

UBS research focus

Wealth Management Research

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Inflation

The next wave takes shape

*One concept, many misunderstandings
From monetary inflation to price inflation
Three scenarios – the Fed sets the tone
Protecting investments against loss of value*

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UBS research focus

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Editorial



Dirk Faltin



Thomas Berner

Dear reader,

The global economic crisis has split the investor community into two camps. One side expects deflation, a period of sustained price declines, while the other is worried about inflation, a long-lasting and substantial increase in prices. Inflation was a real *bête noire* in the 1970s, but has played an extremely minor role in industrialized countries over the last 25 years, particularly if viewed without the highly volatile energy and food components. The core inflation rate, which is calculated without these elements, is currently around 1% in the US and the Eurozone, lower still in Germany and France, and was recently even negative in Japan.

However, fears of inflation are growing. The most significant central banks, especially the US Federal Reserve, have “printed” vast amounts of new money. And sharper price rises have recently been observed in several emerging markets, including India, Argentina and Brazil. Commodity and oil prices have also risen by a good 30% over the past 12 months and the United Nations’ Food Price Index hit a record high not long ago. In addition, the prices of some financial assets, such as equities and bonds, have climbed steeply over the last year.

Is inflation, or even hyperinflation and an accompanying currency collapse, waiting in the wings, or should we be positioning ourselves for deflation? We first addressed this question in February 2011 when we published *The Decade Ahead* and concluded that US inflation will likely accelerate during the decade. This edition of the *UBS research focus* builds on this discussion by assessing inflation risk from a global perspective. Inflation is a complex phenomenon, many aspects of which are unclear. We will shed light on how inflation arises and what its associated costs and mechanisms are, as well as discuss relevant scenarios for future price developments and derive investment recommendations from these.

We hope you will find this report interesting and informative.

A handwritten signature in black ink that reads "Dirk Faltin".

Dirk Faltin
Head Thematic Research
Wealth Management Research

A handwritten signature in black ink that reads "T Berner".

Thomas Berner
US Economist
Wealth Management Research



All that glitters is not gold. The silver dollar dating back to 1883 is worth around thirty times more than the new dollar coin (Sacagowea dollar from 2008)

Inflation

The next wave takes shape

Inflation or no inflation, the issue remains: what is the best course of action? This question preoccupies investors. But before we try and answer it, it is important to understand what inflation is, how it arises, and what kind of impact it has. Contrary to popular belief, inflation does not first and foremost mean rising prices; rather, it means that money is losing value. This generally occurs when the money supply increases in relation to the things that can be bought with the money.

It is not labor unions or companies that cause inflation, but rather those that “produce” the money – that is, governments and their institutions. Strictly speaking, therefore, terms such as energy price inflation or food price inflation are essentially meaningless. The overall economic cost of a sustained decline in purchasing power, namely inflation, includes price and interest rate distortions and redistribution effects that can weaken the economy over the long term and significantly increase volatility in the economic cycle.

From monetary inflation to price inflation

The growth of the money supply in relation to the goods supply is the start of this process, which becomes apparent through a general increase in prices. Monetary expansion since the global financial crisis is unprecedented. Despite this, increases in consumer prices in most developed economies has remained fairly well contained. A major reason for this is that the transmission mechanisms leading from monetary expansion to price inflation are currently not functioning. In particular, interest and credit mechanisms are still blocked.

The important questions are, accordingly, if and when these transmission mechanisms will start to function again, and whether or not a rise in prices across a broad front can then be prevented. Inflation is strongly correlated globally, and future developments will depend heavily on monetary policy in the US.

High and volatile price inflation from around 2013 onward

In our main scenario – that is, the one that we think is the most likely – we anticipate that the transmission mechanisms from monetary policy to prices will soon gain traction in the US. Lending will pick up, the economy will start posting sustainable growth and new jobs will be generated. However, monetary policy will take some time to catch up with these developments, which will result in higher price inflation in the longer term. Only when the production gap in the US is closed will there be a sustained rise in price inflation both in the US and around the world. We estimate that this scenario could materialize from around 2013 onward. We also expect this increasing inflation to be coupled with higher inflation volatility.

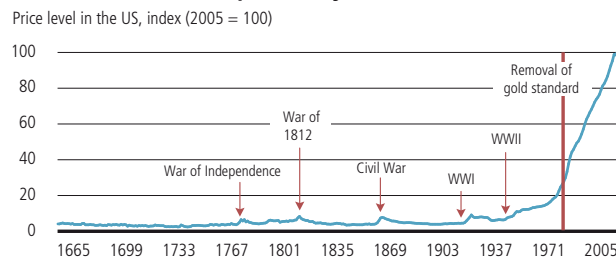
However, should the monetary policy transmission fail to take off and the liquidity glut result solely in price bubbles on the financial and commodity markets, when these bubbles burst this would create deflationary risks – risks the central banks would have to counteract with fresh monetary expansion measures. If these countermeasures fail, in the worst-case scenario this could lead to hyperinflation. Although deflation and hyperinflation are important risk scenarios for investors to understand, we think neither outcome is very likely.

How to protect portfolios

If our main scenario of elevated and volatile inflation from around 2013 materializes, investors whose portfolios consist largely of nominal assets will be exposed to a greater loss of purchasing power. Since the cost of living would rise and, at least nominally, fixed income investments would decline in value, this development could pose the risk that long-term investment objectives will not be met. Investors concerned about accelerated price inflation should therefore consider protecting their portfolios against inflation at an early stage.

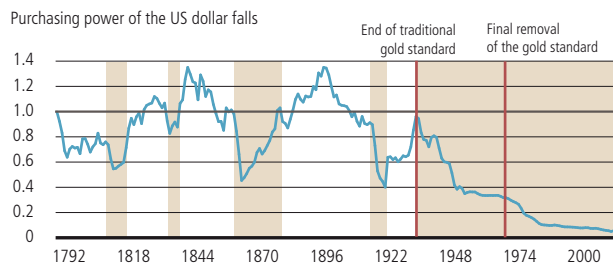
A wide range of asset classes that offer equally good inflation protection can be used for this purpose. It is also important to take into account personal circumstances when answering the question of how much inflation protection a portfolio needs. Inflation protection is not free, as a rule. But in the event of an unexpected acceleration of price inflation, a diversified portfolio that is more focused on real value can provide valuable protection against declining purchasing power.

Price trends over the past 350 years



Source: Inflation data made available by Prof. Robert C. Sahr, Oregon State University, UBS WMR

Without the gold standard, prices rise



Note: Shaded phases denote periods when the gold standard was suspended. Source: Data made available by the American Institute of Economic Research (AIER), UBS WMR

One concept, *many misunderstandings*

Inflation is currently a hot topic. And yet, the subject is plagued by misunderstandings. Although inflation is damaging to the economy and few are able to escape its effects, it is by no means a natural phenomenon. Inflation is always knowingly set in motion by governments and their institutions.

Modern economics textbooks define inflation as a sustained and significant increase in the general level of prices. Only when the average of all prices within an economy rises, does inflation actually exist. Strictly speaking, therefore, terms such as energy price inflation or food price inflation are meaningless. If oil or wheat prices rise while other prices remain unchanged or even fall, this is a relative price movement, which usually has very little to do with inflation.

Inflation means money declines in value

However, this definition of inflation as an increase in the price level is also extremely problematic. It suggests that the crux of inflation is rising prices. But this is not the case. What inflation actually means is that the purchasing power of money declines, no more and no less. If the price level rises, the value of money declines. Inflation involves a shift in the measure by which the value of goods, services and assets is assessed.

Defining inflation as an increase in the price level is problematic because it distorts the view of the causes of inflation. If we understand inflation to mean a price rise, then anything that causes prices to increase can be deemed inflationary, and anything that prevents prices from increasing or pushes them down can be deemed disinflationary or deflationary. Sharp wage increases or oil price shocks would then actually be potential inflation

triggers, and administrative price controls would be an appropriate measure to counter inflation. But this is also wrong.

The major cause of all inflation is an increase in the money supply relative to the things that can be bought with the money. The laws of supply and demand apply to money, too. If the supply of money increases compared with the supply of goods, services and assets for sale, then the purchasing power of the individual monetary unit will fall. More units of money will have to be offered to purchase certain units of goods. However, if this ratio remains unchanged, then there cannot be a sustainable rise in the price level. For example, if the oil price rises while the money supply remains unchanged, the price of other goods will have to fall and the price level will therefore not be able to rise over the long term. Oil or food price shocks or significant wage increases are at most a symptom of inflation – they are never the cause. This also means that inflation cannot be caused by greedy companies or irresponsible unions. All over the world, inflation is without exception caused by those who produce the money, i.e., the government and its institutions.

There is, therefore, a cause-and-effect relationship between money supply and price movements. The term “inflation” comes from the Latin verb “inflare,” which means “to expand,” and it was in the past related to the expansion of the money supply beyond an appropriate volume. It was only later that the use of the term shifted from meaning the expansion of the money supply to one of its consequences, namely the increase in the price level.

“Inflation is when wallets get fuller and fuller and shopping bags get emptier and emptier.”

Robert “Bob” Orben,
American writer



In fact, the term “inflation” has undergone further change over time, and today it is commonly used to mean an increase not in the general price level, but only in consumer prices. For example, when the European Central Bank (ECB) announces that its price stability target has been achieved, this means that consumer prices have not risen by more than a certain amount above the previous year’s level for a sustained period. As such, in the ECB’s view, there is no inflation.

Consumer price index as an incomplete measure

Consumer price movements are generally measured using a selection of goods and services that together create a “basket of goods.” The consumer price index (CPI) is calculated based on the weighted average price of this basket, which replicates consumer spending as closely as possible. Measuring the loss of purchasing power by means of the CPI has the advantage of being relatively simple and can be carried out without a significant time lag. However, it also causes significant problems.

First, the CPI covers only a small proportion of the full price spectrum. Producer prices, commodity and real estate prices, and prices of assets such as stocks and bonds are not included in the basket of goods. Central banks, which generally use the CPI as a proxy for the overall price level in an economy, are therefore ignoring a large chunk of prices that could also provide them with informa-

tion on the value of money. In concrete terms, this can lead to central banks ignoring commodity, equity and real estate market price bubbles in their monetary policy, which can have a devastating effect on the economy and the financial markets.

Second, the CPI’s averaging approach is problematic. The spending habits of pensioners, for example, are usually completely different from those of young adults or families. If prices of healthcare services surge while prices of consumer electronics drop, the CPI might show that prices are stable. However, for those who have to spend a significant proportion of their income on medical care, the purchasing power stability indicated by the CPI does not apply.

Other difficulties arise in using the CPI as a measure of prices. For example, how should factors with a subjective element such as product quality improvements be taken into account? Furthermore, CPI measurement can have innumerable variations. This means inflation rates are often not exactly comparable either between countries or over time within a country.

The fact that the depreciation of money, rather than price increases, is the key feature of inflation becomes particularly clear when looking at the costs of inflation. These do not primarily result from price increases, but from the expansion of the money supply and the consequent deprecia-

tion of money. It is important to note that when the money supply expands, it does not affect all stakeholders in the economy at the same time and to the same extent. Instead, the new money slowly spreads through the economy. The price changes are gradual, meaning the winners and losers are clearly identifiable.

Redistribution of purchasing power and weakening of the economy

The winners, who are the first to receive the new money and therefore able to make purchases before prices rise, are predominantly the central banks and various government agencies, but also the private banking sector. The losers, who receive the new money last or not at all, are mainly people receiving a fixed income, such as a pension or unemployment benefits, whose real income falls as a result of rising prices. Interestingly, this redistribution of purchasing power even occurs if the supply of goods increases to the same extent as the money supply and prices ultimately remain unchanged. If the supply of goods were to increase while the money supply stayed the same, those holding cash, i.e., the savers, would be able to benefit from the increased purchasing power of their money.

In general, however, the expansion of the money supply outpaces the increase in the goods supply and eventually results in rising goods, services and asset prices. The successive price changes, with the purchasing power of money diminishing, lead to a further redistribution of purchasing power from the savers, whose savings have declined in value, to the debtors, who will be able to pay off their debts in the future with money that is of a lower value. This redistribution presents a real net cost for the economy, as the creeping depreciation of money reduces the incentive to save and therefore takes away savings capital – the foundation for investments, progress and sound economic growth – from the economy. In the long term, this can undermine a country's economy.

Inadequate allocation of scarce resources

In addition to these very significant redistribution effects, inflation generates a whole series of additional costs arising from the inadequate allocation of scarce resources. If prices rise steeply, consumers and businesses feel compelled to spend in order to protect their income and assets from the consequences of inflation. Although this expenditure increases the statistically measured economic output (gross domestic product), it represents a loss to those spending.

Studies have shown that, over time, increased inflation gives rise to more and more political intervention in the economic process. Assuming that the allocation of resources through the market process is more efficient than through the political process, this generates costs for the economy. However, the inadequate allocation of resources arising from the price distortions is more serious. Prices are important indicators of investment and consumer behavior. Since an increase in the money supply never causes prices to rise uniformly, relative pricing becomes distorted and leads to the inadequate allocation of scarce resources.

The most important price is interest, which not only determines the supply of and demand for funds, but also the time preferences of borrowers and lenders. If interest rates are high, more is saved and consumer spending is partly deferred to a later date. However, if the interest rate falls owing to an increased money supply, this leads to higher debt levels, greater consumption and unsustainable investment projects that have to be liquidated in a subsequent recession, as we saw with the global financial crisis. Inflation, meaning expansion of the money supply, is an important driver of the economic cycle, and therefore of the ebb and flow of the economy that affects us all.

In spite of the costs, most economists and politicians argue that moderate and stable price inflation is useful. Three questionable justifications are usually cited for this:

“Inflation is hell for creditors and paradise for debtors.”

André Kostolany,
author and stock market
expert

1. Constant, moderate price increases make real wage adjustments easier. If prices rise by 3% per year and wages rise by just 2%, real wages will fall without nominal wages having to be reduced, which often meets with fierce opposition. This advantage is clear. However, it is highly unlikely that it will be able to offset the costs outlined above.
2. Moderate price inflation gives impetus to economic growth. A consistent, underlying decline in the purchasing power of money stimulates spending and therefore economic growth. However, this overlooks the fact that there are always two parties to a sale. The decline in purchasing power incentivizes consumption, or the exchange of money for goods. But why should sellers be prepared to exchange their goods for money if this money will be worth less in the future?
3. Constant price inflation is useful, as it makes sinking into the dreaded deflation less likely. It is highly doubtful, however, that deflation, or an underlying increase in the purchasing power of money, would actually represent a real danger to the economy, particularly if it is brought about by productivity gains.

A hidden tax

If inflation causes so many problems and has so few commercial benefits, why does it exist at all? The answer is fairly straightforward. Governments cause inflation because inflation is a tax.

Deflation

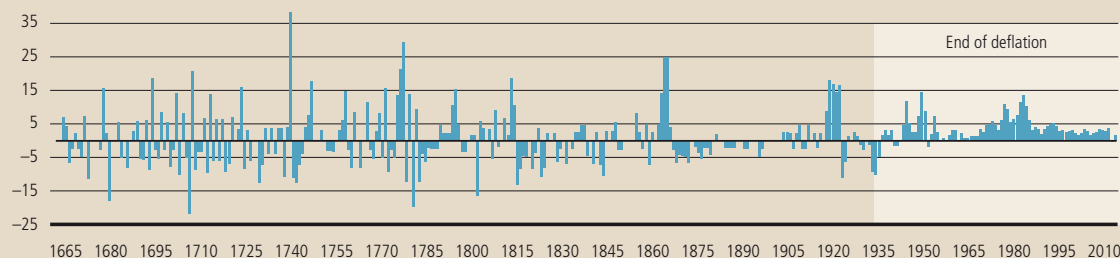
Deflation can be defined as the opposite of inflation: a sustainable and significant decline in price levels. In any case, a long-term increase in the purchasing power of money is the key feature of deflation. Deflation can therefore also be positive if the greater purchasing power of money is attributable to rising productivity. In fact, the most marked and longest phase of US economic growth at the end of the 19th century was accompanied by constant deflation.

Nevertheless, deflation also has a dark side. This becomes apparent when, following a significant increase in the money supply, a crisis occurs where the money supply shrinks rapidly.

Money supply movements are closely linked to credit volumes, which is why debt deflation is often also mentioned in this context. Money supply deflation does not necessarily cause prices to fall. Deflation in the form of a long-lasting decline in price levels or the CPI is a nightmare scenario for most modern central banks that is to be avoided at all costs. Figure 1.1 shows that they have managed to do just that since the days of the Great Depression in the 1930s. Since then, the US (and most other major economies) has not experienced deflation. With the notable exception of Japan since the early 1990s, price deflation with slow or no growth is an extremely rare phenomenon.

Fig. 1.1: Historical inflation in the US

Annual change, in %



Source: Inflation data made available by Prof. Robert C. Sahr, Oregon State University, UBS WMR

Hyperinflation

Hyperinflation has little to do with “normal” price inflation. Hyperinflation is the rapid loss of confidence in the currency. Paper money only has a value because we have confidence that the money we receive today can be exchanged for a certain quantity of goods, services and assets in the future. If this confidence is eroded, hyperinflation becomes a threat. Holders of cash will try to exchange their money for material assets at practically any price. Hyperinflation can only occur in a paper money system. The classic examples of hyperinflation are Germany in the 1920s, Hungary after the Second World War, and Zimbabwe, where hyperinflation ended in 2009. Indeed, hyperinflation is not that rare at all. The economist Peter Bernholz identified no fewer than 28 cases of hyperinflation in the 20th century.

Moreover, it is a tax that can be collected surreptitiously and without legislative approval. Through inflation, the government can acquire scarce resources without giving anything in return. Ever since currency came into use, there have been few extended periods when governments have been able to resist the temptation to benefit from inflating the money supply.

Even in Roman times, the emperors melted down valuable silver coins, combined the silver with less valuable metals and then minted new coins with the same face value. One good denarius could be used to make two or more lower quality denarii. Naturally, people noticed the deterioration of the money and adjusted prices accordingly.

Expanding the money supply in this way, by converting good coins into poor quality coins, was relatively easy to spot and often triggered unrest and revolt in the past. Gold and silver acted as a sort of anchor, making it more difficult to increase the money supply. The purity of the Roman solidus, a gold coin, remained almost unchanged and maintained more or less the same purchasing power for more than 800 years.

A modern phenomenon

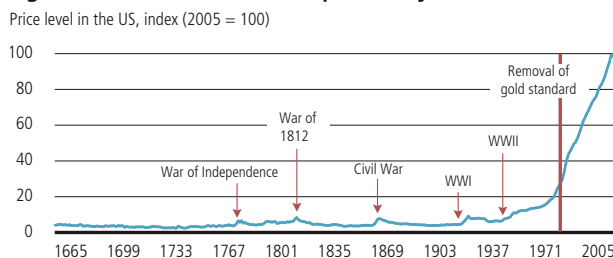
Over time, all economies moved over to paper money systems, with governments and central banks controlling the money supply without any tie to real assets. A new anchor was needed to perform the role of gold and silver and prevent the uncontrolled increase of the money supply. In modern economies, this anchor is defined by the targets of central banks, which are responsible for ensuring monetary policy with as little political influence as possible.

However, the success of the central banks’ efforts since the elimination of the gold standard has been limited, particularly relative to earlier centuries. Figure 1.2 shows that the price level in the US since the removal of the traditional gold standard in 1934 has risen twentyfold. This development is reflected in the decline in purchasing power. Figure 1.4 shows that since the US Federal Reserve was founded in 1913, the US dollar has lost around 95% of its value, after its purchasing power had remained practically unchanged for the previous 100 years. The shaded areas in Figure 1.4 show phases when the gold standard for the currency was discontinued. In each case, there was a sharp drop in the purchasing power of the dollar. Naturally, this trend was not restricted to the US dollar. Figure 1.5 tracks the purchasing power of major currencies in the 20th century. As can be seen in Figure 1.3, the money supply has tended to be increased during times of crisis in particular, in order to reduce war debts.

“In the absence of the gold standard, there is no way to protect savings from confiscation through inflation.”

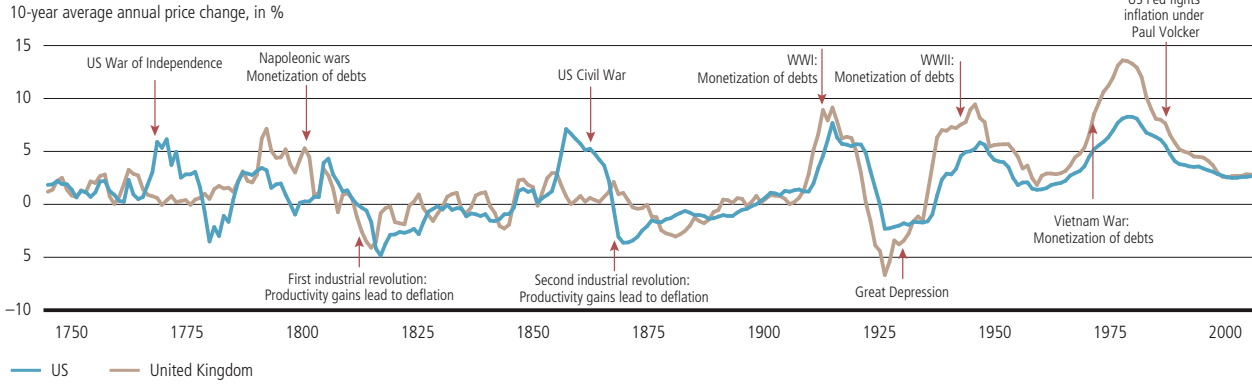
Alan Greenspan, former chairman of the US Federal Reserve

Fig. 1.2: Price trends over the past 350 years



Source: Inflation data made available by Prof. Robert C. Sahr, Oregon State University, UBS WMR

Fig. 1.3: Wars impact consumer prices

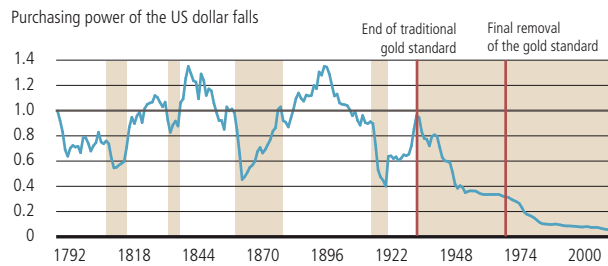


Source: EH.net, UBS WMR

Conclusion

Contrary to popular belief, inflation does not first and foremost mean rising prices; it means money is losing value. This generally occurs when the money supply increases in relation to the things that can be bought with the money. The overall economic cost of a sustained decline in purchasing power, namely inflation, includes price and interest rate distortions and redistribution effects that can weaken the economy over the long term and significantly increase volatility in the economic cycle. The growth of the money supply in relation to the goods supply is the start of this process, which becomes apparent through a general increase in prices. But how does money supply growth lead to price inflation? This is the key question we address in Chapter 2.

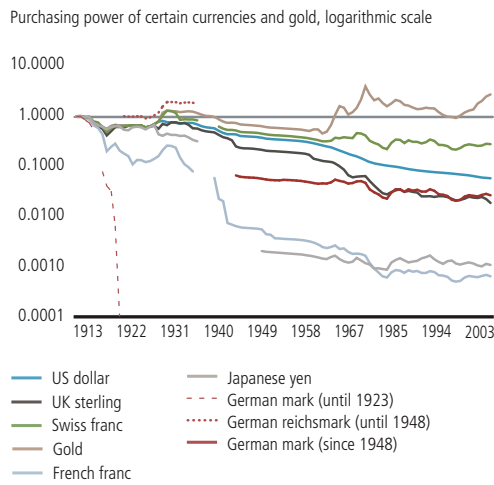
Fig. 1.4: Without the gold standard, prices rise



Note: Shaded phases denote periods when the gold standard was suspended.

Source: Data made available by the American Institute of Economic Research (AIER), UBS WMR

Fig. 1.5: Declining purchasing power in major economies



Source: AIER (2010), UBS WMR



From monetary inflation *to price inflation*

The causal chain from an increase in the money supply to increased prices can follow various paths. The decisive factor is the behavior and expectations of economic actors.

The connection between monetary inflation and price inflation discussed in Chapter 1 can be empirically demonstrated, particularly over long periods (Fig. 2.1). This is the connection that led economist and Nobel laureate Milton Friedman to say that inflation is always and everywhere a monetary phenomenon.

Disappearing link between money supply and consumer prices

Previously, there was a very close and direct link between changes in the money supply and changes in prices. For example, if the money supply grew 10%, the price level soon rose at a similar rate. However, since the mid-1980s, this close connection between money and prices seems to be disappearing (Fig. 2.2). The money supply (at least as measured by the monetary aggregate M1, covering cash and demand deposits) started

growing significantly faster than prices as measured by the CPI. During the global economic crisis in 2008–2009, the connection completely vanished. M1 exploded, but the CPI fell. How can we explain this?

If the money supply rises, the price level only rises if the quantity of items that can be purchased with money remains unchanged. If the quantity of purchasable items also rises 10%, there is no reason for the price level to rise 10%. One possible explanation for the discrepancy between monetary growth and price inflation since the mid-1980s could thus be a rapid growth in purchasable goods, services and assets.

Globalization increases the supply of goods and competition

As a result, the first possible explanation for the decoupling of consumer prices and monetary aggregates is globalization, the integration of large economies (headed by China) into the international division of labor. The Asian economies are generally net savers, i.e., they produce more

goods than they consume, creating an additional supply of goods, which has a deflationary effect on the prices of consumer goods.

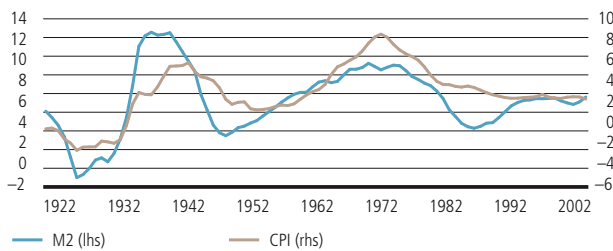
More important than the direct effects of cheaper imports could be the indirect effects – Western producers and employees are increasingly competing with Asia. A growing division of labor and expanding trade depress prices, allowing gains in efficiency and a resulting reduction in costs and prices. The loss of power by unions and the growing competition from low-wage countries have also reduced the danger of a wage-price spiral.

Growth in financial markets limits monetary expansion

Another reason for the disappearing connection between money supply and consumer prices is the qualitative and quantitative growth of the financial markets. There has been a massive increase in the global stock of capital in recent decades. Thanks to technical innovations and financial market liberalization, a growing part of the expanding capital stock is traded on the financial markets. This may have absorbed part of the inflation in the money supply, preventing monetary inflation from leading to a significant increase in consumer prices.

Fig. 2.1: Growth in US money supply and price inflation

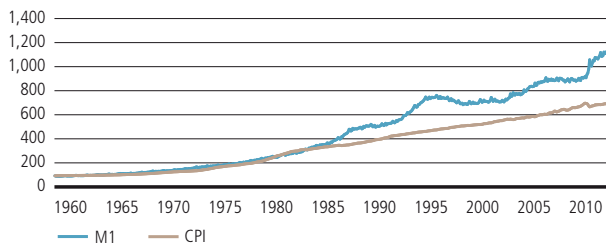
10-year forward average annual change, in %



Source: Federal Reserve, UBS WMR

Fig. 2.2: Decoupling of US money supply and CPI

Consumer prices and M1 in US, index (1960 = 100)



Source: Federal Reserve, UBS WMR

Money supply and monetary aggregates

The money supply covers the amount of money in an economy, and is broken down into various monetary aggregates which differ in their maturity, or their closeness to money as a means of payment. A distinction is generally made between the following aggregates, although their exact definition can vary significantly from one country to another:

- Monetary base (M0) = total cash balances and reserve deposits of commercial banks held with the central bank
- M1 = M0 plus part of the bank reserves and, frequently, deposits due daily (= demand deposits)
- M2 = M1 plus savings deposits, money market accounts and securities up to certain amounts with shorter maturities
- M3 = M2 plus savings deposits, money market accounts and securities in larger amounts with longer maturities

If the central bank increases the monetary base, commercial banks can increase their lending. In the process, commercial banks create new deposit money, which is reflected in higher monetary aggregates.

Conversely, the development of financial markets has made it possible for companies to finance themselves directly through the capital markets rather than via bank lending, which has weakened the connection between the money supply, bank lending and economic activity. The development of new forms of investment and payment has also made it increasingly difficult to define the money supply.

Four transmission mechanisms

But how can situations arise where, as in 2008/2009, the money supply expands rapidly while inflation, at least as measured by the CPI, falls? One explanation is that the CPI reflects only a small part of the price level. Prices of assets or raw materials are not directly reflected in the CPI. However, as a result of monetary inflation, some of these have risen massively.

Another reason is that there are transmission mechanisms between monetary expansion and price inflation that function more or less well. Basically, we can distinguish between four transmission mechanisms:

1. Interest rates: If the central bank increases the money supply, short-term interest rates fall. Saving becomes less attractive, which stimulates investment and consumption. Growing demand drives up prices for factors of production such as labor or raw materials, and companies try to get higher prices for their products.

2. Credit: The expansion in the money supply reduces the refinancing costs of commercial banks, which pass on part of this benefit to their customers. There is an increase in borrowing, which can result in consumption, investment and ultimately price increases.

3. Exchange rates: The expansion in the money supply and the associated reduction in interest rates tend to result in a depreciation of the domestic currency. This makes domestically produced goods cheaper in comparison with imported goods, which can lead to a boost in demand and higher prices.

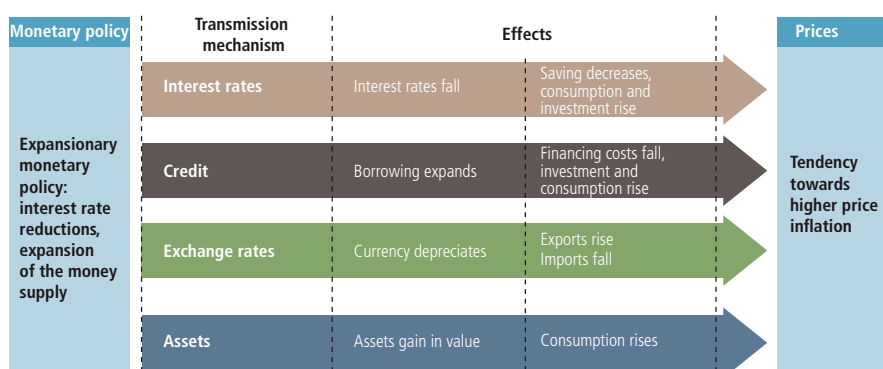
4. Assets: The first prices to respond to monetary expansion are often asset prices. If holders of these assets feel richer as a result of the price increase, this can also stimulate the economy and favor a spillover from monetary inflation to price inflation.

Like all economic variables, prices are determined by human action. In other words, the functioning of the transmission mechanisms described above depends very substantially on the subjective values and expectations of economic actors.

Expectations play an important role

If economic actors expect a positive trend in the economy, they will be more willing to spend money, withdraw their savings or borrow to finance consumption and investment. In this case,

Transmission mechanisms: how monetary policy influences prices



Source: UBS WMR

the growth in the money supply will quickly be reflected in higher prices. Conversely, if expectations for the economy are negative, price increases will be impossible at first, even though there has been an increase in the money supply.

With higher unemployment and continuing underutilization of productive capacity, economic actors are less inclined to spend money. The extra money supplied by the central bank is saved, or used to repay existing debt. In such a situation, where there are gaps in production and employment, there is very little danger that monetary inflation will lead to rising prices.

The same connection can also be explained with liquidity preference and its counterpart, the velocity of money. High economic uncertainty is associated with high liquidity preference – i.e., people hold more money than otherwise, and the velocity of money falls. If liquidity preference falls, for example because of growing confidence in an economic recovery, this is equivalent to an increase in the velocity of money. The speed of monetary transactions increases, and the possibility of implementing price increases rises.

Transmission mechanisms currently not functioning in industrialized nations

In all the major developed economies, central banks have sharply increased the money supply over the course of the global financial and economic crisis. This applies particularly to the US, but also to the Eurozone, the UK and Japan. (Fig. 2.3 and Fig. 2.4)

Even so, there has been virtually no spillover from the monetary expansion to the real economy, and particularly consumer prices. This is clear from the rise in the broad monetary aggregates (M2, M3), which lie virtually between the monetary base and the real economy. There has so far been little increase in these monetary aggregates, which include longer-term savings, money market securities and bonds. There has also been little growth in lending so far. This means that the commercial banks have not been able as yet to use the new money for lending to companies and individuals (Fig. 2.5). As a result, the interest and credit mechanisms are virtually ineffective at present.

The exchange rate is a different story. Although this is functioning, the US dollar (USD) cannot depreciate on a broad basis as the Asian currencies are aligned with the USD. Just like the Eurozone, the US is also a large, closed economy, so the exchange rate has a limited effect in any case. The situation is different in the UK. The British pound (GBP) has depreciated significantly against the currencies of its most important trading partners, making imports more expensive, which has contributed to the increase in prices in the UK.

Fig. 2.3: Historical rise in monetary base in the wake of the financial crisis

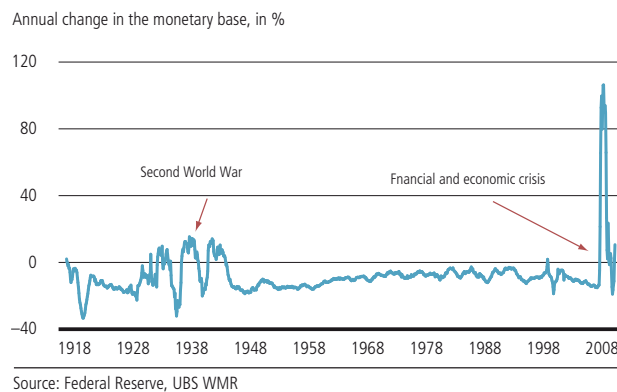
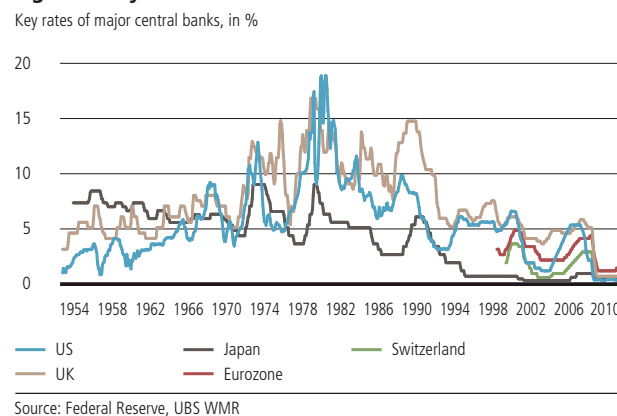


Fig. 2.4: Key rates at record low





Assets are particularly relevant in the US and the UK as a transmission mechanism, although this is also blocked, at least the important parts of it. Although the expansionary monetary policy boosted prices of equities and raw materials, house prices are continuing to fall or are stuck at low levels. In addition, excess capacity in the real estate sector and mortgage debt have to be reduced, particularly in the US but also in a number of European countries. In the Eurozone, this transmission mechanism plays a lesser role, as private equity investment is less widespread there.

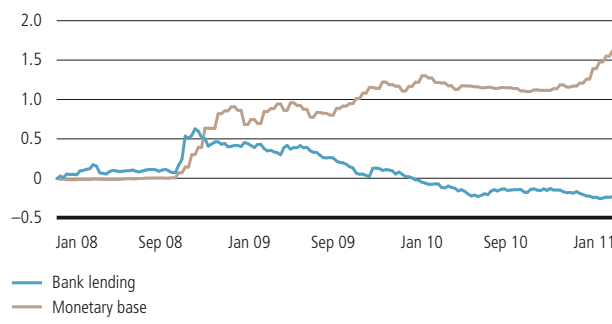
Expansionary monetary policy exported to emerging markets

In the emerging markets, these transmission mechanisms – and particularly interest and credit – function far better than in the developed economies. In several countries, and particularly China, transmission through credit can actually be determined administratively, by instructing the banks to lend a certain amount.

In addition, several emerging nations have tied the value of their currency to the US dollar. In other words, they have also had to follow an expansionary monetary policy to counter the pressure on their currencies to appreciate against the dollar. As a result, expansionary monetary policy – i.e., an increase in the money supply – in the US is being exported in part to the emerging markets, where it is causing the rise in prices to accelerate.

Fig. 2.5: Monetary base and bank lending have diverged

Cumulative change in US monetary base and bank lending, in USD trillion



Source: Federal Reserve, UBS WMR

Mechanisms depend on numerous factors

As already noted, these transmission mechanisms cannot be seen as purely mechanical processes. Instead, the individual judgments, expectations and actions of economic actors play the decisive role. Credit and interest do not work as transmission mechanisms because private households and companies have decided that they need to save and repay loans. This behavior is apparent in the very low velocity of money, or unusually high liquidity preference.

The US and several European countries, such as Spain, have had very high unemployment rates since the crisis in 2008/2009, so the shortfalls in

production and employment are still substantial in many cases. Only when the economic situation improves further – i.e., capacity utilization and employment rise – can we expect the interest and credit mechanisms to function again, and monetary inflation to emerge as price inflation. The situation is different in the emerging nations. In some cases, there is a threat of overheating, which has already led some central banks to curb their expansionary monetary policy.

Conclusion

The monetary expansion since the global financial crisis is unprecedented. Despite this, increases in consumer prices in most developed economies has remained fairly well contained. A major reason for this is that the transmission mechanisms leading from monetary expansion to price inflation are currently not functioning. The important questions are, accordingly, if and when these transmission mechanisms will start to function again, and whether or not a rise in prices across a broad front can then be prevented. We look at these questions in Chapter 3 and discuss the most important scenarios for future price changes.

Three scenarios – *the Fed sets the tone*

We evaluate three potential scenarios — deflation, hyperinflation and elevated inflation — and conclude that an acceleration of inflation is the most likely outcome. Although we consider the two extreme cases unlikely, investors should keep an eye on the risks.

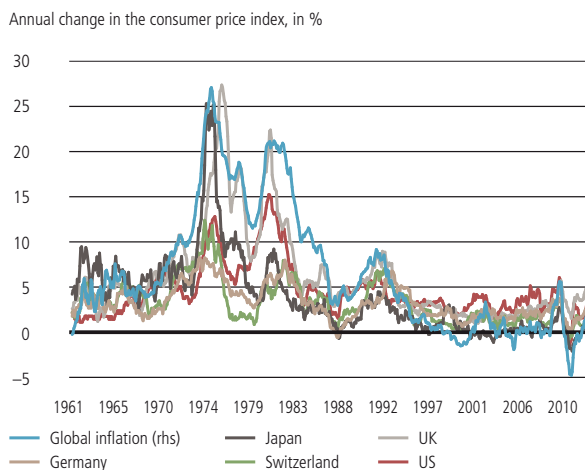
Price inflation is essentially a global phenomenon. Inflation rates exhibit high levels of correlation across the world and – in spite of regional differences – global influences dictate the fundamental trend (Fig. 3.1). In our view, a significant and sustained decoupling of price inflation rates in Asia from those in Western industrialized nations is unlikely. The three situations we have described below should therefore be seen as global scenarios.

US monetary policy a key pointer to global inflation trends

Global inflation trends are largely determined by developments in the US. Not only is the United States the world’s largest economy, the US Federal Reserve (Fed) also determines monetary policy for a large part of the global economy on account of direct or indirect dollar pegs for various currencies.

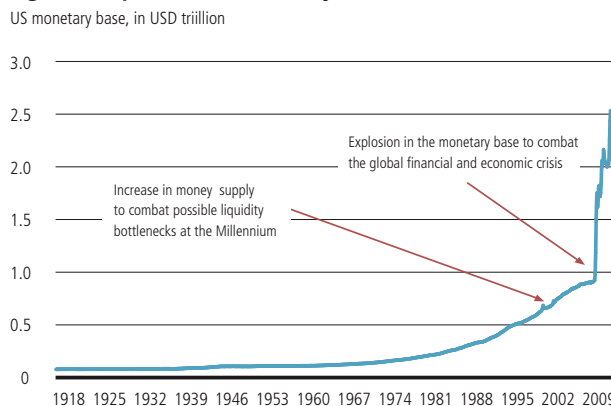
US monetary policy has been strongly influenced by the financial crisis for a number of years now. In its battle against the deflationary consequences of the financial meltdown, the Fed has more than tripled the size of the monetary base (Fig. 3.2). However, as we discussed in Chapter 2, this extremely expansionary monetary policy has yet to feed through into the broader money supply aggregates (M2 and M3), lending or the real economy – transmission via the interest rate and credit channels is faltering. The outlook for global price inflation in the coming years largely depends on

Fig. 3.1: Inflation is highly correlated across countries



Source: Reuters EcoWin, UBS WMR

Fig. 3.2: Explosion in monetary base the US



Source: Federal Reserve, UBS WMR



whether this monetary policy transmission mechanism in the US is able to function normally again. The chart on page 21 illustrates what we consider to be the most important potential scenarios.

Risk scenario 1: Deflation

Monetary policy transmission via the interest rate and credit channels has yet to make any headway in the US (brown color in the chart on page 21). Instead, the liquidity glut brought about by the Fed is leading to speculative bubbles in global financial markets and emerging economies.

Specifically, we see the risk of expansionary US monetary policy producing a bubble in the commodity markets (Fig. 3.3) and in Chinese real estate. If a large global speculative bubble bursts before the US economy has found its feet, there is a renewed risk of deflation, with a sharp contraction in credit availability – a trend which could spread to the global economy.

Deflation is avoidable

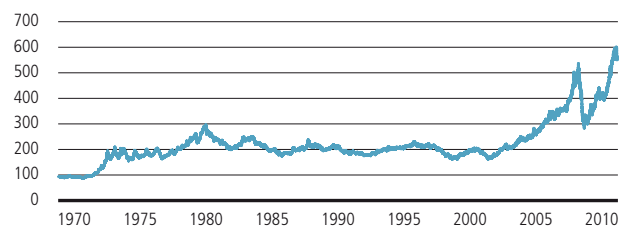
However, in the past three years central banks have shown that they have both the will and the policy instruments to put a stop to deflationary trends¹: they can further expand their balance sheet. Should the purchase of government bonds fail to achieve the desired effect, central banks could also buy private assets (bonds, stocks, real

estate) and thus support prices or – in extreme cases – even bypass the banking system by distributing money directly to households or businesses.

Therefore, we consider a sustained period of deflation rather unlikely. Nonetheless, there is still a risk that future economic downswings could become deflationary more quickly than was previously the case. This is because deflationary

Fig. 3.3: Commodity prices at record highs

Reuters/CRB equal weight commodity price index



Source: Reuters EcoWin, UBS WMR

¹ In a speech made several years ago, Fed Chairman Bernanke explained how a central bank determined to take any measures necessary can prevent deflation: Ben S. Bernanke, November 21, 2002, “Deflation, Making Sure ‘It’ Doesn’t Happen Here”, Remarks before the National Economists Club, Washington, D.C.

pressures from the period before the crisis are still present, and this could play out again in future economic downturns.

Risk scenario 2: Hyperinflation

Although this appears at first glance to be the opposite of deflation, hyperinflation is closely correlated with the risk of deflation and is a pos-

sible consequence of measures to combat deflation. If deflation did actually return, central banks would combat it by taking additional measures to expand the money supply. Fiscal policy would also become increasingly dependent on assistance from the central bank printing presses in funding measures to stabilize the financial markets. Ultimately, a deflationary scenario would mean that central banks would have to continue monetizing government borrowing by using new money to purchase large amounts of sovereign debt.

Deflation and inflation aversion in Japan

In the 1980s, the Japanese central bank took measures to effect rapid growth in the money supply. This resulted in huge price bubbles on the real estate and equity markets which then burst as the decade came to an end. This situation ought to have prompted high deflation, and Japan is indeed viewed as a country which has been mired in deflation for some 20 years. However, this deflation can at most be described as deflation in slow motion. Although there were some years when consumer prices fell, they have actually risen slightly on average since 1990.

The Japanese central bank has been successful in its efforts to avert genuine deflation, which was important in any case given the high levels of sovereign debt. However, it has taken an extremely cautious approach – growth in the money supply has remained very low over the past 20 years. There have been two main reasons for this caution: the high average age (a large percentage of the population lives on a fixed income) and the fact that more than 90 percent of Japanese government debt is held domestically. In this context, high price inflation is extremely unappealing.

Would a scenario such as this potentially materialize in the US or the global economy? We think not. In countries such as the US which have a far younger population and a large share of sovereign debt held abroad, aversion to inflation is likely to be far lower than in Japan.

If interest rate and credit channels remain blocked, the new money simply creates additional price bubbles in the financial and commodity markets. If these burst, this in turn results in deflationary pressures. There is then a risk that this process would be repeated several times. Each repetition and each increase in the extent of sovereign debt monetization heightens the risk of a loss of confidence in the currency, i.e., the risk of hyperinflation (in the chart on page 21 this scenario is highlighted in red).

Hyperinflation is avoidable

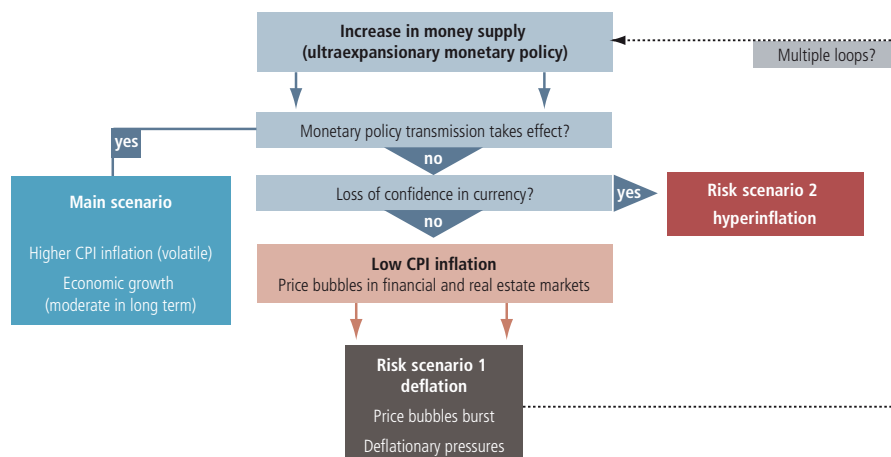
One prerequisite for hyperinflation is that the central bank monetizes a large proportion of government debt. Steps to tighten monetary policy, which importantly includes putting an end to the monetization of government debt, can stop hyperinflation. Ultimately, then, hyperinflation is a political decision. Given what is known about the devastating consequences of hyperinflation, it must be assumed that central banks would put a stop to hyperinflationary trends soon after they emerged. As long as monetary policy is independent of political decision-making, it should be possible to end nascent hyperinflation relatively quickly.

For hyperinflation to be halted, huge rate hikes, an end to the monetization of sovereign debt and an end to budget deficits are required. This would plunge the economy into a deep recession, but would bring about an end of hyperinflation. But even if hyperinflation were arrested at an early stage, prices may increase considerably in a very short space of time, creating vast redistributions of wealth between borrowers and creditors. Nonetheless, we consider hyperinflation unlikely.

“Inflation is periodically recurring proof of the fact that printed paper is printed paper.”

Helmar Nahr,
mathematician and
economist

Scenarios



Source: UBS WMR

**Main scenario:
elevated and volatile price inflation**

In our main scenario, we assume that the transmission of monetary policy via the interest rate and credit channels will soon be restored. As a result, there will be an increase in the broader monetary aggregates (M2 and M3) as well as in lending. House prices will stabilize and the US economy will enter a phase of self-sustained economic growth, with new jobs being created; this means that the production and employment gaps will close.

However, in the wake of the global financial crisis we expect potential growth (sustained growth with normal capacity utilization) in the US and a number of other large indebted industrialized nations to be lower than was previously the case. At the same time, the inflation-neutral unemployment rate will likely be higher than in the past. This is partly because some parts of the economy will have to undergo structural reform. In addition, the vast expansion in lending, which was a key growth driver in the past, looks set to play a more minor role. Accordingly, the closure of the

Government deficits and hyperinflation

From an empirical perspective, high government deficits and their funding by the central bank played a key role in all cases of hyperinflation during the twentieth century. According to research by economist Peter Bernholz, budget deficits of 40 percent or more of the state’s total spending were a key fundamental prerequisite for the emergence of hyperinflation (Fig. 3.4). In eight out of twelve cases of hyperinflation investigated by Bernholz, a deficit of 20 percent of overall spending was sufficient. In the US, the

deficit is currently around 25 percent of total spending, while in the UK and Japan it is almost 20 percent. In the Eurozone in 2010, the deficit was only just over 10 percent.² This metric alone would suggest that the US dollar in particular, and after that the British pound and the Japanese yen, are at risk of a hyperinflationary scenario.

²Bernholz, P. and Kugler, P. (2008)

output gap and in turn an accelerated increase in prices can be expected at relatively low growth rates in future. At times, this scenario could awaken memories of stagflation (the combination of high inflation and very low economic growth), which was a defining characteristic of the 1970s.

Outlook:

Increased and volatile inflation as of 2013

We expect the Fed to normalize its monetary policy stance later rather than sooner and to accept higher price inflation as a consequence (see Box below). In the short term, however, the reversal of surplus liquidity and the rise in interest rates will likely weigh on equity and commodity prices. A fall in commodity prices and the still very low level of capacity utilization at present should ensure

that price inflation rates in the US and the Eurozone remain low in the next one to two years and could even moderate in Asia.

Only when the output gap in the US is closed will there be a sustained rise in US price inflation. We estimate that this scenario could materialize from around 2013 onward. Up to 2020, we expect US consumer price inflation of some 5 percent on average. (In the ten years prior to the crisis, from 1998 through 2007, US consumer price inflation averaged around 2.5 percent). Figure 3.5 shows that a similar average was posted in the 1940s and 1950s, though inflation rates reached double digits at times during that period, contributing to a marked reduction in the public debt ratio.

“By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens.”

John Maynard Keynes
“The Economic Consequences of the Peace,” 1919

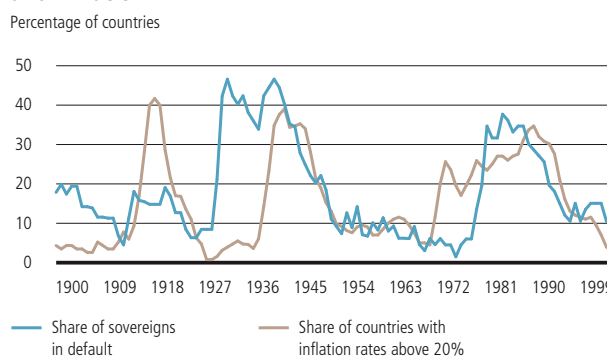
We believe that other regions will be unable to decouple from the rise in inflation in the US. As a result, from around 2013 onward inflation rates across the world will settle at levels well in excess of the respective national central banks’ inflation targets for several years. For the UK, where price inflation has been above the Bank of England’s target range since 2010, we expect inflation rates to run at similar levels to those in the US. In the Eurozone and Switzerland, price inflation rates are likely – as always – to be lower than in the US on the whole, whereas we expect prices in the majority of emerging nations to rise at a higher rate than in the US on average.

The Fed will tolerate higher rates of inflation

In our view, the Fed will normalize its monetary policy rather late. There are several reasons for this:

1. The central bank will not want to jeopardize the economic recovery via early rate hikes, especially since the government has little scope to support the economy given the already high budget deficits.
2. The effect of monetary policy is subject to a time lag that can last several years. Once there are mounting indications of accelerated price inflation, it may already be too late to prevent inflation rates from reaching excessive levels at times.
3. Before interest rates can be hiked, the surplus liquidity created when the Fed expanded its balance sheet (i.e., quantitative easing) has to be managed and perhaps even reduced. This must not take place too quickly in order to avoid placing an excessive burden on the financial markets.
4. The reduction in liquidity could result in the Fed realizing losses. This is one reason to postpone this process for as long as possible.

Fig. 3.4: Close correlation between fiscal crises and inflation



Source: Data made available by Prof. Carmen Reinhart, Peterson Institute for International Economics

Price inflation lowers the debt ratio

Another factor that points to accelerated price inflation in future is the fact that this offers a means of cutting the real value of government debt, as existing debts are paid back with money whose value has fallen. Figure 3.4 illustrates the long-term but complex correlation between fiscal crises and elevated price inflation. Firstly, a substantial proportion of government spending, especially on social needs, is generally pegged to the respective rate of price inflation. These obligations rise in tandem with price inflation and cannot, therefore, be “inflated away.”

Secondly, price inflation might be anticipated. This would be the case if inflation rates rose slowly and steadily. In this instance, interest rates and, in turn, funding costs for the state would also increase. Although empirical studies show that price inflation can seldom be anticipated in full, the effect would be very low in adverse cases. So if the government debt ratio is to be reduced through inflation, it would be far better if inflation arose in spurts. Figure 3.5 shows that this was generally the case in the past. In the 1940s and 1950s, when the key aim was to bring the large war debts under control, the average inflation rate was around 5 percent, however, consumer price inflation attained peaks of almost 20 percent. Such periods were then followed by phases of very low inflation rates and even deflationary episodes.

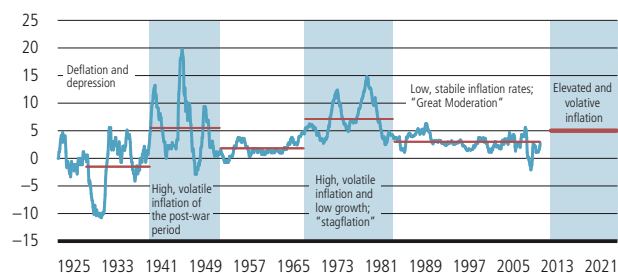
Conclusion

If the recent rise in equity and commodity prices or the increase in real estate prices in China prove to be unsustainable and the financial markets suffer a major setback this year or next, with the US economy continuing to falter, the risk of a deflationary scenario will increase. If, in the wake of a setback of this nature on the financial markets, central banks expand their government bond purchase programs against the backdrop of a concomitant and marked increase in the price of gold, this could point to forthcoming hyperinflation. A further loss of independence by key central banks or signs of a sovereign debt crisis in major economies would also increase the risk of hyperinflation. At the present time, we think it rather unlikely that there will be a protracted phase of either deflation or hyperinflation. Nevertheless, investors should not lose sight of these risks completely.

In our view, elevated and volatile price inflation in the US and across the world is the most probable scenario in the decade ahead. However, this sustained rise in inflation would only materialize after some years. For this scenario to take place, monetary policy transmission, especially in the US, will have to gain traction; the dollar peg on a number of currencies means that US monetary policy will dictate conditions for large sections of the global economy. A rise in broader US monetary and credit aggregates, a stabilization of house prices and an improvement in labor market conditions would provide further support for our thesis.

Fig. 3.5: Trend in consumer prices in the US

Annual change in the consumer price index, in %



Source: Reuters EcoWin, UBS WMR

Protecting investments *against loss of value*

Investors are not entirely at the mercy of inflation risk. In this chapter, we outline a wide range of approaches for investors to protect their assets. Effective inflation protection takes into account both individual asset classes and personal circumstances.

The US experienced three major periods of inflation in the 20th century. Figure 4.1 shows how our main scenario of increased and volatile inflation from 2013 could look. During past periods of inflation, most investors had to accept significant losses in the value of their portfolios. Even in the Great Depression of the 1930s, it was easier to generate positive, inflation-adjusted returns than it was in the periods of very high inflation. There are three basic strategies to guard against deteriorating purchasing power:

1. Spend money – incur debt: If we could purchase everything today that we would purchase until the end of our lives, we would be able to avoid the effects of any future inflation. Obviously, this is not possible, but if inflation looms it makes sense to carry out any foreseeable purchases as soon as possible. This strategy is particularly effective when the expenditure is financed by debt, as the real value of the debt decreases over time as money loses its purchasing power.

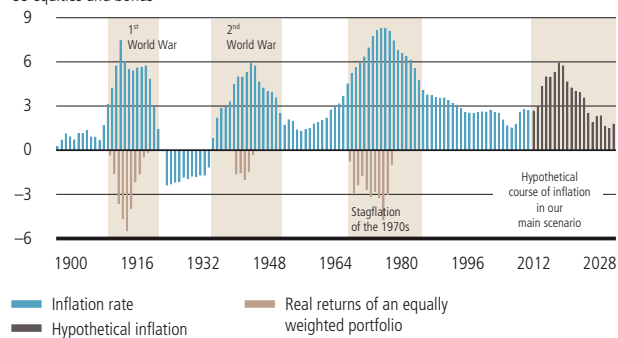
2. Choose a currency that maintains its purchasing power: This is a sensible strategy where there are significant differences between the inflation trends in individual currency areas. However, as we note in Chapter 3, inflation is highly correlated globally, so this approach is limited. Added to this is the fact that a country's currency is generally the legal tender – meaning that in most cases it cannot simply be picked at the investor's discretion.

3. Invest in asset classes that offset losses in purchasing power: Assets that rise in value or generate returns during periods of high inflation, compensating or even exceeding losses in purchasing power, can offer protection against declining purchasing power. Inflation-indexed bonds, for example, were developed precisely for this purpose. However, both the market for these instruments and their liquidity is extremely limited. Investors therefore also have to look to traditional asset classes when seeking inflation protection.

In principle, nominal assets (assets with a nominally fixed par value and/or cash flow) suffer at the hands of inflation. However, assets based on real value can offer protection against inflation. This applies in particular to real estate and commodities, inflation-indexed bonds, and some equities and money market investments (Fig. 4.2).

Fig. 4.1: Negative real returns in inflationary periods

Sliding 11-year average inflation and real returns of portfolios equally weighted with US equities and bonds



Source: Inflation data made available by Prof. Robert C. Sahr, Oregon State University; Shiller, Robert (2000, updated 2005); UBS WMR



Real estate offers good, but not absolute protection against inflation (office building in Beijing).

Money market investments:

Flexibility guaranteed

Money market investments (e.g., overnight money or time deposits and short-term loans with a residual maturity of up to one year) can provide partial protection against inflation. Although these investments are nominally fixed and their real value declines when inflation unexpectedly rises, they can soon be redeemed for their nominal value and the proceeds can be invested in new instruments. The shorter the term to maturity, the quicker an adjustment can be made to the new inflation environment. However, monetary policy plays a significant role in money market investments. If the central bank holds interest rates at a low level despite rising inflation, money market investors will suffer real losses.

Nominal bonds:

Losses in value when inflation rises

Investments in nominal bonds are always negatively correlated with the inflation rate, as these bonds offer a nominal return that does not

change over time. The longer the term to maturity, the more the price of these bonds will suffer as inflation expectations grow. However, the price of shorter-term bonds is less affected by increasing bond yields. Faced with rising inflation, a reduction in the maturity of the bonds (the maturity risk or duration) can reduce the portfolio's inflation sensitivity. It should be remembered, though, that bonds (particularly long-dated bonds) can offer protection against other risks, such as falling stock markets, which would then be lost.

Inflation-linked bonds:

Security at a price

Inflation-protected bonds are a special case. With these bonds, the nominal return is linked to the inflation rate, so the real return remains unchanged if inflation rises. This is why they are also known as real bonds.

But there are also disadvantages. For starters, the market for these bonds is highly limited. There are very few issuers in the corporate sector and no

Fig. 4.2: Appeal of asset classes in the three scenarios

	Attractive	Neutral	Unattractive	
Deflation	Government bonds	Corporate bonds Gold Real estate Money-market investments	Equities Commodities inflation-linked bonds	Risk scenario 1
Elevated and volatile inflation	Real estate	Equities Commodities Inflation-linked bonds	Money-market investments Gold Corporate bonds Government bonds	Main scenario
Hyperinflation	Gold Real estate Inflation-linked bonds	Commodities Equities	Government bonds Corporate bonds Money-market investments	Risk scenario 2

Source: UBS WMR

Inflation protection has three components

When assessing the inflation protection offered by individual asset classes, three main factors need to be taken into account:

1. Level of inflation protection: If the price of an asset class rises just as quickly or more quickly than the inflation rate (high positive correlation), the asset class provides good inflation protection. The lower the correlation coefficient, the lower the inflation protection. If the correlation is negative, the price of the asset class will fall as inflation rises.

2. Reliability of inflation protection: The price performance of asset classes is determined by many factors in addition to infla-

tion. Although a high correlation between the inflation rate and price performance is an advantage, if this correlation is frequently disrupted by other factors this will impair an asset class's ability to protect against inflation.

3. The cost of inflation protection: As a rule, inflation protection is not free. However, the asset classes we are looking at here are liquid and highly investable, so any costs usually arise from returns lost if the expected inflation scenario does not materialize.

bonds of this sort are issued in Switzerland, for example. There is also the risk that the price index to which the bond is linked does not correspond to the investor's own inflation rate, or that the price index underestimates the actual rate of decline in purchasing power.¹ In such cases, inflation-protected bonds do not provide full inflation protection. The costs also need to be taken into account. Inflation-protected bonds currently seem expensive. Investors who wish to protect themselves against higher rates of inflation over the long term should favor short-to-medium maturities (up to five years) and roll them over at maturity. Staggered entry is another option.

Equities: Inflation protection with limits

Equities are often said to offer good inflation protection. This is because equities are usually considered to be based on real value, as they represent shares in company profits. However, this has generally not been borne out by empirical

studies – at least not over the short term.² There is no positive correlation and, over the short term at least, equities do not protect against inflation. Opinions differ regarding the long-term protection offered. We believe that equities hold their value relatively well even in an inflationary environment over the long term, with long-term meaning five years or more.

Nevertheless, there are certain limits. Firstly, this pertains in particular to the US – in the UK and Germany, for example, a positive relationship between share price performance and inflation is less apparent. Secondly, this positive correlation is not particularly stable, as stock market performance is influenced by many other factors. And, thirdly, this relationship only applies to inflation rates up to a certain level. From rates of around 6–10 percent, the performance of equities deteriorates and they no longer offer inflation protection.

¹ For example, the official rate of inflation in Argentina in 2010 was around 10 percent, while independent economists put the inflation rate at 20 to 25 percent. This difference is serious, as inflation-protected bonds make up around 40 percent of Argentinean government debt.

² Attie, A.P. and Roache. S.K. (2009)

Real estate:

Good, but not absolute protection

Investment property offers partial inflation protection over the long term. The prerequisites for this are as follows: firstly, leases must be linked to a price index; secondly, there should be adequate long-term, fixed-rate debt finance; and thirdly, the inflation needs to be accompanied by positive market expectations. If these requirements are met, there is a positive correlation between the nominal total return and inflation. As a rule of thumb, the higher the land component of a real estate investment, the greater the sensitivity to the inflation rate and, therefore, the inflation protection.

However, this relationship and, consequently, the inflation protection are not always stable. In the event of central bank intervention in the economy, for example, the correlation can turn negative. In 2007, for example, the central banks corrected their long-standing monetary expansion by introducing an unexpected, restrictive monetary policy. They then reacted to the financial crisis with unexpectedly strong monetary expansion, which led to a negative correlation between real estate returns and inflation as a result of interest rate shocks.

Commodities: Good, but not always reliable inflation protection

Commodity prices and commodity futures, in particular, are positively correlated with inflation

over both the short and long term. Commodity prices usually significantly exceed the rise in the general consumer price index. From this perspective, commodities provide very effective inflation protection (Fig. 4.3).

However, commodity price movements are also influenced by many other factors. As a result, the correlation between commodities and inflation is sometimes somewhat unstable over time, meaning that the inflation protection is not always reliable. History has also shown that commodity markets are frequently subject to government price controls, which can also impair the reliability of this asset class as a means of protecting against inflation.

Gold: A crisis hedge, but not without costs

Gold has a special position among commodities. Global demand for gold increases in step with uncertainty about the economy and financial system – particularly with respect to the US. Gold is a crisis hedge, the ultimate currency, able to offer protection against extreme inflationary and deflationary trends. But this protection has its price. Over the long term, the return on an investment in gold is likely to correspond to the inflation rate less storage costs. This is significantly lower than the return expected from equities and bonds.

The reliability of gold as a crisis hedge also has its limits. In extreme situations it is not clear whether

Fig. 4.3: Appeal of individual commodity sectors in the three scenarios

Scale of 1 to 5, relative to the other commodity sectors in each case, 1 is the most attractive

Relative attractiveness of individual raw materials per scenario						
	Energy	Base metals	Precious metals	Gold	Agricultural commodities	Absolute attractiveness of commodities
Hyperinflation	4	5	2	1	3	Attractive
Elevated inflation	3	4	1	2	5	Neutral
Deflation	4	5	3	1	2	Unattractive

Note: This is solely an estimation of relative attractiveness within the raw materials investment class. A raw material group in 1st place (attractive) can nevertheless despite absolute estimation be unattractive to other investment classes in comparison.

Source: UBS WMR

Equity sectors offer partial inflation protection

Equities offer, at best, partial protection against inflation, and this varies according to the sector. Companies and sectors whose input prices are impacted only slightly by higher inflation generally benefit from rising inflation. These include primarily capital-intensive companies, which tend to have a high proportion of fixed costs.

Companies that enjoy a dominant market position or inelastic demand for their products have the advantage that they can more easily pass on price rises in the market. This frequently applies to large-cap companies, as well as companies in the industrial, basic materials, oil, gas and chemicals sectors.

Companies that directly own a very large amount of real assets can have partial “built-in” inflation protection, as do various regulated infrastructure companies (e.g., water suppliers, toll road operators) whose tariffs are linked to an inflation index. At the same time, however, the very fact that they are regulated means that these companies are also highly dependent on policy decisions: for example, regulators may decide to adjust electricity prices to reduce the general inflation pressure on the economy.

gold investors always have access to the physical gold holdings stored outside their own home; added to this, government intervention is to be expected in crisis situations. During the Great Depression, for example, the US government ordered that all privately held gold be surrendered at a price of USD 20.67 per ounce and then fixed the new gold price at USD 35. Gold is certainly a crisis hedge, but investors should never solely rely on the precious metal.

The right mix is key

It would be easy to avoid the negative effects of future price inflation if we knew when it was going to start, how high it was going to be and how long it was going to last. We would simply have to invest in asset classes that offer the greatest and most reliable inflation protection. Unfortunately, this information is not available. So it is advisable to spread the risk through appropriate diversification, incorporating asset classes and currencies that have as little correlation as possible to each other.

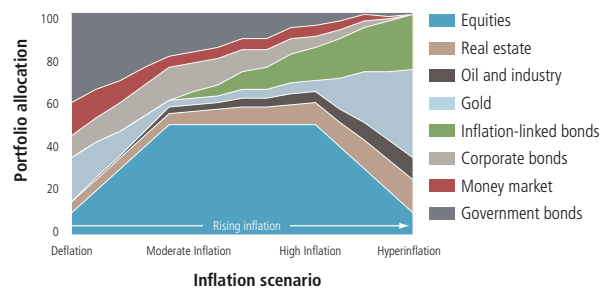
It also needs to be taken into account that this correlation can change. Rising inflation initially has a positive effect on the performance of equities, but this turns negative once inflation reaches a certain rate. This means that when inflation is very high, equities and bonds are positively correlated. So even if a portfolio is already geared toward real value, it is essential that it is regularly

monitored and, if necessary, adjusted for any changes in the inflation environment.

Figure 4.4 shows how the portfolio allocation might change given the scenarios discussed in Chapter 3. In the event of deflation, equities and corporate bonds suffer, as do real assets like real estate and commodities. Conversely, nominal bonds benefit and cash and gold are added to the portfolio allocation as a crisis hedge.

Fig. 4.4: Sample allocation of a portfolio with medium risk profile

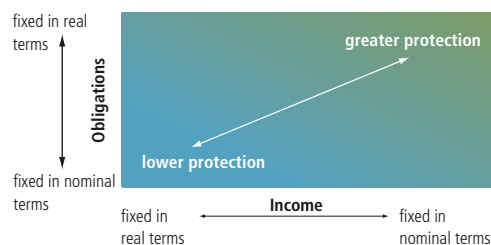
The asset class weightings are dependent on the various inflation scenarios



Source: UBS WMR

Fig. 4.5: How much inflation protection is necessary?

Obligations and income play an important role



Source: UBS WMR

Note: The lower the risk tolerance, the greater the need for protection.

In the case of positive inflation, the equity allocation rises particularly sharply. Corporate bonds also take a more prominent role. In the event of elevated and volatile inflation (our main scenario from 2013), investments based on real value gain in importance: commodities, gold, real estate and inflation-protected bonds are added to the portfolio mix. The weighting of nominal bonds, on the other hand, is reduced. The other investment objectives are not usually compromised by the portfolio's concentration on real value.

How much inflation protection is necessary?

The need for inflation protection changes over time. People of working age who receive variable salaries and wages generally require less protection from inflation than pensioners or investors who are close to retirement. The following factors play an important role in determining how much inflation protection is necessary:

- 1. Risk tolerance:** Investors with low risk tolerance will opt for greater inflation protection and therefore be prepared to pay higher costs than investors with greater risk tolerance.
- 2. Expenses:** In particular, if current and future expenses are nominally fixed, as with fixed-rate mortgages or certain rental and lease agreements, for example, the inflation protection within the portfolio can be reduced. However, if most expenses are not nominally fixed they will rise alongside accelerated price inflation, so more inflation within the portfolio is advisable.

- 3. Income:** If most income is variable and rises in line with or more quickly than the inflation rate (as is often the case with wages and salaries), this provides natural protection against inflation that can be taken into account in the orientation of the portfolio. On the other hand, if income is nominally fixed and only reacts to inflation slowly or with a time lag (as is frequently true of pensions, annuities, social security and rental income), additional inflation protection may be required (Fig. 4.5).

Conclusion

If our main scenario of elevated and volatile inflation from around 2013 materializes, investors whose portfolios consist largely of nominal assets will be exposed to a greater loss of purchasing power. Since the cost of living would rise and, at least nominally, fixed income investments would decline in value, this development could pose the risk that long-term investment objectives will not be met. Investors concerned about accelerated price inflation should therefore consider protecting their portfolios against inflation at an early stage.

A wide range of asset classes that offer equally good inflation protection can be used for this purpose. It is also important to take into account personal circumstances when answering the question of how much inflation protection a portfolio needs. Inflation protection is not free, as a rule. But in the event of an unexpected acceleration of price inflation, a diversified portfolio that is more focused on real value can provide valuable protection against declining purchasing power.

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