



Special edition

Key points

- Terrorist attacks could have cost the US 1 per cent of GDP in 2001 and 2002 and 2003.
- Extra monetary and fiscal stimulus is likely to offset the loss in 2001 but not in 2002 or 2003.
- Longer term US growth is slightly lower than before.
- US stockmarket may be overbought.
- Emerging markets may be oversold.

ECONOMIC SCENARIOS

A joint product of the
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The aftermath of terrorist attacks in the US

The terrorist attacks in the US have had a major impact on the US and world economies. The September 11 attack came at a time when the US was already weakening, and monetary and fiscal policy eased in response. The events of September 11 have caused a major reassessment of economic prospects by market participants and policy makers.

Since the terrorist attack, monetary policy has been eased a further 175 basis points, the stock market was sold then bought so it is back where it was prior to the attack, and fiscal policy has eased further through compensation payments to airlines and extra military and security related spending. A further stimulus package is before Congress.

Firms in the US, and to some extent worldwide, have refocused spending on security issues and extra spending in this area is expected. Meanwhile, US imports have fallen along with consumer confidence. This special edition — larger than normal and covering several scenarios — deals with the aftermath of the September 11 attack.

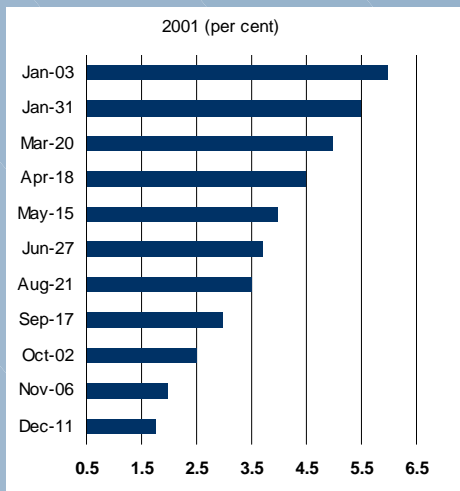
The economics of the terrorist attack

The September 11 attack was totally unexpected and has led to a major reassessment of economic prospects. Many different economic effects can be traced. First is the effect on consumer spending. The shock and sense of grief led to an initial drop in spending. Subsequently, consumer spending has recovered, partly in response to price discounting, especially on motor vehicles.

Next is the uncertainty about where the US economy is going and an increase in perceived risk about the future health of the world economy. On top of that is the loss of \$40 billion of capital — which, although large, is not great relative to the total capital stock of the US economy.

The reappraisal of risk causes an initial move out of stocks and into bonds, and the rising uncertainty causes business investment in the US and around the world to fall. Revised prospects for the US, in turn, has negative repercussions for other world economies such as Asia and Europe. Commodity prices, such as oil, are also affected. As the world slows, oil prices fall and partly act as a buffer against the downturn. As prospects are revised in other parts of the world, so too are there implications for world stock markets and trade and capital flows.

1. US FEDERAL FUNDS TARGET RATE



Source: Federal Reserve.

Using these scenarios

Nobody can foretell the future. If they could, they wouldn't tell you about it. These scenarios are not predictions or forecasts. To make profitable investments from this information you also need to decide how likely the events portrayed here are, and what is already priced in the markets. The value of this material is in the insights it offers into the economic effects of various possible events.

Naturally, officials have appreciated these effects and have responded with monetary and fiscal policy. Monetary policy was eased a further 25 basis points on December 11. Important for the analysis here is the *extra* easing caused by the September 11 attack in the context of a weak US economy and the monetary easing during 2001 (chart 1).

The fiscal stimulus has come in two forms. One is the compensation to US airlines in the wake of the attacks — an industry already in a downturn prior to the attack — plus the extra military and security spending that has followed. The other is a direct stimulatory package to the economy that has yet to be cleared by Congress. This stimulus is on top of the tax cuts offered by the new President Bush Administration on winning office. The expectation that this stimulus, on top of earlier stimulus, will lead to recovery has its own effect on the stockmarket, which will offset the effects of risk equity reappraisal.

A final effect is the extra 'security' cost of doing business. Airline travel will be slower and more expensive than before. Screening of mail now has to occur in the wake of a spate of anthrax attacks. Extra security surrounds buildings and sporting events. There is more security spending by business. All this extra spending, while a boost to some supplying firms, is an extra cost — a negative productivity effect. This effect will dampen growth prospects and have repercussions around the world.

Some of these effects are reinforcing; others cancel out. Which of these effects is most important? What do they mean for future US growth? What are the global repercussions? These questions and others are explored in the analysis of the following four scenarios with the MSG3 model (see www.economicsscenarios.com for model details).

The scenarios

1. An increase in the perceived risk of economic growth in the US and the world economy

This scenario is explored in two parts: a worldwide reappraisal of the equity risk premium (the risk premium on equities over more secure investments such as bonds) and a reappraisal of risk in just the United States.

The worldwide reappraisal is a rise in the equity risk premium of 5 per cent in 2001, 4 per cent in 2002 and so on to 1 per cent in 2005. This pattern of risk premia change is scaled so that the fall in the stock market is roughly what happened in the following month.

The US equity risk reappraisal is as above except that it is confined just to the US.

2. A monetary easing

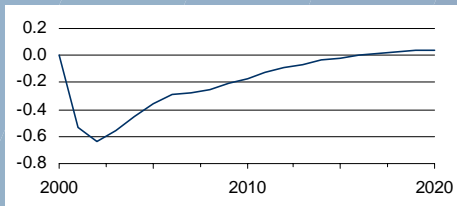
This amounts to a 2 per cent rise in money supply, which implies a 0.5 per cent fall in interest rates in 2001. This is the extra stimulus on top of the easing already under way.

3. A temporary fiscal stimulus

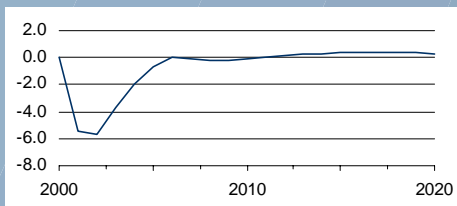
This amounts to 1.5 per cent of GDP in 2001 and 1 per cent in 2002 financed through issuing bonds. Again, this is the extra easing on top of earlier stimulus.

2. REAPPRAISAL OF GLOBAL EQUITY RISK (Percentage deviation from baseline)

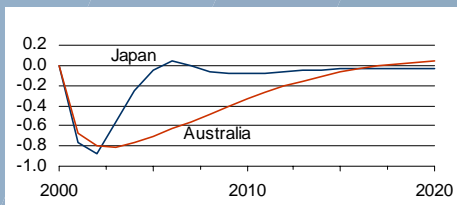
US real GDP



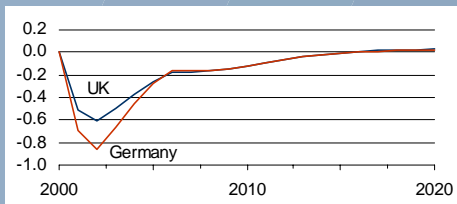
US real investment



Asian real GDP

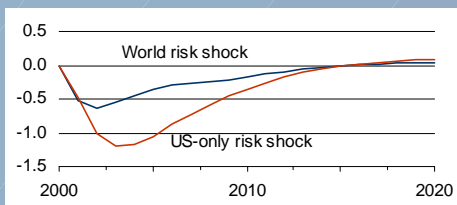


European real GDP

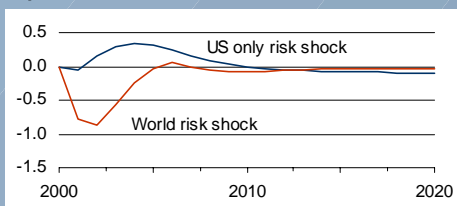


3. REAPPRAISAL OF ONLY US EQUITY RISK (Percentage deviation from baseline)

US real GDP



Japan real GDP



4. A negative productivity shock

The scenario here is a permanent fall in the level of total factor productivity of 0.3 per cent in the United States. Also, there is a similar fall in productivity in other areas of the world since security tightening has occurred elsewhere. There is a similar decline in productivity in high and low income developing Asia and in OPEC. Extra security tightening and productivity decline is also apparent in Europe, but the effect is assumed to be less because of its history of terrorism (such as by the IRA in the UK). The decline in productivity in Germany, the UK and the rest of Europe is assumed to be half the decline in the US. The effect on the rest of the OECD (Canada and New Zealand) is also assumed at half the decline in the US.

Effects

Reappraisal of global risk

The shock here is an initial rise in the equity risk premium worldwide, which declines over the next five years. The reappraisal of risk on equity markets causes investors to redistribute funds over other assets — both internationally and at home. Since a reappraisal of risk is occurring everywhere in the world under this variant of this scenario, there is little incentive to reallocate portfolios across countries. There is an initial drop in US investment, which falls to 6 per cent below baseline by 2003 before recovering. This fall in investments leads to an initial decline in real GDP of 0.6 per cent below baseline. With the risk premium reappraisal returning to normal, investment recovers and so does real GDP. These effects are shown in chart 2.

Other countries get hit hard with the reappraisal of risk and decline in US GDP. Japan and Australia, for example, experience greater initial declines in real GDP as shown in chart 2, only the recovery in Japan is faster than elsewhere because of more flexible labor markets. The United Kingdom and Germany exhibit a similar pattern of change in GDP from baseline as the US, only the downturn in Germany is initially greater.

Reappraisal of only US risk

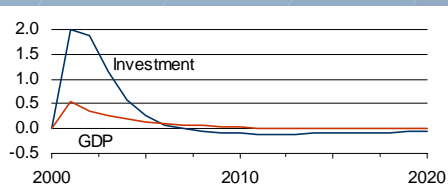
The US was the target of the September 11 terrorist attack and could be the target again. It is possible that the equity risk premium will be reappraised for the US alone. While the same mechanisms are at work as before, the difference now is a large relative difference between countries regarding perceived rates of return. Not only do investors switch out of US equities and into bonds, but the tendency to reallocate portfolios across the world is much more pronounced.

There is now a much stronger capital outflow. The decline in US real GDP is double the previous effect, and the recovery slower when the US alone experiences the reappraisal of the equity risk premium. These differences are shown in chart 3 along with the effect on Japan.

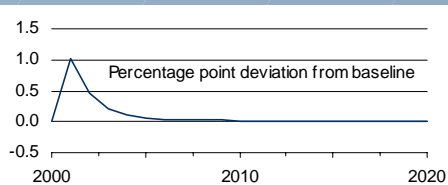
Note that Japan actually *gains* compared to baseline when the US alone experiences the reappraisal of risk. Japan becomes one of the countries

4. MONETARY STIMULUS (Percentage deviation from baseline)

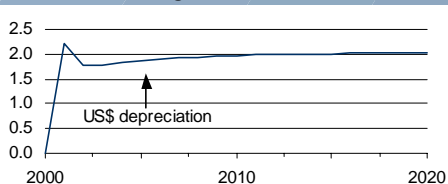
US real investment and GDP



US inflation

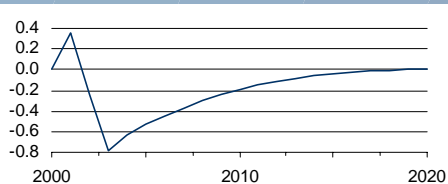


US\$/Yen exchange rate

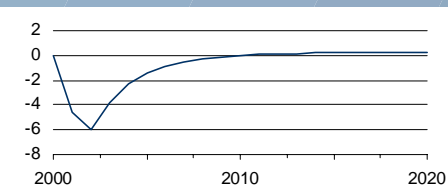


5. FISCAL STIMULUS (Percentage deviation from baseline)

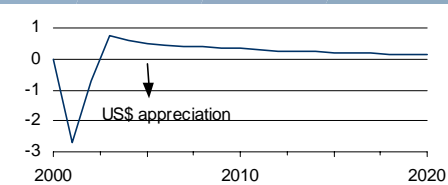
US real GDP



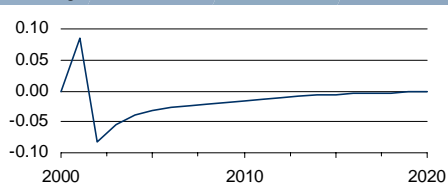
US investment



US\$/Yen exchange rate



US 10 year bonds



that is a *relatively* more attractive place to invest in than before (even though its baseline economy is still depressed) and this has a small positive effect on real GDP than would otherwise have occurred. So there are two effects working on Japan: a negative effect from the downturn in the US, but a positive effect from the reallocation of global investments. These two effects cancel out in the first year, but the positive effect dominates in later years. This demonstrates the value of using a comprehensive global framework to quantify all the different effects.

Monetary stimulus

The monetary relaxation stimulates real private investment, which rises by nearly 2 per cent above baseline in the United States. The flow-on effect to real GDP is an initial additional 0.5 per cent above what it might be before returning to baseline over time.

The monetary stimulus has an impact on consumer prices, which are 1 percentage point above baseline in the first year following relaxation. Because the monetary stimulus is temporary, the inflationary impulse is only temporary. Note that this does not mean actual inflation rises — it is 1 percentage point higher than would have occurred without the stimulus. The actual inflation rate depends on the underlying baseline inflation rate.

The price adjustment removes the real effects of the monetary stimulus so the economy settles down to the original baseline but with a one-off higher price level. The higher inflation causes the US dollar to depreciate against the Yen (and other currencies) by 2 per cent below baseline. These effects are shown in chart 4.

Fiscal stimulus

The fiscal stimulus given in this model is for an additional 1.5 per cent of GDP in spending in 2001 and 1 per cent in 2002, financed by selling bonds.

This stimulus increases government spending and so adds to real GDP which initially rises by nearly 0.4 per cent above baseline. Later, GDP falls by over 0.6 per cent below baseline by 2004 due to the crowding out of private sector activity as a result of the sale of bonds and rise in interest rates.

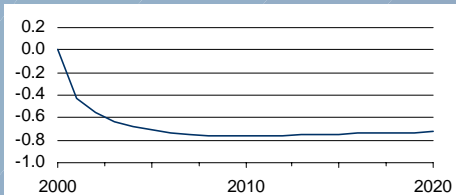
These effects are shown in chart 5. Note there is a large decrease in US real investment as the financing of government spending crowds out private activity.

The fiscal stimulus leads to higher consumption, part of which is met by higher imports of 0.2 per cent above baseline in the first year, but which declines by nearly 0.3 per cent in the second year as the economy slows. The imports are facilitated by a 2.7 per cent appreciation of the US dollar against the Yen, which becomes a 0.8 per cent depreciation from baseline by 2003.

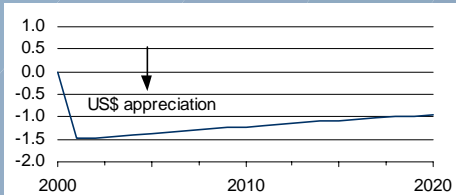
Interest rates (nominal 10 year bond rates) rise initially due to the short run rise in demand and shortage of funds, but fall as the demand for money falls as the economy slows.

6. PRODUCTIVITY DECLINE (Percentage deviation from baseline)

US real GDP



US\$/Yen exchange rate



Productivity decline

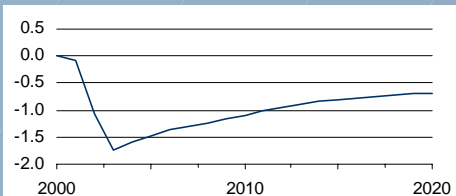
The productivity decline from the attack stems from the extra security measures business and government have had to implement. This additional cost burden could be greater in initial years than later as new technology will partly offset the additional cost. But the productivity fall assumed here will be a permanent shift — even if it is small and one that is offset by rising productivity elsewhere.

The additional burden of extra security measures causes a decline in the expected return to capital. It therefore causes equity prices (as represented by Tobin's q) to fall by 5.3 percentage points initially and by nearly 3 percentage points in 2002 below baseline. Falling productivity causes US real private investment to decline to an average level of around 1.2 per cent below baseline. This fall in productivity and real investment causes real GDP to decline to a long run level that is nearly 0.8 per cent below baseline (chart 6).

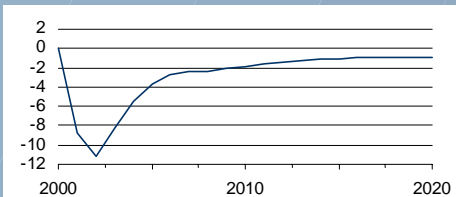
The lower productivity, production and consumption cause imports and exports to fall because of the capital outflow (or less capital inflow) as investors seek higher returns in the world. The trade balance and current account balance deteriorates slightly. Even though there is a small capital outflow, the exchange rate appreciates because the US is so large in the world that the fewer exports causes the relative price of US goods to rise and import prices to fall. That is, there is a favorable terms of trade effect leading to an appreciation of the currency.

7. COMBINED EFFECT (Percentage deviation from baseline)

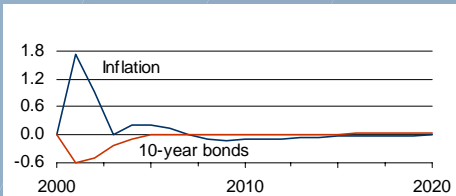
US real GDP



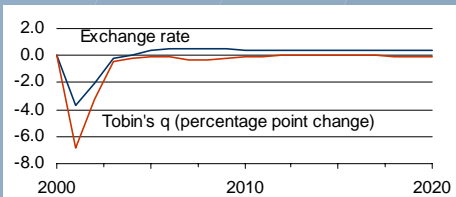
US real investment



US inflation and 10 year bonds



US\$/Yen exchange rate and Tobin's q



Putting it together

Is the extra monetary and fiscal stimulus as a result of the terrorist attacks sufficient to offset the negative effects of the worldwide reappraisal of the equity risk premium and negative productivity? In the first year following the attack the answer is: nearly. But two and three years out, US real GDP declines to a low of nearly 1.7 per cent below baseline by 2003. The need to finance the fiscal stimulus and the crowding out of private sector activity, plus the decay in real economic activity after the first year from the one-off monetary stimulus, means that US real GDP is significantly lower than baseline (chart 7).

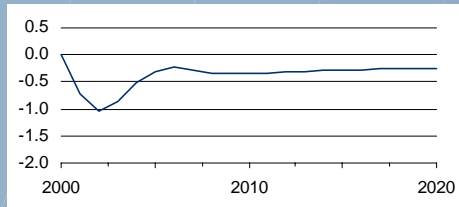
In later years, the monetary relaxation is not stimulatory enough on real private investment to offset the negative effects of the world equity risk reappraisal, the crowding out from financing the fiscal stimulus and the negative productivity decline. Inflation peaks at 1.7 percentage points above baseline in 2001 and 10 year US bond yields are 62 basis points below baseline in that year (chart 7).

The net outcome of all four scenarios is that the US dollar appreciates against all major currencies when there is a global reappraisal of the risk premium on equities. The US dollar could be 3.6 per cent higher in the year following the attack measured against the yen (chart 7). This movement of the US currency seems consistent with what has been happening.

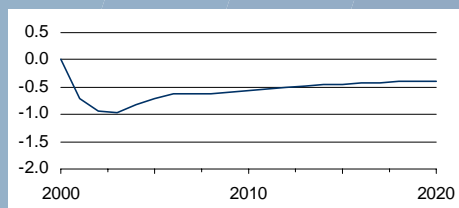
By 2004 there is a small depreciation of the US currency below baseline. This result is quite different when there is a reappraisal of the risk

8. GLOBAL REAL GDP (Percentage deviation from baseline)

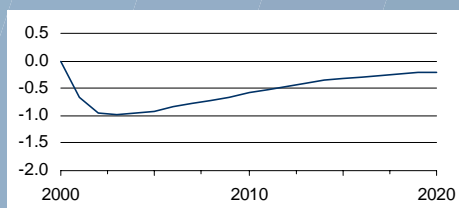
Japan



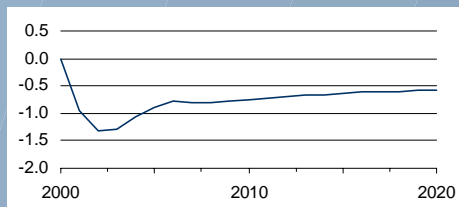
Korea



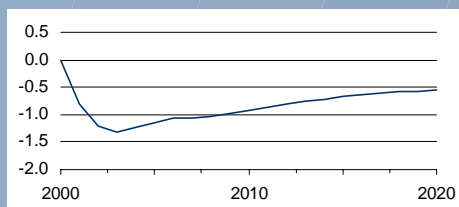
Australia



Singapore



Rest of OECD



premium in the US only. In that case, the large capital outflow from the US as investors seek relatively higher returns elsewhere in the world causes the US dollar to depreciate, offsetting the appreciating forces from other scenarios. The current strength of the US dollar causes us to favor the idea that there has been a general worldwide reappraisal of equity risk in the aftermath of the terrorist attacks.

The net result of the attack and subsequent adjustments as represented by the scenarios depicted here is for the sharemarket (as represented by Tobin's q) to fall by nearly 7 per cent in the first year below baseline but recover by the third year (chart 7).

The net effect of all shocks and interactions on some other key economies' real GDP is shown in chart 8.

The US is the economy worse off from the attacks. The reason is that only the US has been assumed to respond with stimulatory policies and the temporary fiscal stimulus sets up a dynamic that means the worst effects occur two, three and more years out. Note that is a difference from baseline — it does not necessarily mean that the US must be performing badly two or three years out. It means that growth will be lower than otherwise. Japan and Germany are less effected by the fallout from the attacks and other economies such as Australia, other OECD and high income Asia (not shown) exhibit a similar pattern of effects.

Of interest is the effect on developing countries. While they suffer as a result of the world downturn, they experience a positive income effect due to the lower interest rates in the world and their high levels of debt. This substantially lowers the burden on their economies (chart 8).

Variations

The above results are obviously dependent on the scenarios chosen and how events of September 11 have been translated into shocks to input into the global MSG3 model.

The differences between world equity risk reappraisal and equity risk reappraisal have already been noted.

Much will also depend on future events. Obviously, another major terrorist attack in the US would cause a further reappraisal of risk and even more effort, and hence cost, devoted to security. It would affect business and consumer confidence.

Also, there are alternative ways of providing the fiscal stimulus than modeled here. For example, a permanent tax cut would yield different results. For more variations on these scenarios, please contact the authors on www.economicsscenarios.com.

Summary and implications

The effects of the September 11 attacks in the US will be felt for years to come. The policy response only just offsets the negative effects of the attacks in the first year.

The longer term effect is negative with the dynamics working to make 2003 and 2004 slower years of economic growth below baseline. How these years turn out in actuality depends on how well the economy would have recovered in the absence of the attacks and how events — such as possible further attacks — might unfold.

Another point is that the effects on other countries depend crucially on whether the events of September 11 are perceived to be a 'US only' effect. The more it is US centered, the worse it is for the United States — but other countries do not fare as badly since global capital is reallocated to the (relatively) better returning investments in the world when the risk reappraisal is for the US alone.

'... the extra stimulus to the US economy as a result of the attacks is likely to offset the negative effects so caused.'

Events to date, particularly the strong US dollar, suggest other major economies have made the assessment that they too could be vulnerable to terrorist attack. Money has continued to pour into the US and keep the US dollar strong. Our preferred scenario is for a global equity risk reappraisal.

The goal of this exercise is not to predict what will happen, but to provide a framework for thinking about and disentangling the many factors at work so decision makers can reassess strategies and risks.

The implication is that the extra stimulus to the US economy as a result of the attacks is likely to offset the negative effects so caused. Whether the US economy comes out of recession soon depends on whether the previous stimulus was sufficient to offset the underlying weakness stemming from monetary tightening in 2000 and the fall-out from the bursting of the tech bubble, but this is the subject of a separate analysis. However, if the underlying economy has not picked up in a year or two, growth in the US could look sluggish and the US stockmarket overpriced.

Other countries have been adversely affected by the terrorist attacks as risk has been reassessed and the US turns down. Markets, including emerging markets, have been sold down. That is obvious enough, but developing countries, which are highly indebted, also benefit relatively more from the lower interest rates and their downturn as a result of the September 11 attacks is not as severe. Emerging markets may have been oversold.