



## WAR with IRAQ: the compounding effects of oil prices, budgetary costs and uncertainty

### Key points

- A long war could wipe up to 2 per cent off world GDP by 2005 with costs persisting for a decade.
- Even a short war could cost the world 1 per cent of GDP per year over the next few years.
  - The cumulative cost to 2010 could be over US\$1000 billion, half of which is borne by the USA.
- Investment is one of the main casualties of a war.
- Equity markets will be under pressure.
- Exchange rates of major economies may not be greatly affected if there is global participation in the war and the rebuilding of Iraq.

War with Iraq could cost the world economy up to 2 per cent of GDP by 2005 (0.7 per cent reduction in annual growth of major countries from 2003 to 2005) under a pessimistic scenario. Private investment would be one of the casualties and equity prices are likely to fall. Even a short war could have significant effects. The main economic costs stem from the increase in fiscal deficits due to extra government spending rather than higher oil prices and greater uncertainty, although all effects compound to give the final result. This analysis does not evaluate the potential benefits of a war to global security which, under various scenarios, could be substantial.

The costs of a war with Iraq are a matter of conjecture. Federal Reserve Chairman Alan Greenspan was questioned at a congressional hearing on the US\$100 billion a year cost of United States troops being in Iraq. He responded that he was 'doubtful if the impact on the economy is more than modest, largely because this is not Vietnam or Korea'.<sup>1</sup> Others disagree. William Nordhaus, for example, believes the economic costs of a war with Iraq are underestimated.<sup>2</sup>

War with Iraq would be costly to the world economy. How costly depends on the length of the war and the compounding effects of three different economic aspects. The main economic costs are the flow-on effects from higher budgetary costs, rising oil prices and greater uncertainty.

This analysis uses a consistent framework to disentangle these separate elements so investors can better appraise the potential risks to the global economy from a war.

Two scenarios out of a wide range of possibilities are examined: an optimistic outcome of a short conflict; and a pessimistic outcome of a long-term protracted war with attendant higher costs of reconstruction. The three economic aspects likely to matter most — budgetary costs, oil prices and uncertainty — are examined under both scenarios.

#### ECONOMIC SCENARIOS

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<sup>1</sup> *Newsweek*, December 2, 2002, page 44.

<sup>2</sup> Nordhaus W., 2002, *The Economic Consequences of a War with Iraq*, October 29.  
<http://www.econ.yale.edu/~nordhaus/iraq.doc>. Accessed 18 February 2003.

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## 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.

## Long or short war

Nobody knows what a war with Iraq would be like — let alone whether there will be armed conflict at all. Any number of valid scenarios could be devised regarding the length of a war, the type of conflict, and subsequent reconstruction costs in Iraq.

To assess the implications of a war with Iraq we have taken two scenarios:

- a short war (with subsequent 'occupation') of one year and two years of rebuilding financed by major countries; and
- a long war and occupation lasting five years with five years of rebuilding financed by major countries.

Other valid scenarios outside these bounds clearly exist. Some say a war could be a matter of days. Some argue it could destabilize the region and war and occupation could drag on for many years, like Vietnam. The two scenarios here have been chosen to learn as much as possible about the risks to the world economy and the key drivers of the global impacts if war with Iraq eventuates.

## The budgetary costs of a war

In estimating the costs of a potential war, the Congressional Budget (CBO) examined two cases.<sup>3</sup> These two cases varied in their emphasis on use of ground or air forces. The CBO did not speculate on the length of a possible war and found that executing a war with Iraq could cost between US\$6 billion and US\$9 billion a month with an incremental cost of deployment between US\$9 billion and US\$13 billion. On top of this would be the costs of return of forces and any occupation.

Analysis by Nordhaus<sup>4</sup> suggests the CBO underestimated the economic costs to the economy because they excluded a number of other potential costs. The costs excluded are the total costs of occupation, peace keeping, democratization, nation building and post-occupation humanitarian assistance. On top of these budgetary costs are the impact on oil markets and the macroeconomic impact (discussed below). Nordhaus puts the budgetary costs to the United States, including occupation, reconstruction and humanitarian assistance at US\$151 billion for a 'short and favorable' war and a ten year cost of US\$1 595 billion for a 'protracted and unfavorable' war.

These estimates, however, are just for the United States. Other countries are likely to be involved — notably Britain, Australia and several European countries. Our scenario assumes France and Germany will decide to stay out of the conflict. Japan is assumed to be a smaller contributor during the conflict stage, but a larger contributor to the rebuilding phase. Iraq and some other Middle-Eastern countries are assumed to spend considerably on defence, represented by an increase in defence spending by OPEC. These assumptions are spelt out in table 1.

### 1. Extra government spending from a war with Iraq under two scenarios (annual per cent of GDP)

SHORT WAR	Conflict phase 2003	Rebuilding phase 2004–05
United States	1.3	0.8
Japan	0.2	0.8
Australia	1.0	0.5
Europe	0.5	0.5
Other OECD	0.2	0.2
East Europe & Russia	0.2	0.2
OPEC	2.0	2.0

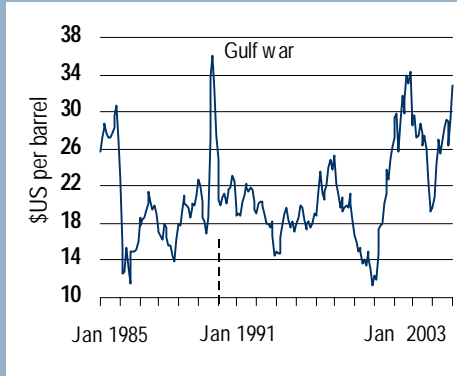
  

LONG WAR	Conflict phase 2003–07	Rebuilding phase 2008–12
United States	1.3	0.8
Japan	0.2	0.8
Australia	1.0	0.5
Europe	0.5	0.5
Other OECD	0.2	0.2
East Europe & Russia	0.2	0.2
OPEC	2.0	0.0

<sup>3</sup> Congressional Budget Office 2002, *Estimated Costs of a Potential Conflict with Iraq*, September.

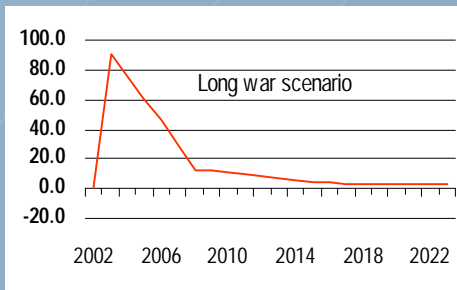
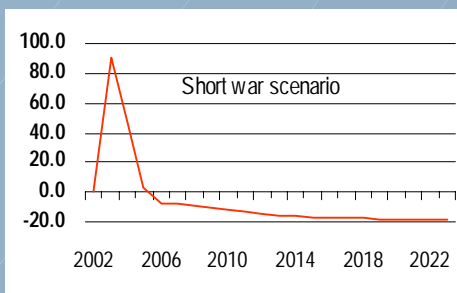
<sup>4</sup> Nordhaus, W, 2002.

## 2. Price of West Texas intermediate crude



Source: Federal Reserve Bank of Dallas  
<http://www.dallasfed.org/htm/data/data/oilp.tab.htm>  
 Accessed 16 February 2003.

## 3. Oil price shocks (Percentage deviation from base of US\$25 per barrel)



### Macroeconomic effect and model used

Nordhaus used previous experiences with war and oil price rises to infer a macroeconomic cost to the United States. In our model, there would also be a substantial macro-economic cost from the above economic effects, but the model cost is treated endogenously. The model allows us to compute the macroeconomic effects from each scenario for each economic aspect in a complete and consistent way for all countries, capturing all inter-relationships. For example, if Japan is adversely affected by a war with Iraq, that will have a knock-on effect to the United States. The model used is the G-Cubed model Version 48e and all variables, assumptions and so on can be accessed by the links on this website.

## Rising oil prices

Iraq's oil reserves are the second largest in the world behind Saudi Arabia's. But production is well down and now represents around 2 million barrels per day (2 to 2.5 per cent of world oil use). The Gulf War in 1991 saw prices rise by 90 per cent, only to fall again (chart 2). Again, any number of scenarios are possible including sabotage of oil fields by Iraqi forces or destruction of oil-producing capacity in neighbouring countries. One set of estimates<sup>5</sup> puts oil prices at US\$75 per barrel under a 'worse case' scenario and US\$161 per barrel for a 'worst case' scenario. The oil price shock for the two scenarios for a short and long war are benchmarked to the price of oil from an average level in the baseline (or 'business as usual') projection of US\$25 per barrel (chart 3).

In both scenarios, there is an initial 90 percent rise in the US\$ price of oil. The difference is that, under the short war scenario, the price spike quickly dissipates and the world oil price falls to a level below baseline once the war is over. That is realistic since a 'war premium' has already been built into oil prices for some time and the United States government has been purchasing oil to add to its strategic petroleum reserve.

## Uncertainty

The third aspect of war, which is difficult to model but an important part of the costs, is the impact of war on uncertainty. Companies and investors do not know if there will be a war, or if there is one, what the outcome might be. Perhaps it could tip the world into recession? When investors change their appetite for risk they are in effect demanding a higher return on their invested capital. The change in attitude to risk is represented by a change in the equity risk premium for all countries, as a war with Iraq is assumed to be a global issue. Under both scenarios, the equity risk premium rises 5 per cent in 2003; however, in the short war scenario the premium returns to baseline in 2004, while in the long war scenario the equity risk premium dissipates in equal increments over the five years to 2008.

## Effects of a short war

### Extra government spending crowds out private activity

Initially, extra war-related government spending boosts GDP in the United States. But the extra spending has to be borrowed, so there is a small increase in long term interest rates in 2003 and 2004.

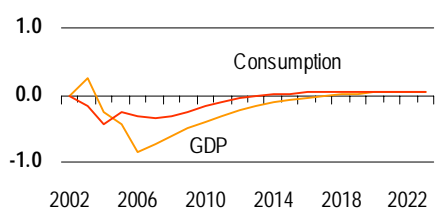
By 2004, the extra borrowing and expectations of a future slowdown causes private investment to fall by 5 per cent below baseline in 2004 and 2005. Therefore, there is a subsequent drop in GDP that approaches 1 per cent below baseline by 2006 (chart 4). The consequences of extra government spending for even a short war are significant although 'manageable'.

<sup>5</sup> George L. Perry, 2001. *The War on Terrorism, The World Oil Market and the US Economy*, October 18.

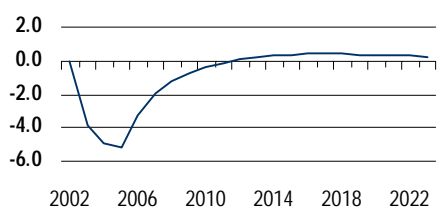
## 4. Short war: more government spending

(Per cent change from base)

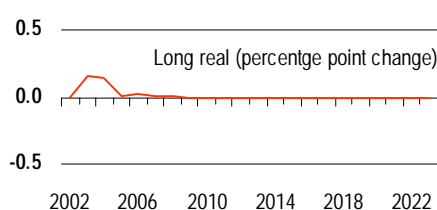
### Real GDP and consumption, USA



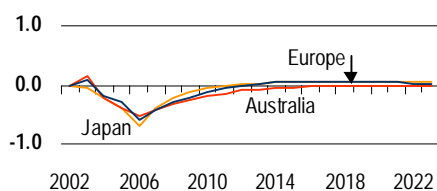
### Real investment, USA



### Interest rates, USA



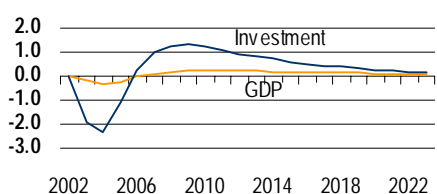
### Real GDP: Japan, Australia and EU



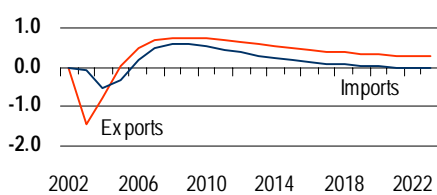
## 5. Short war: temporary oil shock, USA

(Per cent change from base)

### Real GDP and investment



### Exports and imports, USA



## Temporary oil price shock

With the temporary oil shock there are a number of effects — for countries that have few domestic supplies of oil, there is an initial negative income effect although for other countries such as Australia and the United States there are gains from higher oil prices for domestic owners of oil.

To the extent that countries are net importers of oil, the negative income effect will lead to lower consumption and less demand. The higher input cost of oil will make outputs more expensive, which will also reduce demand. To the extent that some products are more energy intensive than others there will be a temporary shift in the composition of demand away from energy intensive goods. The higher input cost would be expected to lead to a shift in demand away from the expensive oil input into other energy sources such as coal and gas which raises the price of these energy supplies.

There will also be a substitution into more capital and labor-intensive goods although this effect will likely be small because the oil price rise is temporary. To the extent that the income effects dominate the substitution effects, the oil price shocks are negative for most economies — with some harder hit (such as Japan) and others. Some of the effects on the United States are shown in chart 5.

## Temporary uncertainty

A temporary increase in risk means the required rate of return on capital by investors is increased. Low rates of return relative to high-required returns imply the capital stock is too high. Since there are real-world adjustment costs in this model, the economy adjusts to the new desired level of capital by way of investment temporarily declining and the capital stock running down. Investment in the United States falls by 2.4 per cent below baseline in 2004 and that has a knock-on effect on GDP. The decline in GDP is 0.4 per cent in 2003 (chart 6).

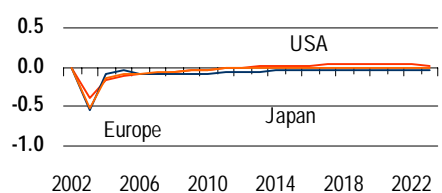
The reappraisal of risk causes investors to redistribute funds over other assets — both local and global. However, because the temporary rise in uncertainty is a global issue and all countries experience the rise in equity risk premium, there are few implications for international capital flows and exchange rates.

## Combined effect

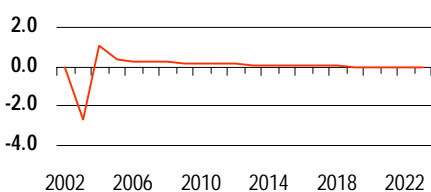
Although the individual effects of extra spending, a temporary oil price shock and a temporary rise in uncertainty from a short war are either small or modest, they do compound. Altogether, there could be a drop of investment in the United States of over 8 per cent below baseline in 2003 and 2004. The fall is less for Japan and Europe, given the assumptions for their contribution to a war and rebuilding. The effect on Australia is similar to the United States. The implication is that GDP would fall across all countries, being 1 per cent below baseline for the United States in 2006 and negative for a decade. The negative effects overall are more protracted and what little initial stimulus there was from extra spending in

## 6. Short war: temporary uncertainty (Per cent change from base)

Real GDP: Japan, USA and EU

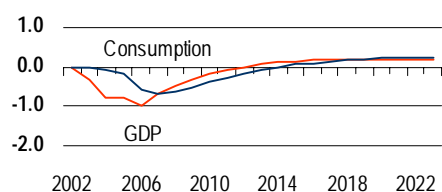


Equity prices, USA (percentage point deviation from baseline)

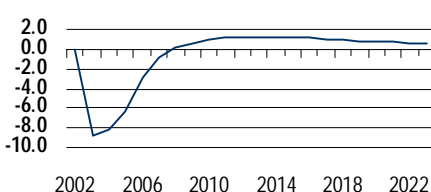


## 7. Short war: combined effects (Per cent change from base)

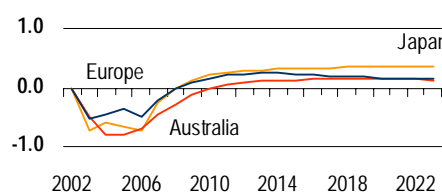
Real GDP and consumption, USA



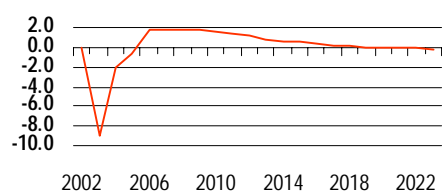
Real investment, USA



Real GDP



Equity prices, USA (percentage point change from baseline)



2003, is offset by the negative effects of rising oil prices and higher uncertainty (chart 7).

Although the timing of effects is different, the most important aspect from a growth perspective is the increase in fiscal deficits. The conclusion is that even a short war will have a significant and noticeable impact on the world economy, but on current projections of world growth, would not lead to recession.

## Effects of a long War

### Financial burden now serious

The extra government spending required by a long war scenario has a significant adverse impact on investment, growth, consumption, interest rates and stockmarkets for the decade of involvement. As with the short war, the extra spending has to be borrowed which crowds out private activity. The drop in investment in the United States is nearly double the effect of the short war scenario in the first year, despite the size of the deficit increase in that year being the same. Expectations of future deficits are important. The investment fall is also of a much longer duration. It is 2017 before investment is above baseline shown on chart 8.

The extra budget financing requirements means long term real interest rates are up to 40 basis points above baseline for the first three years of war and higher than baseline for most of the decade to 2012<sup>6</sup>. The United States is a bigger contributor to the financing of the war than Europe (because France and Germany are assumed out) and Japan (which is not as large a contributor, relatively, until the rebuilding phase). Some of the extra savings the United States needs to draw on to finance its extra spending will therefore come from other countries. Therefore, the trade balance must worsen which is reflected in rising imports and falling exports relative to base.

### Sustained oil price rise

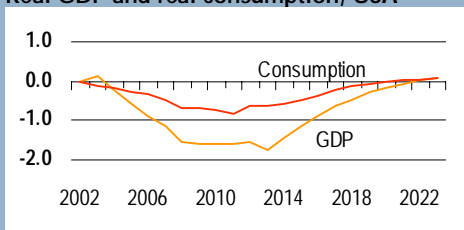
Under a long war scenario, a sustained oil price rise has a greater adverse effect on the world's major economies than the short war scenario. Japan's growth is more adversely affected than for either Europe or the United States and reflects their dependence on imported oil (see chart 9). Even for a country like Australia, which is a large exporter of coal and gas, the negative effects of higher oil prices and a slower world economy outweigh the positive effects from higher prices of these oil substitutes.

As before, higher oil prices have a negative effect on real disposable income, so private consumption falls. Higher costs leads to lower than expected future profits, so equity prices shown on chart 9 (represented by Tobins  $q$  for capital goods) fall by 1.8 percentage points in the United States and nearly 2 percentage points in Japan in 2003 before recovering.

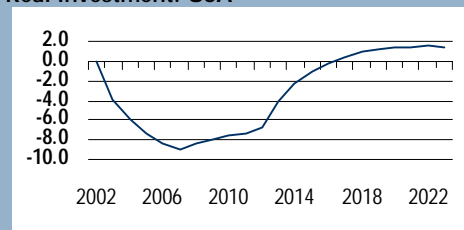
<sup>6</sup> There is a current debate on whether fiscal deficits raise long term interest rates in the context of the recent Bush Administration tax cuts. It is much harder to argue that deficits don't change real interest rates when the deficits are caused by military expenditure.

## 8. Long war: extra government spending (Per cent change from base)

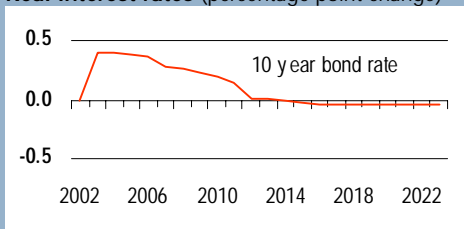
Real GDP and real consumption, USA



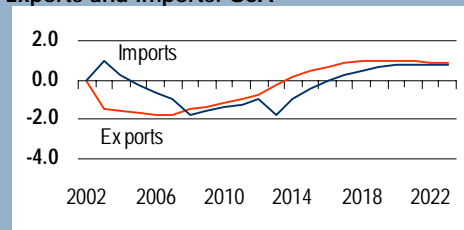
Real investment: USA



Real interest rates (percentage point change)

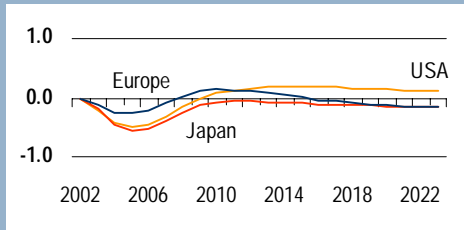


Exports and imports: USA

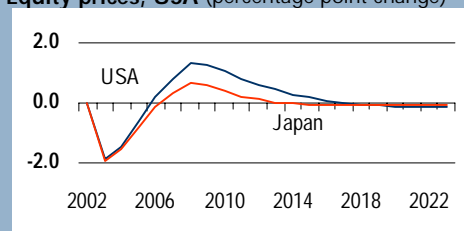


## 9. Long war: sustained oil price rise (Per cent change from base)

Real GDP



Equity prices, USA (percentage point change)



## Long term uncertainty

The longer a war drags on, the more protracted is the uncertainty and its costs. As with the temporary increase in risk (represented by a rise in the equity risk premium), there is a fall in equity prices (chart 10) as investors switch into other assets such as bonds and real estate. In the United States, equity prices could fall by 6 percentage points in 2003 before recovering by 1.8 percentage points in 2008. The impact is not as great as in Japan. Purchases of bonds sends long-term real interest rates down. Because the required rate of return on capital is now higher, there has to be a run-down in the capital stock and so investment declines — by around 6 per cent below baseline for the United States in 2003 and 2004. The consequence is a drop in GDP of over 0.5 per cent below baseline until 2007. Consumption initially increases slightly as the wealth effect from increased asset prices, such as real estate, temporarily offsets the negative wealth effect from lower equity prices.

## Combined effect

The main difference between a long war and a short war is the depth and duration of the decline to growth, investment and equity markets.

All major countries experience lower investment, output and consumption for the duration of the war and rebuilding phase. GDP could be nearly 2 per cent below baseline in the United States from 2005 to 2009 (chart 11). Again, that may not be enough to cause recession in the United States if current official projections of GDP growth prove correct, but it will be a major dampener on activity.

One of the biggest changes is the fall in investment and would be a key variable to watch if war breaks out. Real investment could be over 14 per cent below baseline in the United States in 2004 and 2005. Equity prices across major economies could fall from 8 to 16 per cent below baseline. Higher uncertainty and the extra government spending from a war are the main drivers of possible change to equity markets.

## Benefits of war

The above analysis focuses on the possible costs of war. We have not attempted to assess the benefits of any campaign, such as disarming Iraq of its weapons of mass destruction and supposedly making the world safer from terrorism. How much safer would be a matter of conjecture. But terrorism itself imposes large costs to the world economy. In our December 2001<sup>7</sup> issue, we found the cost to the United States of the September 11 terrorist attack, as an example, to be 1 per cent of GDP in each of 2001, 2002 and 2003.

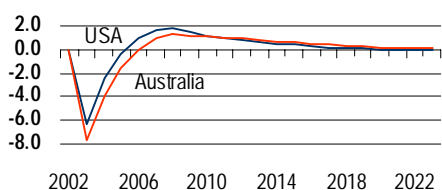
## Implications for investors

A war with Iraq could depress equity and bond markets for some years. In contrast to recent events, these markets will tend to move in the same direction rather than in opposite directions. The fiscal implications of the

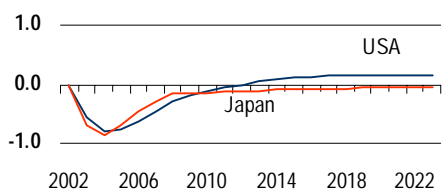
<sup>7</sup>The December 2001 issue can be accessed at [www.economicsscenarios.com](http://www.economicsscenarios.com).

## 10. Long war: long term uncertainty

Equity prices, USA (percentage point change)



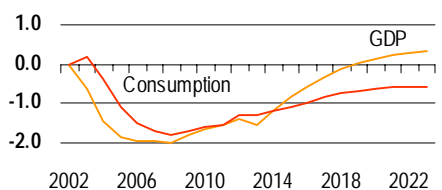
Real GDP (Per cent change from base)



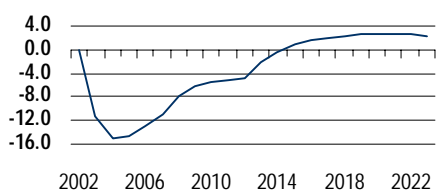
## 11. Long war: combined effect

(Per cent change from base)

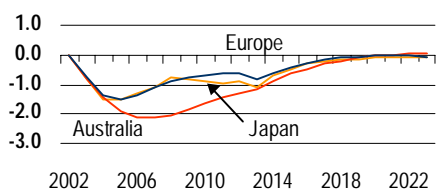
Real GDP and consumption, USA



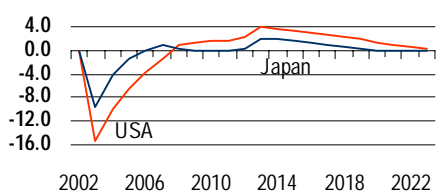
Real investment: USA



Real GDP



Equity prices, USA (percentage point change from baseline)



shock will determine this relationship. An important consideration is what is already priced in the markets. Although a war with Iraq is not a certainty, it will not come as a surprise to investors. Already, equity markets have fallen on recent news of an impasse with the United Nations Security Council. Even if the onset of war is fully priced in the market, equity prices will likely fall further if new information learnt on the duration and intensity of the war is much more pessimistic than currently expected. Oil prices are another example. They have already edged up as well and are now over US\$36 per barrel. They may go higher once the duration of the war is better understood.

The key variables to watch are the duration of the war and the costs in terms of fiscal expenditure. Estimates of the duration will quickly feed into equity markets, oil markets and other asset markets such as long term bond markets. Also important will be the extent of re-building of Iraq once the war is over. Investment will be another key variable to watch, as it is where most change is expected to show up. Equity markets will find it difficult to stage a rally in the environment painted here.

A comparison of GDP losses for key regions and countries in 2003 and the simple sum over the period from 2003 to 2010 for both the long war and short war scenarios are shown in Table 12. This table shows that both scenarios have important implications for GDP projections over the coming decade. The largest cost is borne by the United States, which is also the largest economy. China bears relatively little burden of the loss and that partly reflects our assumption that they do not contribute to the cost of the war or the rebuilding of Iraq. Non oil-developing countries lose nearly US\$130 billion of cumulative GDP under a short war.

A final point is that these scenarios point out few implications for exchange rates and capital flows of the major economies. That is because we have assumed this is a global problem and financed (mostly) by the major global players. Were, for example, the United States to 'shoulder the burden' itself, the implications would be very different and would be an interesting variant to examine.

Table 12 Loss in GDP US\$ billion (year 2000 values)

	Short war		Long war	
	2003	2003-10	2003	2003-10
USA	34	491	65	1470
Japan	33	122	39	429
Australia	2	18	4	69
Europe	47	157	67	748
Rest of OECD	7	51	10	149
China	3	2	4	56
Non-oil developing countries	36	129	35	469
Eastern Europe and Russia	11	73	15	183
<b>Total</b>	<b>173</b>	<b>1043</b>	<b>237</b>	<b>3573</b>

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