The financial crisis and its aftermath

Public sector debt imbalances to grow more acute
Lower trend economic growth, higher risk of inflation
Earnings to revert to a more sustainable path
Financial markets have priced in a very austere outlook
Nominal bonds expensive, stocks and corporates cheap
Inflation-linked bonds should top cash as a safe long-term asset
Past performance is no indication of future performance. The market prices provided are closing prices on the respective principle exchange. This applies to all performance charts and tables in this publication.
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Dear reader,

The financial crisis that intensified in 2008 shook the global economy to its foundations. It also unleashed a crisis of confidence among consumers, businesses and investors that threatened to unravel most forms of global commerce. In response, the actions taken by governments – spending measures, tax cuts, reductions in short-term interest rates and purchases of financial assets – are essential steps to revive confidence and global economic activity.

In the aftermath of the crisis, a new economic era is taking shape. It is already clear that the state will play a much bigger role in economic affairs, one that it is unlikely to give up even after the situation stabilizes. And longer-term risks loom. One of them, inflation, is an expedient tool for policymakers to redistribute the burden of high levels of private and public debt. Another, protectionism, is a regrettable knee-jerk reaction during times of economic upheaval.

Falling trade barriers, increased international capital flows, and the spread of private-sector activities produced enormous benefits for the world economy. At the same time, however, these same international trade and capital flows became increasingly unstable, as we discussed in a UBS research focus report entitled, “Currencies: a delicate imbalance,” early in 2008. Restoring sustainable economic growth will not be easy, but strong efforts are now underway to reverse the downturn’s momentum and offer hope for a recovery.

But we should not forget that well before the crisis hit, demographic forces were already pointing to both slower long-term economic growth and greater pressure on government finances. The unwinding of household and corporate balance sheet leverage, as well as heightened regulation, are likely to slow economic activity even further.

In sum, we expect public sector imbalances to grow steadily in future as countries grapple with tough choices over potential spending cuts or higher taxes.

Financial markets, once priced for perfection, now reflect a pessimism that is, in fact, far darker than the new economic realities indicate. Surely, the aftermath of the crisis will seem austere given its bubbling prelude, but it will also offer investors attractive opportunities. We think this turning point demands a clear-eyed review not only of assets and portfolios, but also of the methods used to evaluate them. That is what we have attempted to deliver in this edition of the UBS research focus.

Andreas Höfert
Global Head Wealth Management Research

Walter Edelmann
Head Global Investment Strategy

Kurt E. Reiman
Head Thematic Research
Summary

The financial crisis and its aftermath

A new post-crisis policy paradigm
Measured in lost wealth, the financial crisis that erupted in 2007 and intensified throughout 2008 has already achieved historic proportions. Today, we are witnessing the emergence of a new policy paradigm. After decades of burgeoning free-market internationalism, governments will extend their reach as they struggle to revive their economies. So far, governments and their central banks have intervened on two fronts: stabilizing and in some cases nationalizing their crippled financial sectors, and using fiscal and monetary policy tools to counter a deep global recession.

In our view, these measures are crucial to turn the tide of falling demand, rising unemployment and looming deflation. Had governments not undertaken strong measures during the second half of 2008 to repair dysfunctional financial markets, most forms of global commerce, which were already under severe stress, would have likely ground to a halt.

Public sector debt imbalances to grow more acute
As credit markets seized, households and corporations began reducing balance sheet leverage rapidly. This, in turn, has accelerated the contraction in overall economic activity in the countries that were hit hardest by the financial crisis. But as one set of imbalances begins to fade, another is set to grow, this time on the balance sheets of governments.

With central banks having cut short-term interest rates to historic lows, attention now shifts to government spending plans and nontraditional monetary policy tools. The spending measures mostly target boosting short-term demand, not returning the economy to a sustainable long-term growth path. At best, these fiscal measures will succeed in dampening the impact of the recession while allowing the private-sector imbalances in the economy to adjust. Indeed, our analysis suggests that the initial positive effects of the spending measures on growth are likely to be reversed in subsequent years.

While the effect of fiscal stimulus on the economy is highly uncertain, and a subject of intense academic debate, the consequences of big spending packages on government deficits and debt are clear. The large fiscal packages, the cost of bank bailouts, and the generally diminished tax revenues have increased public-sector debt faster than at any time since World War II.

At the same time, central bank purchases of public- and private-sector debt have swelled their balance sheets, and hence the money supply. In our view, the question is not whether more central banks will undertake so-called “quantitative easing” measures – increasing the money supply by debt purchases (and the printing press) – but how they will exit this path later on.

Lower trend growth, risk of higher inflation
The ongoing aging of the population coupled with both broad-based deleveraging and increased regulation are very likely to significantly dampen future growth rates in developed countries. Consequently, governments face ever-increasing deficits and subdued growth with few effective options at their disposal. Debt-to-GDP ratios will likely rise unless there are cuts in discretionary and entitlement spending or taxes are increased. And in countries most exposed to the financial crisis, policymakers may prefer higher inflation as an antidote to ever-increasing debt.

For many, the inflation of the 1970s is still fresh and it is often regarded as something bad. Yet inflation would advance the deleveraging process. It profoundly affects wealth redistribution by reducing the real value of outstanding debt. The main problem for policymakers once the financial crisis has passed will be to ensure that the massive liquidity injections from governments and central banks do not lead to a surge in inflation. We think recent history has shown that the focus on consumer price stability has its practical limits. It can neither prevent “irrational exuberance,” as the Tech, real estate and credit bubbles have shown, nor avoid the risk of deflation when the exuberance of market participants turns to panic.

Nominal government bonds expensive
Given the cyclically depressed level of bond yields, we find that nominal government bonds offer little value at present. The only supportive scenario for nominal government bonds is one of intensifying deflation risk, which, while it cannot be flatly excluded, is nevertheless unlikely, in our view. On a standalone basis, we find a more compelling risk-return tradeoff in other sectors of the bond market, such as money market instruments, inflation-linked bonds and corporate bonds.

Earnings growth to return to a more sustainable path
The crisis has had a profound effect on the drivers of asset returns. In our view, a sharp earnings recovery is unlikely, and trend earnings are likely to be structurally weaker. Given the diversity of sectors and companies in overall equity market indexes, the risk to the sustainable earnings trend is much less pronounced than for individual sectors.
Summary

Overall, we think a trend growth rate of real earnings of about 2.5% for the US is a reasonable assumption. Although this is significantly lower than the earnings growth rate during the two decades preceding the financial crisis, it is broadly in line with the postwar experience.

**Lower trend earnings in the financial sector**
The financial crisis faces more regulation and tighter supervision. However, too tight a grip on the industry might undercut efforts to unclog the financial system and encourage lending. Overall, we expect that after the crisis passes, the financial sector in developed economies will be more heavily regulated and will face more limited growth opportunities than in the past. After outpacing other industries since the 1980s, we expect lower trend earnings growth in the financial sector as regulation curtails activities that offer higher margins and growth, whether because of market realities, loss of risk appetite or because of regulatory constraints.

**Equities appear cheap**
Stocks have tended to deliver the strongest returns after periods of extreme economic stress and financial market upheaval, which, not surprisingly, were times when stocks were at their least expensive levels. Despite the weak outlook for growth in trend earnings, equities offer significant long-term scope for gain in a scenario where the economic environment stabilizes, as we expect.

**US dollar at risk**
We believe the US dollar remains at risk of further depreciation despite its neutral valuation. The financial crisis had its epicenter in the US, and the fiscal and monetary policy reactions there have been much more aggressive, and much bigger, than in the Eurozone, for example. As soon as the US economic situation starts to stabilize, this liquidity overhang poses a major risk to the USD. Moreover, the supranational architecture of the European Central Bank could help to ensure stronger inflation-fighting credentials compared to national central banks that would face pressure from rapidly rising government deficits and debt. This would further support the euro relative to the US dollar if inflation expectations were to begin to diverge between the two regions, as we think is increasingly likely.

**Investing in trying times**
As individuals reassess their risk appetites in the aftermath of the financial crisis, we continue to stress the benefits of diversification at all risk levels. Knowing where the “real” risks to your portfolio lie, especially for those assets traditionally perceived as safe, is more important than ever.

Although equities have fallen sharply since their peak and have posted negative real returns during the past decade, we recommend taking on equity exposure in combination with bond investments. This applies even for conservative investors. The traditional mix of nominal bonds and equities has appeal, especially in times when extreme outcomes are probable. Nominal bonds provide shelter against deflation. Equities offer potentially strong returns in the event that the economy stabilizes. We think even fairly defensive investors can boost risk-adjusted returns through corporate bond exposure. Investors with a sufficiently long time horizon and the ability to withstand further market volatility should consider adding more significant exposure to equities, given that deflation is an extreme scenario and not our base case.

In our view, inflation-linked bonds are the preferred long-term safe asset, and we favor them even over cash. Investors concerned about soaring inflation should consider investing in inflation-linked bonds, which offer a safe long-term alternative and a fixed real return. Gold might also play a role in a mixed portfolio context, especially if major geopolitical risks were to increase. For pure protection against inflation, however, we prefer inflation-linked bonds, as gold prices have already been bid up due to heightened risk aversion.
Chapter 1

Reversals of fortune
Reversals of fortune

Measured in lost wealth, the financial crisis that erupted in 2007 and intensified throughout 2008 has already achieved historic proportions. We are witnessing a structural break – a moment that marks a before and an after. And as in past crises, we expect government’s role to grow in our economic future.

The end of an era

The cycles of financial markets are easy enough to characterize, but doggedly difficult to time. After decades of burgeoning free-market internationalism, collapsing asset values are swinging the ideological pendulum back toward the state. Bubbles and their aftermath have always been with us. Ignoring the economic cataclysms of the ancient world, in the East and in the West, we need only recall the historically closer episodes of Tulip mania in 17th century Holland, England’s South Sea frenzy a century later, Railway mania a hundred years after that and the Great Depression of the 1930s.

The bursting of the real estate and credit bubbles in 2007 marked more than the end of an era of sustained economic growth and asset price appreciation – although it carries that distinction without doubt. After all, by March 2009, the world’s advanced economies were in deep recession and most major equity indexes had shed more than 40% of their peak value (see Fig. 1.1). But this collapse did more than puncture a bubble. It challenged a model of value creation that had prevailed for a generation. Financial truths that had seemed chiseled in stone appeared to crumble like sandcastles as the tides of fortune turned.

This epochal event raises many questions:

- Why did so few people forecast what was about to happen?
- If a few people did indeed see it coming, why did they not sound an alarm?
- And if they did make noise, why did no one listen?
- And finally, what are the lessons to be learned so that events like these will not be repeated?

The real estate bubble had become an important policy issue well before the bubble burst (see Fig. 1.2). In its annual report from 2004, the Bank for International Settlements, for example, wrote:

“Policies to strengthen the financial system, and to encourage more prudent lending behavior in upturns, might help to mitigate the damage in downturns and reduce the need to resort to aggressive policy easing in the future. … recognizing the increasing interdependencies in the modern, liberalized world between financial behavior and macroeconomic outturns, it is crucial that the supervisory and monetary authorities work together ever more closely.”

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**Fig. 1.1: Reversals of fortune**

Annual percent change

- Real GDP growth, advanced economies (lhs)
- Real total return, S&P 500 index (rhs)

Note: Real GDP growth projection for 2009 based on the IMF’s World Economic Outlook update from January 2009. Source: Bureau of Labor Statistics, IME, Standard and Poor’s, UBS WMR

**Fig. 1.2: House price bubble inflated for years**

Land and house price index (1980 = 100)

- Japan
- Switzerland
- UK
- US

Source: Freddie Mac, JREI, Nationwide Building Society, Wüest&Partner, UBS WMR
Others sounded warnings, too, but these were easy enough to ignore because growth, inflation, employment, earnings and productivity were all working so well. But some observers persisted in their concerns. Nouriel Roubini, professor of economics at New York University’s Stern School of Business and a senior economist for the Council of Economic Advisers during the Clinton administration, wrote in 2005 that, “…the US economy is already imbalanced with low private savings, large budget deficits, large current account deficits, a real estate bubble and a ‘shopped-out’ consumer.”

Alan Greenspan, chairman of the Board of Governors of the Federal Reserve from 1987 to 2006, was one of the leading advocates of the view that the US had entered a new era of prosperity thanks to greatly improved productivity. In a widely acclaimed speech back in 2002, he said that the increasing use of computers and other high-tech equipment was supporting the gain in productivity, much like the introduction of electricity and automobiles triggered a sharp rise in productivity a hundred years earlier. This seemed a good explanation for why the economy was so strong. However, imbalances were growing, too. The US current account deficit was widening steadily as US household saving rates fell dramatically, and America’s dependency on China to finance these gaps was increasing.

When free markets reigned
Financial crises often spur policymakers to rethink the merits of the prevailing economic wisdom. We are witnessing such a transformation unfold today, as economists and politicians search for new or rediscovered recipes to stimulate the economy and avert an even wider contagion.

The last major revision of government and industrial policy emerged in the 1970s, when stagflation triggered a change in mindset. In the three decades following World War II, the industrialized world enjoyed an extraordinary phase of economic growth characterized by accelerating productivity and incomes. This came to a screeching halt after the first oil crisis, in 1973. Annual inflation rates soared to over 12% in the US in the early 1970s and peaked at 14.5% in 1980 (see Fig. 1.3). In Western Europe the picture looked more or less the same. Unemployment rates moved higher and budget deficits rose amid stagnating overall economic activity.

In the search for solutions to these growing problems, Milton Friedman and Robert Lucas from the University of Chicago, and Karl Brunner from the Universities of Rochester and Bern, Switzerland, challenged the then-dominant theory of John Maynard Keynes, which bestowed an important role on the public sector to stimulate the economy. Keynes’ General Theory of Employment, Interest and Money (1936) gained popularity during the Great Depression, when flagging demand sent the unemployment rate soaring to 25%. Keynes argued that governments should create jobs to stimulate demand, reduce uncertainty and stabilize the economy. However, reducing public sector spending proved difficult when the economy got back on its feet again. In the 1970s, government spending and deficits grew steadily, and together with the decade’s twin oil crises, contributed to the extended stagflation episode.
The new monetarist school of thought focused its efforts on fighting inflation by cutting the supply of money, although at a cost of a deep recession in the early 1980s. Attempts to bring inflation under control bore early fruit, which boosted the influence of the Chicago School. Fiscal policy and big spending were out of fashion, and monetary policy became the principal tool to smooth the business cycle, but never at the cost of letting inflation run out of control. The ideology of the next quarter-century reflected the belief that market liberalization, smaller government and lower rates of inflation were the principal ingredients of improved productivity, greater entrepreneurship, solid economic growth and wealth creation.

British Prime Minister Margaret Thatcher and US President Ronald Reagan were the champions of this new approach, despite strong opposition from labor unions and other political opponents. During his first inaugural address, in 1981, Reagan declared, “In this present crisis, government is not the solution to our problem; government is the problem.” Early success at restoring vibrancy to their economies silenced many critics and paved the way for a prolonged period of market liberalization, privatization, tax cuts, globalization, and disinflation during the remainder of the twentieth century.

- **Market liberalization.** US President Jimmy Carter marked what is now seen as a watershed in deregulation when he signed the Airline Deregulation Act of 1978 and, with the stroke of a pen, removed government control over many aspects of commercial aviation. Reagan took another large step when he dismantled the federal air traffic controllers union in 1981. Together with Thatcher, they initiated a steady stream of liberalization that eventually included financial markets and international capital flows (see Fig. 1.4).

- **Privatization.** In Britain, state-owned companies accounted for 12% of GDP in 1979 but only around 2% by 1997. Privatization in Continental Europe had also become more widely accepted by the mid-1990s (see Fig. 1.5). Germany, Spain and even the Socialist-governed France privatized large sectors of the economy, like telecommunications, airlines, and broadcasting. Increasing productivity, soaring financial markets and high rates of economic growth were the proof that neo-liberalism functioned. Megginson et al. summed up the benefits of this policy in a paper in 2001:

> “The political and economic policy of privatization, broadly defined as the deliberate sale by a government of state-owned enterprises or assets to private economic agents, is now in use worldwide. Since its introduction by Britain’s Thatcher government in the early 1980s to a then-skeptical public (that included many economists), privatization now appears to be accepted as a legitimate – often a core – tool of statecraft by governments of more than 100 countries. Privatization is one of the most important elements of the continuing global phenomenon of the increasing use of markets to allocate resources.”

In the US, privatization had less of an impact because fewer sectors were state-owned to begin with. However, Reagan’s ambitions to scale back government were on display when he implemented a sweeping round of supply-side tax cuts in 1981. Reagan’s initial approach was a simple one: the best way to shrink government was to starve it of funding.

1 Concerning trade, there are no fundamental differences between the Keynesians and the monetarists. The theory of comparative advantage, developed by David Ricardo in 1810, is still widely accepted. In a simple two-country, two-commodity framework, Ricardo demonstrated that trade is beneficial for all countries even if one country produces both items more cheaply. Politicians are prone to restrict free trade during hard economic times because their increasingly unemployed constituents see international competition as destroying domestic jobs. In fact, according to Ricardo’s theory, the opposite is true: protectionism reduces productivity and efficiency.
Globalization. At almost the same time, the engine of globalization started to hum (see Fig. 1.6).1 Although the US failed to ratify a charter to form an international trade organization in 1950, the World Trade Organization (WTO) was finally created in 1995, concluding the Uruguay Round of trade negotiations. The formation of the WTO was vital to spur the expansion of the global flow of merchandise imports and exports (see Fig. 1.7). Another key factor was the technological revolution and the creation of the Internet, which drastically reduced the cost of communication and the exchange of information. The third spur to globalization was the collapse of the Soviet Union and the economic opening of China, which simultaneously integrated hundreds of millions of productive workers, consumers and investors into the free-market system.

Disinflation. Each of these three forces — market liberalization, privatization and globalization — worked in conjunction with monetary policy measures to bring about a long period of steadily declining inflation in the world economy (see Fig. 1.3). As we mentioned above, central bankers took the first step in the early 1980s by raising interest rates to lower money supply growth, which effectively lowered inflation expectations. But the spread of globalization continued to keep price pressures at bay through lower-cost manufactured goods from emerging economies with large and highly productive labor forces.

The end of the great moderation
The twenty-five years leading up to 2007 were notable for a steady decline in the volatility of economic growth and inflation, as well as a more muted business cycle (see Fig. 1.8). Because of its exceptional nature, this period was widely dubbed the “great moderation,” a term used as the title of a speech by then-Fed governor, now chairman, Ben Bernanke in 2004. Whether it was macroeconomic policies, the four trends we just mentioned, just plain luck or some combination of all these elements is hotly debated by economists.2 In any case, the great moderation produced one of history’s most sustained bull markets in financial assets.

This happy set of circumstances persisted right up to 2007, when the housing and credit crises started.

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1 See Galí and Gambetti (2009).

2 See Gali and Gambetti (2009).
The financial crisis: an array of factors

There is no single catalyst that triggered the present financial crisis (see box on page 16). Rather, it took a wide array of institutions and innovations to bring about the demise of the financial system as we knew it over the past quarter century. Considered in isolation, each individual factor seemed capable of having only a marginal impact on markets, but in combination they have had a near lethal effect on the global financial system. We examine some of the principal causes of the financial crisis with an eye to understanding how this will impact the structural make-up of financial markets in future.

Subprime: an increase in risky loans

Before the start of this decade, the US subprime mortgage business was very much a low-profile niche market. Indeed, Baily et al. (2008) describes the business as “virtually non-existent.” Within a short time it had ballooned such that, when it burst, it threatened the world’s economy. How did this happen?

In 2001, USD 2.2 trillion in new mortgages were issued in the US. Some 90% of these were more traditional standard prime loans, while just 10% consisted of both subprime and Alt-A, a category between prime and subprime. By 2006, these latter two categories had grown to 33% of the overall supply of mortgages issued that year (see Fig. 1.9). Adding home equity withdrawals, when owners borrow against the market value of their homes, brings the sum of non-prime US mortgages to 48% of new mortgage origination in 2006.

The ratio of the loan amount to the value of properties rose – sometimes to more than 100% – as the difficulty of obtaining such types of loans declined. Between 1999 and 2006, the average loan-to-value (LTV) for new loans rose from 79% to 86%. Over the same period, the share of full-documentation loans (those with stated and verified income and assets) as a proportion of all subprime fell. The logic was that, as house prices continued their inexorable rise, homeowners could roll over their old mortgages at a high LTV into lower LTV mortgages later, not by paying down the loan, but owing to the rising value of the home. By the same logic, US homeowners funded consumption by tapping the increased value of their homes: Greenspan and Kennedy (2007) estimate that net equity extraction from homes over 14 years to 2005 rose tenfold to nearly USD 750 billion. Similar patterns could be seen in residential housing in other developed markets.

The erosion of lending standards and the rapid expansion in non-prime loans was driven in large part by government policies, as elected officials sought to provide low-income households with access to financing for home purchases. Government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac were encouraged to facilitate this process. Home ownership is a broad, aspirational goal in the US, and is closely correlated with income (see Fig. 1.10). When the opportunity of home ownership presented itself, many pursued it eagerly.

However, personal aspirations, government’s good intentions and lax lending practices would not have constituted enough to inflate the subprime market to the staggering dimensions it eventually attained. That needed another agent, a process called securitization, to over-inflate the home mortgage bubble.

Securitization: debt for sale

Up until the 1980s, loans – whether mortgage or otherwise – were held on lenders’ balance sheets, and thus were limited by the “normal” constraints on those balance sheets. This visibility encouraged rigorous due diligence by lenders, as the default risk was their problem. This constituted a bottleneck for expanding credit markets and home ownership. But not for long. Financial innovation allowed for an expansion in credit creation through the process of loan “securitization.”

Securitization allowed lenders to sell their loans to others. This had two advantages, both for the lender and for the lending system as a whole. First, it removed the loans from
lenders’ balance sheets, which in turn allowed them to extend many more loans. Second, in exchange for the revenue stream from those loans, securitization spread the risk to market participants who were most prepared to take it. The immediate effect was to increase the supply of loans and – in theory, at least – increase market transparency and efficiency. But securitization also had a fundamental disadvantage when compared to the previous approach: the originators of the loans no longer bore the full risk, and, inevitably, their interest in assuring the quality of the loans they issued waned. Securitization encouraged lenders to lend, which in turn fanned the borrowing binge.

Individual loans were initially packaged together as mortgage-backed securities (MBSs) and sold on to investors. Freddie Mac produced the first MBS in 1983. With these instruments, the payment streams on the pools of mortgages were “passed through” to investors. Risk was split between the MBS purchaser, who was exposed to interest rate and prepayment risks, and the issuing government-sponsored enterprises (GSE), which guaranteed the MBS and thus retained the default risk on the underlying mortgages. Over time, the private sector entered the MBS issuance game, eventually constituting the majority of the new issue market. MBSs issued by private-sector financial institutions were generally not guaranteed and most were made up of non-conforming mortgages, and increasingly the Alt-A and subprime segments.

Over time, the securitization process became increasingly complex, as these “pass-through” securities were then repackaged into other types of instruments known as collateralized mortgage obligations (CMO). Within a CMO, the pass-through income streams that investors receive from private-sector MBS were also carved up into different classes or “tranches.” Rather than providing equal pro-rata disbursement of cash flows to all bond holders, the CMO allowed the cash flows to be segregated by targeting the returns of principal by tranche holder. All principal repayments were initially targeted to shorter-dated tranches, intermediate- and longer-term tranches had principal return deferred. This allowed for the creation of MBS with different effective maturity profiles from the existing pass-through securities (see Fig. 1.11).

**CDOs: more than the sum of their parts?**

The next link in the chain formed when MBS become subsumed within collateralized debt obligations (CDO). CDOs can resemble MBSs, except that CDOs contain bonds and other assets. They combine different tranches of MBSs together with other asset-backed securities; for instance, credit card, student, car or business loans. As with mortgage-backed securities, these were divided into different tranches: senior, mezzanine and equity. Over ten years to 2006, annual CDO issuance went from virtually nil to more than USD 500 billion (see Fig. 1.12). This in turn provided a huge source of funding for the subprime market, further stimulating demand. By combining apparently uncorrelated debt, the perceived risk profile of these CDOs was judged to be lower than their individual parts.

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**Fig. 1.11: Different risk and return for different investors**

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<tr>
<th>First loss</th>
<th>Lowest expected yield</th>
<th>Lower expected yield</th>
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<td>Pool of mortgage loans</td>
<td>Senior</td>
<td>Mezzanine</td>
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**Fig. 1.12: Securitization jumps to half a trillion in 2006**

Annual CDO issuance, in billions of USD

<table>
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<th>Year</th>
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<td>2000</td>
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<td>2008</td>
<td>900</td>
</tr>
</tbody>
</table>

Source: Securities Industry and Financial Markets Association
Crisis timeline: how it all unraveled

Sequence of events

1. **December 28, 2006**
   - Owns Mortgage Solutions, which described itself as a leading lender to homeowners with weak credit or none at all, closes on December and files for bankruptcy on December 28.

2. **February 7, 2007**
   - HSBC Holdings announces a bigger charge than expected for bad debt in its US subprime portfolio, likely to exceed USD 10.5 billion for 2006.

3. **February 27, 2007**
   - Freddie Mac announces it will no longer buy the riskiest subprime mortgages and mortgage-related securities.

4. **April 2, 2007**
   - The second-biggest subprime mortgage lender in the US, New Century Financial, files for Chapter 11 bankruptcy protection.

5. **July 31, 2007**
   - Bear Stearns two hedge funds investing in mortgage-backed securities file for Chapter 15 bankruptcy protection after collapsing in mid-July.

6. **August 2, 2007**
   - German bank KfW Deutscher has to be bailed out due to troubles from its exposure to US subprime loans.

7. **August 6, 2007**

8. **August 9, 2007**
   - The amount of ABCP outstanding falls, signaling a seizure of credit markets.

9. **August 17, 2007**
   - Countrywide, the biggest mortgage lender in the US, is forced to draw on its entire USD 11.5 billion line of credit, and its debt is downgraded to just a notch above junk.

10. **December 13, 2007**
    - Citigroup brings USD 49 billion in distressed assets onto its balance sheet.

11. **January 11, 2008**
    - Bank of America announces that it will purchase Countrywide in a transaction worth about USD 4 billion.

12. **March 21, 2008**
    - The Fed announces that it will provide term financing to facilitate JPMorgan Chase’s acquisition of Bear Stearns.

13. **July 15, 2008**
    - The SEC issues an emergency order temporarily prohibiting “naked” short selling in the securities of Fannie Mae, Freddie Mac, and Wall Street’s primary dealers.

14. **July 30, 2008**
    - The Housing and Economic Recovery Act is passed. It authorizes the Treasury to purchase GSE obligations and reforms regulatory supervision of the GSEs.

15. **September 7, 2008**
    - Fannie Mae and Freddie Mac enter US government conservatorship.

16. **September 15, 2008**
    - Bank of America announces its intent to purchase Merrill Lynch for USD 50 billion.

17. **September 17, 2008**
    - Lehman Brothers files for Chapter 11.

18. **September 21, 2008**
    - The SEC announces an emergency ban on the short selling of stocks of all companies in the financial sector.

19. **September 25, 2008**
    - The Office of Thrift Supervision closes Washington Mutual Bank; JPMorgan Chase acquires WaMu’s banking operations.

20. **September 29, 2008**
    - Bradford & Bingley becomes the second British bank to be nationalized.

21. **First week of October, 2008**
    - Iceland’s banks collapse; the IMF extends USD 2.1 billion loan a month later.

22. **October 8, 2008**
    - The UK launches its first bank bailout, making GBP 500 billion available.

23. **October 12, 2008**
    - The Fed approves the acquisition of Wachovia by Wells Fargo.

24. **October 14, 2008**
    - The US Treasury Department announces the Troubled Asset Relief Program (TARP) that will purchase capital in financial institutions, making USD 250 billion available.

25. **November 10, 2008**
    - The Fed and the US Treasury announce restructuring of the government’s financial support of AIG, with Treasury to purchase USD 40 billion of AIG preferred shares under the TARP.

26. **November 12, 2008**
    - The US Treasury decides not to use TARP funds to purchase illiquid mortgage-related assets from financial institutions.

27. **November 18, 2008**
    - Executives of Ford, General Motors, and Chrysler testify before Congress, requesting access to the TARP for federal loans.

28. **November 22, 2008**
    - The US Treasury, Fed and FDIC announce an agreement with Citigroup to provide a package of guarantees, liquidity access, and capital.

29. **November 25, 2008**
    - The Fed announces the creation of the Term Asset-Backed Securities Lending Facility (TALF), under which the Fed will lend up to USD 200 billion on a non-recourse basis to holders of AIG-rated asset-backed securities and recently originated consumer and small business loans.

30. **December 19, 2008**
    - The US Treasury Department authorizes loans of up to USD 13.4 billion for General Motors and USD 4.0 billion for Chrysler from the TARP.

31. **January 16, 2009**
    - The Treasury, Fed, and FDIC announce a package of guarantees, liquidity access and capital for Bank of America.

32. **January 28, 2009**
    - US House of Representatives passes a USD 819 billion stimulus package, which is later reduced to USD 787 billion during Congressional reconciliation.

33. **February 10, 2009**
    - US Treasury Secretary Timothy Geithner announces a Financial Stability Plan involving Treasury purchases of convertible preferred stock in eligible banks, the creation of a fund to acquire troubled loans and other assets from financial institutions, expansion of the Fed’s TALF, and initiatives to stem residential mortgage foreclosures and to support small business lending.

34. **February 18, 2009**
    - President Obama announces the Homeowner Affordability & Stability Plan, which permits the refinancing of conforming home mortgages owned or guaranteed by Fannie Mae or Freddie Mac that currently exceed 80% of the value of the underlying home.

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**Fig. 1.13: Timeline of the financial crisis**

MSCI world equity market index

Source: Bloomberg, Factso, MSCI, UBS-WM
Ratings agencies: financial alchemy
Growth in CDO issuance received a huge boost from the ratings agencies that were assumed to be accurately monitoring the default risk in the underlying pools of assets. With an assigned triple-A rating, investors and lenders facing low yields on credit instruments were more willing to ignore some of the underlying risks and implicitly accept the ratings agencies’ guidance.

This leap of logic (or faith) meant that the income stream of a CDO assigned a AAA credit quality by rating agencies could flow from junior-rated securities. The underestimation of risk turned out to have been partly because the ratings agencies’ default estimates only considered data from the early 1990s onwards, a period when defaults were historically low, and also because the estimates assumed a low probability of a nationwide downturn in the US housing market.

Transformed from MBSs to CDOs, subprime mortgage debt thus morphed into AAA-rated securities. But subprime debt retained the risks inherent in its name. These were merely hidden in their new guise as CDOs, but their risk was unchanged. And many of the MBSs and CDOs that were not granted the highest rating by the credit ratings found their way to triple-A status anyway through the provision of credit insurance. “Monoline” insurers, whose traditional mainstay had been offering default insurance on US municipal bonds, extended their business into insuring securitized assets using credit default swaps (CDSs) to remove the default risk.

SIV: off balance sheet risks
Banks and other financial institutions were limited in terms of how much of these securitized assets they could hold on their balance sheets. After all, they must meet required minimum capital requirements in the form of shareholder’s equity and retained earnings, which limits their profitability and the degree to which they can employ leverage. In an increasingly competitive business environment, financial institutions sought ways of circumventing the restrictions placed on their operations by regulators in order to increase the return on capital. This opened the door for the use of off-balance-sheet financing mechanisms.

In this case, the masterstroke involved shifting debt-based assets such as CDOs into off-balance-sheet entities that were called structured investment vehicles (SIV), thus technically separating these assets from the banks. This circumvented banks’ capital requirements, enabling a higher degree of gearing (debt) than regulations would allow for on-balance-sheet holdings. These assets were bought by issuing short-term debt in the form of asset-backed commercial paper (ABCP). This conduit served to expand the pool of funding for off balance debt, and encouraged banks to increase their leverage.

Short-term ABCP issuance – with a maturity between one and four days – climbed evermore steeply between early 2004 and their peak in 2007. In contrast, the issuance of paper with maturities of 21 days and more remained fairly flat over this period. This led to what has been termed a “maturity mismatch:” short-term financing of long-term liabilities. Baiy et al. (2008) estimate that by 2007, “investment banks were rolling over liabilities equal to one quarter of their balance sheets overnight.” This system worked as long as liquidity flowed.

3 See, in particular, the UBS research focus entitled, “Currencies: a delicate imbalance” (March 2008) and the UBS global outlook from January 2006. In the latter, we wrote: “US consumption, the only real engine driving global growth, could be on the verge of faltering. The income stream generated by the rise in the price of private residential property is likely to run dry in the near future. Savings activity has also plunged into negative territory, which means that consumption is partly being financed by debt. This not only applies to the average private US household; the whole of the United States is financing a portion of its current expenditure abroad via a sizeable current account deficit... Even Asia, the world’s most dynamic region, will be unable to decouple from the slowdown in the US economy despite the increase in intra-Asian trade.”

Fig. 1.14: Global central bank reserves skyrocket

Foreign exchange reserves held at central banks, in trillions of USD

<table>
<thead>
<tr>
<th>Year</th>
<th>Rest of the world</th>
<th>Japan</th>
<th>Taiwan</th>
<th>Korea</th>
<th>China</th>
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Source: Bloomberg, IMF

Fig. 1.15: Large global imbalances in trade and capital flows

Absolute sum of current account balances as a share of world GDP, in %

<table>
<thead>
<tr>
<th>Year</th>
<th>Rest of the world</th>
<th>Japan</th>
<th>Taiwan</th>
<th>Korea</th>
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Source: IMF World Economic Outlook October 2008
Governments: supercharging the Western consumer

Where did all this money come from? Over the past three years, we have been drawing attention to the dangers involved in the increasingly delicate imbalances in international trade and capital flows (see Fig. 1.14 & 1.15).3 Countries including China, Germany and Japan produced more than they consumed as their economies grew increasingly dependent on exports to heavy-spending countries such as the UK, Spain – and, of course, the US. The resultant excess savings among the prudent were exported to the spendthrifts to fund their consumption.

These capital flows helped, in part, to inflate huge asset price bubbles in the spending nations, which in turn were fuelled by debt (see Fig. 1.16). As the theory goes, the “global savings glut” lowered bond yields in the spending countries compared to where they might otherwise have been. Lower yields, reflected through lower borrowing costs, stimulated borrowing. They also lowered the discount rate, which raised the value of fixed assets such as homes, which then fueled even more borrowing, such as home equity release plans and the ever-more inventive mortgage products designed to tempt the would-be homeowner.

This spiral was further exacerbated by an extended period of loose monetary policy after the Tech bubble bust and the September 11 terrorist attacks. In fairness, this loose-money approach seemed a low-risk path at the time given the disinflationary effect of globalization. But in dodging the potential deflationary effects of the burst Tech bubble at the start of this decade, the Fed unwittingly stoked the housing frenzy and the credit explosion that fed it.

When the music stopped

In a world of rising asset prices, the credit spiral is not a problem. However, when asset prices stopped rising, the entire construct was threatened with collapse, triggered by rising delinquencies in the US subprime market (see Fig. 1.17).

The financial crisis was ultimately caused by a deterioration in fundamentals – house prices eventually succumbed to economic gravity in the wake of rising interest rates and high energy prices. The dominoes fell (see box on page 20). With debt delinquency rising, and mortgage defaults leading the pack, the value of financial instruments tied either directly or indirectly to leverage, such as CDOs, MBSs, and CDSs, became increasingly worrisome. The short-term financing that had sustained the SIVs stocked with CDOs and MBSs had dried up. Banks became reluctant to lend to counterparties because they did not know their default risk. Ultimately, credit, which had oiled the wheels of commerce, had evaporated. The conditions that, for a quarter of a century, had allowed both individuals and institutions to add leverage with impunity had shifted in a sudden and violent manner.

Pendulum swings toward the state

The bull market of the 1980s and 1990s was not immune to severe corrections and crises. Despite the great moderation in growth and inflation, large market gyrations seemed to occur with greater frequency. From Greenspan’s defining moment, the stock market crash of 1987, to the current credit crisis, the last twenty-five years have been marked by a series of extreme market events: the US savings and loan crisis, the real estate bubbles and subsequent busts in Europe and Japan in the early 1990s, the currency crisis in Europe in 1992, the Mexican crisis, the Asian crisis, the Russian crisis, the implosion of Long-Term Capital Management, and the bursting of the Tech bubble all come to mind.

So far, governments and their central banks have intervened on two fronts: stabilizing and in some cases nationalizing their crippled financial sectors, and using fiscal and monetary policy tools to counter the resulting recessions. In our view, it is reasonable to assume that they will extend their reach in future as they struggle to revive their wounded economies (see box on page 19).
There is a certain inescapable logic to the notion that the one who pays has the right to decide. Thus, re-regulation of the financial market and financial intermediaries is inevitable, in our view. In the UK and the US, the tough questioning of the most senior bankers presages a rough institutional environment for the industry.

There is also a large and growing consensus among the broader public and policymakers that central banks in general – and the Fed in particular – made tactical errors leading up to the financial crisis. By keeping interest rates too low for too long after the Tech bubble burst, the Fed may have fuelled the housing bubble and, therefore, shares at least some responsibility for the current crisis.

Moreover, the role of central banks as guarantors and supervisors of the financial system is also now in question. But the main problem that governments will have to tackle once the financial crisis is passed and the recession overcome is to control the potential damage from the flood of liquidity and a massive increase in public debt that will accompany the rescue packages. As one set of imbalances begins to fade, another one, this time on the balance sheets of governments, is set to grow. Just how governments will make their presence felt in financial markets – operationally and strategically, short-term and long – is the subject of the balance of our study.

The state versus the market

Debates over regulation and government involvement in financial markets often cite the dispute between the two economics giants of the twentieth century, John Maynard Keynes and Friedrich von Hayek. While Hayek championed the wisdom of market forces, Keynes saw the need for government intervention. In his *The General Theory of Employment, Interest and Money*, Keynes stressed the “vital importance of establishing certain central controls in matters which are now left in the main to individual initiative.” This view is enjoying a currency that it has not seen for 30 years. With markets in disarray and with so much wealth destroyed, the era of unfettered markets appears to be over.

Many voices today point to the failure of private markets as evidence of the need for greater government involvement. They argue that the crisis is in part due to what economists call the “asymmetric information” of buyers and sellers. In theory, in efficient markets all information is reflected in prices. But do buyer and seller have the same information levels, for instance, with a secondhand car? The next time you walk onto a car dealer’s lot, would you be satisfied with the dealer’s handshake only, or would you want to feel that the law backed you up in the event that the car you bought was not what you thought?

Applied to the current crisis, some argue that the subprime market collapsed because the buyers of subprime mortgages were badly informed about the underlying quality of the houses and the respective securitized loans. Credit ratings overstated the reliability of the income from these mortgages, so demand for these investments exceeded sustainable levels. This laid the foundation for the crisis. The breakdown in interbank lending points to the same problem, as individual banks started to doubt the credit quality and solvency of counterparties.

It can also be argued that state involvement is necessary if private activity has public effects, for example, if a private company causes environmental pollution. Regulatory activity can address this through taxes, fines or environmental regulation. Well-functioning banks normally have positive external effects: banks have traditionally been the hub of modern economic activity, which is based on paper money and credit. When banks fail, the negative external effects are huge and societies look to governments to repair the damage.

Government intervention in commerce may also have social aims, for example, to redistribute income or extend healthcare services or educational opportunities. When governments become shareholders, they have the power, for example, to influence bonuses and benefits towards a more socially equitable distribution than might result from free-market values.

Other voices argue that governments cannot have sufficient information to operate efficiently. People make their preferences felt through the market. To believe that government can do a better job satisfying people’s needs, say free-market advocates, one must believe that governments know what individuals want better than the individuals themselves. And the consequences of this belief system are what Hayek warned about in *The Road to Serfdom*. The title says it all. What is more, government officials are vulnerable to the lobbying of private interest groups, again giving rise to skewed outcomes.

The interdependencies between regulation and markets are complex. There are valuable insights in both viewpoints. Our intention here is to outline these positions rather than take sides. What is certain, however, is that those advocating increased regulation are now setting the agenda. And the concrete consequences of this sea change will profoundly influence the investment environment.
Lost wealth

Barely a week passes without news of another unprecedented loss in financial markets. Indeed, “unprecedented” became one of the most overused words of 2008. But just how much has been lost? And what do these cash values mean in practical terms?

There have been some quite stunning numbers tossed around in the media. In early 2009, respected individuals and institutions have estimated that the crisis has led to total wealth destruction of between 16% and 40% from the peaks in equity and real estate markets. And few are asserting that we have reached bottom yet. An IMF study of crises (Claessens et al., 2008) estimated that a credit crunch episode typically lasts two and a half years, with nearly a 20% decline in credit, while a housing bust tended to last four and a half years, with a 30% fall in real (inflation-adjusted) house prices.

Focusing on losses in equity and real estate markets to date, data is so thin and dispersed on the actual size and composition of global wealth that it is difficult to establish a measure with any real confidence. However, the UN (Davies et al., 2008) estimates that global wealth amounted to some USD 125 trillion in 2000. We calculate that about USD 53 trillion was accounted for by equities, with the remainder in property, both residential and commercial. The exact split is not known.

However, the global value of equities grew by about USD 9.5 trillion between the height of the Tech bubble in March 2000 and the market peak of October 2007, about 17.5%. Property markets vary enormously from country to country, and between commercial and residential. From the start of this decade to the market peak, both US and UK markets more than doubled, although these are extreme examples. Global listed real estate more than doubled in the three years to the market peak in February 2007. Then, too, we have surging commodity prices over the same period. So, conservatively, we think we can pin a value of USD 150 trillion on global wealth by 2007. With this established, we can attempt to determine how much has evaporated since.

Equities

Over the course of the crisis, the capitalization of the US market slid from USD 19.1 trillion at its October 2007 peak to USD 9.2 trillion in late February 2009; a nearly USD 10 trillion destruction. The market cap of the Tokyo Stock Exchange fell from JPY 578 trillion at its June 2007 high point to JPY 244 trillion in February 2009, or down 58%. A similar Bloomberg series for world market capitalization went from USD 63 trillion to USD 28 trillion – a loss of USD 35 trillion, or a 56% fall (see Fig. 1.18).
Real estate

US residential property has been at the center of the storm and its losses have been great. As a percentage of GDP, the value embedded in housing hovered between 100% and 120% of household wealth between 1985 and 1999. By 2006 it had leapt to more than 170%, falling back to 130% by 2008. Thus, net wealth increased by about USD 1.5 trillion, then lost that and a further USD 2 trillion and more. So, from its peak to the end of 2008, household wealth in the US had fallen some USD 3.5 trillion. And in the other hardest hit residential market, the UK, we estimate that the value of its owner-occupied housing fell GBP 641 billion from its market peak in August 2007 to January 2009, or USD 923 billion.

Given the average duration of housing busts and the broader economic context, it is reasonable to assume that this downward trend in house prices will continue throughout this year. But we would also emphasize: for those not aiming to sell or withdraw equity on their home – instead, simply to live in it – the price development is irrelevant. The notional monetary value of a house only has practical meaning when one sells it.

Commercial listed real estate, too, has seen drastic falls. The two years between February 2007 and February 2009 saw the GPR 250 PSI Global index plummet by a massive 63.4%, wiping out a further USD 774 billion.

Adding up the figures, we get a minimum total of just over USD 40 trillion of monetary value that has disappeared since the height of property and equity markets. Thus far, then, we have seen a minimum decline in the monetary value of global wealth of 30%.

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2 Space limitations force us to oversimplify. The important thing to note with declining housing values is not the headline figure. That your house has a lower price today than it did a month ago is not in itself significant; but the fact that rising residential values had boosted consumption is. Meanwhile, tighter lending standards and greater economic uncertainty also constrain demand. We examine past housing crises and their implications for the current one in an Education Note entitled, “Crawling from the rubble,” from 26 September 2008, and in an Investment Theme “Home is where the heartache is,” from 11 February 2009.
The rise of even bigger government
The rise of even bigger government

Governments are unveiling mammoth fiscal stimulus packages and, at the same time, preparing to impose far sharper regulatory oversight upon the financial industry. Even during the era of small government, the state never really shrunk, which suggests many of these changes are here to stay.

The new financial handbook

The policy response to the financial crisis began modestly, with a few half-point interest rate cuts in the US in September 2007 (see Fig. 2.1). This was nothing new for the Federal Reserve, which had launched its 2001 rate-cutting campaign with a succession of 50 basis point rate reductions amid the implosion of the Tech bubble. In August 2007, when the first evidence of a wider subprime crisis began to emerge, the Fed held two inter-meeting conference calls to discuss developments, but opted to leave its monetary policy unchanged. Within the next year, however, the US central bank would slash its fed funds rate by a total of 325 basis points, eventually trimming the target rate nearly to zero.

Just as “zero” was acquiring almost an iconic status in global monetary policy, many more zeros were being added to the cost of bank bailouts and fiscal stimulus packages. The sums under discussion were incomprehensible, even surreal for many observers as trillions replaced billions. But this numerical escalation advanced steadily: from the USD 152 billion Housing and Economic Recovery Act in the summer of 2008, to the USD 700 billion committed to the Troubled Asset Relief Program (TARP), and the nearly USD 800 billion economic stimulus package approved in February 2009. Costs directly or indirectly related to the financial crisis soon carried a dozen zeros.

In January 2009, the International Monetary Fund estimated that potential write-downs on US-originated credit assets could exceed USD 2.2 trillion. No surprise then that the Federal Reserve’s balance sheet more than doubled to USD 2 trillion during the final four months of 2008 (see Fig. 2.2). And estimates of the US federal deficit for fiscal year 2009 alone ballooned from roughly USD 215 billion in August 2007 to nearly USD 1.4 trillion by February 2009 (see Fig. 2.3). According to UBS estimates when this report went to press, governments worldwide had already pledged 3.1% of global GDP, or USD 2.4 trillion, to get the economy back on its feet.

Not only have mountains of money been set in motion by the financial crisis, the entire deeply shaken global financial edifice – banks, markets and regulators – stands at the precipice of an extensive overhaul. In one epochal swoop, financial institutions and markets are about to be remade to meet shifting economic realities. We think the changes will be less an about-face, and more a moderation of extreme positions, especially the dogmatic notion that free markets always represent the optimal solution to both economic and financial market problems. But we have no doubt that governments are increasing their role in the economic world. In the balance of this chapter, we examine some of the ideological shifts underway, consider their real-world implications – especially for banks –
The rise of even bigger government

Fiscal and monetary policy measures are crucial to combat waning demand, rising unemployment and the looming threat of deflation.

and argue that the enlarged role of government in economic affairs is unlikely to quickly fade even after the current crisis passes.

Fiscal policy: money with a mission

At its November 2008 summit in Washington, DC, leaders of the Group of 20 pledged to “use fiscal measures to stimulate domestic demand to rapid effect, as appropriate, while maintaining a policy framework conducive to fiscal sustainability.” Since then, many governments have unveiled fiscal stimulus in the form of economic recovery packages to offset the slowdown in domestic private demand and to boost household spending and business investment. The economic stimulus measures take many forms, including tax cuts, a tighter safety net for the unemployed and people earning low incomes, as well as spending on public infrastructure and services.

Despite these good intentions, the debate among economists about whether fiscal stimulus works to revive a faltering economy is very much alive (see box on page 27). Those who favor government spending point out that the economy could otherwise enter a vicious cycle of falling demand and higher unemployment. Critics of government rescue packages usually note that deficit spending can make matters worse in the long run and that the economy is going through a healthy and necessary adjustment to bring spending, investment and stock prices down to a level that reflects a new lower path of long-term economic growth.

This philosophical debate over the responsibility of government in the economy is critical in informing policymakers about their role during normal business cycle fluctuations. However, purging past excesses and imbalances built up over past decades make this downturn decidedly different and this debate a moot one. In our view, these spending measures represent crucial steps – in conjunction with monetary policy stimulus – to turn the tide of falling demand, rising unemployment and looming deflation. Had governments not taken strong measures during the second half of 2008 to repair the dislocations in financial markets, most forms of global commerce, which were already under severe stress, would have likely ground to a halt. With central banks having already cut short-term interest rates to historic lows, attention now shifts to fiscal policy to do the heavy lifting. Here, we provide a broad outline, as well as a sense of the extent, the timing and the potential effectiveness of the various fiscal stimulus packages.

Stimulus packages vary widely

The G20 countries have either adopted or are planning to adopt fiscal stimulus measures that would amount to around 0.5% of their collective GDP in 2008, rising to 1.5% in 2009, and falling slightly to 1.25% in 2010. As a share of global GDP, the announced stimulus measures roughly match the 2% minimum threshold that the International Monetary Fund (IMF) deemed necessary to tackle the crisis.

The US, China and Japan have announced USD 424 billion of stimulus measures during 2009, which account for the lion’s share of the total. The US contributes nearly 40% of the overall stimulus in 2009, while China and Japan account for 13% and 10% of the total, respectively. US fiscal stimulus in 2009 amounts to 1.9% of its 2008 GDP – somewhat higher in China at 2.1% and smaller in Japan at 1.4%. For the remaining G20 economies, the fiscal stimulus measures are more moderate, amounting to 1.0% of their overall 2008 GDP.

In 2010, the US share of the total announced fiscal stimulus increases to over 60%; China and Germany run a distant second and third, respectively. The 2010 fiscal stimulus in the US grows to around 2.9% of its 2008 GDP, whereas China plans to spend 2.3% and Germany 2.0%. Fiscal stimulus plans in other major economies are minimal. For example, new spending announced in Italy fails to exceed 0.5% of the country’s GDP. And in the UK, which is particularly hard hit by the current crisis, fiscal stimulus has so far played only a minor role. Therefore,
while almost every country has signed on to one form of fiscal stimulus package or another, the size varies substantially across countries.

**Composition of spending matters**

Besides considerable variation in size there is also variation in the composition of the stimulus packages. Among the G20 countries, but excluding the US, about one-third of the stimulus is accounted for by tax cuts and the remainder by spending measures. In the US, the share devoted to tax relief is somewhat higher (see Fig. 2.4). Some countries, including Brazil, Russia and the UK, have focused almost entirely on tax cuts. Others, including China and India, have mostly proposed spending measures.

In general, direct expenditure measures are likely to produce a stronger near-term effect on economic growth than revenue measures, such as tax cuts. Thus, three-quarters of the G20 countries have announced plans to increase spending on infrastructure, largely on transportation networks (Canada, China, France, Germany, Indonesia, Italy and the US, among others).

About half of the G20 countries have announced sizeable cuts in personal income taxes (including Canada, Germany, Indonesia, Italy, the UK and the US); while around one-third have announced reductions in indirect taxes. At the same time, about half of the G20 countries also have plans to cut corporate income taxes (Canada, France, Germany, Indonesia, Korea, Russia, Spain, and the US, among others).

In addition, many countries have announced plans to protect credit and cash-constrained or vulnerable social groups, through higher unemployment benefits (Canada, Russia, the UK and US), cash transfers (Canada, Korea, Japan), or support to children (Australia, Germany) or pensioners (Australia, Canada). A few G20 countries are also stepping up support for small- and medium-sized enterprises (Korea) and strategic or vulnerable sectors, such as construction (Canada), the automobile sector (Germany), and defense and agriculture (Russia). Finally, a few countries are using stimulus measures to address longer-term policy challenges, such as improving the quality of health and education (Australia, China, and Saudi Arabia) or introducing incentives for developing environmentally friendly technologies (Canada, China, Germany, the US).

**Aim for a quick fix**

At first glance, there appears to be a good deal of front-loading, meaning that most of the fiscal stimulus packages aim for a maximum impact in 2009. Only four of the G20 countries (China, Germany, Saudi Arabia and the US) plan to spend as much, or even more as a share of GDP in 2010 than in 2009. We should also note that some countries recognized the extent of the crisis early and implemented stimulus plans at some point in 2008. This list includes Australia, China, Japan, Korea, Saudi Arabia, South Africa, Spain, UK and the US.

However, a significant share of fiscal stimulus may become effective only in 2010. Reasons for delay in implementing the various programs are manifold, including the vagaries of national budget processes, diverging assessments of the duration of the recessions, or simply different stages of the election cycles. The danger here is that a significant share of fiscal measures become effective at the point in the business cycle when economic activity has already stabilized, leading to the crowding-out of viable private investment projects, the misallocation of resources and possibly inflation.

**Growth effects are uncertain**

According to IMF estimates, the combined fiscal stimulus currently planned is expected to lift G20 GDP growth in 2009 by around 0.5 to 1.25 percentage points. The effects on advanced and emerging economies would be broadly similar. According to the IMF’s assessment, the growth impact among the advanced economies is expected to be highest in Canada, Germany, Japan, Korea, and the US. Among the emerging economies, China, Russia, and South Africa are expected to receive the most significant boost to growth. In 2010, under current information regarding the size of fiscal packages, the additional growth effect would be minimal.

In general, we doubt that fiscal stimulus packages will have a lasting beneficial effect on economic activity. Thus, the efficacy of these packages will depend not only on the characteristics of the programs, but also on the conditions prevailing in the individual countries. Past experience suggests that fiscal expansion is more likely to be successful given the following conditions:

1. **Large underinvestment in infrastructure and education.** Countries like Italy, Greece and Portugal would have the most to gain from public investment programs. The same is true for Spain, where the government deliberately restrained public infrastructure investment during the private property boom. Of the major advanced
economies, the UK and the US would also seem to be in a position to benefit. However, under this criterion, emerging markets, such as China, would appear to be in the best position to spend their way out of the crisis.

- **Low propensity of households to save.** The overall impact of fiscal policy on aggregate demand crucially depends on how private-sector saving responds to changes in fiscal policy. In principle, the effect of increased government spending can either be offset or reinforced by changes in private-sector saving. The critical factor is the credibility of governments. If households and firms are confident that the public debt burden will remain manageable in future, they might be inclined to spend a relatively large share of the additional money they receive in the form of tax cuts. By contrast, if households lose confidence in governments and decide to increase their savings to pay for future tax increases or reduced benefits, the fiscal expansion becomes counterproductive. Developed countries with adequate social safety nets may not question the government’s credibility, whereas fiscal largess in emerging markets could end up bolstering already high levels of precautionary savings.

- **Large share of liquidity-constrained households and companies.** The balance sheets of households and companies play an important role in influencing the effectiveness of fiscal policy. Fiscal policy has a greater impact when the supply of credit is constrained because households and firms will be more likely to spend extra money derived from lower tax bills, public sector wages and transfer payments. In contrast, consumers with less balance sheet stress and open access to credit are more likely to save any extra cash. We would expect the share of credit-constrained households and companies to be largest in countries where house price bubbles imploded, such as in Spain, Ireland, the UK and the US.

---

**Does government spending boost economic growth?**

Economists have long debated the ability of fiscal policy to boost economic activity during times of crisis. On one side of the room are the Keynesians, strong advocates of deficit spending to boost aggregate demand and foster full employment to smooth the business cycle. Despite its widespread acceptance among policymakers eager to revive the economy from a downturn worse than any in recent memory, voices on the other side of the room doubt the long-run effectiveness of this approach.

After all, if people realize that their taxes will increase in the future to pay for debt-funded stimulus today, they might simply save what they “receive” today, so demand will remain stagnant. This is what Ricardian equivalence, an economic theory first proposed by David Ricardo in 1820 and expanded upon by Robert Barro in 1974, argues: that government spending is unlikely to boost aggregate demand. This is irrespective of whether it is financed with tax increases or government debt. According to the theory, consumers and businesses would be expected to curb their spending in the face of increased taxes or in anticipation of governments needing to raise taxes in the future to pay down the debt and accumulated interest. This would neatly offset any positive boost from the fiscal measures.

The theory of Ricardian equivalence presupposes three rather strict, even unrealistic, conditions that are often the subject of criticism. First, the assumption that perfect capital markets enable households and businesses to save or borrow in unlimited amounts at one fixed rate is highly unlikely in times of economic stress. Second, the path of government spending is not fixed or known, as is evident during the present crisis. Third, it assumes that people will choose not to heap huge financial burdens on their children or grandchildren, which, is open to debate.

Sweden’s experience serves as a reminder that fiscal policy can backfire and make a preexisting economic slowdown even worse. At the height of its banking crisis in the early 1990s, Sweden massively increased its budget deficit to offset a sharp rise in private savings. The surge in private savings was partly triggered by falling house prices, which eroded people’s overall wealth positions. But there is also evidence that concerns about the sustainability of the government’s expansionary fiscal policy stance played a role in driving private savings even higher. The lesson here is that fiscal expansion must remain credible, so that households are confident that the public debt will be reduced again, once economic conditions improve.

Empirically, the existence of Ricardian equivalence is hard to prove. There is, however, widespread agreement that expansionary fiscal policy does increase total aggregate demand during periods when there is sufficient slack in the economy – but even more so when it comes in the form of government spending rather than tax cuts. And this is especially true when the spending can increase the productive capacity of the economy, such as through energy efficiency projects or the replacement of failing infrastructure. But if this spending begins to destabilize public finances and limit private investment, then the Ricardian camp could ultimately have the final word.
Low degree of openness. Fiscal stimulus packages are likely to work best in relatively closed economies, like the US, where the propensity to satisfy rising demand with imported goods is low. In contrast to the widely held view that much of what Americans consume is produced outside the US, imports actually account for only about 13% of GDP. The Eurozone economies are of course all open to intra-Eurozone trade, which makes it more difficult to ensure that government spending remains within its borders.

Overall, we think that the impact of fiscal stimulus on economic growth will vary widely across the G20. The best we can expect is that fiscal policy will succeed in lessening the impact of the recession while also allowing the private-sector imbalances in the economy to adjust. The fiscal stimulus measures are being undertaken to boost consumption in the short-run, not as an initiative to return the economy to a sustainable long-term growth path. Indeed, estimates for the US fiscal stimulus measures indicate that the positive growth effects in the first two years may be partly reversed in subsequent years (see Fig. 2.5).

A new set of public-sector imbalances emerges. While the effect of fiscal stimulus measures on the economy is highly uncertain, the consequences for government deficits and debt are clear (see Fig. 2.6). Public-sector debt is now rising at the fastest pace since World War II due to the combination of large fiscal stimulus packages, the cost of bank bailouts and slowing tax revenues. We think government deficits in developed countries will rise to an average of around 7% of GDP in 2009 from less than 2% in 2007. Consequently, gross government debt-to-GDP ratios are likely to increase by an average of 10 percentage points or more by 2012 (see Fig. 2.7).

The complications that this creates for government finances are formidable. First, the risk of sovereign debt default on foreign-currency-denominated liabilities will likely increase. Countries that finance their debts in currencies other than their own may find themselves saddled with an unmanageable amount of private- and public-sector liabilities as the crisis unfolds. This is precisely what happened in Latin America during the late 1980s. We would therefore be most concerned with those countries that had both high public debt-to-GDP ratios, as well as significant amounts of debt denominated in foreign currencies.

Second, the flurry of government spending and revenue cuts could lead to a worldwide increase in sovereign debt issuance, with implications for interest rates, exchange rates and bond markets. In particular, if the US were to flood financial markets with Treasury bonds, there is a risk that household and corporate borrowers will face higher financing costs when they assume new debt (a phenomenon known as “crowding-out”). For the moment, this is not a problem because government debt issuance has replaced a large amount of private-sector borrowing. This crowding-out effect would become a cause for concern if private borrowing begins to compete with the government’s need to finance new debt. The consequences of

---

**Fig. 2.5: Big boost to US GDP comes in 2010 then fades**

<table>
<thead>
<tr>
<th>Year</th>
<th>Change from Trend (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>-0.5</td>
</tr>
<tr>
<td>2010</td>
<td>2.5</td>
</tr>
<tr>
<td>2011</td>
<td>2.0</td>
</tr>
<tr>
<td>2012</td>
<td>1.5</td>
</tr>
<tr>
<td>2013</td>
<td>1.0</td>
</tr>
<tr>
<td>2014</td>
<td>0.5</td>
</tr>
<tr>
<td>2015</td>
<td>0.0</td>
</tr>
<tr>
<td>2016</td>
<td>-0.5</td>
</tr>
<tr>
<td>2017</td>
<td>-1.0</td>
</tr>
<tr>
<td>2018</td>
<td>-1.5</td>
</tr>
<tr>
<td>2019</td>
<td>-2.0</td>
</tr>
</tbody>
</table>

Source: Bureau of Economic Analysis, Congressional Budget Office, UBS WMR

**Fig. 2.6: Wider deficits in US government finances**

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Fiscal Deficits due to Stimulus Package (in billions of USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>-50</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>50</td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
</tr>
<tr>
<td>2013</td>
<td>150</td>
</tr>
<tr>
<td>2014</td>
<td>200</td>
</tr>
<tr>
<td>2015</td>
<td>250</td>
</tr>
<tr>
<td>2016</td>
<td>300</td>
</tr>
<tr>
<td>2017</td>
<td>350</td>
</tr>
<tr>
<td>2018</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Congressional Budget Office
higher interest rates are also relevant for emerging-market governments looking to raise money on international capital markets.

Finally, rising deficits and debt levels may change investor perceptions of sovereign default risk for issuers that have long been perceived as “safe haven” destinations, such as the US and the UK. Low government debt-to-GDP ratios are no guarantee of future fiscal sustainability, as countries may face far larger financial claims than those reflected in official figures. The UK provides a clear illustration: its decision to take the liabilities of two partly nationalized banks onto the public accounts could push the debt-to-GDP ratio from just below 50% to somewhere in the region of 190% by 2012.¹

If debt burdens continue to rise, questions of fiscal sustainability would likely start to dominate. For countries like the US and the UK, the risk of outright default is still low despite rising debt-to-GDP ratios, as virtually all of their obligations are denominated in dollars and pounds, respectively. Rather than default, these nations can instead devalue their currencies and inflate their way out. If that were the case, interest rates would be poised to rise sharply. In an extreme scenario, this could lead to a crisis of confidence in US Treasuries and the US dollar, damaging the US dollar’s status as the world’s reserve currency.

**No magic bullet**

The efforts of governments worldwide to combat the effects of the financial crisis have often been bold, but they have not been wholly unexpected. Sharp increases in unemployment loom, and with them potential social unrest, so governments have been quick to act. However, government spending by itself will not cure all the ills of the economy. For one thing, without ongoing spending increases, the impact of fiscal stimulus measures on economic growth soon fades. Equally important is knowing when to turn off the spigot when the economy begins to mend, otherwise sustained deficits and debt buildup could threaten the recovery through higher interest rates and inflation expectations (see box on page 30). It is a tough balancing act. And as we will see in the next section, central bankers are walking a tightrope as well.

**Monetary policy: beware of excess liquidity**

As we noted at the start of this chapter, the Fed has lowered its policy rate effectively to zero, as have the Bank of Japan and the Swiss National Bank. In the UK and the Eurozone, policy rates are likely to fall to record lows during 2009, in our view (see Fig. 2.8). At or near zero, the theoretical downward limit for interest rates has been reached, since lenders generally prefer holding cash to a negative interest rate. Economists call this a liquidity trap, where interest rate policy can no longer stimulate demand.

When central banks are no longer able to lower short-term interest rates, they can turn to what is known as “quantitative easing.” This refers to policies or actions that increase the central bank’s balance sheet and hence increase the measure of the money supply known as the “monetary base.” This is the sum of a country’s total liquid financial assets, namely, currency in circulation and the reserve deposits of commercial banks held at the central bank. Quantitative easing usually entails purchases of government bonds or other securities, which influence interest rates and asset prices directly. However, the central bank and its government might also implement a fiscal expansion by printing money to finance the spending measures.

After it cut interest rates to zero in 1999, Japan embarked on a path of quantitative easing in order to combat deflation. However, Japan’s quantitative easing experiment was not very successful. Debate continues as to why its results were so modest, but one reason often cited was Japan’s

¹ Keep in mind, however, that this accounting exercise fails to consider the assets that were added to the government’s balance sheet.
Chapter 2

The financial crisis and its aftermath

Small government a myth

“We will meet these challenges, not through big government. The era of big government is over.” – Bill Clinton, State of the Union Address (1996).

Despite the outlook for an increased government presence in the daily lives of individuals, the notion that this constitutes a “return of big government” is misleading. Governments have never played a small role. As noted in Chapter 1, the 1980s saw a wave of privatization and deregulation, which could suggest that the state contracted. However, we find little evidence of government contracting, either in size or economic impact.

Fig. 2.9 shows the share of public employment in the US and the UK, as well as the GDP share of government consumption expenditures – a statistical measure including government expenditures on things like salaries, goods and services. The proportion of public employees has remained very stable over the past thirty years, growing at about the same pace as employment in the overall economy, despite the privatization of many industries and services. And government consumption expenditures have also been relatively stable, although more varied than public employment. Government never shrank and it now looks set to grow. It is important to note that public sector spending as a percentage of GDP spiked during World War II, and has moderated only somewhat since then. There is therefore a concern that the response to the current crisis could prompt a similar upward shift in public sector spending. Keep in mind that the current projected deficit for 2009 is the largest as a percentage of GDP since WWII and the largest non-defense deficit since the New Deal. (see Fig. 2.10).

An unenviable position

It is impossible to precisely forecast how the crisis and the fiscal and monetary measures undertaken to address it will unfold. However, we think that the developments suggest two main longer-term scenarios: either prolonged growth...
weakness, or instead, the “brakes fail” and rising inflation erodes the value of government debt. In effect, the alternatives are bad and worse.

In the first scenario, the central bank’s commitment to reverse monetary and quantitative easing is credible, as is the government’s commitment to raise taxes and cut public spending. In this case, a future inflation surge is preventable, but most likely at the expense of a prolonged period of very weak, if not recessionary, economic activity. This could take the form of the economy alternating between stagnation, recession and sluggish recovery for years to come. Of course, the rate of growth will depend in part upon just how successful prior policy measures were in helping to rebuild personal savings rates, tempering the deleveraging process within financial institutions and expanding the infrastructure base through targeted investment spending. The more successful the policy mix, the better the long-term growth prospects.

In the second scenario, the central bank may find itself incapable of reversing policy in time. This could happen if a government’s financial credibility were severely undercut. It could lead to rising sovereign default risk premiums, higher financing costs and difficulty in rolling over the debt. In theory, the central bank’s mandate would require it to fight inflation and leave the government to its fate. In practice, however, no central bank would allow its government to default. Thus, despite rising inflation, the central bank would have to continue buying the government’s debt that cannot be placed in the market. The central bank would be forced to monetize the government’s debt while high inflation would, over time, reduce the real value of the debt. As we said, bad and worse characterize two plausible outcomes right now.

Policymakers must be agile after this financial crisis passes. They run the risk of either creating slow or recessionary economic conditions if they tighten too quickly and cut spending too sharply, or fanning inflation if they wait too long to act. The evidence of how easy it is to get this wrong has been on display in Japan for the past decade (see box on page 32).

Financial industry regulation: a new framework in the making

In addition to spending and monetary policy measures, governments are also poised to increase their role in regulating a broad number of industries. Some of these moves had already been set in motion before the financial crisis erupted. For example, governments had been expanding their commitment to mitigate the effects of climate change and improve long-term energy security through new regulations on a number of business and individual activities (see box on page 37). Other steps came about as a direct result of the financial crisis. Slowing economic activity has spurred many instances of financial protectionism as governments dole out revenues to support ailing domestic companies (see box on page 82). The risk that we will see a jump in traditional forms of protection cannot be ruled out as economic misery intensifies. But here we address the industry sector where the largest regulatory changes are forthcoming: financials.

The world of financial services has no shortage of regulators or regulations. Banks, brokers, asset managers and insurance companies each have distinct rules to govern their actions, and different regulatory bodies to monitor and enforce those rules. Moreover, increasingly large swaths of the financial sector – including hedge funds and the market for CDSCs – appear to have fallen between the cracks. With the lines between financial institutions having blurred, global markets increasingly complex and interdependent and capital largely agnostic as to which regulated entity it flows through, the current patchwork regulatory system has proven inadequate to keep up with all the changes.

The financial crisis has compelled central banks and governments around the world to intervene heavily in the financial system, erecting far-reaching safety nets to limit further fallout (see box on page 36). Governments and the financial industry they regulate have become increasingly linked. These tighter ties and the severity of the crisis is likely to lead to a thorough rethinking of the role and scope of financial regulation and supervision. The issue of how to regulate and supervise the financial industry, and to what extent, will occupy central banks and governments for some time. Choosing between additional regulation and more effective supervision on the one hand and the reign of market forces on the other will be a tough balancing act. The financial crisis has exposed the need for more regulation and tighter supervision. However, too tight a grip on the industry might undercut efforts to unclog the financial system to encourage lending. Overall, we expect that after the crisis passes, the financial sector in developed economies will be more heavily regulated and will face more limited growth opportunities than in the past.

![Fig. 2.11: Central bank responses to housing crises](image-url)
Japan or not Japan

At the end of the 1980s, Japan experienced a double bubble as its stock market and housing market swelled. Those bubbles then burst almost simultaneously, leading to an acute credit crunch, a period of stagnation in GDP, and deflation in prices that came to be known as the “lost decade.” Many fear that the Japanese experience will be repeated in the US and elsewhere.

There are several reasons why this might not occur. The real estate bubble in Japan was far more pronounced than the one in the US (see Fig. 2.12). At the height of the Japanese bubble, the Imperial Palace and gardens in downtown Tokyo, roughly the size of Central Park in Manhattan, was estimated to be worth as much as all of California.

The stock market bubble burst after the Nikkei 225 share index more than tripled between 1985 and 1989, leading to a price-to-earnings multiple of 78 (see Fig. 2.13). While the US stock market was clearly overvalued at the beginning of 2000, with the S&P 500 trading at 30 times earnings and the Nasdaq at 175 times, valuations were not expensive at the most recent peak, in October 2007, at 18 times earnings for the S&P 500 and 33 for the Nasdaq.

After Japan’s real estate bubble burst, in the third quarter of 1990, it took eight years to bail out the country’s banks. By then, they were laden with non-performing loans and unwilling to lend, exacerbating the credit crunch. In the US and Europe, the first bailouts began about three years after the housing market peaked and only one year after it became apparent that the subprime mortgage overhang was seriously threatening financial intermediaries.

The steady appreciation of the Japanese yen after the financial crisis began in the 1990s, as well as during some fleeting periods of economic recovery that followed, also weighed on the country’s vital export sector. Japan’s failure to acknowledge the extent of the crisis is often cited today as having increased its severity. Monetary and fiscal stimulus measures are far more extensive in the US than was the case in Japan. Most prominently, despite its zero-interest-rate monetary policy, Japanese officials never dared to create as much money as the Fed has provided thus far to ensure liquidity in the banking system. During the 1990s, Japan’s seigniorage revenues rose only once, in 1998, when the banking sector was finally bailed out, to slightly above 1% of GDP. In the fourth quarter of 2008, the Fed’s seigniorage revenues amounted to more than 15% of GDP.

In addition, while the Japanese debt-to-GDP ratio grew from roughly 65% in 1990 to 135% by 2000, this was not solely the result of aggressive fiscal policy, especially at the beginning of the stagnation. Rather, the debt-to-GDP ratio’s increase was more the result of the stagnation itself. Fig. 2.14 shows the fiscal impulse for Japan in the 1990s and for the US between 2006 and 2009, according to the latest budget figures. The 2009 US budget alone exceeds Japan’s total response until 1998 when they finally tackled their banking problem.

Inflation and deflation rates reflect future expectations, and they can sometimes be self-fulfilling prophecies. In the 1990s, Japan never managed to convince markets that it was serious about combating deflation. Its policies stuttered – one year focusing on fiscal stimulus, the next year on fiscal discipline. Such an erratic course did little to manage expectations both at home and abroad. The Japanese experience explains why the US government, among others, is responding so vigorously and visibly to its financial crisis. They want the world to know that they are not asleep at the wheel. Reading between the lines...
of every statement, the message they are trying to convey is, “You can be confident in our actions.”

Some economists argue that the Japanese government should not be faulted for its inability to jump-start its economy after the housing bubble burst. They argue that Japan would have slid into a deep depression without the government’s intervention. However, most economists remain convinced that Japan’s stagnation was exacerbated by poor policy. Nevertheless, economists should also remain humble. While the Great Depression and Japan’s lost decade offer fairly clear lessons on what not to do, retrospectively, we have no clear prescription today on how to avoid years of dismal growth that may lie ahead. Japan’s experience might be able to tell us how to avoid getting lost, but it offers little guidance for getting out of the thicket of economic trials we face today.

Fig. 2.14: Much quicker fiscal response in the US
Change in the structural deficit as a share of GDP, in %

<table>
<thead>
<tr>
<th>Year</th>
<th>Japan</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>1.5%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>1990</td>
<td>0.5%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>1995</td>
<td>-0.5%</td>
<td>-4.0%</td>
</tr>
<tr>
<td>2000</td>
<td>-4.0%</td>
<td>-6.0%</td>
</tr>
<tr>
<td>2005</td>
<td>-2.5%</td>
<td>-4.5%</td>
</tr>
<tr>
<td>2010</td>
<td>-1.0%</td>
<td>-3.0%</td>
</tr>
</tbody>
</table>

Source: UBS WMR based on OECD

The call for increased regulation is understandable. Taxpayers around the world are being asked to foot the bill for losses that they never saw coming and never agreed to protect. Financial institutions and their regulators failed to recognize the underlying risks of securitization and credit derivatives. As is typical of bubbles, exuberance gave way to unrealistic assumptions, this time about house price appreciation. Regulators and ratings agencies were apparently equally beguiled. In financial institutions, harsh competition and the profit expectations of shareholders exacerbated the excesses, leading to a focus on volumes rather than on longer-term profitability and sound credit risk management. Since the financial system manifestly failed to supervise itself, it can only expect stringent supervision will be imposed upon it. The outlook for growth is likely to be muted even after the worst of the crisis passes, at least until the regulatory landscape becomes clearer.

**Shifting focus**
As a starting point for regulatory reform, The Group of 30, an international body of regulators led by former Fed Chairman Paul Volcker, produced a roadmap for reform of bank regulation and supervision (Group of Thirty, 2008). We believe that many of the key recommendations in their report, which we discuss below, will find their way into internationally accepted regulatory standards and those of individual countries.

We expect capital and liquidity requirements to become more stringent, with more resources devoted to enhancing the quality and effectiveness of bank supervision. While these changes may appear incremental at first glance, they amount to a reversal of direction for banking regulation and will significantly impact the operating environment. For years, regulation and supervision looked for ways to prudently relax standards, especially for more complex institutions. In the future, we expect to see more rigorous requirements and robust supervision, combined with an effort to improve the quality and expertise of bank supervisors. We would also expect to see efforts to streamline overlapping regulatory bodies and improve coordination among domestic and international regulators.

**Capital adequacy.** In our view, the Basel Accord’s Tier 1 capital-to-risk-weighted assets ratio, the traditional regulatory measure of capital adequacy, proved to be a poor predictor of bank failures during the crisis. Therefore, we expect regulators to increasingly focus on other aspects:

- Leverage-based measures will complement traditional capital adequacy tests.

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2 A similar dynamic was one cause of Switzerland’s prolonged stagnation in the 1990s.

3 The fiscal impulse is the change in the structural deficit as a percentage of GDP. Public deficits can be divided into a cyclical and a structural component. While the cyclical component reflects the fact that there are automatic stabilizers in the economy and is, by definition, zero throughout the business cycle, the structural deficit reflects government actions beyond the stabilizers. If the fiscal impulse increases, it means that the government is having a positive impact on the economy. If it decreases the government is acting restrictively.

4 Richard C. Koo (2008) is the most prominent defender of this point of view.

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5 In discussing these recommendations, it is useful to contrast regulation and supervision. Regulation sets rules and limits financial institutions’ activities, such as through capital or liquidity requirements, whereas supervision relates to government oversight to ensure that regulated institutions follow the rules and operate in a safe and sound manner.
Capital requirements will be increased for the banking system as a whole.

Regulated institutions will be expected to build capital levels through retained earnings and other methods so that there will be a larger capital cushion during periods of stress. They will also increase generic reserves during good times to protect against loan losses during hard times.

Large, systemically important banking institutions will come under greater scrutiny. Given the enormous burden that their rescue places on public finances, larger financial institutions are likely to face higher capital adequacy requirements than smaller institutions.

**Liquidity.** We expect regulators to develop enhanced liquidity standards with more emphasis on stringent stress-testing and better disclosure. In addition to ensuring sufficient quantity, there will also be a focus on the quality of liquidity provisions, as certain assets thought to be liquid were instead found to be significantly less liquid when the crisis intensified and financial markets faced acute stress.

**Business activities.** We believe regulators will apply more stringent rules on those activities that are deemed acceptable for financial institutions. Possible outcomes include: stricter capital requirements to protect against the risk of proprietary trading activities; a requirement for banks to take a more significant financial stake related to securitization transactions; and stricter review of board oversight and risk management practices. We also expect a number of financial instruments and investment vehicles to be more tightly regulated. For instance, we think it is likely that the over-the-counter derivatives market will be subject to tighter rules. In some areas, such as credit derivatives, we may even see a shift to a centralized exchange. Hedge funds and private equity funds are likely to face closer regulatory scrutiny. It is highly unlikely that all loopholes will be closed, and banks may find ways to circumvent new regulations. Ultimately, however, these measures are likely to reduce the scope of several activities and ultimately limit the profitability of regulated financial institutions in these areas.

**Ratings agencies.** The mission of a ratings agency is to provide market participants with an unbiased and professional opinion of the creditworthiness of a borrower and an estimate of the probability of default for its obligations. To achieve this, ratings agencies in many cases receive internal non-public information from borrowers, which puts them in a privileged position compared to other market participants. Publicly available credit ratings are an important element supporting the intention of governments and their regulators to enhance transparency and adequate information about risks of financial instruments. However, many are concerned over the apparent conflict embedded within the rating agency model, whereby, the entities that are subject to the rating are also the ones that pay fees to the agencies for those ratings. Given this crucial role and potential for conflicts of interest, we expect ratings agencies will also be subject to tighter regulatory oversight. Elements of ratings agency regulation could include a regulatory review and approval of the agencies’ rating methodologies for each sector and security type, as well as enhanced mandatory disclosure on the estimates and assumptions used to derive a credit rating.

**International coordination.** Each nation has been dealing with the banking crisis individually, for the most part, which poses risks to internationally active financial institutions seeking to operate on a level playing field. International coordination is needed to restore a more neutral competitive landscape among countries. We expect a deliberate effort among national supervisors to better coordinate their activities and share information, especially with regard to large, complex institutions that operate around the world. It seems clear that in some instances there were gaps in information among supervisors, with home country supervisors not fully aware of risks being borne by a bank in other jurisdictions. Better coordination and information-sharing should lessen the possibility of a bank utilizing one jurisdiction to pursue activities that might be more closely scrutinized at home.

**Lower profitability and earnings growth**

At this stage, making predictions about the longer-term future of the financial sector is difficult, given the uncertainties about the unfolding financial crisis, the remaining credit losses that the financial sector faces, and the ultimate degree and nature of government involvement. The analysis below describes a scenario for the financial sector that we consider likely after the crisis has passed and the new regulatory framework is in place. We assume that, regardless of whether parts of the financial sector are temporarily nationalized, developed economies will continue to rely on a largely privately run financial sector in the aftermath of the crisis. It will operate under a more stringent and burdensome regulatory framework than in recent years.

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![Fig. 2.15: Stricter financial regulation leads to lower profitability and growth](source:UBS WMR)
We expect lower growth and profitability for banks in such an environment (see Fig. 2.15). We identify the following driving forces behind this:

- First, stricter regulation will impose higher capital adequacy requirements and lower financial leverage.

- Second, regulation may limit the scope of activities that regulated financial institutions can engage in or, at the very least, reduce their incentives to operate in some businesses. This will likely lead financial institutions to focus on less risky businesses with lower returns, which would tend to reduce their return on assets.

- Third, the crisis-driven consolidation in the industry will allow surviving institutions to operate with less severe competition. Since this would contribute to increasing their return on assets, the overall effect on this profitability measure is unclear.

- Finally, the backlash over the failure of certain types of structured products and derivative instruments to perform as expected could hamper financial innovation. Keep in mind that despite some high-profile blowups and even some abuses, advances in financial innovation have helped improve the functioning of capital markets. Reluctance to embrace new products and risk management tools could impair the capital allocation process and negatively impact growth.

Overall, return on equity (ROE), the product of financial leverage and return on assets, will most likely be lower because of reduced leverage and more limited business activities. Furthermore, we expect lower long-term earnings growth than in the last two decades, as higher margin and growth (and higher risk) activities are curtailed, whether by market realities, loss of risk appetite or ultimately by new regulation and enhanced supervision. Recent trend profitability and growth for the financial sector gives a sense of the magnitude and direction of future adjustments. The return on equity of global financials during the last decade averaged 12% (see Fig. 2.16). If the financial bubble years of 2004–07 are ignored, the average is 11%. When ROEs eventually recover from their depressed crisis levels, we expect that they will hover below 11%.

In the US, the ROE of commercial banks averaged 11.7% since the early 1980s, with the 1992–2006 period yielding average ROEs of more than 13% (see Fig. 2.17). Like global financials, we believe that the ROE of US commercial banks will also decline on a structural basis, eventually reverting to a level that is more consistent with the period

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6 Long-term earning growth is frequently computed as the product of return on equity and the earnings retention ratio. We do not have reasons to believe that the retention ratio would be significantly altered under a future regulatory framework.
of lower profitability that preceded the boom years. This was also a time when the financial sector was more heavily regulated. Inflation-adjusted profit growth for the US financial sector averaged 5% per year since 1930, but rose to an average of 10% from 1983 to 2006. Excluding these most recent years results in a long-term average of just over 3%. We believe real financial sector profit growth in the 5%–6% range over the next decade in the US is realistic, representing a return to a phase of tighter financial sector regulation.

Before our scenario of future returns and profitability highlighted above can even be considered, the first signs that banks are returning to “normalized” profitability need to be visible. We think this is unlikely during 2009, as credit losses will remain a challenge for earnings at least until 2010. Moreover, most of the funds that governments have paid out to banks (particularly the large, systemically important ones in the US) will eventually have to be repaid, placing a drag on earnings given large annual dividend payments. Finally, if governments end up taking controlling interests in the form of common equity infusions, those nationalized banks could possibly be managed more for the public interest than for common equity holders. One unintended consequence of such a development could well be that nationalized institutions disintermediate the private banks, as depositors and creditors view the nationalized institutions as more stable and secure. Although not our base case scenario, if nationalization creates two groups of banks with fundamentally different business opportunities, then the scenario depicted above for the entire sector may hide very significant growth and profitability differences within the sector.

**Government’s lengthening shadow**

Governments are compelled to boost economic growth through fiscal spending, despite the dire effects this has for the health of public finances. Governments will also become much more involved in re-regulating and supervising the activities of the financial industry, not to mention areas that stand to contribute to climate change mitigation and energy independence. The ideological shift underway is not that free markets are entirely broken, but that state guidance may stand a better chance in certain circumstances of producing more favorable outcomes than that of free markets. Central banks are also becoming more influential actors amid an expansion of their balance sheets and unconventional steps to boost liquidity. What these trends mean for long-term economic growth and inflation are the subjects of the next chapter.

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**After the bailout: managing moral hazard**

The notion of moral hazard refers to situations in which individuals, suspecting that they will not bear the full consequences of poor decisions, become less likely to pursue more sensible ones. When investors believe that the government will protect them from losses (through explicit or de facto guarantees), they are less likely to exercise proper due diligence over their investment decisions.

During financial crises, the government faces a conundrum. If it fails to rescue troubled financial institutions, the spillover to the rest of the financial sector and the wider economy can be dramatic. If it decides to bail out particular investors, it may alleviate the severity of a crisis. However, it will also cement market expectations that bailouts will limit losses in the future as well. With large portions of the financial sector now on public life support, the existence of a government financial safety net is apparent.

The moral hazard created by the bailouts during the financial crisis will likely encourage governments to regulate the financial sector even more heavily. Policymakers and regulators are aware of the trade-offs inherent in bailouts and will wish to correct any misunderstandings and incentives that their actions during the crisis may have created. If there is an emerging risk that claimholders will not exert enough diligence when making investment decisions, having been bailed out once before, the government will need to act behind the scenes in the form of tougher regulation and supervision to limit risk.
Green recovery: jobs, energy security and climate change

Given the dire state of the global economy, concerns that governments will backtrack on their agenda to reduce greenhouse gas emissions have begun to surface. Indeed, pressure is likely to ease in the short term since the recession has likely done a far better job than any government policy at slowing the rise in carbon-dioxide emissions from fossil fuel consumption. Far from slowing momentum for environmental renewal, however, governments see this crisis as an opportunity to promote the development of clean and efficient energy.

Free markets are not well-suited to controlling greenhouse gas emissions since the external costs of a warming climate (for example, more arid farming conditions, increased water stress, coastal flooding) are not reflected in the market prices of the goods that cause the pollution, such as fossil fuels. Environmental regulations, whether in the form of mandatory standards, taxes, or market-based mechanisms such as emissions trading, establish a framework to encourage businesses and individuals to reduce their impact on the environment and make investments in sustainable growth. Before the financial crisis, governments were already on a path to ramp up regulation of greenhouse gases. The increased skepticism over free market outcomes, justified or not, could facilitate efforts to increase the pace of implementation and the stringency of new regulatory measures.

Green investments form a sizable share of the fiscal stimulus packages that have been approved since the financial crisis hit. Calculations of the various multiplier effects (that is, the increase in GDP per dollar of spending) of different stimulus options are debatable. But there is admittedly a convincing logic in spending money on sustainable and stimulus options are debatable. But there is admittedly a convincing logic in spending money on sustainable and efficient growth. Governments are looking to stimulate industries, as opposed to supporting imports from boosts that materialize, they are likely to appear in the renewable energy sector, as well as in cyclical industries, such as capital goods, electrical equipment, automotive supplies and construction. All of these have been particularly hard-hit by the economic downturn, and positive momentum in these sectors would be a welcome sign. And the investments will be made primarily in the government-targeted domestic industries, as opposed to supporting imports from boosts to private consumption.

However, the first gaps between rhetoric and reality are emerging. Only roughly USD 65 billion of the USD 787 billion US fiscal stimulus package is being appropriated to cleaner and more efficient energy use and transportation. There are basically four main areas: energy efficiency in buildings, cleaner and more efficient transportation, a smart electricity grid, and a higher share of renewable energy sources. This is certainly good news for energy efficiency, and also a positive for renewable energy. But is this green recovery much ado about nothing?

In our view, these measures, particularly the ones in the US, send an important signal: governments are ready to take more responsibility to tackle climate change and provide a regulatory environment that supports sustained long-term investments in improved energy efficiency and the development of renewable energy capacity. Although perhaps not as grand as initially forecast, these investments set the stage for further development and offer business opportunities upon which to build. Key to long-term success will be a global framework to sustain a price for carbon (whether through greenhouse gas emission trading or taxes on fossil fuels); more stringent standards on energy use with defined timetables; and a more stable and predictable policy environment.

While the benefits to energy security and climate change mitigation are relatively straightforward, the benefits to the labor market are not. The Center for American Progress, a Washington, DC think tank that influenced President Obama’s green recovery ideas, claims that USD 100 billion in spending over two years in green recovery could generate two million new jobs (see Fig. 2.18). Unfortunately, investments in infrastructure rarely yield quick results. While programs to weatherize and retrofit buildings can be implemented relatively quickly, it often takes more than a year for energy and transport infrastructure measures to feed through to the labor market. However, when the jobs materialize, they are likely to appear in the renewable energy sector, as well as in cyclical industries, such as capital goods, electrical equipment, automotive supplies and construction. All of these have been particularly hard-hit by the economic downturn, and positive momentum in these sectors would be a welcome sign. And the investments will be made primarily in the government-targeted domestic industries, as opposed to supporting imports from boosts to private consumption.

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7 Keep in mind that such an analysis is typically provided by those with a specific position of advocacy, and therefore may distort the economic analysis.
The long-term economic effects of the crisis
Chapter 3

The long-term economic effects of the crisis

After feasting on credit for years, banks, businesses and households are now on a strict diet. Thrift is good, but this abrupt deleveraging burdens growth just as millions of baby-boomers retire and government finances deteriorate. Inflation could ease the public debt burden, but it must be well orchestrated.

Structural debt growth ahead

At the height of the financial crisis, on October 1, 2008, the US National Debt Clock in New York’s Times Square suddenly stood still. The display simply ran out of digits as the national debt crossed the USD 10 trillion mark for the first time in history. When the clock was unveiled on February 20, 1989, it read USD 2.7 trillion. Over the next 20 years, the US national debt would grow at a rate of USD 1 billion per day, or nearly USD 42 million per hour.

According to the OECD’s Economic Outlook database, the US national debt grew 6.2% per year, with considerable volatility during this period. For example, it grew at 9.2% on average during presidency of George H. W. Bush (1989-1992), 2.5% during the Clinton years (1993-2000) and 8.6% during the administration of George W. Bush (2001-2008). Other countries experienced similar rates of increase in their national debt over the past 20 years (see Fig. 3.1).

While a 6.2% annual increase in the national debt might seem like a lot, it needs to be put into perspective. When considering the evolution of government debt and its sustainability, its growth in the absolute value of the debt and deficits, as well as how this relates to growth in nominal GDP also have to be considered. If the national debt grows faster than nominal GDP, then the debt-to-GDP ratio will increase. If debt grows at the same rate as nominal GDP, then the debt-to-GDP ratio remains unchanged.

During the last two decades, US inflation averaged 2.9% and the economy grew by 2.7%. So, at current prices, the US government’s debt increased by a full percentage point faster than the economy. Therefore, the US debt-to-GDP ratio rose from 50% in 1989 to 70% in 2008. The most profligate G7 country in terms of debt growth was neither Italy nor Japan – two countries famous for debt-to-GDP ratios significantly above 100% – but the UK. However, whereas Japan’s ratio increased from roughly 68% in 1989 to an astonishing 173% in 2008, the UK managed to keep its debt-to-GDP ratio contained at 59% in 2008. What explains this apparent anomaly? The difference in nominal growth rates: 5.5% on average for the UK and only 1.2% for Japan.

A debt-to-GDP ratio above 100% is generally problematic. It means that an economy would need the income from a full year’s GDP to reimburse the government’s debt.

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1 Throughout this chapter, we will use statistics from the OECD Economic Outlook database. These may differ from those of the Congressional Budget Office and other sources. However, the OECD database enables a consistent, cross-country comparison. Whenever another source is cited, we will indicate it in the text.
Japan, Belgium and Italy have been in this position for years now. The higher this ratio becomes, the higher the burden of the debt both in absolute terms and relative to the overall economy.

Developed countries usually issue sovereign debt in their own currencies, which means they can “monetize” the debt, if necessary. This means that they can print money to pay interest and the principal. Of course, if they print too much money, they also face the risk of a sharp currency depreciation. But defaulting is not a danger. By contrast, emerging market countries issue most of their debt in a major foreign currency like the US dollar or the euro. Therefore, large deficits can be destabilizing. If an emerging market country lacks the foreign currency to repay or service its debt, it faces the risk of defaulting and the likelihood of a steep depreciation of its currency.

Piling on
Government expenditures consist of outlays for current activities and the interest on any outstanding debt. The primary government balance is equal to the difference between its revenues, usually in the form of tax receipts, and its current expenditures interest payments. Adding interest payments yields the overall government balance. If the primary balance is in equilibrium (in other words, if revenues exactly cover current expenditures), then the overall deficit would only equal the interest payments the government has to pay on its debt obligations. In such a situation, governments would issue new debt just to pay for the accrued interest.

If a government balance sheet is in equilibrium, the growth rate of its new debt will correspond to the interest it has to pay on its debt. If the primary balance is in surplus, the government will be able to pay back some of its debt. If the primary balance is in deficit, however, the government has to continually issue new debt.

For a country’s debt-to-GDP ratio to stabilize:

- the government must at least get its revenues and expenditures, net of interest, into balance, and
- the interest rate on the debt must be below the growth rate of the economy.

Primary balances in the past
As noted, the primary balance of a government is equal to its total revenues minus its expenditures, but excludes the interest it has to pay on its debt. Looking at G7 countries over the past forty years, some interesting patterns emerge (see Fig. 3.2). Over the whole period, only Japan and Italy averaged a primary deficit. France’s primary balance was roughly at zero and the four other G7 members averaged a primary surplus. After having been quite profligate in the 1970s and 1980s, Italy became extremely frugal in the last 20 years. After running a sizable primary deficit in the 1980s, Italy managed to generate a primary surplus from the mid-1990s until 2006.

Compared with the periods immediately before and after it, the spectacular health of the US government budget
during the Clinton administration is dramatic. Moreover, an estimate of the US primary balance since 1800 shows the historical dimension of this period is only matched by the periods following the Civil War and the two world wars (see Fig. 3.3).

**A ticking bomb**

Will primary surpluses ever be seen again? It doesn’t look likely. In 2008, the mandatory spending portion of the US federal budget, which includes Social Security expenditures, represented 54% of the government’s overall outlays. According to Congressional Budget Office estimates, entitlement spending (that is, long-term healthcare, Social Security and other benefits that a person is entitled to receive) will exceed 60% of overall expenditures by 2019. With defense expenditures another 25% of the overall federal budget, there is scant room for additional discretionary spending in the future unless taxes and Social Security contributions are increased or Social Security benefits are cut.

The OECD’s historical series of “social security benefits” provides a loose proxy for the mandatory expenditures of G7 countries that may, in fact, even underestimate the actual funding shortfall. In most of the countries under review, the share of mandatory expenditures to overall outlays has increased in the past 40 years (see Fig. 3.4). Given the aging of the population, this trend will likely accelerate in the future. Fig. 3.5 shows the old-age dependency ratio, that is, the number of people age 65 or over relative to those people between the age of 15 and 64. All G7 countries are at a tipping point as the baby-boomer generation enters retirement. There is no question that such a demographic watershed will weigh heavily on social security expenditures in most developed countries.

Fig. 3.6 shows two possible paths of social security expenditures as a percentage of overall government expenditures. The first scenario leaves social security benefits per person constant. In the second, social security per-person benefits remain below 50% of the average per capita income of the 15-64 population by 2020. This reduces social security benefits per person in all countries but Japan and Canada.
The long-term economic effects of the crisis

The bottom line is that primary budget surpluses appear highly unlikely without cutting either discretionary or entitlement spending and increasing taxes. It is our view that some combination of both spending cuts and tax increases will be required in future.

Future economic growth

In addition to the primary balance, the nominal growth rate of the overall economy has a strong bearing on whether a country’s government debt-to-GDP ratio will increase or decrease. As mentioned above, strong nominal GDP growth in the UK mitigated the increase in the debt-to-GDP ratio during the past 20 years, even as the national debt grew at an annual rate of just over 8%. But to understand where nominal growth rates are headed, we must look at its constituents: growth in the real economy and inflation. We will first explore the outlook for real GDP growth and then address inflation in a subsequent section.

In a previous UBS research focus entitled, “Demographics: a coming of age” (2006) we stressed that trend growth rates for many countries will likely be significantly lower in the future than they were in the recent past (see Fig. 3.7). There are two main driving forces behind our assessment:

- **Demographics.** both aging and declining (even negative) population growth rates will weigh on GDP growth in most of the developed economies, as well as some important emerging markets.

- **Convergence.** GDP growth rates of emerging markets will begin to decline as per capita incomes catch up to those of developed economies.

In nearly all countries, trend GDP growth rates will come down in the future even without considering the effects of the financial crisis.

But the financial crisis is likely to slow long-run GDP growth even more through at least two additional channels, one private, the other public:

---

**Fig. 3.7: Lower trend growth rates in the future due to demographics and convergence**

**Developed economies**

<table>
<thead>
<tr>
<th>Trend GDP growth and projections, in %</th>
</tr>
</thead>
</table>

**Emerging markets**

<table>
<thead>
<tr>
<th>Trend GDP growth and projections, in %</th>
</tr>
</thead>
</table>

Source: UBS WMR based on model and data explained in UBS (2006)

**Fig. 3.8: Labor and capital explain growth differences**

<table>
<thead>
<tr>
<th>Trend growth accounting from 1995–2008, in %</th>
</tr>
</thead>
</table>

**Fig. 3.9: High investment begets current account deficit**

<table>
<thead>
<tr>
<th>US investment- and current account-to-GDP ratios, in %</th>
</tr>
</thead>
</table>

Note: Solow model calculation assumes constant labor and capital shares of 2/3 and 1/3, respectively.

Source: UBS WMR based on data from Penn World table and OECD

Source: Penn World table, OECD

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**Deleveraging.** The recent high growth rates in some countries may reflect an increased amount of debt. One outcome of the crisis that is already apparent is that debt-financing will likely play a much smaller role in the future and some debt might even be paid back.

**Increased role of the state.** To varying extents, high growth rates in some countries may be attributable to reduced regulatory intervention. But as we have noted in the first two chapters, the financial crisis seems likely to reverse that trend.

The impact of deleveraging

In Fig. 3.8 we separate the trend GDP growth rates of the G7 economies, Spain and Switzerland into three components: labor, capital and total factor productivity. Total factor productivity—the part of growth that is not explained by either labor or capital—is roughly the same in all countries except Spain, which is still catching up to the others. The big differences in trend growth rates between countries can be explained by the combined growth rates of labor (in four countries it was negative in terms of working hours) and capital.

The US, the UK, Canada and Spain had significantly higher trend growth rates of capital than the other countries we analyzed. This structural trend is visible in the US, where the ratio of investment to GDP—a real-world measure of the share of capital to the overall economy—went from an average of around 21% between 1950 and 1995 to significantly above 25% between 1995 and 2008. During the same period, the US current account balance slid deeply into negative territory, which meant that additional net capital was flowing into the US from abroad (see Fig. 3.9). A similar pattern can be observed for other countries under review. Fig. 3.10 shows both the change in the investment-to-GDP ratio and the change in the current account balance-to-GDP ratio. With the exception of Canada, where heavy investments in energy skewed the results, the evolution of investment activity moved in the opposite direction of the current account balance. In other words, a country with a higher investment-to-GDP ratio in 2008 than in 1995 had a lower current account balance-to-GDP ratio, and vice versa.
This raises the suspicion that foreign capital inflows financed part of this increase in investment. It could be argued that foreign capital flows to the US were not used to finance investment activity but rather to fund private consumption or government spending. However, if the US were a closed economy, it is very likely that its investment activity would have either remained more or less unchanged, or would have even declined as households reduced their savings rate (see Fig. 3.11). We can therefore conclude that foreign capital inflows boosted economic growth in countries with sizable current account deficits. Instead of increasing thanks to financing from abroad, if the investment-to-GDP ratio had remained at around 21% between 1995 and 2008, growth would have been even lower than the observed decline in the trend growth rate (see Fig. 3.12).

Ultimately, we estimate that the “leverage” from abroad in the form of deficit financing of US investment activity boosted US GDP by nearly 5% cumulatively between 1995 and 2008.

We have performed a similar analysis for the other countries according to the two scenarios of how the investment-to-GDP ratio developed over time (see Fig. 3.13). The first scenario assumes that the ratio stayed at 1995 levels, while the second allows for fluctuations in the ratio so that the current account balance would remain at its 1995 level. As noted, Canada is an exception. But the message is unambiguous for the other countries: the US, the UK, France, Spain and Italy face a lower trend growth rate as the deleveraging process proceeds.

**Government regulation also costly**

The unfolding deleveraging of households and the financial industry will likely weigh on long-term economic growth, but what impact will the increased role of the state have on the economy? When assessing this question, either the share of the government’s expenditure to GDP or its regulatory influence needs to be considered. Fig. 3.14 shows the share of government spending in overall GDP for the G7 countries. It is worth noting that since the early 1980s the period known as the “great moderation” produced, at best, a stabilization of the share of government spending to GDP. A similar picture emerges when looking at government consumption expenditures (see Fig. 3.15), where any moderation was short-lived and thereafter reversed.

The literature on the relationship between government spending and economic growth is inconclusive. Sala-i-Martin (1997) conducted a broad investigation into the variables that might have a significant impact on growth for a cross-section of roughly 100 countries between 1960 and 1990. He concludes that, “no measure of government spending (including investment) appears to affect growth in a significant way.” We extend the Sala-i-Martin study by using a regression framework developed by Barro (1991) to gauge how the average economic growth rate between 1985 and 2008 is influenced by four factors: the level of GDP in 1985, the average growth rate of the population, the investment-to-GDP ratio and the government consumption-to-GDP ratio. The coefficient of government consumption is 0.01, which means that a 1-percentage point increase in the government consumption-to-GDP ratio raises economic growth rate by a single basis point, or a hundredth of a percent. In other words, government consumption has virtually no measurable effect.

The most striking evidence of a decline in the government’s influence on the economy can be seen in the area of regulation (see Fig. 3.17). The Fraser Institute’s Economic Freedom of the World index assesses many different aspects of economic freedom for a wide selection of countries through 2006. The overall index summarizes separate component indices on the size of government, legal rights, freedom of international trade, soundness of monetary policy, as well as regulation of credit, labor and business. There is also a separate sub-index on the regulation of credit. An increase in the index indicates that the economy is becoming more deregulated. One sees a steady increase in the index beginning at the end of the 1980s, concurrent with the fall of the Soviet Union.
Given the underwhelming results of our first regression analysis using the government consumption-to-GDP ratio, we repeated our study, but this time using the Fraser indices. We perform this analysis for a sample of 100 countries, as well as two sub-samples, one of 22 OECD countries, the other of 78 emerging markets. The regression coefficients are listed in Fig. 3.16.

According to Fig. 3.16, each one-point increase in the overall Economic Freedom of the World index adds 0.47 basis points to a country’s economic growth rate. Importantly, the results of the regression are statistically significant for the index of regulation of labor, business and credit, as well as for the credit sub-index. In 1985, for example, the credit market regulation indicator for the OECD countries averaged 7.97, as compared to 5.57 for the emerging markets. By 2006, the index had climbed to 8.94 for the OECD and 8.09 for emerging markets.

If we assume that credit markets are re-regulated in the future, how much would it reduce long-run economic growth? Fig. 3.18 shows the growth impact according to two new scenarios. The first scenario assumes that each country reverts back to the domestic regulatory regime that existed in 1985. The second assumes that each country returns to the regulatory environment that prevailed for the entire OECD in 1985. The results vary significantly by country and scenario, but the direction is the same.

The results presented here should not be taken at face value. They are based on numerous assumptions about a world that is far more complex than our model. Nevertheless they show that trend growth in the coming years – already burdened by demographics in many developed countries and convergence in emerging markets – could be further squeezed by longer-term economic adjustments in the wake of the financial crisis. Both heightened regulation and deleveraging will likely drag on economic activity after boosting growth for at least the past decade.

### Fig. 3.16: Regression results of the Economic Freedom of the World indices and economic growth

<table>
<thead>
<tr>
<th>Regression coefficients</th>
<th>Overall indicator</th>
<th>Size of government</th>
<th>Legal rights</th>
<th>Sound monetary policy</th>
<th>Freedom of international trade</th>
<th>Regulation of labor, business and credit</th>
<th>Regulation of credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire sample</td>
<td>0.47</td>
<td>0.20</td>
<td>0.05</td>
<td>0.17</td>
<td>0.09</td>
<td>0.42</td>
<td>0.20</td>
</tr>
<tr>
<td>OECD countries</td>
<td>0.52</td>
<td>0.22</td>
<td>0.77</td>
<td>0.07</td>
<td>0.52</td>
<td>0.75</td>
<td>0.32</td>
</tr>
<tr>
<td>Emerging markets</td>
<td>0.61</td>
<td>0.16</td>
<td>0.17</td>
<td>0.23</td>
<td>0.15</td>
<td>0.38</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Note: Bold indicates statistical significance.
Source: UBS WMR calculation based on Fraser Institute’s Economic Freedom of the World 2008 Annual Report

### Fig. 3.17: Widespread deregulation in the past two decades

<table>
<thead>
<tr>
<th>Regulation of credit, labor and business index (0 = highly regulated, 10 = highly deregulated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Note: Interpolation of the five-year periods to smooth the data.
Source: Fraser Institute’s Economic Freedom of the World 2008 Annual Report, UBS WMR

### Fig. 3.18: Re-regulation costly to economic activity

Estimated growth impact on re-regulating credit markets, in percentage points

- Canada | France | Germany | Italy | Japan | Spain | Switz. | UK | US |
- Return to the country’s 1985 regulatory environment
- Return to the OECD’s 1985 regulatory environment

Note: Calculation based on coefficients in Fig. 3.16.
Source: Fraser Institute’s Economic Freedom of the World 2008 Annual Report, UBS WMR

Debt-to-GDP ratios will rise, as spending cuts and tax increases will prove difficult.
The first to emerge from the global recession

In addition to understanding how the financial crisis and its aftermath will affect long-term economic growth and inflation, we are also curious about which country will emerge first from the recession.

Several studies have assessed the characteristics of the US and international business cycles.\(^2\) Using a filter to examine a historical cross-section of US business cycle data dating back to 1970, we can show whether the various components of GDP move before, after, or at the same time as the overall economy (see Fig. 3.19).\(^3\) The results confirm some oft-cited observations about correlations between large GDP aggregates:

- Private consumption moves in sync with the business cycle. In other words, its peak and troughs coincide with those of the overall economy. This is hardly surprising since consumption is overwhelmingly the largest share of US GDP.
- Private investment also mirrors GDP. But dividing this category into residential and non-residential investment, we see that residential investment leads the business cycle by one to two quarters, while non-residential investment lags behind it by roughly the same amount of time. This suggests the US economy will struggle with a sluggish recovery amid still large excess inventories of unsold homes and still rising default rates. Imports move in lock-step with the business cycle, while exports exhibit limited cyclicity. This is also not really a surprise. Imports respond directly to consumption, and exports represent a small share of the US economy anyway.

\(^2\) See Stock and Watson (1999) for an overview and a thorough assessment.

\(^3\) These charts were constructed using Stock and Watson’s (1999) methodology of a band-pass filter. See also Christiano and Fitzgerald (2001).

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**Fig. 3.19: Most GDP components move together, except for government and exports**


![Graph showing cross-correlations between US GDP and its components from 1970–2008](source: UBS WMR based on OECD)

**Fig. 3.20: US tends to lead but not so in the case of Germany**

Cross-correlations between US GDP and selected countries from 1970–2008

![Graph showing cross-correlations between US GDP and selected countries from 1970–2008](source: UBS WMR based on OECD)
Finally, government consumption is slightly negatively correlated with the business cycle pointing towards the effectiveness of automatic stabilizers, rather than explicit fiscal policy steps, in bringing about a recovery.

For a small, open economy like Switzerland, the broad correlations differ from those of the US. For example, exports and investment lead the business cycle whereas consumption trails it.

An assessment of international business cycle correlations shows that the US economy has consistently led the G7 by between one and three quarters since 1970 (see Fig. 3.20). Germany, the so-called European locomotive, only led Italy and Switzerland by one quarter and actually trailed France by a quarter.

These findings do not fundamentally change when the time period is split. In fact, in the 1990-2008-sub-period the US led the G7 countries by an even wider margin. So the metaphor that the US was the locomotive of the world economy is not at all farfetched. Over the past two periods of global economic weakness, in the early 1990s and early 2000, the US clearly led first the slide and then the recovery. This does not seem to have changed in the 2008-09 recession. The fact that economies like Germany (an 8.7% decline in real GDP growth in the fourth of quarter 2008) and Japan (with an astonishing 12.7% drop) were hit much harder than the US (down 6.2%) reaffirms this pattern today (see Fig. 3.21).

However, the current US recession is different from the previous two in one important respect: indebted US households are deleveraging at a fast pace, which drastically lowers consumption. Therefore, this recession is likely to last longer than those that were driven primarily by falling investment activity.

Since the housing market collapsed in the US, the UK, Spain and some other countries more dramatically than in countries like Germany or Japan, it could seem plausible that the less-affected countries might emerge sooner from the recession. But for this to happen, some pick-up of domestic demand in these countries is needed, and this is far from certain given their subdued consumption and construction activity in the recent past (see Fig. 3.22).

Moreover, Germany and Japan have so far trailed the general trend of increasing government expenditures to stimulate their economies. It is true that Japan will have a deficit estimated currently at 9.7% of GDP in 2009, but the bulk of this is cyclical, as we expect Japan’s economy to contract during 2009. As for Germany, despite its bleak growth prospects, the government has confirmed that it does not intend to breach the Maastricht deficit criteria of 3%. Japan and Germany are also reluctant to grow their deficits in the face of a much more rapidly aging population than in the US or even in the UK. This leads to the sobering conclusion that in the near future, without the US recovering, the global economy will likely only be able to move forward in low gear.
Inflation in the future

Having assessed what we think are the critical economic growth implications of the financial crisis, we now turn our attention to inflation. According to Milton Friedman, “inflation is always and everywhere a monetary phenomenon.” Of course, there might be some other nuances in the short run. Prices may be sticky or people may debate whether a surge in inflation originates from cost-push or demand-pull prices increases. But in the long run, over a horizon of a decade or more, an increase in the overall price level can only be sustained if too much money is pursuing too few goods and services.4

The left side of Fig. 3.23 shows the average inflation relative to the average growth rate of money for 52 countries over the past ten years. The relationship is positive and statistically significant, even if it could be argued that this correlation is influenced by the outliers in the upper right-hand corner of the graph. But even if we exclude the five countries with inflation rates above 10%, the relationship remains positive and statistically significant. This result has been confirmed in several studies,5 not only with regard to cross sections of countries but also with a group of seven countries over a period of 160 years, as shown on the right side of Fig. 3.23. Therefore, the behavior of inflation in the future will depend to a large extent on the conduct of monetary policy.

The relationship between governments and paper, or “fiat,” money is an explosive one. Fiat money has no intrinsic value; rather, its status as legal tender relies solely on people’s confidence in the issuing government. The world’s experience with fiat money began in 1973, with the collapse of the Bretton Woods system after World War II. Before that, most of the world’s currencies were fixed to the US dollar, which in turn was backed by gold.

Governments find paper money very convenient as a medium of exchange. It has a face value as legal tender. But since it has no intrinsic value, governments are free to create as much as they want or dare. The Republic of Zimbabwe has been testing the limits of this freedom in recent years. With an inflation rate of 13 billion percent per month at the end of 2008, which means prices double every 15.6 hours, new and ever-larger bank notes are printed regularly in a hyperinflationary spiral of historic proportions and with tragic social implications.

The early years of fiat money were characterized by soaring inflation in developed countries and even hyperinflation in some emerging economies. Fortunately, since the mid-eighties and the beginning of the great moderation, inflation has been held in check across the globe. One reason for this was the decision to take the printing press out of the hands of governments by strengthening the independence of central banks. In the early 1990s, several studies validated this move, concluding that independent central banks had achieved lower rates of inflation (see Fig. 3.24).

But while the great moderation ushered in an era of increased central bank independence, there is no reason why this trend cannot reverse. Indeed, the risk of such a reversal increases when government budgets come under stress. Using the printing press to ease the strain of rising debt might be viewed as an obvious quick fix.

Governments can benefit from printing money in several different ways, the most obvious and immediate being when the new money is used to buy goods and pay for services. This type of financing is known as “seigniorage.”6 While in normal times this represents a minor portion of a developed country’s GDP (for example, less than 0.5% of GDP for the US), it has surged quite significantly because of the financial crisis and the urgent efforts to keep the worldwide financial system afloat. The US monetary base doubled during the fourth quarter of 2008, which puts it at a level equivalent to 15% of US GDP, or 50% more than the direct taxes paid by US households (see Fig. 3.25). If the Fed embarks on a program to buy government debt, as it has suggested it might, this would represent another straightforward example of seigniorage.

This flood of liquidity will eventually need to be reabsorbed once the crisis is truly vanquished. However, there is no guarantee that the timing will be perfect, which could increase inflationary pressure down the road.

The second way governments profit from using their printing presses occurs whenever they intentionally create inflation. Inflation is essentially a tax on the people who hold money. Everyone who holds non-interest-bearing cash in his or her pocket during inflationary periods pays this tax in the form of lost purchasing power. The inflation tax, however, can be of particular interest to central banks that hold debt. If governments issue longer-term debt and agree to pay a fixed nominal interest rate, any inflation will reduce the inflation-adjusted value of the debt and, thus, interest payments. The central bank that creates the money earns this tax by acquiring bonds in exchange for issuing cash and then earns the interest on those bonds.

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4 One of the best-known economic theories, it can be traced at least as far back as the French alchemist and philosopher Jean Bodin (1530-1596), though it seems that the ancient Greeks recorded inflation and knew that currency debasement was responsible for it.

5 McCandles and Webber (1995) is the most famous of those studies.

6 Seigniorage is named after the charge the “seigneur” or sovereign asked for minting and issuing coins (that is, setting the value of a coin slightly above the value of the metals contained in it). Seigniorage today measures the income that the central bank (and therefore, by extension, the government) earns by issuing currency to the public.
High and permanent fiscal deficits and inflation

Given the surge in government debt worldwide, the incentive to use the printing press has increased markedly. Even if such a scenario seems unlikely, there are still two reasons why inflation could be a more likely outcome of the current crisis than many expect.

Suppose that a central bank prints money during a financial crisis to fund the government deficit and that, once the financial crisis passes, it wants to resume its pre-crisis low-inflation policy. First and foremost, it will have to sell the government bonds that it accumulated during the crisis in order to mop up the extra liquidity. By doing this, it sends its government debt back out to the market. Suppose now that a government, still fighting with a tough economic environment, does not intend to reduce expenditures or increase taxes. In this environment, people will be inclined to believe that government deficits have permanently increased and will expect either future tax increases to repay the increased deficits, or that the central bank will print money to pay for the debt.

Fear of deflation can lead to inflation

“Persistent deflation in the prices of currently produced goods and services – just like a persistent increase in these prices – necessarily is, at its root, a monetary phenomenon. Just as changes in monetary conditions that involve a flight from money to goods cause inflation, the onset of deflation involves a flight from goods to money.” – Alan Greenspan (1998)

Former Fed Chairman Greenspan first expressed deflation concerns in 1998 following the Asian currency crisis. Deflation fears resurfaced in 2002 when current Fed Chairman Ben Bernanke, then a member of the Fed’s...
The long-term economic effects of the crisis

Board of Governors, delivered his now famous speech, “Deflation: Making Sure ‘It’ Doesn’t Happen Here,” which earned him the nickname, Helicopter Ben. In hindsight, the critique that after the 2001 recession the Fed should have increased interest rates much earlier, and that by not doing so, fuelled the housing bubble in the US, has to be balanced against the big concern of the time: deflation (see Fig. 3.26).

Deflation concerns today are even more pronounced than in 2002. It is therefore possible that the Fed and other major central banks will again wait longer than seems necessary to adopt a more restrictive monetary policy stance once the current crisis passes. In the short run, this could lead to higher inflation as the recession fades, but this alone is insufficient to generate higher sustained inflation. After having seen the specter of deflation surface three times in the last ten years, central banks might conclude that the cushion below their inflation targets may be too low. This realization could lead to a higher inflation target in the future.

In our view, central banks are more concerned with deflation than inflation, especially in the US, and have decided that inflation might not be such a bad thing. The fear of deflation is much greater because of the prevailing high debt levels, both in the public and private sectors. Deflation raises both the inflation-adjusted burden of the debt’s face value and the interest payments on it, which can severely disrupt the economy.

**Inflation is bad, yes, but not for debtors**

The inflation experience of the 1970s is still fresh for many and it is often regarded as something bad. But inflation is not necessarily bad for debtors. In fact, by reducing the real value of the outstanding debt, inflation redistributes the burden of the debt from debtors to savers. Given the fact that one of the major problems, at least for the US and the UK, is the high level of household indebtedness, many might consider inflation a better tool to mitigate the debt problem than higher taxes and lower government expenditures (see Fig. 3.27).

The policies of central banks will be critical once the recession is behind us. Obviously, inflation-targeting, the core of modern monetary policy at all major central banks, has shown its limits. It can neither prevent “irrational exuberance,” as the tech, real estate and credit bubbles have shown, nor effectively fight off deflation when exuberance switches into panic.

How to improve central bank inflation-targeting in the future? We see two main possible approaches:

- The first: broaden the target beyond just inflation to include asset prices in order to puncture bubbles early in their formation. Of course, implementation would be problematic. For example, what distinguishes a bubble from a healthy market evolution? This would therefore require new tools to help evaluate whether the Fed needs to intervene to address an asset bubble.

- Our second idea refers to a remark in Bernanke’s 2002 speech: to avoid deflation, the Fed and other central banks should try to preserve a “buffer zone” for the inflation rate when the economy weakens. Given the persistent recurrence of deflation fears over the past ten years, this buffer zone may now be too thin. It might be wise to set future inflation targets higher than they presently stand.

Ultimately, political considerations will shape future inflation-targeting. The answer to this policy question promises either lower but steadier average returns as central banks try to curb market excesses, or higher long-term inflation. After the inflation-free bull run of 1982-2007, neither option is appealing. Then again, market crashes and deflation fears are far worse than either of these outcomes.
Chapter 3

Managing a new bubble in public debt
The unfolding financial crisis and recession will continue to severely strain government finances. It is likely to increase the debt-to-GDP ratio of almost all developed countries, with potentially explosive consequences. This comes at a time when government finances will also be tested by the ongoing aging of the population. Moreover, this demographic pressure coupled with both the deleveraging and increased regulation is very likely to significantly dampen trend growth rates for developed countries in the future, (see Fig. 3.28).

Today, and tomorrow, governments must confront ever-increasing deficits and subdued growth, with few options to escape this difficult environment:

- Either taxes will have to be increased, with the risk of dampening growth even further, or
- Part of the debt will have to be monetized at the risk of surging inflation down the road, or
- Mandatory government spending will have to be trimmed significantly. Cutting government discretionary spending might help somewhat but will certainly not be enough to reverse the soaring budget trajectory.

Fig. 3.28: Trend economic growth to be weaker and inflation expectations higher

In countries most exposed to the financial crisis, policymakers may prefer higher inflation as an antidote to ever-increasing debt.

Estimated change in trend growth for selected developed countries, in pps

Estimated change in inflation expectations for selected developed countries, in pps

Source: UBS WMR
Note: Compares the 1998-2007 period to the forecasted or estimated trend in 2010-2020.
China the savior?

China is often cited as another potential candidate to pull the world out of recession. Despite the fact that the fourth quarter of 2008 witnessed the worst economic growth since 2001, China did not go into recession. Furthermore, some early evidence has emerged, especially in credit activity, that the roughly USD 600 billion Chinese stimulus plan will help to reaccelerate the economy.

However, China’s performance will have only a limited impact on the rest of the world. Despite being the second or third largest world economy (depending on the measurement method used), the overall purchasing power of the Chinese consumer is far below that of other large economies. China’s consumption share of GDP is below 40%, and only 30 million people in China have an income equal to or above the US median income, compared with 200 million in Europe and 45 million in Japan (see Fig. 3.29 and Fig. 3.30).

Fig. 3.29: Chinese private consumption is not strong

Chinese exports and private consumption, in % of GDP

Fig. 3.30: Limited purchasing power outside the OECD

Number of people in million with an income at or above the US median income in 2008

Source: IMF, OECD, UBS WMR

Source: UBS WMR estimates based upon WIID, UN and IMF
A fundamental reassessment of asset returns
A fundamental reassessment of asset returns

The crisis has had a profound effect on the drivers of asset returns. Earnings growth – no longer debt-inflated – will find a more sustainable trend, while inflation appears poised to move higher. Amid this austere investment landscape, we challenge long-held assumptions and see value in some higher-risk assets.

A fresh look at the investment horizon

It is clearly time to reassess the basic premises of investing. Asset prices have been on a rollercoaster ride the past couple of years, and the probable long-term effects of the financial crisis on the global economy have clouded the outlook on returns to such an extent that a fundamental reassessment of strategic portfolio holdings and allocations is needed.

For the moment, subjective factors like investor sentiment and expectations about the success or failure of sweeping government policies are influencing day-to-day and month-to-month changes in asset prices. These are significant though temporary concerns. Meanwhile, many long-held assumptions about how to maximize returns for any given level of risk have been profoundly shaken by the financial crisis. In this chapter, we review these fundamental investment axioms, applying a long-term perspective informed by historical analysis, and we will offer our considered views on strategic investing in the years ahead.

History confirms that long-term asset class performance is dictated by trends in inflation and economic growth. These forces define the environment in which corporations do business, and their ability to generate earnings. Moreover, inflation has an enormous bearing on bond market outcomes and it can also sway equity, commodity and real estate returns. In addition to analyzing fundamental return considerations, we will provide a framework to assess investment risk. We will also discuss the investment implications of various policy stances.

In sum, we aim to describe how different asset classes are likely to perform within a portfolio in order to meet an investor’s goals.

We take a long-term view and consider inflation’s effects carefully as we assess the performance of various asset classes and present our conclusions on optimal strategic portfolio allocations.

Long-term outlook. Any decision to alter a strategic portfolio allocation should not be made lightly. It requires either a significant change in personal financial circumstances or a major shift in the long-term return outlook. Both of these conditions are currently relevant. Given the large swings in realized long-term returns and related moves in fundamental valuation measures, we believe investors should regularly review their long-term investment anchors (see Fig. 4.1). Strategic allocation decisions have a profound impact on long-term portfolio performance and investors should be mindful of how difficult it is to exactly time financial markets (see box on page 61).

Fig. 4.1: Large swings in real US asset returns

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Large-cap equities</th>
<th>Long-term government bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926–2008</td>
<td>3.0</td>
<td>3.7</td>
</tr>
<tr>
<td>1926–1950</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>1950–2008</td>
<td>3.7</td>
<td>4.8</td>
</tr>
<tr>
<td>1926–1939</td>
<td>–1.8</td>
<td>1.4</td>
</tr>
<tr>
<td>1940–1949</td>
<td>5.4</td>
<td>0.4</td>
</tr>
<tr>
<td>1950–1959</td>
<td>2.2</td>
<td>1.9</td>
</tr>
<tr>
<td>1960–1969</td>
<td>2.5</td>
<td>3.9</td>
</tr>
<tr>
<td>1970–1979</td>
<td>7.4</td>
<td>6.3</td>
</tr>
<tr>
<td>1980–1989</td>
<td>5.1</td>
<td>8.9</td>
</tr>
<tr>
<td>1990–1999</td>
<td>2.9</td>
<td>4.9</td>
</tr>
<tr>
<td>2000–2008</td>
<td>2.5</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Source: Ibbotson, UBS WM

Fig. 4.2: Inflation and nominal returns in the US

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Inflation</th>
<th>Treasury bills</th>
<th>Long-term govt. bonds</th>
<th>Large-cap equities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926–2008</td>
<td>3.0</td>
<td>3.7</td>
<td>5.5</td>
<td>9.6</td>
</tr>
<tr>
<td>1926–1950</td>
<td>1.3</td>
<td>1.0</td>
<td>4.0</td>
<td>7.7</td>
</tr>
<tr>
<td>1950–2008</td>
<td>3.7</td>
<td>4.8</td>
<td>6.1</td>
<td>10.2</td>
</tr>
<tr>
<td>1926–1939</td>
<td>–1.8</td>
<td>1.4</td>
<td>4.9</td>
<td>5.1</td>
</tr>
<tr>
<td>1940–1949</td>
<td>5.4</td>
<td>0.4</td>
<td>3.2</td>
<td>9.2</td>
</tr>
<tr>
<td>1950–1959</td>
<td>2.2</td>
<td>1.9</td>
<td>–0.1</td>
<td>19.4</td>
</tr>
<tr>
<td>1960–1969</td>
<td>2.5</td>
<td>3.9</td>
<td>1.4</td>
<td>7.8</td>
</tr>
<tr>
<td>1970–1979</td>
<td>7.4</td>
<td>6.3</td>
<td>5.5</td>
<td>5.9</td>
</tr>
<tr>
<td>1980–1989</td>
<td>5.1</td>
<td>8.9</td>
<td>12.6</td>
<td>17.5</td>
</tr>
<tr>
<td>1990–1999</td>
<td>2.9</td>
<td>4.9</td>
<td>8.8</td>
<td>18.2</td>
</tr>
<tr>
<td>2000–2008</td>
<td>2.5</td>
<td>3.1</td>
<td>9.1</td>
<td>–3.9</td>
</tr>
</tbody>
</table>

Source: Ibbotson, UBS WM
Inflation-adjusted returns. When economists use the term “real” in connection with asset performance, they are referring to results that have been adjusted to account for the effects of inflation over a given time period. Real returns are the vital yardstick in assessing long-term asset class performance. Inflation sees the general prices of goods and services rise, which erodes an investor’s purchasing power. Investors need to generate a nominal return that exceeds inflation over the long run so that the purchasing power of their asset base does not shrink (see Fig. 4.2 and Fig. 4.3). With this goal in mind, we focus only on real returns in this analysis.

What it means to think long term

Fig. 4.4 shows the real returns of equity, bond and money market returns in the US and the UK since 1925. The charts illustrate how funds invested in equities have outpaced other assets. It is this observation that inspired Jeremy Siegel to publish his popular book, Stocks for the Long Run. However, other authors¹ suggest that this outperformance reflects “survivorship bias,” whereby poorly performing companies are simply dropped from consideration, thus skewing results unfairly to the positive. Further, given that the US and the UK did not experience the degree of destruction to their industrial infrastructure that Japan, France, Italy and Germany suffered in World War II, an over-reliance on US and UK asset returns will not account for such devastating historical events.

As Dimson, Marsh & Staunton (2006) document, several countries suffered extended periods of real equity price declines (see Fig. 4.5). Beginning in 1900, Germany and Japan suffered more than a half-century of negative real returns. However, using a comprehensive international database that also includes the nadirs of war and hyperinflation, the authors found that global equities should yield an annualized excess return over short-term government bonds of between 3.0%–3.5% (see box on page 61). This estimated long-term outperformance also fits with the view that riskier assets, like equities, should offer an additional return, the so-called “risk premium,” over the risk-free rate, or cash. If risky assets cannot offer outperformance, investors would opt for risk-free assets. Behavioral finance asserts that investors’ financial decisions are not always purely rational. For example, behavioral studies have demonstrated the emotional reaction to losses is greater than it is to gains of equal size. That is, loss aversion is asymmetric. At present, since most people have recently suffered large portfolio losses in addition to declining home values, the need to protect against further losses is likely to override any rational assessment of the long-term equity risk premium. While people may not be fully aware of the risks entailed in every financial decision, we maintain that investors show risk-averse behavior when it comes to preserving their wealth and living standards, and thus prefer a risk-free asset to a risky asset when the expected returns appear the same.

¹ See Jorion and Goetzmann (1999).
Still, there have been many periods since World War II, some of them prolonged, when investors were not rewarded for holding risky assets in their portfolios (see Fig. 4.5). For example, during the 1970s, US equities lost an average of 1.5% each year after subtracting inflation. In real terms, since their peak in 2000, equities have shed an average of more than 5% per year, which more than erases their gains made during the 2003–2006 equity rally. And despite steep rises and falls over the years, investors who bought and held Japanese equities more than two decades ago have not yet managed to break even in real terms (see Fig. 4.6). So, although risky assets should outperform “in the long run,” it is not clear how long that run needs to be. The outcome, we argue, clearly depends on the investor’s entry point.

This may seem obvious, but it does depart from standard portfolio theory and the modeling of long-term expected returns and risk, which have claimed to be independent of time and entry point.2 Furthermore, in extreme circumstances such as at present, opportunities are likely to arise that investors will want to exploit, whether to seek shelter against losses or to acquire assets at attractive price levels. Given the tumult on financial markets lately, we think investors are going to reassess their strategic asset allocation decisions. We advocate using robust valuation models and relevant fundamental indicators in this process.

**Valuation and fundamentals: avoiding false parallels**

A careful analysis of the current investment environment can help investors avoid drawing potentially false parallels, such as concluding from Japan’s experience since the 1980s that all developed equity markets will experience several decades of decline. Two points are important in assessing the return outlook:

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2 See Cochrane (2001) for a discussion of generally accepted finance theory as it existed during the 1970s and 1980s and how the next generation of empirical research changed those beliefs.

### Fig. 4.5: Real equity returns in key markets over selected periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Description</th>
<th>US</th>
<th>UK</th>
<th>France</th>
<th>Germany</th>
<th>Japan</th>
<th>World</th>
<th>World ex-US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected episodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1919–28</td>
<td>Post-WWI recovery</td>
<td>372</td>
<td>234</td>
<td>171</td>
<td>18</td>
<td>30</td>
<td>209</td>
<td>107</td>
</tr>
<tr>
<td>1949–59</td>
<td>Post-WWII recovery</td>
<td>426</td>
<td>212</td>
<td>269</td>
<td>4094</td>
<td>1565</td>
<td>517</td>
<td>670</td>
</tr>
<tr>
<td>1980–89</td>
<td>Expansionary 80s</td>
<td>184</td>
<td>319</td>
<td>318</td>
<td>272</td>
<td>431</td>
<td>255</td>
<td>326</td>
</tr>
<tr>
<td>1990–99</td>
<td>90s tech boom</td>
<td>279</td>
<td>188</td>
<td>226</td>
<td>157</td>
<td>–42</td>
<td>113</td>
<td>40</td>
</tr>
</tbody>
</table>

**Long runs of negative real returns**

<table>
<thead>
<tr>
<th>Period</th>
<th>Return</th>
<th>US</th>
<th>UK</th>
<th>France</th>
<th>Germany</th>
<th>Japan</th>
<th>World</th>
<th>World ex-US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>–7</td>
<td>–4</td>
<td>–8</td>
<td>–8</td>
<td>–1</td>
<td>–9</td>
<td>–11</td>
<td></td>
</tr>
<tr>
<td>Number of years</td>
<td>16</td>
<td>22</td>
<td>53</td>
<td>55</td>
<td>51</td>
<td>20</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

Source: Dimson, Marsh & Staunton (2006)

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### Fig. 4.6: No real return in Japanese stocks since 1985

MSCI Japan total return index deflated with Japanese CPI (1985 = 100)

Source: MSCI, Thomson Financial, UBS WMR

### Fig. 4.7: Equities expensive in Japan until recently

Price-to-earnings ratio based on 12-month forward consensus earnings forecast

Source: IBES, MSCI, UBS WMR

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58 The financial crisis and its aftermath
Valuation. In basic terms, asset prices need to be low enough so that the future income flowing to the investor will more than cover the upfront cost. Japanese equities traded at prohibitively high price-to-earnings (P/E) ratios long after the real estate bubble burst in the late 1980s (see Fig. 4.7). Structural factors, such as the high degree of cross-shareholding between Japanese companies, contributed to this mispricing and it took a very long time just to bring the P/E ratio back to levels comparable to other world markets.

Fundamentals. Trends in fundamentals, which in turn drive valuation measures, will ultimately determine whether prices are too low or too high. For equities, the trend in earnings and dividends is paramount; for nominal bonds (those with fixed coupon payments and unadjusted for inflation), it is the trend in inflation that matters most.

Nominal government bonds expensive

The principal determinants of nominal bond yields are the real interest rate, the inflation premium and the risk premium. The real interest rate is the part of the yield that is determined mainly by the supply and demand of both savings and investment. Generally speaking, any return beyond compensation for expected inflation and asset-specific risk can be attributed to the real interest rate.

The outlook for the real interest rate is uncertain and subject to several conflicting forces. On the one hand, a rapidly aging population in developed countries speaks for steadily declining savings rates and slow upward pressure on real interest rates. But a slower growing, less efficient economy, as we outlined in Chapter 3, would likely reduce investment activity, exerting downward pressure on real interest rates. Thus, aging could trigger a decline in savings, while deleveraging suggests a drop in investment activity – two conflicting trends that obscure the outlook for real interest rates.

Countries with a high capital endowment can endure a rising old-age dependency ratio and fewer working-aged people relative to the number of retirees. From this perspective, countries with rapidly aging populations would do well to provide incentives for savings, which, in turn, lowers interest rates and boosts the investment needed for higher rates of capital formation. If this does not happen, we would expect higher real interest rates in those regions where aging is most evident, such as in Europe and Japan. Keep in mind, however, open capital markets limit the degree to which real interest rates can diverge from each another. This is what we witnessed during the last 10 years when real long-term government bond yields in the US, the UK and Germany all hovered around 2%.

In addition to the real interest rate, investors demand compensation for expected inflation. Since inflation expectations often move in line with realized inflation, bond yields also tend to move together with inflation (see Fig. 4.8). Central bank independence and confidence in inflation targets are the most important factors influencing inflation expectations. As reflected in bond yields, inflation expectations are presently below the inflation targets pursued by central banks. Therefore, potential exists for the inflation premium embedded in bond yields to rise when the economy recovers.

Finally, bond investors demand a risk premium to compensate for uncertainty over principal repayment and default, as well as changes to inflation expectations. For nominal government bonds, uncertainty over the future level of inflation is the most prominent risk. Although bond investors have gotten used to a roughly 2–2.5% average inflation rate in developed countries, deviations from this level in future have become more likely. Therefore, expectations about alternative future inflation scenarios will likely exert a strong influence over the risk premium. If the probability of structurally higher inflation expectations were to increase, investors would likely demand a higher risk premium to hold bonds. We think this precondition has recently been met. As we noted in previous chapters, inflation expectations are likely to rise given the inflationary effects of the large monetary and fiscal stimulus programs being launched and the inherent difficulty of adequately timing their reversal when the economy finally does recover. Add to that the temptation of governments to reduce the real value of their debt and the case for a period of heightened inflation expectations is made only stronger, in our view.

Fig. 4.8: Bond yields move together with inflation

<table>
<thead>
<tr>
<th>Year</th>
<th>10-year US government bond yield</th>
<th>US inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>1970</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>1980</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>1990</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>2000</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>2010</td>
<td>12%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Federal Reserve Economic Data, UBS WMR

3 These components of the bond yield were proposed by Irving Fisher (1930), who argued that the real interest rate is independent of monetary effects.

4 Fixed-coupon nominal bonds pay a predefined cash flow. Therefore, bond prices fall when inflation expectations increase, so that the expected return compensates for the new level of expected inflation. In other words, prices fall so that the yield to maturity can rise. Therefore, investors will suffer a temporary loss in nominal terms and a permanent loss in real terms because the money to be received at maturity will purchase fewer goods than originally thought.
Rising government indebtedness as a share of GDP, as well as the sustainability of funding sources for the debt, are increasingly important risk factors. Government financing of debt in the domestic market tends to be more reliable than external financing. As evidence for this thesis, countries carrying large current account deficits often must pay higher interest rates than countries with current account surpluses (see Fig. 4.9). And when market participants worry that government budget deficits and debt increases are structural, they tend to demand a higher yield for holding longer-dated debt. This is shown in the term spread, or the difference between long- and short-term bond yields (see Fig. 10). We know from Chapter 3 that when interest rates exceed the growth rate of the economy, the debt-to-GDP ratio will increase even when the bulk of the government’s finances are in balance.

Overall, we expect real interest rates to remain somewhat lower than in the past, at around 2%. But uncertainty over the direction of inflation and rising debt levels will likely push the risk premium higher. Since the risk premium is more important to longer-maturity bonds, the yield curve, or term spread, will likely remain rather steep. Given the cyclically depressed level of bond yields and these fundamental factors, we find that nominal government bonds offer little value. The only supportive scenario for nominal government bonds is one of intensifying deflation risk, which, while it cannot be flatly excluded, is nevertheless a low probability event, in our view. On a stand-alone basis, we find a more compelling risk-return tradeoff in other sectors of the bond market, such as money market instruments, inflation-linked bonds and corporate bonds.

**Money market instruments**

Holding wealth in the form of cash and non-interest bearing deposits has entailed a penalty in the form of lost potential returns. Cash earns little return and is unable to hedge against inflation, since a given amount of money will buy fewer goods over time. Only in the case of deflation will a given amount of money buy more goods in the future. And since short-term interest rates tend to be low or even zero during periods of deflation, there is less of a penalty for holding cash compared to interest-bearing securities.

Because of the short-term maturities of money market instruments, their interest rate typically follows central bank target rates. Since central banks tend to adjust their target rate according to the inflation outlook, which is often linked to the inflation rate at that time, money market securities typically compensate for inflation (see Fig. 4.12). Deflation is similarly benign since the nominal value of the securities will not decline. But given the weak expected recovery, central banks may well keep short-term rates artificially low for a prolonged period of time before implementing a more restrictive monetary policy. As a consequence, money market instruments might produce very low or even negative real returns, eroding an investor’s purchasing power in the coming years.

![](Fig. 4.9: Current account surplus linked to lower yields)

Current account/GDP ratio versus bond yields for a selection of countries, in %, 2008

Source: Bloomberg, Fitch, UBS WMR

![](Fig. 4.10: Higher debt points to higher bond risk premium)

Debt-to-GDP ratio versus term spread for a selection of countries, 2008

Note: The term spread is the difference between long- and short-term bond yields.
Source: Bloomberg, Fitch, UBS WMR
A fundamental reassessment of asset returns

Long-term vision provides direction

In this UBS research focus, our aim is to reassess existing notions of portfolio analysis and to provide a long-term vision on investment decisions. We have done this via a scenario framework to compare risk profiles and potential returns amid the current crisis. In addition to regularly reviewing this long-term vision, investors will still want to make shorter-term timing decisions and steer their portfolios to the long-term anchor over time, guided by certain rules and indicators. For example, some investors might prefer to wait until clearer signs of economic stabilization have emerged before investing more heavily into equities. On the other hand, the longer investors wait for clarification, the more likely they will not participate in a potential initial rally.

Continuous screening and assessing sets of financial and economic indicators are vital to timing financial markets. This allows investors to regularly assess whether the risks of more extreme outcomes is increasing or fading and whether greater macroeconomic stability is finally emerging. Cyclical analysis provides insight on the medium-term outlook for key fundamental variables, such as growth, inflation and earnings. We think that neither fear nor greed should guide investment decisions. As such, a long-term vision, together with a disciplined approach for reacting to news and economic and market indicators, is the right approach to steer a successful overall long-term investment strategy.

The power of compounding

A long-term investment horizon demands that the effect of compounding is well understood, since it can determine the final outcome. The real, and very significant, implications of apparently small differences in interest rate assumptions are evident when returns are compounded year after year after year. To illustrate, an asset that yields just 1% each year for the next 10 years will generate a compounded return of about 10% over the period. At 2%, the total return jumps to 22%. An asset that yields an annual return of 6% yields a compounded return of 79% after a decade, and a 7% return nearly doubles the initial investment. Thus, differences in return expectations between various asset classes matter a lot over long time periods.

Jorion and Goetzmann (1999) provide a telling illustration of the importance of compounded growth. In September 1626, Pierre Minuit, the Governor of the West India Company, purchased Manhattan Island from the local inhabitants for the princely sum of 60 guilders, or about 24 of today’s US dollars, surely a modest sum, it appears. However, compounded at a 5% rate of interest, it would have grown to over USD 3 billion in current dollars, which seems expensive for a 31-square-mile tract of undeveloped land. On the other hand, compounding Minuit’s investment at just 3% yields less than USD 2 million, which is more than a 1500-fold difference (see Fig. 4.11).

### Fig. 4.11: The power of compounding

<table>
<thead>
<tr>
<th>Year</th>
<th>3%</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1626</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1702</td>
<td>0.001</td>
<td>0.0001</td>
</tr>
<tr>
<td>1778</td>
<td>0.01</td>
<td>0.001</td>
</tr>
<tr>
<td>1854</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>1930</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>10000</td>
<td>1000</td>
</tr>
</tbody>
</table>

Source: UBS WM/R
Chapter 4

Inflation-linked government bonds
The UK government issued the first inflation-linked note in 1981, and the US and continental Europe followed in the late 1990s. But although the inflation-linked bond (ILB) market is relatively young, it is also well established. The global outstanding market volume increased six-fold over the last decade, to around USD 1.25 trillion as of the end of 2008. Inflation swap contracts and structured inflation investment products add to the inflation-related spectrum of investable assets.

While traditional bonds pay a fixed nominal coupon, inflation-linked bonds pay a fixed real coupon. To achieve this, the principal amount is adjusted according to changes in the reference price index. As a result, the lifetime payment stream compensates investors for inflation.

The difference between the yield on a nominal bond and the yield on an inflation-linked bond is known as the breakeven inflation rate. Although liquidity factors can sometimes distort the results, it is a useful proxy for inflation expectations and a measure to gauge the relative attractiveness of the two types of bonds. The following rule roughly applies: if the inflation rate an investor expects is higher than the breakeven rate, inflation-linked bonds are more attractive than nominal bonds, and vice versa. Inflation-linked bonds tend to outperform nominal bonds when reported inflation is higher than inflation expectations (see Fig. 4.13).

Although we expect inflation rates to temporarily dip below zero in 2009, we think outright deflation is unlikely. Indeed, we think inflation expectations will increase beyond 2009, particularly in the US and UK. As of March 2009, breakeven inflation rates in the US, the UK, and the Eurozone were pricing in only moderate inflation for the next couple of years. Comparing our long-term inflation projection with the market’s breakeven inflation view, we see inflation-linked bonds as being more attractively valued than nominal government bonds (see Fig. 4.14).

In general, inflation-linked government bonds can be regarded as a low-risk investment, especially in real terms. In addition, they usually enhance the efficiency of a portfolio since they are often either uncorrelated or even negatively correlated with other asset classes. However, investors should be aware of the tax consequences of holding inflation-linked bonds. Taxation can vary according to the investor’s domicile, the type of investor and the type of investment (bond or structured product).

Corporate bonds
In addition to the factors mentioned above, corporate bond yields reflect a premium to compensate investors for expected default losses. This is especially relevant for corporate bonds with the highest default risk, known as high-yield bonds. Annual credit losses averaged roughly 12 basis points for BBB-rated corporate bonds over the last 25 years and 320 basis points for B-rated high-yield bonds. These credit losses vary substantially with the business cycle and are likely to rise sharply as the economic downturn intensifies and limits the ability of corporate borrowers to service their debt.

Looking beyond the current period of economic weakness, there are several factors that will likely work in tandem to affect the direction of corporate default rate.

First and foremost is overall GDP growth, which has a strong influence on trends in corporate earnings. History shows that a growth rate above 2% is most favorable for low default rates, probably because earnings are reasonably healthy during these periods (see Fig. 4.15). By contrast, growth rates below 2% are associated with a steep increase in the default rate.

5 For further details, see our Education Note, “Understanding Bonds, Part 8 – Inflation-Linked Bonds.”
A stable inflation environment of between 1.5% and 3% is the sweet spot for default rates, but we also find that default rates rise in periods of very high and low inflation (see Fig. 4.16).

In general, regulation can also alter the default risk profile of corporate bonds by limiting excessive risk-taking and rendering certain activities either unprofitable or off limits. If higher regulation leads to less volatile earnings, it could also bring about structurally lower default rates.

On balance, we find that our economic outlook, which consists of lower trend economic growth and the risk of higher inflation expectations, is not especially friendly to corporate bonds. Nevertheless, we believe that corporate bonds have already re-priced for such an environment and now provide an attractive yield premium to other asset classes.

Equities: value amid structural challenges

Over extended periods, equity prices can deviate a great deal from their fair value (see Fig. 4.17). During the Tech bubble, earnings growth estimates rose to over 20% per year, which ignored the growth potential of real economies and pushed markets to expensive heights at the end of the 1990s. With similar exaggeration, excessive pessimism is likely to emerge during crisis periods, driving prices below what fundamentals would otherwise warrant.

Both theory and history suggest that real equity prices should closely follow earnings (see Fig. 4.18). Dividends, and thus the cash flow to investors, are paid from earnings; while the growth of dividends depends on the reinvestment of retained earnings. This explains the popularity of P/E ratios for assessing whether prices are in line with earnings developments. However, this approach is insufficient to assess value and can lead to vastly inaccurate results if certain adjustments are not considered.

First, earnings are highly cyclical and value assessments need to be based on long-term earnings growth rather than earnings in one year. For this reason, Yale economics professor Robert Shiller applied a smoothing technique in his well-known book, *Irrational Exuberance*, that shows 10-year average earnings relative to equity prices. In addition, he compares inflation-adjusted (real) numbers in order to avoid temporary inflation-induced distortions.

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### Fig. 4.14: Inflation-linked bonds perform well amid inflation

Return under static deflation and inflation assumptions for buy-and-hold investors, in %

<table>
<thead>
<tr>
<th>Inflation rate</th>
<th>–3%</th>
<th>–2%</th>
<th>–1%</th>
<th>0%</th>
<th>1%</th>
<th>2%</th>
<th>3%</th>
<th>4%</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-year inflation-linked bond (2% coupon)</td>
<td>20.71</td>
<td>20.71</td>
<td>20.71</td>
<td>20.71</td>
<td>20.71</td>
<td>33.09</td>
<td>46.61</td>
<td>61.34</td>
<td>77.40</td>
</tr>
<tr>
<td>10-year nominal bond (3% coupon)</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
<td>33.09</td>
</tr>
<tr>
<td>Difference (in percentage points)</td>
<td>–12.38</td>
<td>–12.38</td>
<td>–12.38</td>
<td>–12.38</td>
<td>0.00</td>
<td>13.51</td>
<td>28.25</td>
<td>44.31</td>
<td>61.79</td>
</tr>
</tbody>
</table>

Source: UBS WMR

### Fig. 4.15: Default rates higher at sub-2% growth


Source: Bloomberg, Bureau of Economic Analysis, Federal Reserve, Moody’s Investors Service, UBS WMR

### Fig. 4.16: Default rates lowest at 1.5%–3% inflation


Secondly, the long-term, sustainable (or fair) P/E ratio might shift over time, reflecting trend changes in real interest rates and the equity risk premium. This is important since the required return for discounting future cash flow streams is made up of the real interest rate and the equity risk premium. The higher/lower the required return, the lower/higher is the fair P/E ratio.6

Fig. 4.19 shows the Shiller P/E together with another popular long-term valuation indicator, the “Tobin’s q,” which compares the value of a company or market with its replacement value. Like all simplified indicators, Tobin’s q has its drawbacks and limitations but it does offer a crude estimate of whether stocks are expensive or cheap.7

The Shiller P/E has fallen well below the postwar average of 18.5. Unsurprisingly, these types of valuation indicators usually point to strong value after long bear market corrections (see box on page 70). Thus, the return potential for equities might be highest precisely when investors have completely lost faith.8

This supports the view that investors require an additional future return above cash as compensation for the risk of holding equities. In times of financial market upheaval, this additional return needs to be higher than normal, which only can be achieved through lower equity prices. When the economy eventually stabilizes and risk aversion declines, the risk premium for holding equities declines as well, giving prices a boost (see box on page 65).

**Earnings revert to a more sustainable path**

In our view, a sharp earnings recovery is unlikely, and trend earnings are likely to be structurally weaker. We see four principal factors affecting earnings over the long haul:

---

6 Theory suggests that in a stable environment, or what economists call a “long-term equilibrium,” the fair P/E should match the inverse of the real return investors require for investing in equities. As an illustration, suppose that the real interest rate is 2.5% and the expected excess return of equities over bonds is 4.0%. This results in an overall expected real return for equities of 6.5% and would suggest a fair P/E ratio of 1/6.5%, or 15.4. However, should investors be content with an excess return of 3% and a 2% real interest rate, the fair P/E would increase to 20. This suggests that lower or higher interest rates should lead to higher or lower equity prices in the same way that changes in the equity risk premium do.

7 As a simple illustration, imagine a newsstand on a street corner that generates a fairly stable income stream. To value this business, you could either guess its future income stream and try to determine what it would be worth today, or you could estimate how much it would cost to build the same newsstand and generate the same business. As both businesses are identical, the cost to set up the business (replacement value) provide an estimate for the fair price. Otherwise, competition and arbitrage should set in and replacement costs would adjust until this was fulfilled. From this reasoning, we would conclude that the fair price should mirror the replacement value. Reality is unfortunately more complicated. For one thing, evaluating the replacement value of a given business involves much more than easy-to-quantify tangible assets, such as houses and machinery. There are less tangible aspects involved, such as know-how, patents and human capital. The newsstand might be in the perfect location and capture all of the local business. There might be entry barriers in setting up a new newsstand that are not immediately obvious. In the case of a company with an obsolete product, you might be able to calculate a Tobin’s q, but nobody would want to build the same company again and the value would be fairly meaningless.

8 Historical evidence suggests that those indicators show predictive power only over the long term but not over shorter time frames. See, for example, Cochrane (2001). Thus, investors should include other factors in their evaluation at shorter time horizons. For example, we strongly believe that an evaluation of cyclical conditions is important in assessing the return outlook over the next year. Welch and Goyal (2008) apply empirical regression models to test the forecasting power of standard valuation measures. For one-year periods, they generally do not find consistent predictive power in those approaches.
The equity risk premium

Since 1926, US equities have outperformed long-term government bonds by four percentage points and short-term Treasury bills by nearly six percentage points (see Fig. 4.19). Some observers see this as evidence of an equity risk premium – an additional return from investing in stocks rather than less risky securities, such as government bills and bonds. Throughout this period, however, the premium from investing in equities has varied considerably, and the present decade is turning out to be one of the worst on record.

The equity risk premium can be calculated in several ways. The technique applied in Fig. 4.19 derives an equity risk premium from historical returns. But this approach suffers from a major drawback: it does not serve as a useful future guide at a time when the trend in the equity risk premium is changing. For example, a trend decline in the perceived risk of holding equities can lead to unexpected windfall gains, such as between the early 1980s and the end of the 1990s. The excess returns during that period are a poor indicator of the equity risk premium since 2000 because the perceived risk of holding stocks increased once again.

Fig. 4.19: Realized equity returns and risk premiums

<table>
<thead>
<tr>
<th>Period</th>
<th>Absolute, in %</th>
<th>Relative to, in %-age points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal</td>
<td>Real</td>
</tr>
<tr>
<td>1926–2008</td>
<td>9.6</td>
<td>6.6</td>
</tr>
<tr>
<td>1926–1950</td>
<td>7.7</td>
<td>6.3</td>
</tr>
<tr>
<td>1950–2008</td>
<td>10.2</td>
<td>6.6</td>
</tr>
<tr>
<td>1926–1939</td>
<td>5.1</td>
<td>6.9</td>
</tr>
<tr>
<td>1940–1949</td>
<td>9.2</td>
<td>3.8</td>
</tr>
<tr>
<td>1950–1959</td>
<td>19.4</td>
<td>17.2</td>
</tr>
<tr>
<td>1960–1969</td>
<td>7.8</td>
<td>5.3</td>
</tr>
<tr>
<td>1970–1979</td>
<td>5.9</td>
<td>−1.5</td>
</tr>
<tr>
<td>1980–1989</td>
<td>17.5</td>
<td>12.5</td>
</tr>
<tr>
<td>1990–1999</td>
<td>18.2</td>
<td>15.3</td>
</tr>
<tr>
<td>2000–2008</td>
<td>−3.9</td>
<td>−6.4</td>
</tr>
</tbody>
</table>

Source: Ibbotson, UBS WMR

Estimates of fundamental return models avoid this problem. Over the past decade, various forward-looking models have pointed to a trend decline in the equity risk premium. Dimson, Marsh & Staunton (2006) concluded that investors expected an average 3.0–3.5% equity risk premium over short-term government securities. Falling transaction costs, the introduction of low-cost mutual funds and exchange-traded funds, new tax policies and tax-deferred savings programs, and improved transparency and accounting standards have likely increased the attractiveness of equities and contributed to a structural decline in the equity risk premium.

Fig. 4.20: The equity risk premium surged during the crisis

US earnings yield gap, in percentage points

Note: The yield gap is calculated as the earnings yield minus the real US bond yield, deflated using five-year average inflation. It represents an estimator for the equity risk premium.

Source: Shiller (2009), Thomson Financial, UBS WMR

See, for example, Fama & French (2002) and Dimson, Marsh, & Staunton (2006) for more discussion.

This estimate is calculated on a geometric mean basis. The authors also calculated an arithmetic mean premium for the world index of approximately 4.5%–5%.
Financial earnings. The financial sector, in particular, experienced much faster earnings growth than other industries since the 1980s, aided in part by the boom in credit. Financial profits grew as a share of overall corporate profits and as a share of GDP (see Fig. 4.22). This surge faces a rapid reversal in the wake of the financial crisis. And as we concluded in Chapter 2, the trend earnings potential of global financials will be much reduced in future, especially in countries that experienced the worst effects of the housing and financial crises.

How long financial sector earnings are constrained depends on how heavily the industry is regulated and supervised and how innovative it is in finding new growth opportunities. This will determine the future role of financial services in the global economy. Banks and other financial services firms will continue to play an important role in an expanding global economy in any case. Thus, profit growth in the financial sector consistently outpaced other industries since the 1950s – the one exception being the stagflation period of the 1970s (see Fig. 4.23). The future, however, may well tell another story for this important industry.

Commodity earnings. Fig. 4.23 also shows the exceptional growth of earnings outside the financial sector since the 1980s. Both the materials and energy industries experienced exceptional earnings as the commodity super-cycle gained momentum. With the global economy in deep recession now, earnings have fallen sharply in these industries. Given the reduced economic growth potential in developed countries, we think earnings estimates might still be somewhat optimistic. This also applies to utility companies that saw profit windfalls as a result of high energy prices. However, demand from Asia and other emerging markets will likely remain strong, especially demand from China and India, which will likely limit the downside in commodity-related earnings.11

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11 See the UBS research focus, “Commodities: a scarcity of abundance,” (2006) for a more detailed discussion.

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12 See the UBS research focus, “Commodities: a scarcity of abundance,” (2006) for a more detailed discussion.
On a positive note, falling commodity prices provide cost relief to other sectors of the economy, which helps support earnings. The same is true for sectors that are directly dependent on demand for final goods, which are supported by falling energy and commodity prices more generally.

**Labor costs.** Labor’s share of income has been on a downward path in a number of countries since the early 1980s (see box on page 69). Fig. 4.24 provides additional confirmation of this trend in the US, showing that labor costs have declined steadily as a share of GDP since the 1980s. Not coincidentally, profits moved higher as a share of GDP. Globalization, the marginalization of organized labor, and a surplus of mobile capital all played roles in cutting into workers’ share of the income pool. As labor becomes increasingly scarce in many developed countries thanks to their ageing populations, workers will likely begin to exert greater control over the price they charge for their time. Higher labor costs, we note, would cut into corporate profits.

**Corporate income tax rates.** Another less-than-obvious development that has supported earnings since the 1980s is the sharp reduction in corporate tax rates across the OECD (see Fig. 4.25). These cuts in corporate tax rates became viable when governments took control of deficits. Now, with the pendulum swinging in the other direction, there is a risk that corporate tax rates may rise, with negative consequences for the earnings that flow through to shareholders. Global competition for increasingly mobile international capital flows remains a counterbalancing force. If this mobility of capital is not unduly restricted in the aftermath of this crisis, the risk that sharply higher corporate taxation erodes the net income of equity investors is reduced.

Given the diversity of sectors and companies in overall equity market indexes, the risk to the sustainable earnings trend is much less pronounced than for individual sectors. Overall, we think a trend growth rate of real earnings of about 2.5% for the US serves as a good guide for dis-

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**Fig. 4.24: Lower labor costs supported profits**

Profits as a share of GDP, in %  Costs as a share of GDP, in %

<table>
<thead>
<tr>
<th>Year</th>
<th>Profits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>1960</td>
<td>16</td>
<td>31</td>
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<tr>
<td>1970</td>
<td>17</td>
<td>32</td>
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<td>1980</td>
<td>18</td>
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<td>1990</td>
<td>19</td>
<td>34</td>
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<td>2000</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>2010</td>
<td>21</td>
<td>36</td>
</tr>
</tbody>
</table>

Note: Profits adjusted for the value of inventories and depreciation. Source: Thomson Financial, UBS WMR

**Fig. 4.25: Corporate income tax rates have fallen**

Flat or top marginal corporate income tax rates, in %

<table>
<thead>
<tr>
<th>Year</th>
<th>Canada</th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Japan</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>60</td>
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</tr>
<tr>
<td>1986</td>
<td>39</td>
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<td>64</td>
</tr>
<tr>
<td>1991</td>
<td>38</td>
<td>43</td>
<td>49</td>
<td>53</td>
<td>58</td>
<td>63</td>
</tr>
<tr>
<td>1996</td>
<td>37</td>
<td>42</td>
<td>48</td>
<td>52</td>
<td>57</td>
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<td>2001</td>
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<td>47</td>
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<td>35</td>
<td>40</td>
<td>46</td>
<td>50</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>2008</td>
<td>34</td>
<td>39</td>
<td>45</td>
<td>49</td>
<td>54</td>
<td>59</td>
</tr>
</tbody>
</table>

Source: OECD

**Fig. 4.26: A break in US real earnings trend since 1950**

Real earnings for US equities, in log scale

<table>
<thead>
<tr>
<th>Year</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>1</td>
</tr>
<tr>
<td>1890</td>
<td>2</td>
</tr>
<tr>
<td>1910</td>
<td>3</td>
</tr>
<tr>
<td>1930</td>
<td>4</td>
</tr>
<tr>
<td>1950</td>
<td>5</td>
</tr>
<tr>
<td>1970</td>
<td>6</td>
</tr>
<tr>
<td>1990</td>
<td>7</td>
</tr>
<tr>
<td>2010</td>
<td>8</td>
</tr>
</tbody>
</table>

A dreadful period: Long Depression, Great Depression, two world wars

The post-war experience

Source: Shiller (2009), UBS WMR

**Fig. 4.27: Extreme inflation harmful for equities**

In %

<table>
<thead>
<tr>
<th>Year</th>
<th>US 10-year government bond yield</th>
<th>Five-year average US inflation</th>
<th>Earnings yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928</td>
<td>20</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>1938</td>
<td>19</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>1948</td>
<td>18</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>1958</td>
<td>17</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>1968</td>
<td>16</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>1978</td>
<td>15</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1988</td>
<td>14</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td>13</td>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>2008</td>
<td>12</td>
<td>-3</td>
<td>-4</td>
</tr>
</tbody>
</table>

Note: Equity yield is the inverse of the Shiller price-to-earnings ratio.
Source: Shiller (2009), Thomson Financial, UBS WMR
cussing the impact of different economic scenarios on future earnings expectations. This trend growth rate is significantly lower than that of the two decades preceding the financial crisis. At the same time, it is broadly in line with the post-war experience (see Fig. 4.26).

**Inflation, interest rates, and the risk premium**

Knowing when the economy will return to a more normal level of activity, allowing investors to start to feel more comfortable investing in equities, is a crucial aspect of the risk premium. Meanwhile, shifts in inflation expectations and the levels of government debt will influence equities via interest rates. Simply put, higher interest rates raise the hurdle for equities to outperform. Fig. 4.27 shows how an increase in inflation during the late 1960s and 1970s led to a trend increase in nominal bond yields. This yield increase was also accompanied by an increase in the earnings yield, which is simply the inverse of the P/E ratio. Equity investors were also accompanied by an increase in the earnings yield, which led to a decline in prices and P/Es. In the 1930s and 1940s, a period of deflation and sharply higher real bond yields, the earnings yield also soared. Deflation, combined with the real economic consequences of the Great Depression and later the war, probably kept risk aversion elevated in this period.

As suggested by the experiences of the Depression and the stagflation of the 1970s, inflation also works its way to equity prices through heightened risk aversion. In other words, investors identify certain inflation ranges with heightened economic risk. Both negative inflation and accelerating inflation are likely to send the equity risk premium higher. Higher inflation reduces the ability of businesses to make plans, which dampens investment and increases the potential to misallocate resources. The experience of the 1970s seems to support such a view, although the oil shocks themselves probably also contributed significantly to a rise in the equity risk premium.

**Model simulations**

US equities have tended to deliver the strongest returns after periods of extreme economic stress and financial market upheaval, which, not surprisingly, were times when stocks were at their least expensive levels. Does this generalization also apply today? From a return standpoint, the message is clear: 10-year real US equity returns have fallen to once-in-a-generation lows and have dramatically underperformed bonds. However, this alone need not guarantee good value, as the longer-term economic fallout from the financial crisis, as we outlined in Chapter 3, might justify further steep price declines. Moreover, inexpensive assets can become even cheaper during times of crisis, such as in the early 1980s or during the Depression.

To assess the current situation and consider different scenarios in fundamental value drivers, we applied WMR’s proprietary valuation model to US equities. We have similar models for other regions, but think that the US market

12 In theory, real interest rates should be considered when drawing comparisons with the earnings yield. However, anecdotal evidence suggests that investors compared the earnings yield to nominal bond yields during the inflationary period and afterwards. During the 1990s, the ratio between the earnings yield and the nominal bond yield became a popular way of assessing the fair value of equities. It was cited by Alan Greenspan when, as Fed chairman in 1996, he discussed the equity market valuation; and, for a time, was known as the “Fed model.” During the Depression, deflation made 3% bond yields an attractive investment in real terms, as long as expectations of falling prices (negative inflation) remained entrenched.

13 We apply a dividend discount model that uses the concept of discounted cash flows as its basis. Earnings, future cash flows, interest rates and risk premiums are modeled in several steps. Current earnings and the risk premium gradually adjust according to the trend scenario path. After 15 years, earnings and the risk premium converge to what we consider long-term equilibrium levels.

### Fig. 4.28: WMR valuation model points to upside for US equities

<table>
<thead>
<tr>
<th>Risk premium</th>
<th>Real earnings growth rate 0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>98</td>
<td>136</td>
<td>182</td>
<td>238</td>
<td>305</td>
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<tr>
<td>3</td>
<td>12</td>
<td>32</td>
<td>55</td>
<td>83</td>
<td>116</td>
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<tr>
<td>4</td>
<td>-21</td>
<td>-8</td>
<td>7</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>-39</td>
<td>-30</td>
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<tr>
<td>6</td>
<td>-50</td>
<td>-43</td>
<td>-35</td>
<td>-26</td>
<td>-15</td>
</tr>
</tbody>
</table>

Note: Risk premiums normalizes to 3.3% after 15 years, earnings growth returns to a more normal 2.7% after 15 years, and short-term real yields rise to 2% after five years.
Source: MSCI, Thomson Financial, UBS WMR

### Fig. 4.29: Uneven return potential across developed equity markets

<table>
<thead>
<tr>
<th>Risk premium</th>
<th>Eurozone</th>
<th>Switzerland</th>
<th>UK</th>
<th>US</th>
</tr>
</thead>
</table>
| Note: Risk premiums normalize to 3.3% after 15 years. Real earnings are assumed to grow at the rate of real economic growth, as outlined in Chapter 3 for each region, and then return to long-term growth for each country. Short-term real yields rise to 2% after five years.
Source: MSCI, Thomson Financial, UBS WMR |
A fundamental reassessment of asset returns

is the best proxy for equities in general, given that about half of the world market capitalization is in the US. The model allows us to simulate the impact of various assumptions for future earnings growth, real interest rates and the risk premium. The results of this analysis for the US market are presented in Fig. 4.28.

In our model, we use the postwar period’s trend level in real earnings as an orientation to simulate future earnings. We also seek to determine the value of equities if, over an even longer period of, say, 15 years, the growth rate in real earnings turns out to be much lower than the historical data indicates. Fig. 4.28 also illustrates how different equity risk premiums affect the outcome. A scenario that is broadly consistent with trends in US fundamental data since the 1950s, such as real earnings growth of between 2.5% and 3% and a risk premium between 3% and 4%, would point to significant return potential for US equities, similar to the conclusion reached with the Shiller P/E (see Fig. 4.21).

Labor and capital shares

The steady increase in income inequality throughout the world is a well-documented development during the great moderation, since the mid-1980s. Fig. 4.30 shows the share of total US income of the 10% of the population with the highest income. While this share was roughly one-third in the early 1980s, it increased to 45% in the subsequent quarter century, and to 50% if one includes capital gains. Given its sensitivity to the stock market, this figure might have declined since then, but remains very high.

The rising share of income to the top 10% of earners might reflect the lower share of income to labor relative to capital (see Fig. 4.31). Since the mid 1980s, labor’s share of income has been on a slight downward path in the US, and this trend is visible in other countries as well (see Fig. 4.32). After accounting for shifts in the relative size of various economic sectors, however, this trend is only statistically significant for the US, Japan and France.

**Fig. 4.30: Income inequality has grown in the US**

<table>
<thead>
<tr>
<th>Year</th>
<th>Excluding capital gains</th>
<th>Including capital gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>1933</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>1948</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>1963</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>1978</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>1993</td>
<td>55</td>
<td>60</td>
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<tr>
<td>2008</td>
<td>60</td>
<td>65</td>
</tr>
</tbody>
</table>

Source: Piketty and Saez (2007)

**Fig. 4.31: Declining labor income share since the 1970s**

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor share of income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>80</td>
</tr>
<tr>
<td>1933</td>
<td>75</td>
</tr>
<tr>
<td>1948</td>
<td>70</td>
</tr>
<tr>
<td>1963</td>
<td>65</td>
</tr>
<tr>
<td>1978</td>
<td>60</td>
</tr>
<tr>
<td>1993</td>
<td>55</td>
</tr>
<tr>
<td>2008</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Bureau of Economic Analysis, Creamer and Bernstein (1956), UBS WMR

**Fig. 4.32: A declining labor income share is visible in some G7 countries**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Italy</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>UK</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Germany</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Japan</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
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<tr>
<td>US</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: EU KLEMS Database, UBS WMR

Note: Excludes the government and primary (i.e., natural resource) sectors.
These results are broadly in line with results in other regions (see Fig. 4.27). In this cross-country/cross-regional analysis, we assume inflation-adjusted earnings grow at the same pace as a country’s real economic growth. As we wrote in Chapter 3, this will likely fall between 1.5% and 3% for developed countries. Slightly better value for equities is indicated for the UK and the Eurozone than for the US. For Switzerland, we expect more scope for potential gain than the model indicates, given the high degree of global integration of the major companies on the Swiss exchange. Barring a major retreat of global growth, this implies that Swiss corporate earnings should more reflect global growth than the lower trend rate of growth as assumed in the calculations for Switzerland shown in Fig. 4.29. Instead, if we allow Swiss earnings to grow at the same pace as the US, then results for both countries would be closer.

However, Fig. 4.29 also illustrates the key risks to equity investors if the earnings trend or the risk appetite were to decline further, thus pushing the equity risk premium even higher. As we outline in Chapter 3, we think the global economy will likely grow at a rather low pace for several years. Monetary and fiscal policy responses to the crisis raise the risk of higher levels of inflation in the future. And as the depth and length of this economic downturn are still unknown, we cannot ignore the possibility of a longer-lasting effect on risk appetites. As a study by Malmendier and Nagel (2008) reveals, traumatic experiences can affect an entire generation’s attitude toward risk (see box on page 75). The deeper the economic fallout of the crisis, the longer risk premiums will remain elevated.

Comparing the big bear markets

Taking the S&P Composite real return index as a guide, we identify four major bear markets in the US over the last 100 years: February 1916, September 1929, December 1968 and April 2000 (see Fig. 4.33). The index shows that equities have been in a secular bear market since 2000. The real return index coincides neatly with a top in the real price index, except in 1916 when the real price index peaked ten years before the real return index.

Analyzing these market downturns offers some very interesting insights. First, after a nearly ten-year run, today’s downturn in the real return index is the most severe of all bear markets, worse even than during the Depression, which kicked off with a much sharper initial sell-off but saw markets recover after about three years (see upper left). In terms of valuation, the Shiller P/E started the 2000 bear market at a higher level than our other major equity sell-offs, but the adjustment has been more severe, yielding P/E levels comparable to those of the Depression (see middle left). If normalized to 100 at the peak, the Shiller P/E has moved below the P/E in all other cases (see bottom left).

In absolute terms, the Shiller P/E is still above the level reached after the 1968 peak, but interest rates were much higher then, with inflation surging in response to the two oil price shocks in the 1970s. In the Depression and after the 1916 downturn, authorities held long bond yields stable at levels similar to today’s but inflation was much more volatile (see upper right and middle right). During the Depression inflation fell sharply, boosting real interest rates. And in the years following its 1916 peak, inflation surged to about 20%. As indicated by the five-year moving average of inflation rates, inflation has been much more stable since 2000 than during all prior bear markets (see bottom right).

We think this comparison convincingly demonstrates that investors need to take a long-term view when contemplating future equity market returns. They need to consider extreme events – both positive and negative – over the coming years and decades. If the financial system and the economic downturn show signs of stabilization, we could enter a prolonged bull market offering the buying opportunity of a lifetime. The major risks to such a positive scenario would be a further sharp contraction in economic activity, and a further implosion within the financial system. This is not our base case, but market participants appear worried about such an outcome.

14 Given that developed economies also share in the higher growth path of developed countries, these estimates have to be adjusted accordingly. In the US, for example, the share of earnings from abroad to total corporate earnings has increased steadily over the past decade.

15 In our analysis, we assume short-term real interest rates gradually adjust to around 2% during the next five years. The normal return – without any windfall capital appreciation – is the sum of the short-term real interest rate plus the equity risk premium. Should the risk premium remain at current elevated levels, this would mean that those returns need accrue over time via dividends and normal price appreciation in line with dividend growth. Should the risk premium fall, some of this return would be reaped upfront via additional capital appreciation, as happens when the market rallies.
Fig. 4.33: Comparison of the big bear markets

Trends in various US economic and financial variables after equities peak in real terms

US equity real return index, in log scale (start of bear market = 100)

Years following the peak

- 2000
- 1929
- 1916

10-year US Treasury yield, in %

Years following the peak

- 2000
- 1929
- 1916

Ratio of real US equity prices to the 10-year moving average of real earnings (P/E)

Years following the peak

- 2000
- 1929
- 1916

US annual consumer price inflation, in %

Years following the peak

- 2000
- 1929
- 1916

P/E index (start of bear market = 100)

Years following the peak

- 2000
- 1929
- 1916

Five-year moving average of inflation, in %

Years following the peak

- 2000
- 1929
- 1916

Source: Shiller (2009), Thomson Financial, UBS WMR
Real estate: stricter regulation and lower yields

The illusion of limitless wealth creation fueled by uninterrupted rising property prices has come to a painful end for many homeowners, investors, and the global economy as a whole. The overinvestment cycle in residential and, to a lesser extent, commercial property, was triggered by several factors, as we outlined in Chapter 1. Alongside the overall bursting of the housing bubble, real estate listed on exchanges has also corrected sharply. The correction in unlisted real estate is unfolding more slowly but will also be more prolonged.

Rental growth is the fundamental driver of commercial property values. In many countries, such as the UK, there has been strong growth rates of rental income, during the last period of economic expansion and the accompanying real estate boom. As these countries are now in recession and demand for commercial real estate generally, and office space in particular, shrinks sharply, rental income growth is turning negative and driving property values far below previous levels (see Fig. 4.34). Depending on the region, further declines are likely, as economic activity is still weak. Thus, commercial real estate prices remain at risk until demand stabilizes (see Fig. 4.35).

Assuming that financial firms and consumers continue to reduce leverage to restore their balance sheets, property investors will face difficult conditions for several years. First, banks’ lending standards will remain stricter and much more linked to the repayment capabilities of the borrower, rather than to pro-cyclical valuation models of underlying properties. In particular, the degree of leverage (debt) allowed when making private property investments will likely be curtailed for a prolonged period of time, and the capital required will be increased.

Regulators are also likely to impose stricter regulation on financial institutions and force them to keep part of the credit risk of initiated consumer and mortgage loans on their own balance sheets to create incentives for higher credit standards. Overall, such a framework should lead to lower yields for property investors, limit excessive investments and smooth property prices over the economic cycle. Given the damage done lately to the global economy we believe that the political will to adopt such measures is very strong.

Commodities: a partial inflation hedge

Commodity prices are ultimately driven by physical supply and demand. Over the long term, as the economy stabilizes, supply limitations and bottlenecks and structurally higher demand for commodities will likely revive to support prices.

Our growth forecast for crude oil demand stands at 1.1% to 1.4% per year for the next few years. With emerging economies continuing to converge to developed country incomes, we expect a positive demand trend for base metals, agricultural commodities and platinum group metals (PGM) once negative cyclical forces fade. We think recessionary price levels are unsustainable in the long run, as higher prices are needed to attract the investment needed to meet these demand projections. Once the economy stabilizes – albeit at a lower trend growth rate in most developed countries – energy, base metals and PGM prices should benefit the most.

Commodity prices are highly influenced by changes in productivity. If productivity in supplying a commodity falls, the price of a commodity tends to increase, and vice versa. Although future productivity developments are difficult to assess, we think commodities can be clustered into several groups, according to ease of production.

Within the crude oil complex, productivity is falling, which shifts the entire cost curve higher. The production from an oil field declines on average by 5%–8% per year if no additional investments are made. Moreover, new fields are more remote and more difficult to operate. Thus, cost increases are routine, even as volumes remain unchanged.

Fig. 4.34: UK rental growth for office space in free fall

Fig. 4.35: Valuation of global REITs has corrected
With copper, ore quality is decreasing and new mines come with higher production costs. The same is true for gold and platinum, where costs have increased continuously.

On the agriculture front, there is still scope for productivity increases. This makes agricultural commodities less attractive from a productivity perspective. When productivity increases, prices tend to come under pressure, as producers are able to supply a given volume at lower cost. That said, volatile weather patterns and climate change could hurt productivity and keep agricultural prices structurally elevated.

Like equities and real estate, commodities are real assets, which means they offer some protection against inflation over longer periods. However, given the steep swings in commodity prices and shifts in productivity, inflation is not necessarily the leading driver of returns (see Fig. 4.36). But if inflation were to result from an overheating economy and supply restrictions remained intact, commodities offer a good hedge as long as those conditions persist. This was the situation that prevailed in 2008, before the global economy turned down. Probably the biggest risks to commodity investors over the long term are factors that reduce scarcity, such as new discoveries of oil and metal deposits, or productivity-enhancing innovations.

The inflation link works a bit differently for precious metals, especially gold. It is broadly accepted that gold benefits from soaring inflation expectations (see Fig. 4.37). No other commodity has this “store of value” feature that also makes it an alternative to holding cash. Consequently, gold can experience big price swings due to speculative, or herding, behavior. Gold will likely remain supported as long as both hyperinflation and deflation hover on the horizon as plausible economic possibilities. The safe-haven appeal of gold and silver has no influence on other commodities. Therefore, the insurance benefit from holding gold will likely fade when financial market conditions normalize, reducing gold’s price premium and leading to a drop in value.

Except for precious metals, physical possession of commodities is generally impractical, forcing individual investors to use futures or futures-linked indices to build positions. This exposes investors to roll yields. For the Dow Jones/AIG constituents, roll-yield losses have averaged around 5% per year since 1991. This reduces the return expectations as indicated in the spot price, and must be considered when investing in commodities.

Conclusion

By any measure, we are at a watershed in modern financial history. For investors, we think this turning point demands a clear-eyed review not only of assets and portfolios, but also of the methods used to evaluate them.

Even investors with lengthy time horizons need to reassess the valuations and fundamental risks of their assets in light of the crisis. For example, our economic outlook poses challenges to both nominal government bonds and equities, but with one important distinction. While the

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**Fig. 4.36: Inflation not the only driver of commodities**

CRB index and US CPI (1970 = 100)

Source: Bloomberg, Bureau of Labor Statistics, CRB, UBS WMR

**Fig. 4.37: Gold benefits from sharply higher inflation**

Annual gold price change, in %  
Annual US CPI inflation, in %

Source: Bloomberg, Bureau of Labor Statistics, UBS WMR
The factors that drive returns for virtually all assets have been jolted by this crisis. Economic growth will be slower in the years ahead than in years past, and we think higher inflation is a likely consequence of the flood of liquidity. But we see reasons to believe that sustainable growth will revive. The aftermath of the crisis will seem austere after its bubbling prelude, but it will offer investors attractive opportunities. Investors should carefully consider increasing exposure to higher risk assets at this juncture in order to participate in what could turn out to be a substantial opportunity to grow wealth, perhaps even as early as this year.

recent sharp corrections in equities and corporate bonds now better reflect the weakened business outlook, we think both assets appear attractively valued long term.

We believe that reflationary policies will ultimately succeed in stabilizing the global economy. But we think this broadly favorable development poses a major risk for nominal government bonds. Thus, we favor inflation-linked bonds as a defensive asset in this environment as they insulate investors from rising inflation or its expectations.

Listed real estate has adjusted sharply since the crisis began, especially in regions where oversupply is most visible. Despite its now reasonable valuations, we think this asset class is likely to remain burdened by a supply overhang that will continue to limit rental income growth. Commodities are also suffering from falling demand. However, longer term, limited supply growth could lift a range of base commodities even in a recovery that we think will see only fairly muted global growth in the years ahead.
Neuroscience and financial trauma

The crisis has the potential to become a defining economic and financial event of the current generation of investors. Not only have global markets crashed, but institutions created in response to prior crises and entrusted with the task of restoring economic health have so far failed to do so. We think it is not exaggerated to describe the events to date as a shock. But can macroeconomic shocks change individual financial and investment behavior? And if they can alter how people invest, for how long?

A study by Mansuy et al. (2008) of the University of Zurich and the Swiss Federal Institute of Technology (ETH) focused on how memories of traumatic events are stored in the brain. Their experiments with mice show that the brain stores traumatic memories very differently than it does other experiences. Trauma-induced memories are permanent, and may affect or sensitize behavior over a lifetime. According to their research, traumatic memories may be mitigated by subsequent positive experiences, but they are never fully forgotten. The subject remains sensitized to the initial trigger event, and similar experiences re-initiate anxiety and potentially adverse behavior. The persistence of traumatic events in a person’s memory is confirmed by Post Traumatic Stress Disorder seen frequently in combat veterans and in the long-lasting memories of serious illnesses or accidents. Could a financial shock be similarly traumatic, capable of fundamentally altering investors’ behavior?

There is evidence from behavioral finance that it can. Malmendier & Nagel (2006) have found that investors who lived through the Crash of 1929 and the Depression exhibited higher risk aversion, invested a smaller fraction of wealth in risky assets, and were less likely to participate in stock markets than investors who experienced higher market returns over the course of their lives. This contradicts assumptions built into most traditional economic models that assume investors’ risk tolerance is heterogeneous but stable for each individual (people with a high risk tolerance always have a high risk tolerance). A further assumption is that market participants have the full range of historical market data available to them and should rationally avail themselves of it, basing their decisions on well-reasoned calculations, not merely on their direct experience.

Whether a broad and lasting impact on risk-taking develops from the current crisis depends upon whether events are severe enough to reach a traumatic level. Clearly, at the individual level, many people have experienced financial shocks. Portfolios have been severely hit. Job losses have been increasing. In the US, the unemployment rate has surged to over 8% – the highest rate since 1983 – and 4.4 million jobs have been destroyed since December 2007. However, these numbers, bad as they are, are nowhere near Depression-era levels. At its peak then, US unemployment hit 25%. Unemployment and the lost wealth – highly personal and traumatic events – were widespread. It is therefore understandable that aggregate changes to savings and spending patterns would emerge from the present situation.
Chapter 5

Investing in trying times
Chapter 5

Investing in trying times

As investors reassess their risk appetites in the wake of the financial crisis, we continue to stress the benefits of diversification at all risk levels. Knowing where the “real” risks to your portfolio lie, especially in assets traditionally perceived as safe, is more important than ever now.

Evaluating opportunities and risks

Faced with a global financial crisis and a deep recession, investors have naturally sought safety in cash, government bonds and gold. The steep fall in equity markets has caused investors to question some long-held investment beliefs and may have dealt a serious blow to the equity culture that developed over the past 20 years. How should investors deal with this very different environment? After a year when risky assets behaved in a highly correlated manner during a broad financial market sell-off, should investors abandon the practice of combining different asset classes to diversify risk?

Before addressing these questions, we note that portfolios of equities, commodities, real estate, bonds and gold have yielded diversification benefits over the past year and more. There have been periods when nominal bonds and equities posted negative returns in tandem, but bonds tend to deliver diversification benefits precisely when this is most critical, as they have so far during this crisis.

The present situation is complicated given that outcomes depend increasingly on policy decisions and the ability of governments to design and implement a significant economic recovery. Often, what might look obvious in hindsight may not have been so clear when decisions were made. For example, the potential for a surge in inflation once the crisis passes depends on policy decisions, agility and timing on the part of governments, adding an additional layer of uncertainty to an unclear situation. As long as there is the potential for extreme market outcomes, there are strong benefits from combining diverse asset classes together in portfolios.

Base case: slower growth, higher inflation

Our base case1 economic forecast – the one we think most likely – assumes that the global economy stabilizes during 2009, but that any recovery will only be very muted. Over the next decade or so, we forecast lower trend growth than during the preceding decade. More government regulation, especially in the financial sector, will likely further weigh on companies’ potential to generate earnings. On the flipside, we expect most emerging market countries, especially China and India, to continue to bolster global growth as their economies catch up to developed countries. With regard to inflation, we forecast rising inflation expectations as a result of the round of reflationary policy measures presently unfolding.

Understanding extreme scenarios

In Fig. 5.1, we identify different potential economic growth and inflation outcomes and also specify where each asset class will likely derive the most support.

We constructed four extreme macroeconomic scenarios, each with a different probability, to consider how asset classes might perform in different growth and inflation environments.

- **Supercycle (high growth & high inflation).** As shown in the upper right-hand corner of the diagram, this scenario would occur if the reflationary policies now underway work faster than we expect. Policymakers may err on the side of being too accommodative, such that resource bottlenecks could reemerge. This is the major risk scenario facing investors in nominal bonds, but also the most positive one for real estate and commodities, for example.

- **Stagflation (low growth & high inflation).** Moving to the bottom right corner, we find low growth coupled with high inflation, which is a negative for most asset classes and corresponds to the stagflation environment of the 1970s. Inflation-linked investments, such as US Treasury Inflation Protected Securities, would be the favored asset class in this scenario.

- **Deflation (negative growth & negative inflation).** If a sustained decline in prices emerged, this would most likely occur in combination with much lower growth than in our base case. The extreme outcome here, as noted in the bottom left-hand corner, would be outright deflation as experienced during the Depression. In this scenario, nominal government bonds would perform very well.

- **Goldilocks (high growth & low inflation).** High growth combined with low inflation, such as the experience of the past few decades, would benefit equities generously, as long as the inflation trend does not dip too low. And, in any event, extremely low inflation appears to be an unlikely outcome when growth is strong.

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1. The financial crisis and its aftermath
Finding the outperformers

Fig. 5.2 summarizes the impact of different scenarios on the major asset classes and their likely performance, according to our analysis. In the first four columns we evaluate the extreme deviations from our base case: supercycle, stagflation, Goldilocks and deflation. We indicate how a major change in macroeconomic variables affects asset classes, regardless of valuation considerations. In the fifth column we provide our assessment of present valuations. Here, we assume that fundamental trends in earnings and risk premiums will approximate the experience since the 1950s.

In the last column, we combine those valuation signals with our macroeconomic base case to determine the return potential of the different asset classes. A plus sign points to an excess return over cash that sufficiently compensates for asset-specific risks. In the case of equities, we expect a return of more than 3.5% above short-term real bond yields, which we think is sufficient compensation for taking on equity risk within a portfolio. For example, if bonds provide 2% real returns, then equities would be expected to deliver at least a 5.5% compound annual real return over the long term. Also corporate bonds are expected to do well, although the normal risk premium is expected to be considerably lower than it is for equities.

1 In technical terms, the base case scenario represents the expected values over different possible outcomes. For inflation, for example, readers can think of a continuous distribution function describing our views on the likelihood that inflation will actually fall in certain intervals. The base case is the expected value as determined by this distribution function.

2 For inflation-linked bonds, we assume that the principal amount does not adjust below par in a deflationary environment, which provides upside to real (adjusted for inflation) returns should deflation materialize. Not every real bond provides such a floor. See the discussion of inflation-linked bonds on page 62 for more detail.

Fig. 5.1: Asset class locator for each scenario

Potential scenarios and environments in which we expect asset classes to deliver their best real returns

Finding the outperformers

Nominal government bonds held in conjunction with equities provide important diversification benefits at all risk levels.
Nominal government bonds: Fixed-rate government securities are not as safe as some investors might think. In all cases where inflation is set to rise, including our base case, nominal bonds are set to lose out in real terms and are actually rather risky. On the flipside, this asset provides protection in the extreme event of deflation. Owning bonds from countries that have a long track record of repayment, healthy economic growth, and political stability can offer safety to investors who are concerned about the most extreme negative socioeconomic and geopolitical outcomes (see box on page 82).

Corporate bonds. The yield spread of corporate bonds over government bonds provides a layer of protection if growth and inflation were to be higher than markets currently anticipate. In contrast, the nominal income stream would become even more valuable during periods of lower inflation and even deflation. The single most important risk factor is a sharper rise in corporate defaults than any experienced during the past few decades. Investment grade bonds are less risky than high yield or speculative bonds, which would be expected to suffer much more in a deflationary outcome. Valuation levels indicate that corporate bonds should offer attractive additional return above government bonds over the long term, even as we expect sharply rising default rates in our base case scenario.

Inflation-linked bonds. Bonds that adjust according to inflation are appealing in most scenarios. They protect against inflation with a high degree of safety, provided the issuers – mainly governments – remain solvent. At the same time, inflation-linked bonds even might provide additional potential gain to real returns, similar to nominal bonds in a deflationary outcome.3

Equities. Our previous valuation analysis indicates that in a scenario where the economic environment stabilizes, equities should offer significant outperformance. A full-blown depression is the major worst-case risk for equity returns.

Commodities. Investments in commodity indexes should prosper in the high growth and high inflation directions. High growth supports demand for base metals, oil and energy generally. Given that these are real assets, they offer some protection against inflation, especially when commodity shortages are the source of the price pressure. In the current situation we think high real growth would be the more supporting factor, as it would directly feed into higher physical demand. In contrast, gold is generally expected to offer protection against extreme outcomes. However, this also implies that any stabilization in the economy will send gold prices lower, as safe-haven assets lose their appeal.

Real estate. The high growth state is the most preferred scenario for real estate, as it tends to support real rental income growth.

The portfolio context: putting it all together

Expected return and risk determine the attractiveness of assets. How assets behave under different scenarios matters in a portfolio context.2 The more divergent the behavior of assets to the same situation, the better the diversification potential they offer, and thus the greater their ability to reduce overall portfolio risk when combined. For example, nominal government bonds offer the best return outlook in the case of deflation, exactly when equities are expected to do worst. But in all other cases, we expect equities to outperform bonds. Thus, equities and bonds are negatively correlated, which produces diversification benefits when they are combined in a portfolio.

Fig. 5.2: Valuation and scenario considerations

<table>
<thead>
<tr>
<th>Impact of fundamentals in extreme scenarios</th>
<th>Value indications</th>
<th>Base case1 Value &amp; fundamentals combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supercycle</td>
<td>Value</td>
<td>–</td>
</tr>
<tr>
<td>Stagflation</td>
<td>Value</td>
<td>+</td>
</tr>
<tr>
<td>Goldlocks</td>
<td>Value cheap</td>
<td>neutral</td>
</tr>
<tr>
<td>Deflation</td>
<td>Value cheap</td>
<td>neutral</td>
</tr>
</tbody>
</table>

1 Investors unable to buy inflation-linked bonds in their home currency are faced with currency risk if they buy such bonds in a foreign currency. This can be addressed through currency hedges.

2 In portfolio theory, the behavior of different assets is generally expressed in terms of their co-movement over different time periods via correlations (capturing linear dependencies between returns).

3 A correlation of 1 means returns are fully correlated and thus move 1 to 1, which offers no diversification benefit. The less assets are correlated, the higher the potential diversification gains from pooling these assets together in a portfolio.

4 For inflation-linked bonds, we assume they include a deflation floor on the principal amount, which at least partially kicks in as consumer prices fall.

Source: UBS WMR
Fitting the profile
The left side of Fig. 5.3 shows a spectrum of optimized portfolios for different investor risk profiles. Included in these calculations are nominal government bonds, corporate bonds, equities and cash. The horizontal line indicates risk levels, whereas the vertical axis shows the share of various assets in the overall portfolio. We assigned probabilities to the base case and the four extreme scenarios according to our assessment of their likelihood. We also assigned concrete return forecasts to each asset in each scenario. For example, we assumed in the simulations that the base case has a 40% probability of occurring, and the return estimates are consistent with our classifications as indicated in Fig. 5.2.

Consistent with our assessment, cash, and to a lesser extent nominal government bonds, figure prominently at the low end of the risk scale. The low nominal government bond exposure across the risk spectrum derives from its poor valuation and unfavorable risk-adjusted return expectations.

As we move along the spectrum to somewhat higher risk instruments, cash is replaced with corporate bond and equity exposure. Equity exposure increases along with risk, but in the lower-risk part of the spectrum, corporate bonds are clearly the preferred means for increasing risk exposure. However, at the very low end of the risk range, our findings suggest that equities may be a better diversifier than corporate bonds despite their higher volatility, given the high exposure to cash and government bonds. As we move toward higher risk levels, eventually cash is fully eliminated from the portfolio, and then corporate bond exposure is also reduced. Equities dominate because of their overall higher expected return potential. In the higher risk area, a small portion of nominal bonds remains in the portfolio along with equities because of the substantial diversification benefits that are derived from holding the two assets.

On the right side of Fig. 5.3 we continue to assign a 40% probability to our base case, but we consider the four extreme scenarios as equally likely. This increases the risk of outright deflation and decreases the risk of stagflation. In contrast to the previous optimization, corporate bonds have a less prominent role in lower-risk portfolios. Interestingly, the share in equities is little affected and the substitution mainly happens between nominal government bonds and corporate bonds. This makes sense, we think, as those asset classes are closer substitutes, and higher

In our view, even fairly defensive investors can boost risk-adjusted returns through corporate bond exposure.

Fig. 5.3: Corporates enhance return at lower risk budgets, much less so with higher deflation risk
Stylized portfolio asset weights across levels of portfolio risk, in %

Source: UBS WMR

In the simulations, we applied standard mean-variance optimization techniques to generate optimal portfolio weights. The aim is to illustrate key portfolio properties but not to identify a single optimal portfolio, as this would require an evaluation of the individual investor’s risk profile. In addition, our assumptions and frameworks here are highly simplified, attaching return expectations to discrete outcomes. However, we believe the results clearly indicate important properties of optimal portfolios, and we assessed the robustness of our results to changes in those assumptions.
A financial crisis with geopolitical consequences

Since men wore periwigs and worried about Napoleon’s expansionism, it has been an axiom of economic wisdom that free trade creates greater wealth (see footnote 1 on page 12). Examined theoretically and historically, protectionism’s flaws are well understood, but, like so many other bad ideas, this insight has not led to its extinction.

Periods of economic weakness offer politicians an all-too easy opportunity to advocate protectionist measures (see Fig. 5.4). The Smoot-Hawley Tariff Act of 1930 raised import duties in the US on more than 20,000 products. America’s trading partners retaliated in kind, of course. Within three years, imports had fallen by about two-thirds, and exports by nearly as much (see Fig. 5.4). It is difficult to determine just how much of this damage was due to the 1929 crash alone and how much the Act made a bad situation worse. But over the same period GDP “only” halved, a decline that protectionism surely abetted.

The current crisis should not be viewed as the Tech bubble but on a wider scale. When that bubble burst, geopolitics continued along the same track in all fundamental respects: global politics were based on the same principles and the relationships between rich and poor nations were fundamentally unchanged.

We are seeing not just the loss of wealth, but profound changes in its distribution as well. As the crisis is rooted in global imbalances, in our opinion, the unraveling of these asymmetries could have the power to change the nature of global political relations. And, predictably, an ailing global economy produces local cries for the economic nationalism of protectionist measures.

US consumers are being urged to “Buy American” today from various quarters, something that Asian economies have been doing for quite some time, in the form of US Treasuries. It has not taken long for protectionism to make a comeback, and not just in populist rhetoric, but in policy terms, too: “Since the beginning of the financial crisis, roughly 78 trade measures have been proposed or implemented, of which 66 involved trade restrictions. Of these, 47 measures were actually implemented, including by 17 of the G20.” (World Bank, 2009)

One study of the likely outcomes of higher tariffs finds that a 10% hike in import against emerging Asia would lift the US current account balance as a share of GDP by just a tenth of a percentage point (Faruquee et al., 2006). What is more, such an action would probably trigger retaliatory tariffs that would in turn erode any initial gains for the US and leave the world worse off than before. Ultimately, argue the authors, a protectionist surge would lower global growth without resolving the underlying global imbalances. As Levine (2009) notes, the US and other developed economies have been threatened because the growth in emerging economies of China, India and elsewhere has not been “enough or fast enough to cushion the rest of the world against shocks or to compensate the specific losers in the rest of the world.” The imbalances may have shifted, but they remain intact.

The issues that fuel protectionism will not be resolved without pain, whatever route is taken. While the crisis has been ruinous in developed economies, evidence is mounting that it is at least temporarily forcing many workers in developing economies deeper into poverty. According to

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**Fig. 5.4: World trade spiral, January 1929–March 1933**

Total imports of 75 countries (monthly values in terms of millions of US gold dollars)

**Fig. 5.5: Rising share of US profits earned abroad**

Profits from abroad as a share of US GDP, in %
the World Bank in March, the Ministry of Labor in China estimates that 20 million people are jobless. The most affected sectors “appear to be those that had been the most dynamic, typically urban-based exporters, construction, mining and manufacturing” (World Bank, 2009). In India, more than 500,000 jobs were lost over the last three months of 2008 in export-oriented sectors. The Bank cites International Labor Organization forecasts of up to 30 million workers unemployed. These trends may have long-term effects that outlive the global recession.

Indeed, the World Bank has warned that, “Absent assistance, households may be forced into the additional sales of assets on which their livelihoods depend, withdrawal of their children from school, reduced reliance on health care, inadequate diets and resulting malnutrition. The long-run consequences of the crisis may be more severe than those observed in the short run…estimates suggest that the food crisis has already caused the number of people suffering from malnutrition to rise by 44 million” (World Bank, 2009).

The crisis is also hurting labor productivity in developing economies, as workers increasingly shift out of the more dynamic export-oriented sectors and move back to rural areas. The same World Bank report warns that such trends are likely to “deepen the degree of deprivation of the existing poor, since large numbers of people are clustered just above the poverty line and particularly vulnerable to economic volatility and temporary slowdowns.”

Emerging market debt may also be crowded out by the wave of bond issuance from developed countries to revive their economies, with widening spreads leading to less investment and slower growth in the developing economies. The World Bank estimates that more than USD 1 trillion in emerging market corporate debt and USD 2.5 to USD 3 trillion in total emerging market debt will mature in 2009: “Most of this lending is in foreign currency, and for relatively short terms, meaning that the currency and maturity risks are primarily on the balance sheet of EM banks, corporates and households.”

Finally, emerging market growth will likely be further depressed by an ongoing reduction in foreign direct investment. Between August and November 2008, new private FDI in developing countries was about 40 percent lower than in the previous year. Former US Deputy Treasury Secretary Roger Altman (2009) argues that, in the event of collapses such as those of the Mexican economy in 1994, “major economic assistance from the US or key European nations is unlikely. Instead, the IMF will have to be the primary intervenor.” But the IMF does not have the resources to support many small countries simultaneously, or a single big country.

That countries, industries and people in the developing world are suffering as a result of the crisis does not mean that certain developing economies could not see their situations improve relative to the developed world. China is a case in point. It has massive current account surpluses – some USD 2 trillion in foreign exchange reserves – and, while growth is fading, it is doing so from a much higher level than in Europe or the US. And, as a proportion of GDP, China’s USD 600 billion stimulus package dwarfs those of many other nations.

China is surely not isolated from the global financial crisis, but it has the potential to spend, to look beyond its borders and build alliances while many developed countries are turning inward. The view that China’s excessive savings or alleged currency manipulations is somehow malevolent should be met with healthy skepticism at a time when its five stars are in the ascendancy. And purely from a business perspective, protectionism and rhetorical posturing can only be counterproductive since, as a share of GDP, foreign-earned corporate profits have risen sharply in the US since the turn of the 21st century (see Fig. 5.5).

Because the crisis has gripped the entire world, its resolution will likely be global as well. Protectionism and beggar-thy-neighbor strategies might appeal as populist quick fixes, but ultimately, they will likely just backfire and delay recovery. This is one lesson from the Depression of the 1930s that we should have learned by now.

A fragile and challenged model of international trade, “Globalization 1.0,” has been shaken to its core. The shape of its successor is not yet clear, and real dangers lurk, but most would agree that the world has been greatly enriched by the free movement of capital, goods and labor. We expect this dynamism to find new channels of expression in the years ahead.
Deflation risk increases the relative attractiveness of government bonds versus corporates. Clearly, investors who are very concerned about deflation should consider holding a higher share of government bonds versus corporates, but not necessarily at the expense of equities, which provide strong diversification benefits.

**Inflation-linked logic**

In Fig. 5.6 we illustrate how results are influenced when we add inflation-linked bonds into the portfolios. We assume that those bonds provide additional upside in real terms in the deflation scenario because of the deflation floor they enjoy on the principal amount. Now, cash is not present in the portfolios at all, reflecting that inflation-linked bonds – and not cash – are the safer asset if viewed from a real return perspective. Nominal government bond and equity exposure increase at higher risk levels. The medium risk range includes investments in corporate bonds, but less than in the previous optimization that did not include inflation-linked bonds in the portfolio. At the high end of the risk spectrum, equities again take the lion’s share of the portfolio, as they offer the highest expected return overall. Nominal bonds also maintain a share in the portfolio due to its higher diversification potential in conjunction with equities.

**The bottom line**

Overall, our scenario and risk profile analyses yields the following insights:

- For low-risk portfolios, inflation-linked bonds dominate alongside equities. Inflation-linked bonds take on the role of the “safe” asset, not cash.
- Investors who do not invest in inflation-linked bonds and want to build a very low risk portfolio can pursue a mix of cash, nominal bonds and a smaller share of equities.
- Moving along the risk spectrum to higher risk levels, nominal bonds replace inflation-linked bonds as the share of equities increases, which allows for better diversification. The strength of substitution depends on the deflation properties of inflation-linked bonds and whether those bonds have a binding deflation floor.
- In low- and medium-risk portfolios, corporate bonds improve risk-adjusted returns while enabling investors to build exposure and benefit from cyclical upswings. In today’s extreme conditions, asset class diversification is more important than ever in a portfolio.  
- To increase return expectations requires exploring the upper realms of the risk spectrum, with portfolios becoming more heavily tilted towards equities.
- The higher the probability investors attach to the outcome of deflation, the more it makes sense to tilt portfolios towards government bonds, inflation-linked bonds, and, potentially, cash.
- Conversely, to expect that reflationary policies will finally succeed implies a tilt towards corporate bonds and equities.
- Gold makes sense as an additional layer of safety for investors who are mainly concerned about extreme deflation and stagflation outcomes. However, any trend towards normalization in the macroeconomic environment could be accompanied by potentially large price declines.

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**Fig. 5.6: Inflation-linked bonds preferred to cash**

Stylized portfolio asset weights across levels of portfolio risk, in %

<table>
<thead>
<tr>
<th>Low portfolio risk</th>
<th>Medium portfolio risk</th>
<th>High portfolio risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>Nominal government bonds</td>
<td>Corporate bonds</td>
</tr>
</tbody>
</table>

Source: UBS WMR

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6 Risk-averse investors might prefer to first invest in high-grade corporate bonds or even government-guaranteed bonds. Speculative- or high-yield bonds will likely remain more volatile, as long as the economic situation remains unstable and recession entrenched. Furthermore, default risk is significantly higher with high-yield bonds than with investment-grade bonds.
**Base case considerations: if reflation succeeds**

Clearly, cyclical assets, such as equities, real estate and commodities, tend to move in the same direction in response to large macroeconomic events. This synchronicity certainly prevailed during the years leading up to and now during the financial crisis. However, we believe these assets offer diversification benefits over long timeframes. For example, real estate and commodities might react more positively than equities to a sharp rise in inflation. Also, their cash flow streams are different. Real estate income depends on rental revenue, whereas equities derive their income from earnings and dividend growth. Meanwhile, commodity returns will depend to a large extent on supply and productivity growth.

These asset-specific fundamentals can develop very differently, even in the same overall macroeconomic environment. Although we think that equities are now inexpensive enough to offer solid real returns in an environment of lower growth and higher inflation, diversifying some of the equity exposure into other real assets would likely benefit investors if inflation expectations were to rise even more than we expect. This is especially true for certain types of commodities, as we expect supply constraints to reemerge, which would enable commodities to provide an additional layer of inflation protection.

**Conclusion**

Asset class diversification is a key factor in portfolio decision-making, especially in today’s extreme conditions. Although equities have fallen sharply since their peak and have posted negative real returns during the past decade, we recommend exposure to this asset class in combination with bond investments. This applies even for conservative investors. The traditional mix of nominal bonds and equities has appeal, especially in times when extreme outcomes are probable. Nominal bonds provide shelter against deflation. Equities offer potentially strong returns in the event that the economy stabilizes. Even if the economy entered a stagflation episode like the 1970s, equities are nowhere near as expensive as they were then, and they already factor in a lot of risk.

Investors with a sufficiently long time horizon and the ability to withstand further market volatility should consider adding more significant exposure to equities, given that deflation is an extreme scenario and not our base case. Investors concerned about soaring inflation should consider investing in inflation-linked bonds. In our view, inflation-linked bonds are the preferred long-term safe asset, even over cash. Gold might also play a role in a mixed portfolio context, especially if major geopolitical risks were to increase. For pure protection against inflation, we prefer inflation-linked bonds, as gold prices have already been bid up due to heightened risk aversion.

**Regional considerations still matter**

We have focused on asset class considerations and global macroeconomic scenarios as the key drivers of long-term portfolio returns. However, regional aspects also play a role. Although regional equity and bond markets have become increasingly correlated over the past few decades, performance deviations are still observed. These may be due to differences in economic outlook, policy responses, debt and current account developments, resource restrictions and industry structures. Furthermore, we think that the countries that took on the most leverage leading up to the financial crisis are the ones that will see the greatest reduction in trend growth rates in future. There are also major differences emerging among countries with respect to debt-to-GDP levels and the outlook for inflation expectations, in our view, with potentially dramatic consequences for exchange rates. Those investors who are concerned about some of the most extreme outcomes of the financial crisis – for example, major restrictions on global trade and capital flows, or even political upheaval threatening property rights – need to carefully assess their regional exposure. Often this results in investors favoring certain geographic areas or emphasizing a home bias in their portfolio allocation.
The USD remains an important risk

International diversification automatically creates currency risk exposure. Investors might also deliberately engage in currency positions to boost return potential. Over long horizons, currencies seem to follow certain rules. Most of all, a currency tends to depreciate if its purchasing power is eroded relative to other currencies. This is the simple message of the purchasing power parity (PPP) theory as the key long-term valuation yardstick.

In our UBS research focus entitled, “Currencies: a delicate imbalance” (2008), we warned of large exchange rate deviations from PPP. Sharp adjustments have taken place since then, especially in the case of the Japanese yen and the British pound (see Fig. 5.7). Without major currency misalignments, we would caution against assuming currency risk. Trading-related strategies based on currencies are a separate matter that we do not cover here. PPP does not reveal major misalignments between the US dollar, the euro and the Japanese yen at present. The British pound appears to be significantly undervalued against those currencies. However, given the extreme weakness of the UK economy, which, in addition to the global crisis, suffers from a severe domestic real estate crisis, we see no strong case for the pound at present.

With regard to the other two major currencies, we prefer the euro to the US dollar despite neutral valuations. This stems from the fact that the financial crisis was brought on by too much leverage and a real estate bubble, both of which are major problems for the US but less threatening to the Eurozone countries. Thus, the Fed has started much earlier with monetary easing, and has been forced to let USD liquidity balloon. As soon as the economic situation starts to stabilize, this liquidity overhang will pose a major risk to the USD. Other negatives include rising government indebtedness and a tapering current account deficit (see Fig. 5.8).

At ten years of age, the euro is still a young currency and, not surprisingly, some commentators talk about the breakup of the Eurozone in the face of the current crisis. We think this is unlikely. We note that member governments’ debts are denominated in euros, and leaving the Eurozone would risk capital flight and default. To the contrary, the supranational architecture of the European Central Bank could help to ensure stronger inflation-fighting credentials compared to national central banks that would face rapidly rising government deficits and debt. This would further support the euro relative to the US dollar if inflation were to begin to diverge between the two regions.

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Fig. 5.7: Exchange rates adjusted during the crisis

<table>
<thead>
<tr>
<th>Currency</th>
<th>Deviation from fair value versus USD, in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian dollar</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>British pound</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>Euro</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>Japanese yen</td>
<td>[Diagram]</td>
</tr>
</tbody>
</table>

Note: Fair value measured according to purchasing power parity (PPP).

Source: Thomson Financial, UBS WMR

Fig. 5.8: US government debt weighs on the dollar

<table>
<thead>
<tr>
<th>Year</th>
<th>USD real effective exchange rate</th>
<th>US debt-to-GDP ratio, in %, inverted scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>1984</td>
<td></td>
<td>120</td>
</tr>
<tr>
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<tr>
<td>2004</td>
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<td>2008</td>
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<td>2012</td>
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<td>2020</td>
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<td>30</td>
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Source: Thomson Financial, UBS WMR
Glossary

Breakeven inflation rate
A measure of inflation expectations derived by 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.

Capital
In a macroeconomic model, one of the three input factors of production (i.e., labor, capital, and technology); often referred to as physical capital but also increasingly to intellectual capital; used in the production of output.

Commodity
A physical substance traded on a commodity market. Examples of hard commodities include nickel and copper, whereas soft commodities include grain, cotton and rubber.

Consumer Price Index (CPI)
A measure of prices paid by consumers for a representative basket of goods and services. A country's inflation rate is usually calculated as the year-over-year change in its CPI.

Correlation
Statistical measure of the linear relationship between two series of figures (e.g., performance of a security and 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 linear relationship between the two variables.

Credit crisis
A period marked by extreme difficulty in acquiring new loan financing and much tighter lending restrictions. The cost of obtaining new credit increases independently of changes in official government interest rates, as a flight to safe assets ensues.

Credit ratings
A measure of the credit worthiness of individuals and corporations. The entire credit history is taken into account in order to set the rating, including any previous defaults, borrowing and repayment frequency and balance sheet health.

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 import more goods and services from abroad than it exports; 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.

Deleverage
To reduce borrowing or debt relative to assets on a balance sheet.

Demographics
The characteristics of human populations, such as age, size, growth, density, and distribution.

Deregulation
Dismantling or abolition of state intervention in economic affairs that aims to reduce the influence of the state in the economy, as well as abolishing bureaucratic obstacles and legal regulations.

Developed country
A country that enjoys a high standard of living, high levels of per capita gross domestic product (GDP), and an industrialized and highly diversified economy with well-established legal and regulatory structures.

Developing country
A country that is in the process of building institutions, including the economic foundation, to generate higher levels of per capita GDP and advances in total factor productivity growth as well as the legal and regulatory structures associated with developed countries.

Discount rate
An interest rate that is used to determine the present value of an item in the future.
Disinflation
A deceleration in the rate of inflation, or a decline in the rate at which prices increase.

Entitlement spending
Refers to government spending on socially-oriented programs, such as long-term care, social security, retirement benefits, veterans' benefits, and healthcare.

Externality
Occurs when someone's actions generate a cost or a benefit for someone else, the value of which is not reflected in the market price.

Federal funds rate
The interest rate charged when private depository institutions, mostly banks, lend funds held at the Federal Reserve to other depository institutions. The fed funds target rate is one of the principal tools of US monetary policy.

Fiscal policy
The manner of managing public revenues (taxes) and public spending.

Fiscal stimulus
Tax cuts and increases in government spending aimed at temporaril and quickly boosting aggregate demand and the level of economic activity.

Financial leverage
When borrowed funds are reinvested with the intent to increase the rate of return on an investment.

Foreign exchange reserves
The foreign assets held by central banks.

Free market
A market that allows prices to be determined through the interplay of unregulated supply and demand; the opposite is a regulated market.

Full-documentation loan
Loans based on stated and verified income and assets; a standard term to classify loans in the US mortgage industry.

Government deficit
When a government's total expenditures exceed its revenues. A deficit is distinct from debt, which results from the accumulation of a series of deficits.

Greenhouse gas (GHG)
Gases that trap the sun’s heat in the earth’s atmosphere, producing the greenhouse effect; includes carbon dioxide, methane, ozone and water vapor.

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 common measure of an economy's size.

Inflation
An increase in the general level of prices and wages and a related decrease in the purchasing power of money.

Infrastructure
Refers to the construction and operation of the physical structures that are essential to economic growth and social stability. Experts subdivide infrastructure into five sectors: transportation, telecommunication, electricity generation and distribution, water systems, and social infrastructure. While usually referring only to large-scale projects, infrastructure can also include smaller projects like irrigation, schools, and hospitals.

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.

Labor
In a macroeconomic model, one of the three input factors of production (i.e., labor, capital, and technology); usually referred to as the labor force, which includes people of working age who are either actively seeking employment or are employed.

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.

Loan-to-value ratio
A ratio that compares the amount of a first mortgage loan to the total value of the property and is one of the key risk factors that lenders assess when evaluating borrowers for a mortgage.

Log (logarithm)
The power to which a base number, such as 10, must be raised to produce a given number, e.g., the logarithm of 100 to the base 10 is 2 (10^2).

Market capitalization
Measure of a corporation's size calculated by multiplying the price of the stock by the number of shares outstanding.

Market efficiency
A theoretical concept that assumes prices on financial assets, property, and other consumer goods reflect all available information. Information or news is defined as anything that may affect prices that is unknowable in the present and thus appears randomly in the future.
Glossary

Monetary base
Also known as base money or high powered money, this refers to most liquid forms of money in an economy, such as currency and commercial bank reserves.

Monetary policy
The way in which the money supply and interest rates are managed, usually determined by central banks.

Monetize
The process of converting securities, usually bonds issued by governments as public debt, into a currency that can then be used to buy goods and services.

Money supply
The stock of money that exists in an economy at a given time, including currency in circulation and demand deposits.

Nominal
The quoted price or stated amount of an economic variable, unadjusted for changes in inflation.

Nominal prices
Prices that have not been adjusted for inflation, and are thus not directly comparable across time.

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.

Old-age dependency ratio
The UN defines this as, “the ratio of the population aged 65 years or over to the population aged 15–64.”

Organization for Economic Cooperation and Development (OECD)
An international organization of mostly industrialized countries that addresses the economic, social, environmental and governance challenges of the globalizing world economy.

Quantitative easing
A relatively new financial term that refers to actions taken by central banks to increase the supply of money when short-term interest rates have already been reduced either to zero or near zero. This practice usually involves purchasing private and public debt securities in order to encourage lending and to reduce longer-maturity interest rates.

Real prices
Prices after being adjusted to compensate for inflation.

Rating agency
A company that specializes in assigning credit ratings on debt issuers, as well as debt instruments, according to the expected safety of principal and interest payments.

Real GDP
Inflation-adjusted gross domestic product.

Real interest rates
Nominal interest rates less inflation.

Recession
The stage in the business cycle when economic activity declines, often characterized by a fall in a country’s economic output, or GDP.

Regulated market
The provision of goods or services using an arm of the government; often includes natural monopolies such as telecommunications, water, gas, and electricity supply.

Return on Equity (ROE)
Ratio of net profit generated over a certain period to equity capital.

Risk premium
Premium demanded by investors for engaging in risky capital investments. Generally, a higher risk of loss or default should come with a higher risk premium.

Sovereign default
Occurs when a country fails to honor its legal obligation to pay interest on its debt and return principal when it becomes due.

Stagflation
A period of slow economic growth, relatively high unemployment, and high inflation. The most famous episode occurred during the 1970s when high oil prices and rising government deficits triggered a period of economic stagnation and rising inflation in many countries.

Statistical regression
A data-based method for evaluating the strength of the relationship between selected independent variables and a dependent variable.

Statistical significance
In statistics, a result that is unlikely to have occurred by chance.

Transparency
A condition when investors and the general public have free and open access to information to make informed investment and purchasing decisions.
Technology
In a macroeconomic model, one of the three input factors of production (i.e., labor, capital, and technology); considered as the key link between labor and capital and allows them to work together.

Total factor productivity (TFP)
The sum of the growth rate of technological progress, such as technology growth and efficiency.

World Bank
The World Bank is a development bank that provides loans, policy advice, technical assistance and knowledge-sharing services to low and middle-income countries to reduce poverty.

Working-age population
The population aged 15 to 64, regardless of whether they are actually working.

World Trade Organization (WTO)
The WTO is an international body of voluntarily participating countries that deals with rules of trade between nations. It operates around a series of agreements, signed by the bulk of the world’s trading nations, providing legal ground rules for international trade. The main purposes of the WTO are to help goods and services flow as freely as possible, to serve as a forum for trade negotiations, and to provide dispute resolution. The WTO was formed on January 1, 1995.
Chapter 1


Chapter 2

Bibliography


Chapter 3


Chapter 4


Chapter 5


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