over many years, they might hint at how much Chinese inflation or CNY appreciation is needed before relative prices between China and the US come into balance.

Fig. 2.17: Defining an equilibrium value for CNY



Chapter 3

Economic effects of exchange rate shifts

Thomas Berner – Senior Economist US

Felix Brill – Economist Switzerland

Dirk Faltin – Senior Economist Europe

Thomas Kägi – Senior Economist Southeast Asia

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Brian Rose – Senior Economist Japan

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Economic effects of exchange rate shifts

“The incentive for Japan or China to dump Treasury bills...is not very strong given the consequences it would have for their own economies...but it surely cannot be prudent for us...to rely on a kind of balance of financial terror to hold back reserve sales that would threaten our stability.”

– Lawrence Summers, Former US Treasury Secretary

Healthy adjustment or sharp realignment?

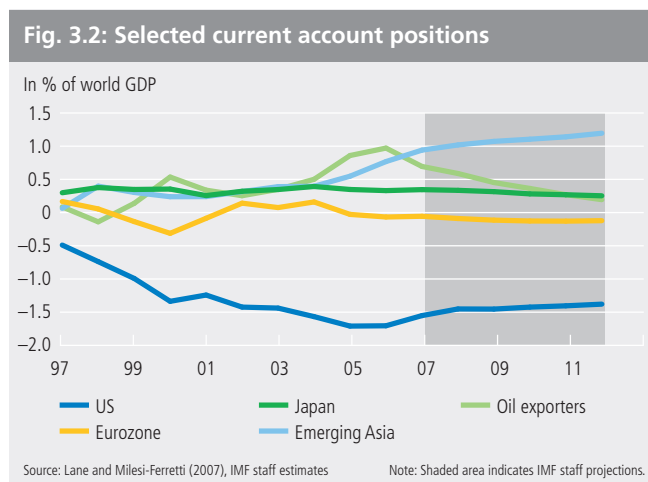
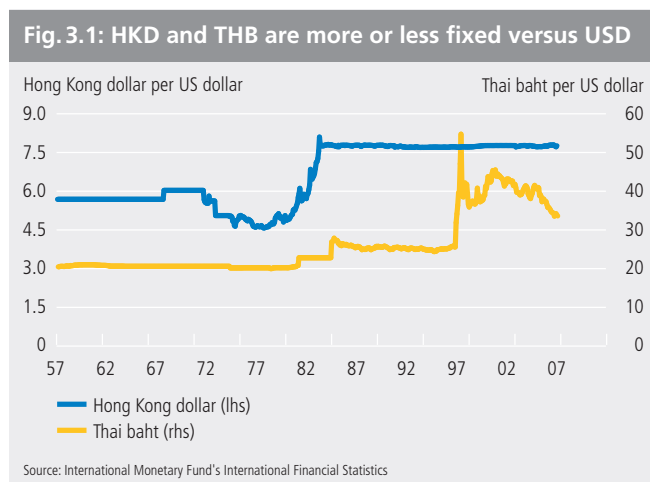
Daily currency fluctuations, if relatively minor, generally have no impact on the world economy and financial markets. After all, exchange rates should theoretically adjust over time to changes in the relative differences in interest rates and inflation.

However, currency fluctuations are not always small, as the breakdown of fixed exchange rates showed in 1973, or the collapse of the exchange rate mechanism in Europe in 1992, the Mexican peso crisis of 1994, the Asian currency crisis of 1997, and, more recently, the Argentine peso meltdown in 2002. During each of these episodes, rapid currency moves had real economic and geopolitical consequences far beyond the country or region where the crisis originated. If currency markets can so often be so volatile, then the current state of exchange rate disequilibrium must surely be a cause for concern. And concerns are only heightened, given that the global monetary system appears unsustainable in its present state.

Need for weak exchange rates has diminished

Growth-targeting countries have profited greatly from their exchange rate stability versus the USD, but their policies may not always be suitable. Granted, exchange rates can be a tool to stimulate growth to help a less-developed country catch up with developed countries, especially following a currency crisis. A currency crisis normally triggers a simultaneous spike in government financing needs (to stabilize the economy and financial sector) and the country's risk premium. Fixing the exchange rate to an anchor like the USD restores confidence to some extent, lowers the government's borrowing costs, and stabilizes the economy and financial markets.

But what exactly happens when the crisis passes in a country that uses its exchange rate to achieve various growth ambitions? Strong economic



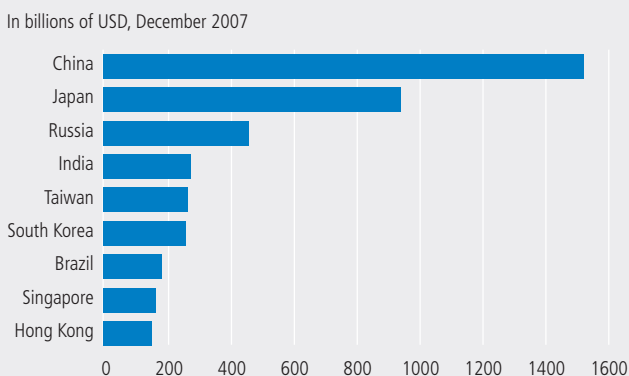
activity, high capacity utilization rates, and rising inflation are the broad trends in many of the growth-targeting countries that have quasi- or fully-pegged currencies (see Fig. 3.1). And today, yields in these same countries have dropped below USD yields. For example, nominal interest rates in Hong Kong are close to zero, inflation is surging, the housing market is soaring, and other critical sectors of the economy are booming. In short, the situation has improved markedly in many countries that use their exchange rate to pursue growth objectives. So much so that inflation is now a cause for concern. This calls into question the present exchange rate regime, or at least suggests an adjustment in the currency peg.

Yet it is more than just the internal dynamics of growth-targeting countries that signals the potential for a regime change, or at least a new fashion, in currency markets. External dynamics are every bit as powerful. Consider the towering currency reserves of China, or their flipside: the US current account deficit. To support growth, China has allowed its domestic economic output to be consumed outside its borders, exported to places where consumer demand is high. This feeds China's foreign currency reserves, which are recycled back into USD assets, particularly US Treasury bills, notes and bonds. This, in turn, reduces US interest rates, spurs US borrowing and discourages saving, thus fueling even greater levels of US consumption. Were it not for China's exceedingly undervalued currency, imbalances, like the US current account deficit of roughly 6.0% of GDP or the USD 1.5 trillion in Chinese foreign exchange reserves, might not have gotten so far out of balance (see Fig. 3.2 and Fig. 3.3).

Central banks in countries with large current account surpluses now possess reserves that are well in excess of these countries' liquidity needs or foreign exchange management requirements. Meanwhile, the coffers of commodity-rich nations have swelled along with the surge in oil and other natural resource prices. Now, central banks allocate some of their excess reserves to so-called sovereign wealth funds (SWFs), which operate on behalf of sovereign states and seek to deploy the accrued wealth in higher-risk assets, such as real estate and equities, rather than more conservative investments, like money market instruments and low-risk government bonds. SWF assets amount to roughly USD 2.5 trillion and rank as the fourth-largest institutional fund segment behind retirement funds, investment funds, and central bank reserves (see Fig. 3.4).

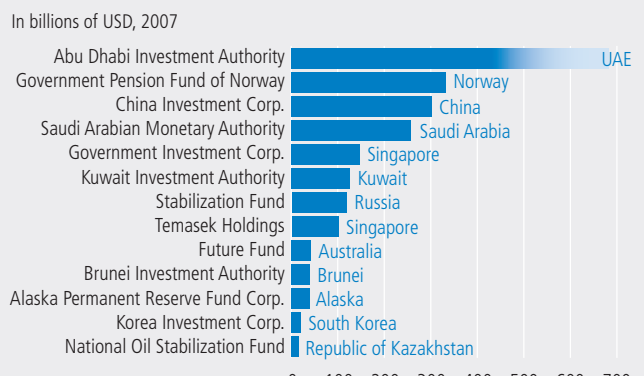
Will growth-targeting countries be able to contain inflation? Will China's citizens continue to tolerate that so much of their own domestic production goes to other countries when many basic services are unavailable at home?

Fig. 3.3: Central bank foreign exchange reserves



Source: International Monetary Fund's International Financial Statistics

Fig. 3.4: Estimates of sovereign wealth fund assets



Source: UBS WMR

Economic effects of currency moves

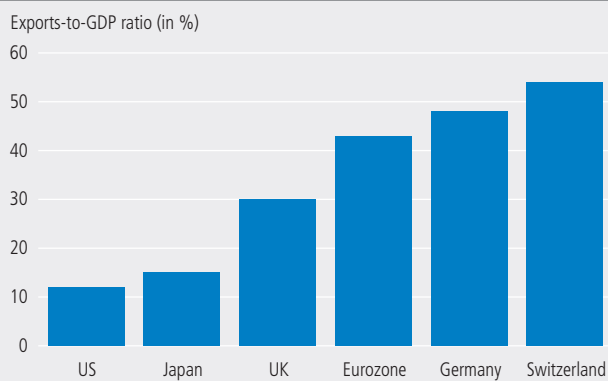
What are the economic consequences of a sharp currency move? Standard economic models, such as the Mundell-Fleming model, can be used to show the impact of exchange rate movements on an economy. Essentially, an appreciation of a country's currency leads to:

- A deterioration of its competitive position in tradable goods. Exports slow while imports accelerate, resulting in lower GDP growth and a worsening of the country's trade balance.
- A dampening effect on overall inflation due to cheaper imports.
- In terms of asset prices, slower growth and lower inflation imply lower interest rates and higher bond prices. On the other hand, reduced export competitiveness negatively impacts corporate earnings of export-oriented businesses and sectors and will therefore put downward pressure on related equity prices.

The magnitude of these effects depends on a variety of factors. First, it depends on the openness of an economy, that is, the degree to which a country is integrated into the global economy via international trade flows. A common way to measure the openness of a country is to divide a country's exports by its GDP (see Fig. 3.5 and Fig. 3.6).

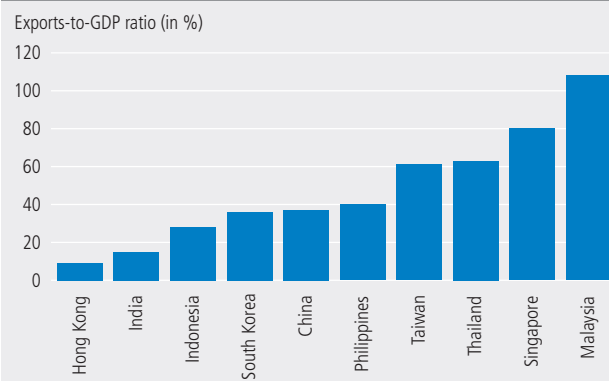
Regarding inflation-dampening effects of an appreciating currency, it must be kept in mind that the so-called exchange rate pass-through to import prices can vary from country to country. For instance, the US has relatively little exchange rate pass-through to import prices because commodity prices (most importantly oil) are denominated in USD and, secondly, because the US is considered a 'price maker' for imported goods (see Fig. 3.7). In Japan and the Eurozone, the pass-through of exchange rate swings to import prices is much more pronounced.

Fig. 3.5: Openness of advanced economies



Source: Thomson Financial, UBS WMR

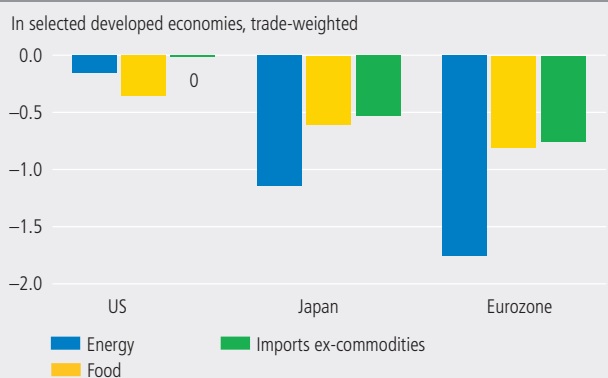
Fig. 3.6: Openness of selected Asian economies



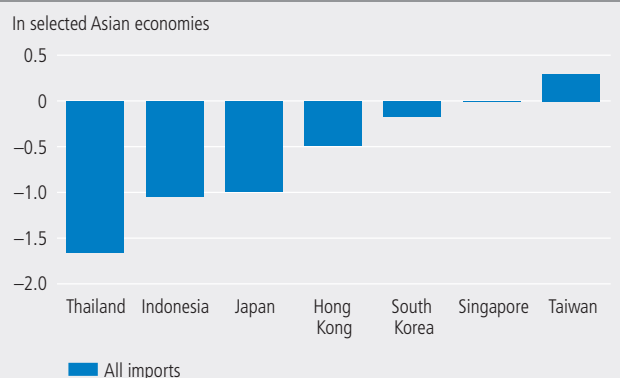
Source: Thomson Financial, UBS WMR

Note: Figures are adjusted for re-exports.

Fig. 3.7: Import price sensitivity to exchange rates



Source: Artus (2008)



Source: Ito et al. (2005)

Will governments with floating exchange rates permit their industries to be minority-owned by state-controlled investment companies? Are relationships between countries so strong as to suggest that these changes in corporate ownership are sustainable for the long term and at an increasing pace?

As economists, we cannot hope to answer all of these questions. We pose them mostly to illustrate the importance of one particular question that we do hope to shed some light on: what would happen to global economic activity and financial markets if countries altered their currency stance versus the USD? When inflation threatens, a growth-targeting country may well slow its money supply growth and either alter or abandon its fixed exchange rate. Some countries will try to fix their peg at a stronger level to the USD, while others may shift directly to an inflation-targeting regime. In either case, central banks of growth-targeting countries will one day slow their foreign exchange reserve accumulation. Using two different scenarios of how this might unfold, we will explore what this shift could mean for economic growth and financial markets.

Two scenarios

Business-as-usual scenario: growth targeting and managed appreciation

The business-as-usual scenario for this study reflects our current global economic outlook: we assume a gradual transition of exchange rates toward their fair values, as determined by PPP. This transition is achieved in a tightly “managed” way, which means we assume that there will not be an abrupt and broad-based switch from growth targeting to inflation targeting. Instead, we expect central banks of growth-targeting countries to muddle through, letting their currencies appreciate to an extent that helps to rein in inflation pressures.

We expect these countries to switch from a purely growth-oriented exchange rate target – most of them with a direct peg to the USD – to one that targets economic growth at a lower level and a reduced rate of inflation, as opposed to an outright inflation target that ignores the implications for economic growth. China, the most prominent example, has already moved towards defining explicit, and lower, growth targets and has taken several steps to create a more flexible exchange rate regime. These moves have so far been unsuccessful at cooling down the economy.

In our business-as-usual scenario, we expect undervalued Asian currencies to move closer to their estimated purchasing power parity (PPP) values, which would imply a USDJPY exchange rate at 102 and a USDCNY exchange rate at slightly below 7 by July 2008 (see Fig. 3.8). The GBP, which has been propped up by the carry trade, falls to 1.87 versus the USD in this scenario. At the same time, we expect the EURUSD exchange rate to fall to 1.34 in this environment, as the appreciation of Asian currencies against the USD is likely to relieve pressure on the EUR.

Depegging scenario: an abrupt shift to combat inflation

But what if things fail to move in such a smooth fashion? In our depegging scenario, countries are forced to switch their exchange rate target from growth to inflation for reasons outlined in Chapter 2. As such, we assume an abrupt and even greater appreciation of growth-targeting currencies against the USD than in our business-as-usual scenario.

We made our scenario roughly equivalent to the USD’s low against the JPY in April 1995. If we translate this into today’s context, the USDJPY exchange rate falls to 80 within two quarters. JPY appreciation versus the USD may be further supported by an unwinding of the carry trade. The USDCNY exchange rate moves to 5.5 based on the assumption that this

level would yield a more sustainable Chinese trade surplus (see Fig. 3.9). Furthermore, we assume that the CHF, which remained weak during the past several years because of the effect of carry trades, moves to 1.46 against the EUR. The GBPUSD exchange rate moves to 1.70, and the EURUSD exchange rate weakens to 1.20.

Currency appreciation and depreciation can be expressed against any single currency and in terms of a nominal effective exchange rate, which reflects the trade-weighted basket of all exchange rates against a particular currency and is expressed as an index. If we translate our depegging scenario into changes to a country's nominal effective exchange rate, we see that the JPY appreciates by 25%, while the USD depreciates by just 3%, since the depreciation against Asian currencies is mostly offset by the appreciation against the EUR. The CNY appreciates by 25% against the USD and by roughly 40% against the EUR as a result of a stronger USD against the EUR. Therefore, the CNY experiences an even stronger nominal effective exchange rate appreciation than the JPY.

Depegging scenario: a regime shift with severe consequences

Perhaps the most obvious result of our scenario analysis is that sizable exchange rate shifts can have a palpable effect on the rest of the economy. Just because growth-targeting countries have many reasons to hold fast to the current regime, there is no guarantee that they will do so. The implications for the world economy are quite severe if currencies begin to shift suddenly, but the impact is not the same everywhere. We begin considering Asia, where the impact is quite strong, and then extend the discussion to other regions, where the effects are more muted.

Asia and the Middle East: adjusting to currency appreciation

In 2007, China faced a new policy challenge: inflation. Since the 1997 Asian currency crisis, China had experienced either very low inflation or deflation. Inflation spiked temporarily during 2003, when food prices soared. Today, China is facing a similar inflation problem, although perhaps more widespread, since prices have started to rise more broadly. A buoyant economy, tighter capacity constraints, rising wages and land prices and

Fig. 3.8: Business-as-usual scenario (halfway to PPP)

	Jan 08*	Apr 08	Jul 08	Oct 08	Jan 09
EURUSD	1.47	1.40	1.34	1.34	1.34
USDJPY	108	105	102	102	102
EURJPY	159	148	137	137	137
GBPUSD	1.97	1.92	1.87	1.87	1.87
EURGBP	0.75	0.73	0.71	0.71	0.71
USDCHF	1.10	1.14	1.17	1.17	1.17
EURCHF	1.62	1.59	1.56	1.56	1.56
USDCNY	7.25	7.10	6.95	6.95	6.95

Source: UBS WMR

* average spot exchange rate during January 2008.

Fig. 3.9: Depegging scenario

	Jan 08*	Apr 08	Jul 08	Oct 08	Jan 09
EURUSD	1.47	1.34	1.20	1.20	1.20
USDJPY	108	94.1	80.0	80.0	80.0
EURJPY	159	128	96.0	96.0	96.0
GBPUSD	1.97	1.84	1.70	1.70	1.70
EURGBP	0.75	0.73	0.71	0.71	0.71
USDCHF	1.10	1.16	1.22	1.22	1.22
EURCHF	1.62	1.54	1.46	1.46	1.46
USDCNY	7.25	6.38	5.50	5.50	5.50

Source: UBS WMR

* average spot exchange rate during January 2008.

An exchange rate gulf?

The currencies of five of the six member countries of the Gulf Cooperation Council (GCC) – Bahrain, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) – are pegged to the USD. Kuwait abandoned the peg in May 2007 (see Fig. 3.10). The sustainability of the remaining pegs is in question.

The sharp increase in oil prices in recent years has caused the combined current account surplus for the GCC countries to jump from USD 25 billion in 2002 to ten times that level by 2007, representing a current account surplus of around 30% of GDP (see Fig. 3.11). This huge inflow of capital has boosted domestic liquidity, investment, and growth. Private-sector credit, a good indicator of liquidity, registered a more than seven-fold increase between 2000 and 2006.

Not surprisingly, inflation has also picked up. Textbook economics would call for tighter monetary policy, and an appreciation of the currencies would be warranted. However, given that these countries' currencies are pegged to the USD, the opposite has happened: interest rates have been lowered in line with the US Federal Reserve's decisions, and the exchange rate has depreciated against the EUR in recent years, in line with USD weakness. Since 2002, the pegged GCC currencies have lost close to 40% of their value against the EUR. Totalling around one-third of all GCC imports, the European Union is the GCC's largest source of imports, supplying about a quarter of Bahrain's imports and over 40% of Qatar's.

These various factors, combined with the global rise in food, energy, and transportation costs, have increased inflation in the GCC countries to multi-year highs. In some member states, inflation has risen above the benchmark interest rate, which means that real interest rates have turned negative. This has been the case especially in Qatar and the UAE. Negative real interest rates have encouraged borrowing and spurred investment, resulting in rising asset prices. For

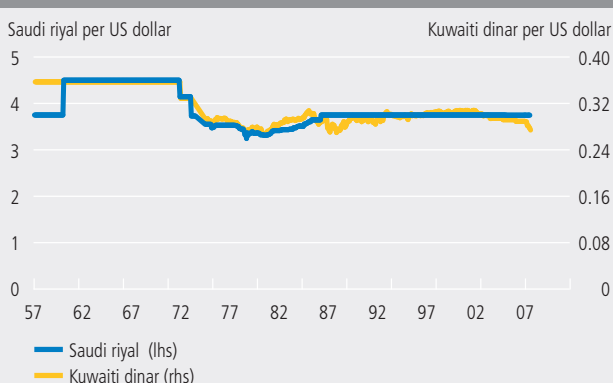
example, residential property prices in Dubai tripled between 2002 and 2007.

Ironically, in our view, the authorities have responded with fiscal measures to boost residents' incomes to compensate for their declining purchasing power. In sum, the GCC economies currently find themselves with an unsustainable policy mix. Increasingly, GCC policymakers are looking at revaluing their currencies against the USD, or re-pegging them to a basket, which would include the EUR. There are three key arguments against a revaluation, however:

- First, the peg has served this region well over several decades. Today's revaluation may become tomorrow's devaluation, which could undermine confidence in the investment framework in the region.
- Second, and probably more importantly, a revaluation today would mean lower income (that is, lower fiscal revenues) from the region's dollar-denominated oil exports, just as these governments are boosting spending. If we combine expected lower USD oil prices in 2008 with revalued GCC currencies, the negative impact on GCC government revenues would be amplified. But herein lies the paradox: had the oil revenues been 'sterilized' in the first place – that is, not allowed to enter the money supply through fiscal spending – then the revaluation itself would be less necessary.
- Third, a revalued currency would result in a capital loss on foreign currency assets.

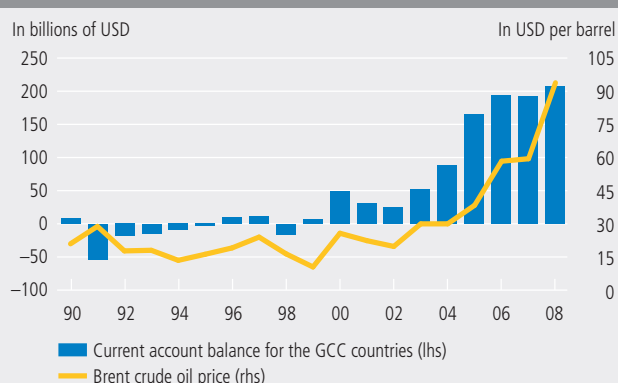
For all these reasons, if a revaluation were to transpire, policymakers would prefer that it either be small or in small steps. We can see this from the way Kuwait has dealt with its currency revaluation: between May 2006 and February 2008, the Kuwaiti dinar appreciated by less than 7% against the USD, an average of 0.3% per month. While small moves may be preferable, a sharp revaluation of the region's currencies may be necessary if inflation really proves hard to contain.

Fig. 3.10: GCC pegs to the USD are under review



Source: International Monetary Fund's International Financial Statistics

Fig. 3.11: Oil prices influence the GCC current account



Source: Thomson Financial, IMF, UBS WMR

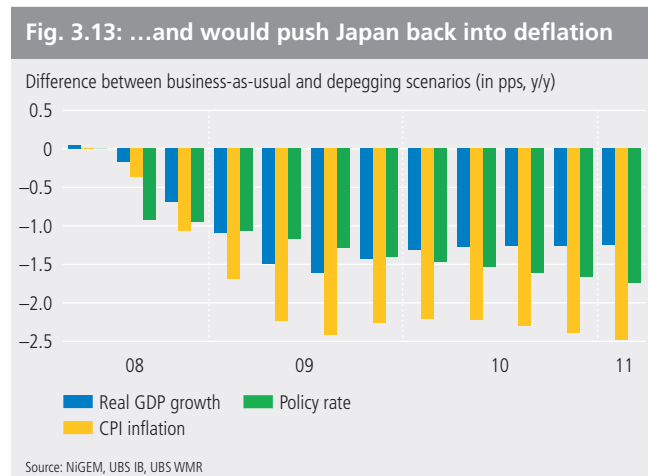
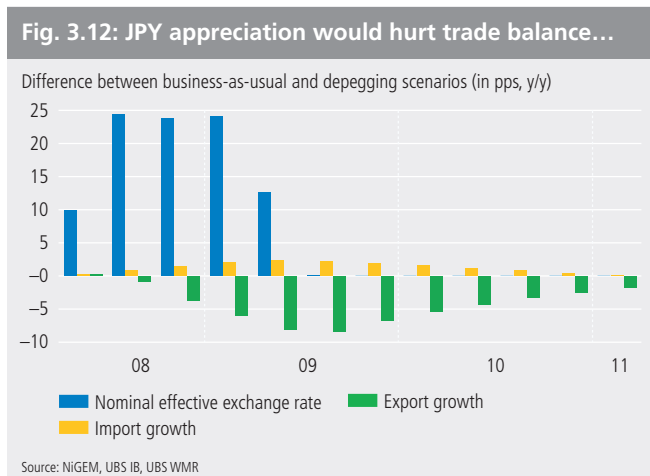
abundant liquidity, together with a supply shock to food prices, caused annual inflation to increase by 7.1% in January 2008. Chinese authorities reacted with a series of tightening measures, including increases in interest rates and reserve requirements, as well as administrative measures.

Although there is a near-zero probability that Chinese authorities will allow the CNY to float in the near term, we are already seeing the currency appreciate at a steady pace. Overall growth is negatively impacted under our depegging scenario, as the financial system is not ready for such a regime shift. Export growth and investment spending suffer as well. A stronger CNY only partially reins in inflation. A 25% appreciation of the CNY against the USD (and a roughly 40% move against the EUR), for example, reduces imported energy inflation.

However, while many goods categories exhibit deflationary price behavior, it is questionable whether some goods prices would fall. For example, while the majority of food products are domestic in origin, a stronger CNY would reduce the cost of imported food. Food imports, which accounted for merely 1.2% of total Chinese imports in 2007, would likely increase alongside a stronger currency. Similarly, housing costs, which have started to climb recently, will be little affected by lower import prices. The currency move would need to achieve a sharp slowdown in economic activity to have a dampening effect on food and house price inflation. Lower inflation would open up the possibility of the People's Bank of China reversing their recent policy tightening, thus acting rather as a counterweight to the currency effects.

Given our expectation of a sharp appreciation of the CNY and the JPY, the other Asian currencies could very well follow suit. First, in several Asian economies inflation has also started to pick up significantly over the past few quarters. Second, if the regional heavyweights were to revalue, the smaller economies would have to follow in order to prevent inflation from climbing even higher. The magnitude of the impact would be determined for each country separately by the degree of inflation pressure, as well as the specific economic ties within Asia and with the rest of the world.

If China is forced to let its currency appreciate sharply, other Asian countries facing similar issues would likely allow their currencies to appreciate as well, linked to, but independent from, China's policies. India remains a notable exception, as it still has a large trade deficit and the Indian rupee (INR) is under pressure due to high capital inflows. It is debatable whether the INR would continue to appreciate, since it is not clear whether the INR is fundamentally undervalued or not.



Japan: in the eye of the storm

Things appear most disruptive for Japan, where core inflation still hovers near zero and economic growth is weakening. Therefore, despite being one of the least open economies in Asia, Japan is the most vulnerable to an abrupt exchange rate regime shift and a 25% appreciation in its trade-weighted currency, as outlined in our depegging scenario.

According to our model, Japan's growth slows to recessionary levels (see Fig. 3.12 and Fig. 3.13). A back-of-the-envelope calculation suggests that a 10% appreciation in the nominal JPY exchange rate shaves roughly 0.5 percentage points off of GDP growth. In the case of a 25% appreciation, this would translate into a 1.25 percentage point reduction in growth. This result is confirmed by our simulations, which puts the loss in growth at 1.6 percentage points six quarters after the JPY has reached its peak. The relatively high exchange rate pass-through to import prices pushes the economy back into deflation. This could be aggravated further if commodity prices fall in response to weak global demand.

Deep fiscal deficits and a further rise in Japan's debt-to-GDP ratio are likely, as corporate income taxes are hit by a stronger JPY, and high real interest rates would drive up the real debt burden. Longer-term structural shifts are also likely, but depend on whether the appreciation in the JPY is, or is expected to be, persistent or temporary. One shift might be a potential reversal of the recent trend in investment patterns, where Japanese manufacturers have started to build some facilities in Japan, rather than overseas, due to the weaker JPY.

Our results also show that the Bank of Japan would clearly have to cut rates, even though there is very little they can do with short-term interest rates at 0.50%. Long-term interest rates could fall from already low levels

Will Japan repeat history with another policy mistake?

During Japan's bubble period (1987–1991) and subsequent bust, the Bank of Japan (BoJ) managed to magnify the economic damage. It waited too long to start raising rates as the bubble inflated, and then waited too long to start cutting rates as deflation became entrenched.

While the former mistake is widely recognized, the latter is not, particularly within the BoJ itself. The risk of another bubble forming, no matter how remote, is seen as something that policymakers must avoid at all costs. By contrast, the risk of further deflation seems not to be taken very seriously. This is one reason why the BoJ has been anxious to raise rates as soon as possible, both in the previous recovery cycle, which ended with the bursting of the Tech bubble, and in the current one.

In our view, the BoJ will be reluctant to lower interest rates even if the JPY strengthens sharply. It would be in the difficult position of having to admit that it was wrong (as it was in 2000) to hike rates in the face of government opposition and near-zero inflation. Still, if there is clear evidence that the economy is in a recession, the BoJ would likely be forced to reverse its course and cut rates. Even under this scenario, the BoJ might stop at 0.25% rather than bring rates back to zero. It would prefer to keep a functioning money market, and the extra 25 basis points of

easing would not make much difference to the real economy, in any case.

A significant and rapid appreciation of the JPY would most likely prompt the Ministry of Finance to resume foreign exchange intervention. However, the MoF may be more reluctant to intervene heavily than in the past. It is earnestly trying to restrain the level of government debt, and intervention would require further debt issuance. This is especially true if other Asian currencies were strengthening at the same time, as Japan has become inextricably linked to the region's economies. Nearly half of all Japanese exports are to other Asian countries, up from just over 30% in 1990.

The speed of the move is also important. If the USDJPY exchange rate moved to 80 within a half-year or so, it would likely inspire intervention. However, the scope for intervention is not unlimited. Japan also has very little freedom in terms of fiscal stimulus. The government is easing off of tax increases in 2008 because a general election is coming, but it cannot realistically push through the kind of huge fiscal packages that it once could. Furthermore, the depegging scenario would devastate tax revenues, so the deficit would increase even without stimulus measures.

in light of the looming deflation. Japanese equities would certainly suffer under this scenario, with corporate earnings hit by a strong JPY, contracting demand, and falling prices.

Eurozone: relief from the strong EUR

The EUR reached an all-time high against the USD in November 2007, but eased somewhat thereafter. The ascent of the EUR began back in early 2002. Since then, Europe's common currency has gained some 70% against the USD. For Eurozone exporters, the strong EUR represents a significant burden. Survey evidence suggests that the average pain threshold for EUR strength is a EURUSD exchange rate of about 1.40.

Individual countries are affected differently, because of differences in the product mixes, industrial structures, and trade links (see Fig. 3.14). According to this analysis, Germany, the Netherlands, and Finland are the least vulnerable to a strong external value of the EUR, while France, Italy, Greece, and Spain appear to be more exposed. Indeed, the French government and to a lesser degree its Italian counterpart were the first to complain about the strong EUR, while the official response in Germany has been more muted. Nevertheless, high-ranking European policymakers, including the President of the European Central Bank (ECB), have appealed to the Chinese government to allow a faster appreciation of the yuan to alleviate the upward pressure on the EUR.

In our depegging scenario, the currently undervalued Asian currencies appreciate by about 25% versus the USD. We also forecast a depreciation of the EUR of just under 20% against the USD, which would return the EURUSD exchange rate to its long-term fair value of about 1.20. Both of these moves implies a roughly 40% depreciation of the EUR versus Asian currencies. A devaluation of the EUR entails a reduction of export prices, which leads to stronger foreign demand and a rise in import prices, which should result in a drop in import demand.

We find that the weaker EUR adds about 0.3 to 0.4 percentage points to economic growth compared to our current forecast of 1.7% GDP growth in 2008 (see Fig. 3.15). Thus, our estimates suggest that a normalization of the EUR exchange rate pushes growth up to levels that are roughly commensurate with the growth potential of the Eurozone. In such a situation, speculation about interest rate reductions by the ECB would quickly disappear, especially since the stronger growth momentum adds about 0.2 to 0.3 percentage points to our business-as-usual assumption for inflation, which is already above the level that the ECB cites as compatible with medium-term price stability. Hence, the model indicates that the ECB would respond to such a situation with a further 50 basis points in rate increases.

Fig. 3.14: National 'pain thresholds' to EUR strength

Country	'Pain threshold' EURUSD
France	1.20
Italy	1.30
Greece	1.30
Spain	1.40
Ireland	1.40
Belgium	1.40
Austria	1.40
Finland	1.50
The Netherlands	1.50
Germany	1.50
Eurozone average	1.39

Source: Business Europe, UBS WMR

US: effect of stronger Asian currencies partially offset by weaker EUR

For the US economy, our currency depegging scenario translates into a USD depreciation of 2.8%, as measured by the nominal effective exchange rate. The strong depreciation of the USD against the JPY, the CNY, and other Asian currencies is partially offset by the sharp appreciation of the USD versus the EUR, GBP, and the CHF.

Real GDP growth runs at a slightly faster pace than in our business-as-usual scenario; however, CPI inflation is in this scenario largely unaffected (see Fig. 3.16). While import prices should react positively to an overall weaker USD, these price increases are not passed on to consumer prices. This corroborates extensive empirical findings of a limited pass-through of a weaker USD to consumer prices since the mid-1980s. Most likely, strong competitive forces in US markets hinder companies from raising prices aggressively in order to keep their market share.

Given the somewhat muted positive effect on real GDP growth coupled with an unaffected CPI inflation forecast path in our depegging scenario, the change to monetary policy is limited. Based on our simulations, the Fed would target a policy rate that is 25 basis points higher than in our business-as-usual scenario, as a higher projected real GDP growth path implies less need for monetary easing.

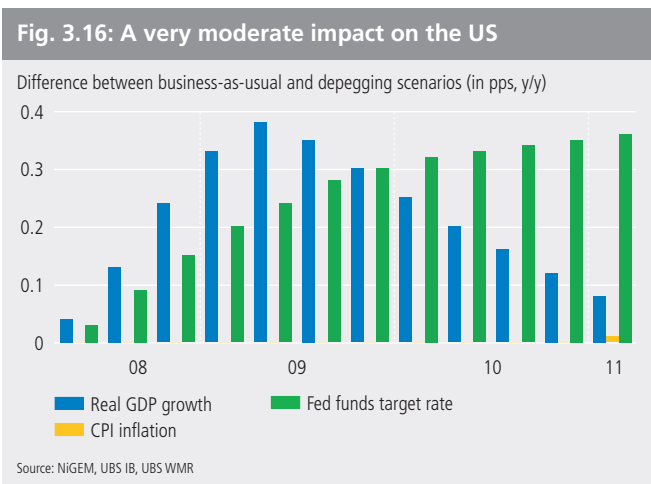
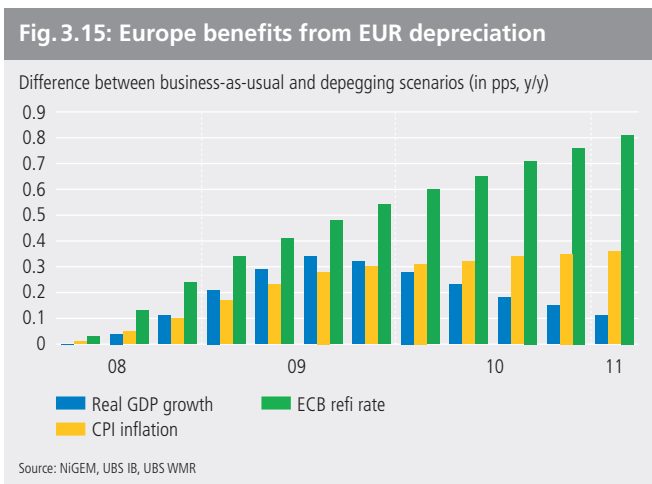
In sum, a significant and rapid appreciation of Asian currencies alone seems unlikely to offer an effective cure for the US current account malaise if it is counterbalanced by a depreciation of the EUR bloc and there is no change in the US savings rate.

Summary of the depegging scenario

The transition from targeting growth to targeting inflation through exchange rate policy seems most appealing for economies with:

- strong and broad-based inflation pressures,
- solid growth, especially strong domestic demand and high capacity utilization,
- a high pass-through of exchange rates to import and consumer prices (that is, high competitive pressure on domestic goods markets so that importers have to pass on lower prices to consumers), and
- a relatively solid banking system that can cope with the effects of exchange rate fluctuations.

If these preconditions are fulfilled, a switch from growth targeting to inflation targeting is likely to be an effective mechanism for coping with an



overheating and inflation-prone economy. The transition to a fully floating exchange rate would likely be disruptive, as currencies tend to overshoot. Furthermore, central banks whose currencies are pegged to the USD and who import the Fed's increasingly accommodative monetary policy will have to build up a track record and credibility in inflation targeting. This path would require tough decisions, such as accepting a recession, in order to bring down inflation expectations.

Overall, it is rather difficult to imagine any country that would willingly endure such a scenario. Even Japan, with its "floating" exchange rate and independent central bank, seems poorly positioned to absorb the shocks from the depegging scenario that we have outlined.

Furthermore, we have to consider a couple of longer-term implications of a significant and permanent realignment in global currency markets. Our depegging scenario assumes a significant appreciation of Asian currencies versus the USD coupled with a depreciation of the EUR bloc against the USD. This is likely to lead to a significant reshuffling of global production and supply chains. While Asia, with its huge labor supply and its undervalued currencies, has become the world's fastest growing outsourcing and production center over the last ten years, we might see a major move of global supply chains away from Asian economies and into Europe and its peripheries, where labor is still relatively cheap and

Switzerland: Stronger CHF could hamper economic performance

Similar to the JPY, the CHF has been a much-used funding currency for carry trades in recent years. This has put considerable pressure on the CHF at a time when financial markets have been remarkably stable and the risk appetite has been high. Between the beginning of 2003 and the end of 2007, the CHF lost about 7% of its value as measured by the nominal trade-weighted exchange rate, largely due to its sharp depreciation against the EUR of roughly 15%.

Coupled with robust global demand, this depreciation helped the Swiss trade balance to improve substantially. Accordingly, net exports have been contributing significantly to the strong performance of the Swiss economy over the last four years. So what would happen if there were an abrupt appreciation of the CHF against the EUR (as outlined in our depegging scenario, where the EURCHF exchange rate moves to 1.46 within two quarters), particularly if it were brought about by an unwinding of the carry trade?

Using a VAR (vector autoregressive) model to quantify the effects, we find that this exchange rate move would trim about 0.4 to 0.5 percentage points from economic growth in 2008 (see Fig. 3.17). In 2009, the negative effects are even more pronounced, as economic growth would be roughly 0.8 percentage points weaker than in the business-as-usual scenario. As expected, the deteriorating trade balance is the primary burden on economic growth. Due to weaker export growth and stronger import growth, net exports (exports minus imports) would be significantly lower compared to the business-as-usual scenario (see Fig. 3.18). In such a situation, we would expect the Swiss National Bank to cut interest rates in order to stimulate economic growth. That there would be room to maneuver can be seen from the dampening effects on inflation evolving from weaker growth and the appreciation of the CHF. Inflation in 2009 and 2010 would be 0.3 percentage points and 0.6 percentage points lower, respectively, compared to the business-as-usual scenario.

Fig. 3.17 Stronger CHF pushes down growth and inflation

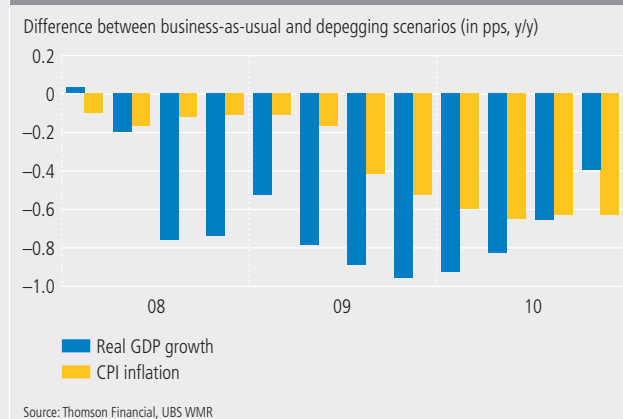
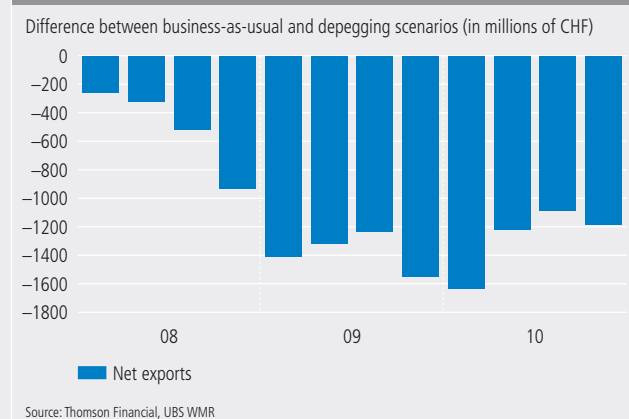


Fig. 3.18: CHF appreciation takes a bite out of net exports



abundant. How successful Europe is in this regard depends to some extent on the use of immigration policy to mitigate labor shortages in Western Europe.

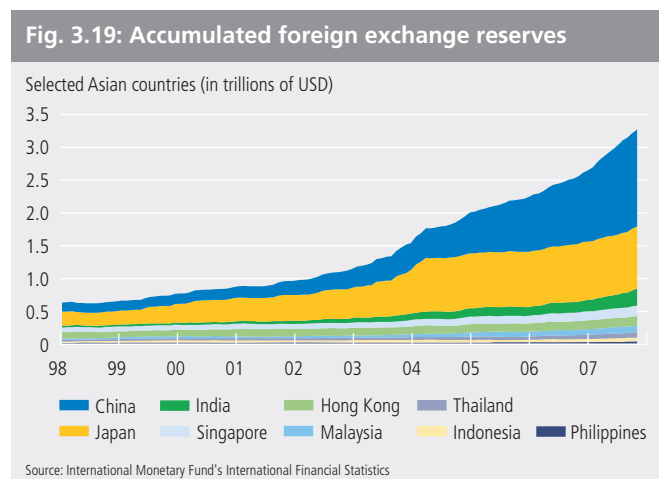
How likely is our depegging scenario? It basically boils down to the following question: will inflation rise to an extent that countries have no other option than to quickly adapt? This is closely linked to the question of whether central banks will be able to at least partially sterilize their accumulated foreign exchange reserves. The answer also very much depends on whether the current downturn in the US is more severe and prolonged than currently anticipated, and the extent to which the rest of the world is affected. In the case of a major global growth slowdown, inflation pressures will likely abate anyway, taking pressure off a sharp appreciation and a broader regime switch to inflation targeting.

However, we still see a strong likelihood that the global economy will continue to grow at a solid pace, despite the US slowdown. The Fed's aggressive interest rate cuts reduce the risk of a prolonged US downturn, and the accommodative monetary policy stance is exported via currency pegs into many emerging market economies. This might soon revive inflation after the US is out of its current doldrums. As we have stated, Japan's Ministry of Finance has less room to intervene to stabilize the JPY at a weaker level should the currency begin to appreciate. Moreover, policymakers might find some other geopolitical or structural reason to loosen their currency pegs and let their currencies appreciate versus the USD, at great cost to the value of their foreign reserve holdings and domestic growth paths.

Business-as-usual scenario: more asset bubbles ahead

Under our business-as-usual scenario, we expect a very gradual shift away from growth targeting towards a more flexible regime. Instead of directly switching to a pure form of inflation targeting, we rather expect many of the countries with significantly undervalued currencies to adopt a regime that would involve a more managed form of growth targeting.

This entails giving up the direct and strict peg to the USD and trying to enter a "managed currency regime," which allows for the needed currency appreciation to enhance control over inflation, while stabilizing economic growth at a more sustainable, and mostly lower, level. In fact, China has already moved away from pure growth targeting and is today targeting growth at a lower level and managing a steady appreciation of its currency. We would expect many of the currently undervalued Asian currencies to



return only gradually to their fundamental fair value. We have outlined the expected currency moves at the beginning of this chapter and dubbed this scenario “halfway to PPP.”

If Asian countries continue to resist market forces for stronger appreciation, monetary authorities will inevitably continue to accumulate foreign exchange reserves. China alone has seen its reserves explode from some USD 150 billion in 2000 to over USD 1.5 trillion in late 2007. Japan’s reserves have surged from USD 280 billion to USD 930 billion over the same period of time (see Fig. 3.19). During 2007, there was even a reacceleration in reserve accumulation, after it had slowed temporarily in 2004. In India and the Philippines, for instance, reserve accumulation has accelerated to yearly paces of 60% and 50%, respectively.

With no countermeasures, such a huge and continued accumulation of currency reserves creates a massive increase in the region’s monetary base and credit volumes. This, in turn, feeds a wide spectrum of asset and financial bubbles. Coupled with continued strong growth and high capacity utilization, it will also eventually lead to surging inflation in consumer goods. Despite a modest setback in early 2008, signs of overvaluation were still visible in some Asian real estate and equity markets (see Fig. 3.20).

A common countermeasure against the effects of excessive liquidity from large accumulated reserves is called ‘sterilization’. By issuing government bonds and increasing the reserve requirements of banks regulated by the central bank, authorities try to soak up the extra liquidity. While many growth-targeting countries have successfully sterilized some of their accumulated reserves, the process is incomplete and still fuels domestic money growth. Yet inflation pressures over the last couple of years have remained astonishingly subdued – at least until very recently.

Earlier experience with large-scale reserve sterilization had been much more difficult. In the 1990s, countries such as Chile, Colombia, South Korea, Indonesia, and Malaysia engaged in massive foreign exchange interventions, but had to give up or scale back sterilization as their economies were booming from very strong private investment. In this environment, sterilization proved self-defeating, since increasing interest rates attracted evermore foreign inflows.

Today’s situation differs in that savings in Asia has remained high, while private investment has remained comparably weak, resulting in a savings

Fig. 3.20: Signs of a bubble?



overhang. The persistent excess of savings over investment has made sterilization a viable instrument on such a large scale without putting undue pressure on domestic interest rates.

However, sterilization may become an increasingly costly exercise for Asian countries. First, if the government debt that is used for sterilization purposes bears a higher interest rate than the accumulated foreign securities, the yield differential entails a real loss. The People's Bank of China, for instance, pays roughly 4% on its sterilization bills, while 52-week US Treasury bills fell to around 2% in early 2008. The turnaround in interest rate differentials seen since mid-2006 has driven up these sterilization costs to roughly USD 4 billion per month. Thus, sterilization has become a rather costly remedy for Asian central banks. Secondly, some central banks now require commercial banks to hold considerably larger amounts of money on deposit in order to shore up liquidity in the banking system, sometimes at significantly lower rates than the cost of sterilization, thereby putting pressure on banks' profitability.

Taking stock

Overall, we lean toward the view that policymakers will try to avoid a fast and brutal move of their currencies and will instead try to gradually switch from a pure growth target to a more managed regime of growth targeting, as described in our business-as-usual scenario. This may shield Asian economies from painful adjustments in the short term, but may also lead to more problems, such as asset price bubbles, in the longer run.

So far, the current system of pegged or quasi-pegged emerging market currencies has proved remarkably stable and has even allowed for a bit of flexibility. A more managed, gradual appreciation against the USD may not completely alter how the world economy and the global monetary system functions. Under this scenario, the major global imbalances – most prominently the symbiotic arrangement between Chinese and other Asian savers who have subsidized US consumers' spending binge over the last couple of years – are likely to persist.

On the other hand, for Japan, the business-as-usual case of only very gradual currency appreciation, or even renewed JPY weakness, may be seen as the only way out of deflation and a return to more normal interest rate and financial market conditions. Even under current conditions, it seems increasingly difficult for Japanese policymakers to strike the right balance between tightening fiscal and monetary conditions simultaneously.

Ironically, then, an only partial and very reluctant correction of current exchange rate misalignments may lead some growth targeters to travel down Japan's road themselves. Reserve accumulation is then set to continue at a faster pace than GDP growth and, as sterilization is unlikely to effectively soak up all the extra liquidity in the system, we would expect more financial asset bubbles to form over the next few years. If inflation-targeting countries started teetering on the brink of deflation or found their currency to be uncompetitive, they could eventually choose to follow the beggar-thy-neighbor policies of current growth targeters, which would only exacerbate the growing inflation problem. In a nutshell, preventing appreciation of growth-targeting currencies may shield economies from overdue and potentially painful adjustments in the short run, but may cause some much nastier boom-and-bust cycles in the medium and longer term.

Chapter 4

Reading asset price smoke signals

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Yves Longchamp – Currency Strategist

Achim Peijjan – Senior Fixed Income Strategist

Kurt Reiman – Head Thematic Research

Reading asset price smoke signals

“No doubt you’ve discovered loyalty is no longer the currency of the realm, as your father believed. I’m afraid currency is the currency of the realm.”

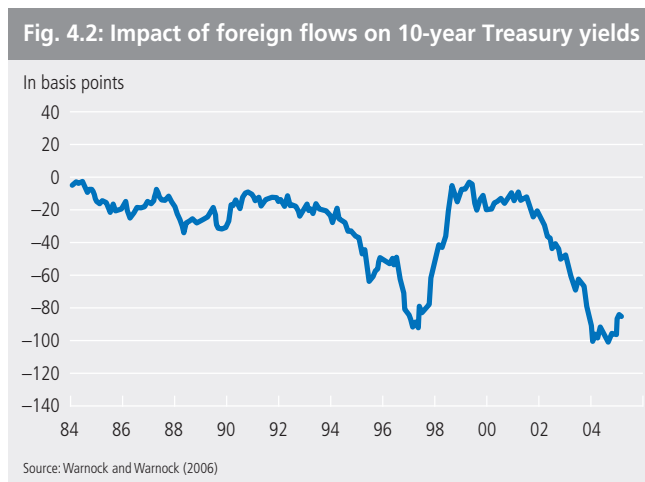
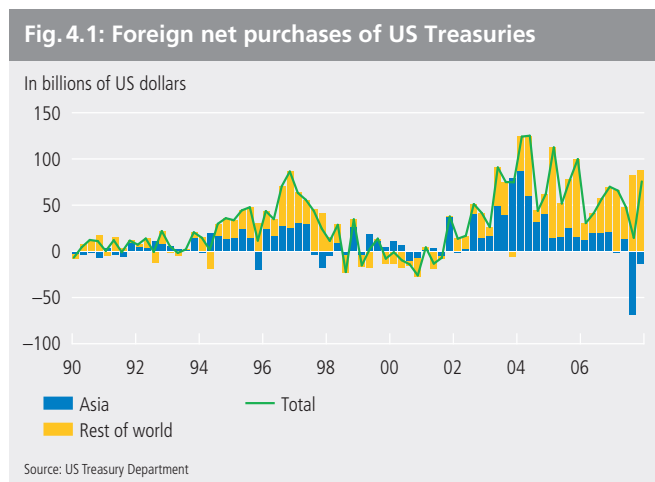
– *Pirates of the Caribbean, Dead Man’s Chest*

Global imbalances transmit to asset markets

Before we look further at how our two currency scenarios may impact financial markets, it may be useful to explain how asset prices reacted to these growing global imbalances. One of the first indications that foreign exchange reserves were beginning to have an effect on asset prices was when Asian central banks and others began to acquire US Treasury securities at an ever-increasing pace (see Fig. 4.1). This heightened demand for US government debt had the clear effect of moderating US interest rates. According to one Federal Reserve study (Warnock and Warnock, 2006), US interest rates would have been 100 basis points higher in 2004 and 2005 had it not been for these inflows (see Fig. 4.2).

By early 2000, the US Fed engaged in an aggressive monetary easing campaign, initially in response to the bursting of the Tech bubble and then following the terrorist attacks in September 2001 (see Fig. 4.3). By 2003, with inflation largely absent and potential deflation a theme for many observers, the Fed lowered short-term interest rates to below 2%. With low yields across the entire maturity spectrum, in part thanks to the unwitting kindness of strangers, namely, foreign central banks, a major distortion in asset markets began to materialize: the US housing market boom. Other asset classes soon followed. By the beginning of 2007, most financial markets were priced for perfection, supported by strong global growth, low inflation, and a prolonged phase of corporate profit growth. Equity prices extended their advance, commodity prices moved higher, real bond yields and corporate credit spreads remained low, and emerging market assets showed signs of resilience. All was buoyant.

Buoyant, that is, until the air started coming out of the US housing market bubble. Several factors precipitated the decline: unreasonable assumptions about house price appreciation, unrealistic mortgage terms, and a new round of restrictive US monetary policy, for example. Almost overnight, the low initial interest rates and easy credit conditions that made financing a home attractive for large numbers of Americans were suddenly no longer available. The downturn in the US housing market and the correction in the



UK real estate market threatened to undermine the global economic expansion that followed since the Asian currency crisis in 1997 (see Fig. 4.4). Subsequently, global equities, emerging market assets, and corporate credit spreads began to experience weakness as well.

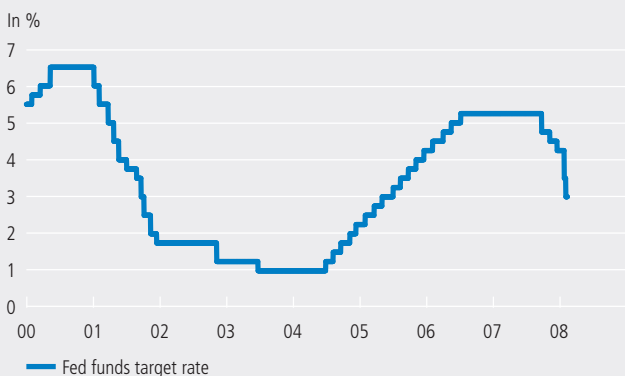
By cutting interest rates a total of 125 basis points in just two weeks in early 2008, the Fed showed unprecedented resolve to shore up the US financial system and protect the economy from the unfolding financial market turmoil. The Fed's actions were clearly aimed to choke off fears that the US economy could slip into a full-blown recession. The Fed's expansionary monetary policy – where lower interest rates ease borrowing and discourage saving – sought to increase the amount of money circulating in the real economy, underpinning consumption and employment. But at the same time, the Fed exported its policy to growth-targeting countries with pegged exchange rates, many of which are facing a new problem: inflation. A more accommodative US monetary policy, designed to stimulate economic growth at home, only adds to the inflation pressures in these countries and escalates the reserve accumulation problem. The growth-targeting central banks are under increasing pressure to let their currencies appreciate to tighten monetary conditions.

Bubbles in the business-as-usual scenario

According to our business-as-usual scenario, central banks in growth-targeting countries will let their currencies appreciate modestly to counter the threat of higher inflation. We are already beginning to see this happen. After resting at 8.28 for the better part of four years, the USDCNY exchange rate began appreciating in 2007 and was rapidly heading to 7.0 in mid-February. Yet, as we wrote in Chapter 2, even this 'managed' appreciation is far from what most economists would consider an equilibrium exchange rate. And there is also little resolve among other countries with pegged exchange rates to let their currencies revalue sharply.

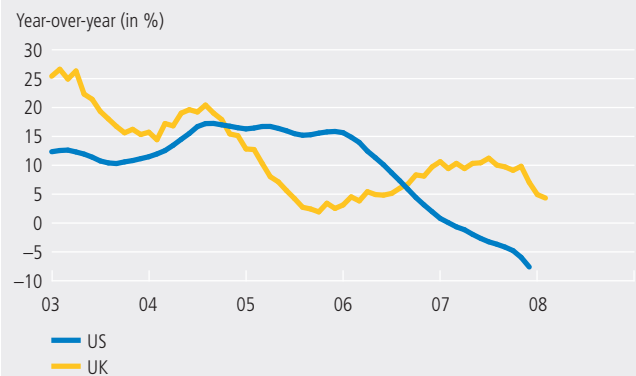
If currencies of growth-targeting countries appreciate only gradually, global imbalances will likely persist and the prices of risky assets in relatively high-growth regions will likely move still higher. The price-to-earnings ratios of equity markets in growth-targeting countries are above those of developed countries and may increase further in our business-as-usual scenario (see Fig. 4.5). Risky assets, including those in developed markets, could well provide solid returns to investors as long as global central banks continue to produce ample liquidity. Industrial and energy commodities, real estate, and agricultural commodities would all receive strong support if the global growth engine continues to purr.

Fig. 4.3: Expansionary monetary policy in the US



Source: Federal Reserve

Fig. 4.4: Home prices in the US are falling



Source: Case-Shiller, Nationwide Building Society

Bond markets are unlikely to fare as well, however, because of the risk of higher consumer price inflation. The business-as-usual scenario comes with a cost, and that is the potential for higher inflation expectations in both growth-targeting countries and developed markets.

Depegging scenario changes everything

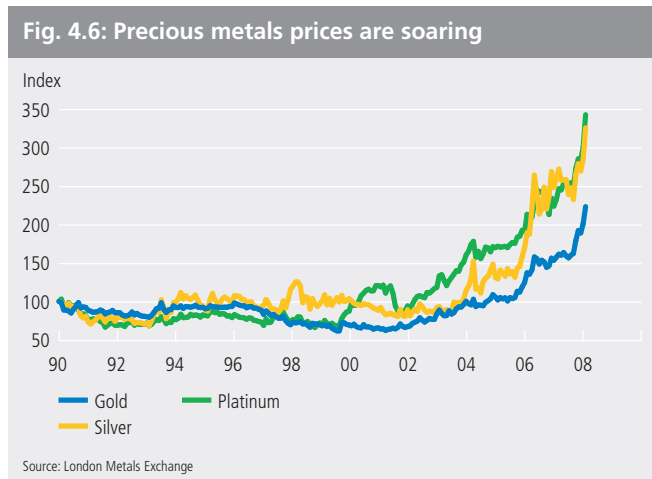
Today's global imbalances are set to keep growing in the business-as-usual scenario. This points to potentially an even larger correction in asset prices if the depegging scenario becomes a reality.

The misalignments apparent in currency and capital markets are also seen in the price of gold. Gold is a traditional store of wealth: its price tends to increase during periods of inflation and heightened risk aversion. Since mid-2000, the price of gold has nearly quadrupled and the prices of other precious metals are also surging (see Fig. 4.6).

Rising prices for precious metals could be driven by growing concern that global monetary imbalances and heightened liquidity will eventually force a sharp rise in inflation. If this were true, however, breakeven inflation rates (a measure of inflation expectations derived from subtracting the yield on inflation-protected securities from the yield on nominal bonds) would likely have already moved higher, too; but they have not (see Fig. 4.7). Alternatively, the rising prices of precious metals, and in particular gold, could reflect the view that large adjustments in the international monetary system are imminent.

Our depegging scenario would not only place a cap on soaring asset prices, it would likely lead to asset price deflation, as growth-targeting central banks shift their focus to fighting inflation by slowing reserve accumulation and mopping up liquidity. The expected downturn in asset prices stems from the global realignment of production and supply chains that would likely result from a large move in exchange rates. Global companies may be expected eventually to transfer production away from Asia to relatively less expensive regions. Such a move would first demand that corporations rethink their entire business strategy in light of the changing circumstances. If the dislocations were severe enough, companies could be expected to temporarily pare back on investment spending as they review their strategic options, which would further harm economic growth.

If pegged currencies were to appreciate rapidly, this could temporarily boost inflation pressures outside these countries. The disinflationary benefits from today's highly productive economies, in the form of progressively lower consumer prices, would likely wane in the event of a sharp currency



appreciation. While such an outcome might seem counterintuitive in a world with slower growth, the associated supply shocks, the inflation imported by countries with weaker currencies, and the international adjustment costs all augur for a higher pace of global inflation than foreseen in our business-as-usual case. On the whole, we expect slower growth and higher price pressures to lead to an even further increase in the global equity risk premium (see box on page 62 for a discussion of the global risk premium).

On the plus side, certain safe-haven assets, such as precious metals and short-term variable rate notes, would likely benefit from a depegging scenario. Although precious metals prices are at historical highs, heightened risk aversion could keep prices supported. Short-term bonds, or bonds with a floating interest rate, would likely partially protect against the erosion of the real (inflation-adjusted) principal amount through an eventual increase in interest rates to counter inflation.

The situation with equity markets is mixed. To the extent that a slowdown in global growth is reflected in earnings, the depegging scenario is negative for global equities (see Fig. 4.8).

However, all developed equity markets will not move in the same direction, as changes in relative economic performance would be positive for some regions and negative for others. In time, we think that European equities could gain in the depegging scenario (in local currency terms). First, the strong EUR has forced Europe's corporate sector to become more competitive and to restructure significantly in recent years (Germany being the most impressive example here). Second, a weaker currency enables European exporters to reap the benefits of their restructuring efforts and expand their market shares at the expense of their Asian competitors. This would further support employment and wage growth and could finally unleash considerable pent-up demand from the consumer side (again, most sharply in Germany).

We expect equity prices to adjust in anticipation of faster overall sales growth, especially among corporations that have already become lean thanks to the euro's strength. Indeed, historical data confirms that EUR depreciation tends to boost equities. Although the net effect of our depegging scenario on the US is rather neutral, companies that have improved export potential to Asia would likely benefit from a weaker USD. Japanese equities (again, in local currency terms) will likely continue to return weak results as growth slows and earnings weaken.

Fig. 4.7: Breakeven inflation rates still tame

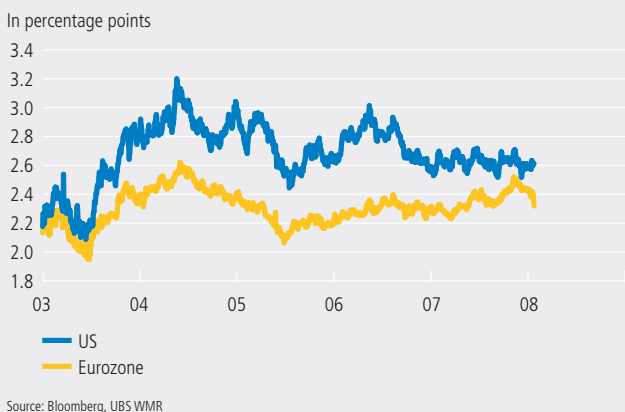
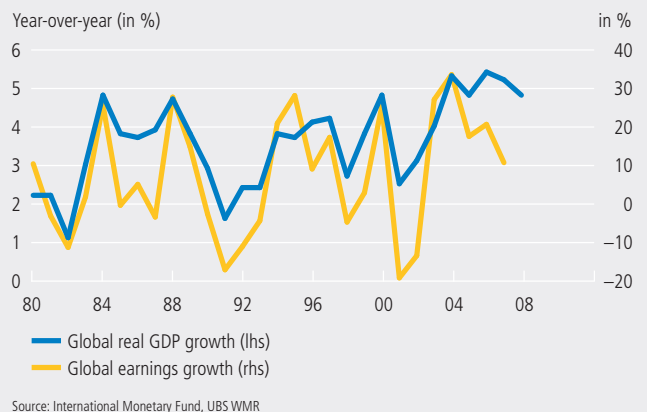


Fig. 4.8: Earnings growth tied to economic activity

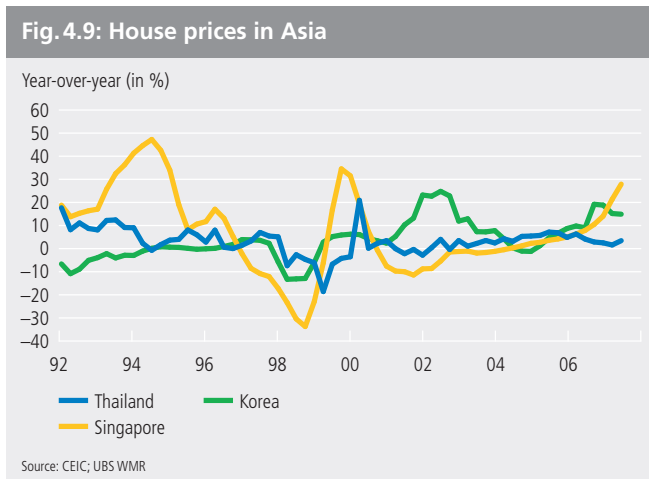


And emerging market equities could also falter due to slower world growth, but differentiating between countries is again critical. The depegging effect would not be the same for all emerging market countries in Asia, nor globally, since the degree of pressure on currency appreciation differs from one country to another. Countries that must allow their currencies to appreciate strongly to cool inflation pressures may be dealt the hardest blow in our depegging scenario. Export-oriented manufacturing industries would take the greatest hits, as currency appreciation erodes their competitive position.

Emerging markets with stable foreign exchange reserve inflows, sustainable current account positions, and prudent local-currency debt management could fare better. Some emerging market countries in Asia, such as South Korea, Indonesia, and Taiwan, as well as Brazil and Mexico in the Americas, are likely to better withstand the risks of our depegging scenario. That said, we must acknowledge that the higher price-to-earnings ratios of most emerging market equities relative to developed market equities are not as sustainable with slower global growth and a rising equity risk premium.

Beyond emerging market equities, the threat of depegging is not fully reflected in the current price of other higher-risk assets, such as emerging Asian and Middle Eastern real estate and certain commodities (see Fig. 4.9 and Fig. 4.10). Infrastructure and manufacturing commodities, such as base metals and energy, would likely come under pressure in the face of slower economic growth. Commodity-rich countries with presently overvalued currencies, such as Canada, New Zealand, and Australia, would likely experience pressure on their equity markets as demand for their commodities weakens. The return prospects would be further eroded by a depreciating currency amid an unwinding of carry trade positions.

At first glance, developed country bond markets would appear to benefit from a slowdown in economic growth and flight-to-safety capital flows. However, the impact of declining global growth will likely be offset by a rise in inflation expectations, as imported Asian goods become less competitive and other export markets are boosted by their depreciating currencies. The bond market's reaction to a slowing (or outright decline) in foreign exchange reserve accumulation bears special consideration. Keep in mind that developed country bond markets were the ultimate beneficiary of the buildup of foreign exchange reserves and global imbalances, particularly in the US. These flows are poised to either slow sharply or reverse their course in the event of a depegging scenario, leading to a sudden drop in bond prices and increase in yields.



Asset price scenarios

In translating the business-as-usual and depegging scenarios into investment views, it is important to note that we are considering extreme cases. Each scenario has a reasonable basis, but there are also other adjustment paths than the depegging scenario that could bring balance to the international financial system. But the extreme scenarios of how global imbalances might correct provide useful guideposts for measuring both the magnitude and the direction of movements on financial markets. As usual, reality will likely be found somewhere between our two scenarios, but closer to our business-as-usual case. The depegging scenario has a rather low probability of occurrence, but we cannot simply rule it out.

The valuation of risky assets has declined substantially since the acceleration of the subprime mortgage meltdown in the US. Stocks have faltered, corporate credit spreads have widened, and prices of emerging market shares have moved lower (see Fig. 4.11). We note that the threat of depegging and the risk of these imbalances are not reflected in the price of higher-risk assets, such as emerging market equities and real estate, and certain commodities, such as base metals and energy. Developed country equity markets are not expensive on a historical basis, but past comparisons may not be relevant during periods when the global risk premium is rising. And global bond markets are presently not priced for an increase in inflation.

Global bonds: at risk

We judge developed country bond markets, particularly the US market, to be poorly positioned to weather either scenario, as an increase in inflation is an outcome of both. This is especially true if the threat of inflation were accompanied by outflows from US Treasury securities among countries that peg their currency to the USD. Given the rather strong correlations between international bond markets, a downturn in USD bonds is likely to weigh on bond prices elsewhere, but to a lesser extent.

Interestingly, we would expect bond yields to rise in both scenarios. In the business-as-usual case, the rise in bond yields would likely be more gradual and allow for a less abrupt adjustment in real variables, such as equity and real estate markets. However, even in such a scenario, bond investors might suddenly demand a much higher risk premium for investing in bonds, as soon as easy US monetary and fiscal policies combine to kick-start the US economy.

Global risk premium on the rise

In principle, the equity risk premium is driven by two sets of factors: the willingness of investors to take on risk and the perceived level of risk in equity markets. The equity risk premium should rise when investors underestimate the risk in the equity market and therefore become less willing to invest. Given these drivers, what should we expect in our depegging scenario?

Our scenario indicates that equity market volatility, and risk, could increase. Adjustments in global manufacturing pro-

duction will not happen without friction and will most likely lead to increased uncertainty on the outlook for corporate earnings. In addition, the risk appetite among investors is likely to decline in uncertain times. And higher uncertainty about the real economy would increase the volatility of other income sources, for example, labor income. As a consequence of higher volatility in other income sources, one could reasonably expect a declining risk appetite among investors. So, both lines of argument speak for a rising risk premium in the depegging scenario.

In a nutshell, global bonds are likely to produce sub-par real returns over the coming several years, and we would advise particular caution in investing in longer-dated securities, especially in the US. And while inflation-linked bonds offer protection against inflation, the present level of real bond yields, as well as other specific investment considerations (tax treatment), limits their appeal, in our view.

Global equities: a mixed outlook

Developed market equities are already priced for a considerable slowdown in economic growth and corporate earnings, which explains the presently high equity risk premium (see Fig. 4.12). Under normal circumstances, this would send investors a clear positive signal when measured against historical comparisons. However, the substantial frictions in global trade and production that would likely arise in our depegging scenario suggest that a further increase in the global risk premium cannot be ruled out.

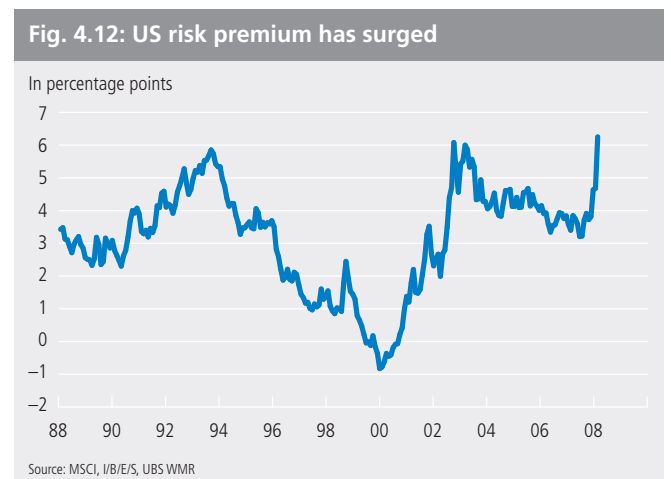
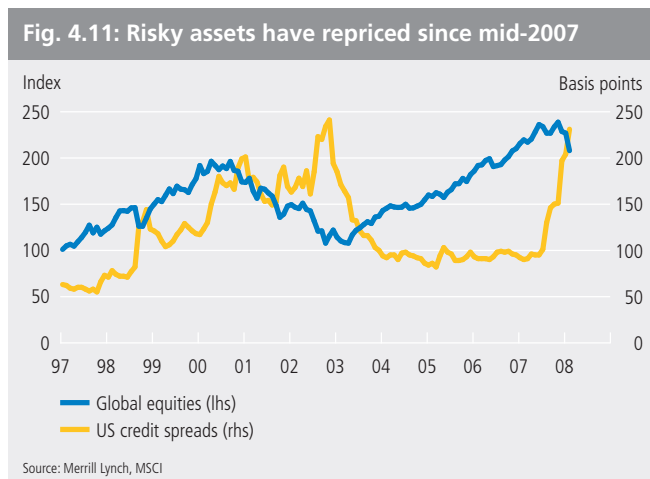
This highlights a real conundrum in the case of global equities. Developed market shares in particular might stage a temporary rebound should an accommodative US monetary policy and fiscal stimulus lift the economy and ease the credit impasse. However, this appears only possible in the business-as-usual scenario. The outcome for equities could look fairly ugly in the sudden and extreme depegging case, as equities would likely be pressured by both rising bond yields and a further temporary increase in the global risk premium.

While we see the potential for global equity prices to move higher, especially if cyclical weakness were to fade, the presence of large global imbalances is an additional structural risk factor that must be considered when investing in equities. In such an environment, developed market equities are positioned more favorably than emerging market equities.

Emerging market equities: differentiation becomes crucial

Despite the sell-off in early 2008, many emerging market equity indexes continue to exhibit higher price-to-earnings ratios than developed market equities. This implies that investors are willing to accept a lower risk premium for holding emerging market equities. It would also seem to indicate that market participants expect countries with pegged exchange rates to deliver strong economic growth, or at least strong earnings growth.

The same performance dichotomy between our two scenarios that exists for developed equity markets is magnified for emerging market stocks. This means that the potential downside in our depegging scenario is worse for



emerging market equities, both because the assumed risk premium is higher and because the valuation is more expensive than for developed market equities.

Within emerging markets there is a further dichotomy. Clearly, in our view, the equities of growth-targeting countries would experience substantial weakness in a depegging scenario. However, equities in Eastern Europe and Latin America, particularly in Brazil, appear better able to withstand a downturn than growth-targeting countries with pegged exchange rates.

Currencies: expected appreciation in Asia

Currencies of growth-targeting countries are set to appreciate against the USD, in our view. Most likely this will be coupled with an even stronger appreciation against the euro. As part of a longer-term investment, we recommend an exposure to a basket of Asian currencies. In general, we see more potential in moderately but not extremely liquid currencies. We would generally avoid investments in the low-yielding but highly liquid Hong Kong dollar (HKD) or Singapore dollar (SGD). Investments in Chinese yuan remain difficult given the lack of CNY-denominated money market instruments. The derivatives market does offer CNY investments, but they often already reflect expectations for CNY appreciation, leaving little scope for gain, in our view.

Nontraditional asset classes: a means to diversify

Pooled hedge funds should continue to provide the benefits of portfolio diversification, but can also enhance overall portfolio performance in an environment of increased global risks and lower return expectations for a number of asset classes, such as bonds and equities. As high volatility in asset markets is likely to persist for some time, such funds may offer scope for gain. However, to avoid exposure to single risk factors, we recommend very well diversified portfolios of hedge funds.

Real estate appears at a disadvantage given the present global imbalances. In both of our scenarios, bond yields are likely to rise, making financing of real estate more expensive. Also, commercial real estate appears expensive on a global level, despite recent regional market corrections.

Commodities are a diverse asset class and require a segmented approach. Precious metals and other safe-haven assets are likely to behave very differently to agriculture, base metals, and energy. This illustrates the wisdom of well diversified investment in various types of commodities. Another consideration when investing in commodities is that prices are often determined by supply factors, perhaps more so than with other assets. While our depegging scenario is certainly negative for critical manufacturing-related commodities, such as base metals and energy, supply constraints remain in place for these same products.

Portfolio implications of global imbalances

Overall, we advise investors to remain alert to opportunities that might arise from a delayed adjustment, but to hold a broadly diversified and defensive portfolio that protects against the risks posed by these imbalances.

Within the fixed-income segment, we would advise shorter maturities or cash to reduce the price risk in the case of rising bond yields. Within equities, we prefer developed market equities in the US and Europe over heavy exposure to growth-targeting equity markets. The right overall equity exposure has to be selected carefully according to individual risk profiles. Within equities we prefer large-cap stocks over smaller companies, as well as companies that can grow earnings even in cyclically difficult times. Nontraditional asset classes, such as real estate and commodities, should be included to add diversification benefits. But in making those choices, investors need to be aware of the potential downside in an extreme depegging scenario, especially in the case of real estate. Finally, hedge funds can help to improve the risk/return properties in such a portfolio context, whereby we would recommend a well-diversified portfolio of high-quality hedge funds.

For those investors who want to play it safe, they would have to accept very low returns by investing in inflation-linked government bonds, variable-rate bonds, and low-yielding short-term money market instruments. Capital protected securities would also provide investors a limited exposure to risky assets, but with the benefit of ensuring no loss of principal. Lastly, investing part of a portfolio in a well-diversified pool of hedge funds would also be a way to prudently enhance returns, notwithstanding the inherent selection risks.

Some final thoughts on delicate imbalances

The global economic and financial imbalances that are so evident today are profound and at the same time surprisingly delicate. Realignment can trigger large shifts in our interlinked economies and financial markets. We have presented the larger features of the currency landscape today and their historical development. We have also looked closely at the risks and opportunities for growth and asset prices that investors should consider in this more interconnected world.

The emergence of the current imbalances was not benign for financial markets, and the eventual return to a more sustainable equilibrium will likely entail some pain. The adjustment mechanisms and probable outcomes of our case studies illustrate that any alteration in the present imbalances comes at a cost, which we have detailed.

Our analysis favors a more defensive posture that reflects the structural risks that a sharp realignment in currency markets could have on financial assets. But it also favors exposure to assets that may yield attractive risk-adjusted returns in the event that the more likely, and more gradual, business-as-usual scenario prevails.

The benefits of currency hedging

According to our forecasts, investors will face both opportunities and threats from a correction in global imbalances. Currency movements could be large enough to have significant effects on the respective local equity and bond market performance. In such an environment, it is particularly attractive to use currency hedging as a means of portfolio management. It provides a vehicle for separately steering currency and financial market exposures. Currency hedging also allows an investor the potential to be more selective than one whose investments are unhedged.

In addition to tactical considerations, currency hedging has general advantages for improving the risk and return characteristic of portfolios over the long term. Therefore, currency hedging can be a good way to manage extended periods of currency exposure in a strategic context and also to exploit opportunities whenever there is an explicit forecast for future currency developments, or the need to protect against volatility in foreign exchange markets.

In practice, hedging currency risk is usually done by buying forward contracts that are denominated in the foreign currency. This allows the investor to lock in the future exchange rate, say, in a month, at a given level. In the case of full hedging, the investor can eliminate the risk of any future currency fluctuation through the maturity of the contract. By rolling such contracts forward, an investor can continuously protect against currency risk. We note that such "insurance" results in costs if domestic interest rates are lower than foreign interest rates. It may also yield profits, if domestic interest rates are higher than foreign interest rates.

To illustrate this, we plot the historical outcome of these strategies for a fictitious EUR investor who invests in the USD bond market (see Fig. 4.13). As expected, over the past 10 years, fluctuations of an unhedged investment have been higher than those of a hedged investment. The volatility of a foreign-currency-hedged investment is very similar to the risk of the investment in local currency terms, since the hedge neither adds nor subtracts risk.

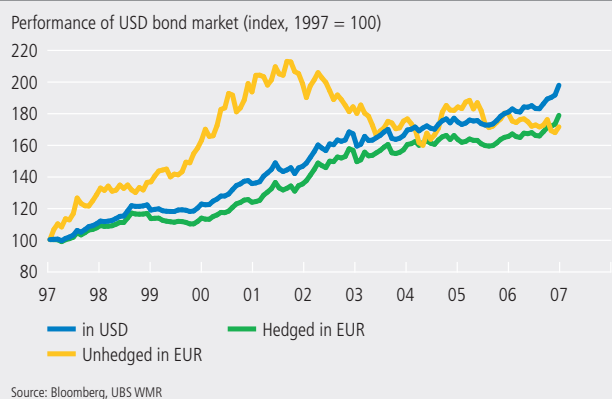
But since this hedge incurred costs, a currency-hedged investment in the US bond or equity markets underperformed the same investment measured in USD. Because EUR interest rates have been lower than those in USD terms for most of the past 10 years, the hedged investment consistently underperforms the local market. (With an average USD money market rate of 4.1% and a local EUR short-term interest rate of 3.2% over the past 10 years, the annual cost of the forward contracts would have been approximately 0.9%.) However, not hedging the currency risk would have produced worse results since the USD has depreciated, especially during the past few years.

Hedging costs for other currencies, such as the GBP, can also be substantial. This is because the EUR offered lower yields than the GBP during the past decade. On the other hand, in the case of the JPY and the CHF, hedging costs turn into net benefits, since Japan and Switzerland have had lower interest rates than in EMU, making the hedged return higher than the local return in Switzerland or Japan.

If we compare the performance of a foreign-currency hedged investment with an unhedged position, we find that hedging has added performance for a EUR investor over the past 10 years. This is quite a common result for a high-yielding currency. Empirically, high-yielding currencies tend to depreciate less than what is predicted by interest rate parity over the long term. This phenomenon reflects a so-called "forward rate bias," which is most likely due to structurally higher real interest rates in these currencies. As a consequence, hedging the exposure in low-yielding foreign markets tends to be favorable, whereas it tends to be less favorable in high-yielding markets. This is because the high-yielding foreign currency will often depreciate less than predicted by interest rate differentials.

While these relationships have held up in normal circumstances, the present situation is a bit of an anomaly because the expected profitability of carry trades has pushed currencies to extremes. The large currency deviations from fair value described in Chapter 1 suggest that foreign currency exposure should be hedged if investing in high-yielding, expensive currencies and remain unhedged in low-yielding currencies.

Fig. 4.13: Large volatility of unhedged investment



Glossary

Appreciation

The increase in value (or price) of one currency relative to another currency.

AUD

Australian dollar.

Beggar-thy-neighbor

A trade policy that uses protectionism or a weak currency to produce gains at the expense of other countries.

Big Mac index

Index published by *The Economist* magazine since 1986 to measure absolute purchasing power parity (PPP) by comparing prices of Big Macs worldwide.

Breakeven inflation rate

A measure of inflation expectations derived from subtracting the yield on inflation-protected securities from the yield on nominal bonds; sometimes thought of as inflation compensation.

Bretton Woods System

Fixed exchange regimes established in 1944 to rebuild and govern monetary relations among industrial states. Member states were required to establish a parity of their national currencies in terms of gold and to maintain exchange rates within a band of 1%. The system collapsed in 1973.

Business cycle

All the regular and irregular fluctuations in gross domestic product around a long-term trend level. An economic cycle consists of the following phases: upswing, peak, downturn or recession, and trough.

CAD

Canadian dollar.

Capital account

One of two components of the balance of payments (the other being the current account) that records the international investment and loan activity flowing in and out of a country; in theory, a country with a capital account surplus is considered a debtor nation, as it would receive more investment from abroad than it sends abroad.

Capital control

A country's regulations and restrictions on the flows of capital abroad.

Carry trade

In terms of currencies, a strategy that tries to exploit the yield differential between two currencies. The transaction consists of borrowing funds in a low-yielding currency (the sell side of this transaction) and investing this amount in a high-yielding currency (the purchase side of this transaction). The yield difference between the two currencies represents a gain if the exchange rate does not move to such an extent that it wipes out the interest rate differential.

CHF

Swiss franc.

CNY

Chinese yuan. Prices are quoted in yuan, the principal currency unit, whereas the renminbi is the name of the currency, literally translated as 'the people's currency.'

Correlation

Statistical measure of the linear relationship between two series of figures, for example, the performance of one security and the performance of the overall market. A positive correlation means that as one variable increases, the other also increases. A negative correlation means that as one variable increases, the other decreases. By definition, the scale of correlation ranges from +1 (perfectly positive) to -1 (perfectly negative). A correlation of 0 indicates that there is no relationship between the two variables.

Consumer Price Index (CPI)

A measure of prices paid by consumers for a representative basket of goods and services. A country's consumer price inflation rate is usually stated in terms of year-over-year changes.

Cross rate

An exchange rate between two currencies arrived at by dividing each currency's exchange rate by a third rate. Typically, all non-USD exchange rates are called cross rates. For example, the two exchange rates of USDCHF 1.10 and EURUSD 1.45 result in a cross rate of 1.60 for the EURCHF pair.

Currency

The monetary system of a country or group of countries, consisting of coins and bills.

Current account

One of two components of the balance of payments (the other being the capital account) that records international trade flows in goods and services and the value of net investment income; in theory, a country with a current account deficit will bring in more goods and services from abroad than it sends abroad; a capital account surplus of equal value 'finances' the current account deficit.

Deflation

A decline in prices or an increase in the purchasing power of a given currency brought about by a decrease in the amount of money in circulation relative to the amount of goods and services available; often accompanied by a contraction in capital spending activity.

Depreciation

The decrease in value (or price) of one currency relative to another currency.

Emerging market

Newly industrializing country or market with above-average growth potential and developing financial markets.

EUR

Euro, the single currency of the European Monetary Union, launched on 1 January 1999 and replacing 11 national currencies in 2002.

Fiscal policy

The management of taxes and public spending.

Fixed exchange rate

Official exchange rate of a currency fixed by central banks or other state authorities. The rate is kept within the permitted fluctuation margin in

trading on the foreign exchange markets, if necessary by the central bank's intervention through purchasing or selling the relevant currency.

Floating exchange rate

An exchange rate that is allowed to move freely, finding its level as a function of supply and demand on the foreign currency market, and subject to only limited intervention by the central bank.

Foreign exchange reserves

The foreign assets held by central banks.

Forward contract

In the case of currencies, a contract that locks in the price at which a holder can buy or sell a currency on a future date.

Forward rate bias

The empirical tendency of forward exchange rates to overestimate changes in spot exchange rates; it leads to a phenomenon in currency markets whereby high-yielding currencies tend to depreciate less than what is predicted by interest rate parity over the long term.

GBP

British pound.

Greenback

United States dollar.

Gross Domestic Product (GDP)

The value of all goods and services produced within a country's borders in a specific time period. GDP is the most commonly used measure of an economy's size.

Growth targeter

Refers to an emerging and rapidly growing economy that tries to control and sustain growth rates by tying its currency closely to the USD.

Gulf Cooperation Council (GCC)

A regional alliance established in 1981 that seeks to strengthen cooperation among its six members: Bahrain, Kuwait, Qatar, Oman, Saudi Arabia, and the United Arab Emirates.

Hedge fund

A private collective investment vehicle oriented towards absolute returns and capital growth. These funds use a variety of hedging techniques, are lightly regulated and accept only a limited number of investors so as to ensure that their investment strategy remains flexible.

Hedging

A strategy used to protect a position or an entire portfolio against negative market fluctuations.

Inflation

An increase in the general level of prices and wages and a decrease in the purchasing power of money, resulting from growth in the money supply in relation to the supply of goods.

Inflation targeter

Refers to an advanced economy that aims to minimize inflation. Interest rates are the most important monetary instrument.

International Monetary Fund (IMF)

An international organization concerned with promoting international monetary cooperation and exchange rate stability, fostering economic growth, and providing temporary financial assistance to countries to help ease balance of payments problems.

Intervention

The attempts by a country's monetary authorities to manipulate exchange rates. Central banks can sterilize the intervention in currency markets so that the domestic money supply is unaffected by the purchases or sales of foreign currency.

JPY

Japanese yen.

Liquidity

The ability of an enterprise to meet its payment obligations on time. In a wider sense, it means the availability of cash and cash-like funds within a company, on the money and capital markets, and within the national or world economy. Also, cash and assets with a short-term maturity

Loonie

Canadian dollar.

Monetary policy

The way a country's money supply is managed, usually determined by central banks.

Monetary target

A goal, or set of goals, that a central bank can target, which includes but is not limited to stable inflation, economic growth, and full employment.

Monetary instruments

The tools a central bank uses to steer money supply, which can include interest rates and exchange rates.

NZD

New Zealand dollar.

Organization for Economic Cooperation and Development (OECD)

An international organization of mostly industrialized countries to address the economic, social, environmental, and governance challenges of the globalizing world economy.

Overshoot

In currency terms, the tendency of exchange rates to overreact to a change in fundamentals.

Pass-through

In currency terms, the extent to which an exchange rate change is reflected in the prices of imported goods. With full pass-through, a currency depreciation would increase the prices of imported goods by the same amount, and vice versa. With no pass-through, prices of imports remain constant.

Pegged exchange rate

A currency is pegged to another when the exchange rate between the two is fixed by either the state or the central bank and market forces have no influence on the exchange rate.

Perfect competition

A hypothetical microeconomic concept supposing that market prices are only triggered by supply and demand. It typically assumes a large number of market participants who are unable to influence prices, who trade homogenous goods, and who share equal information.

Purchasing power parity (PPP)

The effective external value of a currency determined by comparing different countries' relative price levels. For example, a basket of goods costing USD 100 in the United States and CHF 160 in Switzerland would give a purchasing power parity rate of CHF 1.60 per USD. Proponents of PPP theory hold the view that an exchange rate cannot deviate strongly from purchasing power parity over the long term or at least should reflect the differing inflation trends.

Quasi-pegged exchange rate

An exchange rate mechanism that allows for exchange rate fluctuations within in a predefined band, for example, plus or minus 5% relative to a specific USD exchange rate.

Random walk

The development path of a variable with unpredictable changes over time.

Rational expectations hypothesis

The hypothesis assumes that individuals take all available and relevant information into account when forecasting future variables.

Sovereign wealth funds (SWFs)

An investment fund owned by a state to manage a country's national and foreign currency reserves and savings. In contrast to central banks, SWFs tend to invest in a wider assortment of financial assets, including equities.

Sterilization

Short- to medium-term money market paper issued by a state or central bank to absorb liquidity. In currency markets, sterilization neutralizes the effects of foreign exchange intervention on the domestic monetary base.

Supply shock

An event that suddenly changes the price of a commodity or good, often caused by a sudden increase or decrease in supply levels.

Trade imbalance

A substantial difference between a country's exports and imports, often expressed as a trade surplus or deficit.

Unhedged

A position or an entire portfolio that is unprotected against negative market fluctuations.

USD

United States dollar.

Valuation gap

In currency terms, the difference between the actual value of an exchange rate and its equilibrium value, according to purchasing power parity.

Vector-autoregressive model (VAR model)

A multi-equation econometric model widely used to forecast and analyze the effects of structural shocks.

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Publication details

Publisher: UBS AG, Wealth Management Research, P. O. Box, CH-8098 Zurich

Senior editor: Kurt E. Reiman

Editorial board: Christian Frey, Roy Greenspan

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Research assistance: Diana Schramek

Editorial deadline: February 2008

Product management: Valérie Iserland

Desktop: Werner Kuonen, Roland Kurth, Rolf Müller, Margrit Oppliger

Translation: CLS Communication AG, Basel

Cover picture: Masterfile

Printer Switzerland: Multicolor Print AG, Baar (SAP No. 82092E-0801)

Printer US: Unimac Financial, Carlstadt, NJ (R366)

Printer Singapore: Xpress Print Pte Ltd (SAP No. 82092E-0801)

Contact: UBS-Research@ubs.com

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Published in English and German.

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