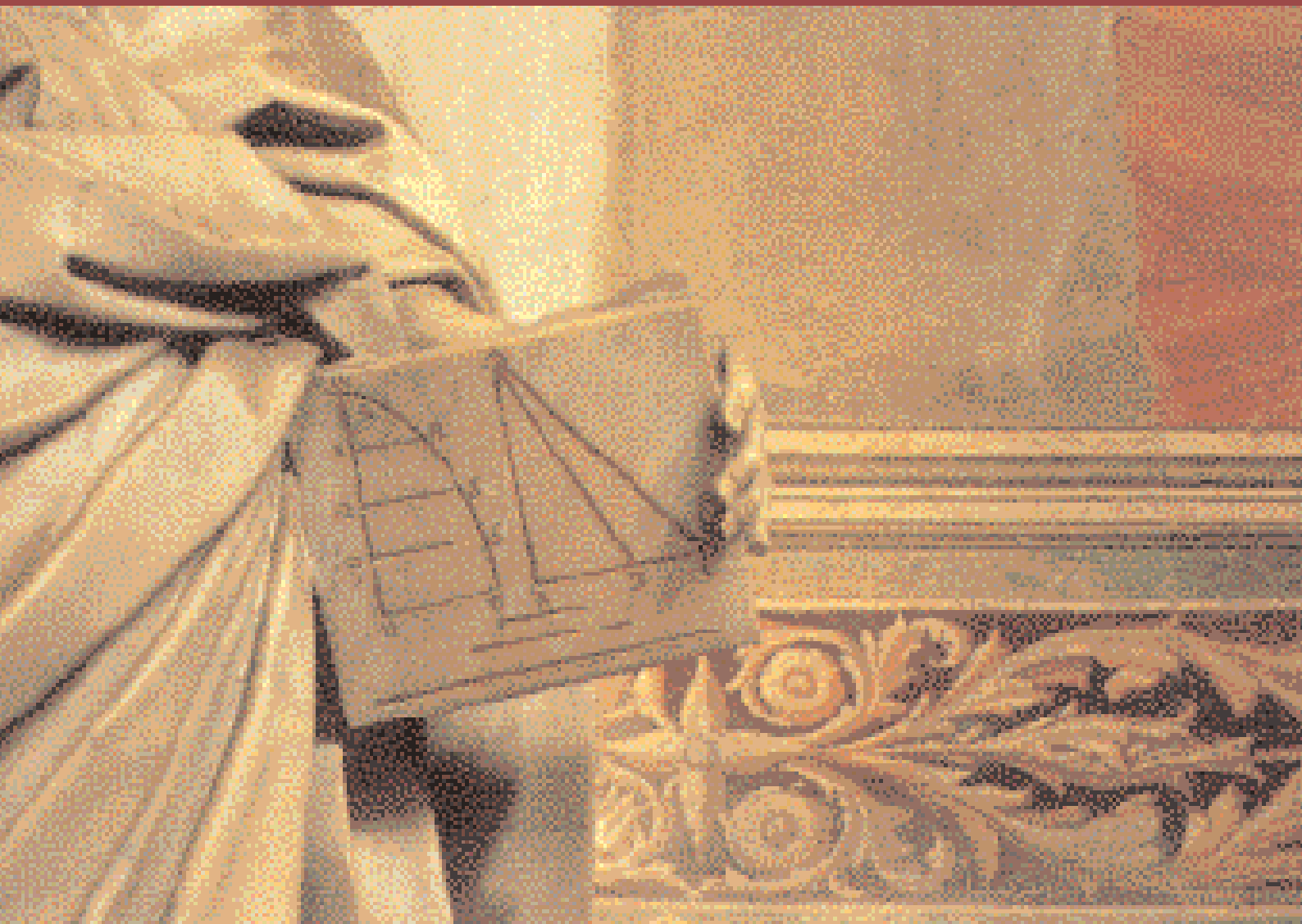


UK Economic Outlook

March 2007



Special features

- Which are the largest city economies in the world and how might this change by 2020?
- The economic impact of increased net migration to the UK

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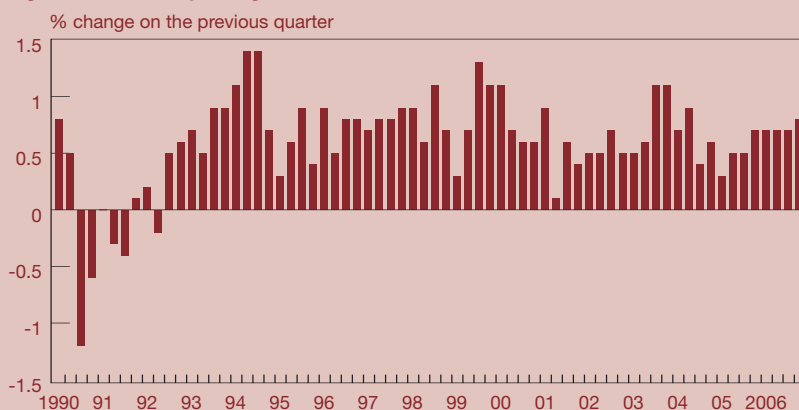
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I – Summary

Highlights

- UK GDP growth is projected in our main scenario to moderate slightly from 3% in the year to the fourth quarter of 2006 to around 2.75% in 2007 and 2.5% in 2008.
- Consumer spending growth is expected to remain somewhat below trend at an average of around 2.5% in 2007 and 2.25% in 2008, as consumers remain relatively cautious in the face of high household debt levels and the rise in interest rates since August 2006. Public spending growth is also set to slow over the next two years.
- Business investment growth strengthened significantly in 2006 and is expected to remain strong in 2007, although the rate of growth may moderate in 2008.
- Risks around growth in our main scenario are significant, but probably broadly balanced at present as regards economic growth. UK consumer spending could be somewhat weaker than we project in our main scenario, but business investment might be stronger.
- In our main scenario, CPI inflation should move back towards or possibly somewhat below its 2% target rate by the end of 2007 as UK retail energy prices fall back, although there are larger uncertainties around the inflation outlook at present than for some years.
- Interest rates are assumed to rise to 5.5% in the short term, but then remain at that level in our main scenario. Larger rate increases are possible if growth or inflation remain higher than we expect but, if growth falters, UK rates could be cut again later in 2007 or in 2008. As for inflation, uncertainties around future interest rates appear relatively large at present.
- This issue includes a special article that estimates the relative economic output of the largest cities in the world in 2005 and makes illustrative projections for how this might change by 2020. London is projected to grow relatively strongly over

Figure 1.1 – Quarterly GDP growth



Source: ONS

this period, rising from 6th to 4th in our global city GDP rankings, but the most marked trend is likely to be the rising economic significance of cities in China, India and other emerging economies.

- A second special article focuses on the economic impact of recent increased migration to the UK. It concludes that this has potential economic benefits for the UK in terms of higher economic growth and there is little evidence of increased unemployment for native workers as a result of higher migration. But there are also some potential offsetting effects in areas such as transport congestion and pressure on housing supply.

Recent developments

UK economic growth was around trend for most of 2006, but picked up to a slightly above trend 0.8% quarter-on-quarter growth rate in the fourth quarter of 2006 (see Figure 1.1). Year-on-year growth reached 3% in the fourth quarter, while the average for the year was 2.7%. Business investment picked up strongly during 2006 and consumer spending was also relatively healthy at the end of the year (although retail sales then fell back in January).

The business and financial services sector has remained a key engine of growth, helped by buoyant financial markets and M&A activity, but other service sectors have also generally remained relatively strong. Manufacturing strengthened gradually during the first half of 2006, but growth

slowed in the final quarter of the year, probably in part due to the strong pound. Employment has continued to rise, but unemployment was also on a gently rising trend for much of the year, although it fell back slightly in the fourth quarter. Earnings growth remained subdued for much of 2006, although there was some evidence of a pick-up in wage settlements in early 2007.

The US economy has slowed in response to a marked weakening of the housing market although the latest data suggest a relatively soft landing may be achieved. In contrast, growth picked up somewhat in Euroland last year and remained strong in Asia, prompting a general rising trend in official interest rates in those regions. Oil prices have fallen back significantly since July 2006, but remain volatile. Overall, global growth is expected to be somewhat slower in 2007 than in 2006, but still above its long-run trend rate, led again by China and India.

UK inflation rose well above its 2% target rate to 3% in December due in large part to increases in electricity and gas bills during 2006, while the headline RPI rate picked up to 4.4%. The Bank of England's Monetary Policy Committee (MPC) surprised markets by raising interest rates to 5.25% in January, rather than in February as generally expected, in an apparent attempt to head off any acceleration in wage settlements in response to higher headline inflation rates. The CPI inflation rate, however, then fell back unexpectedly sharply to 2.7% in January and headline RPI inflation also fell back to 4.2%.

The Pre-Budget Report in December included a £2 billion tightening of fiscal policy in response to continued high budget deficit levels.

Future prospects

Our **main scenario** sees UK economic growth moderating slightly from 3% in the fourth quarter of 2006 to around 2.75% in 2007 and 2.5% in 2008 as the effects of higher interest rates and the US slowdown feed through. As shown in Table 1.1, this is similar to the latest average independent forecasts, but at the bottom end of the Treasury's forecast range. The differences between these various estimates, however, are relatively small compared to the normal margin of error for such forecasts, as indicated by the **alternative GDP growth scenarios** shown in Figure 1.2. At present, risks to our main scenario for growth appear broadly balanced.

Consumer spending growth is expected to remain relatively modest at around 2.5% in 2007 and 2.25% in 2008 in our main scenario. This reflects the dampening effect of higher interest rates and high household debt levels. If the housing market slows sharply over the next year, which is possible as mortgage rates rise, this would tend to reduce consumer spending through confidence, collateral and wealth effects. But there is also some upside potential here if the housing market remains as strong as it has in 2006, driven by supply shortages.

Business investment¹ should continue to grow relatively strongly in our main scenario, although this will be offset by a planned slowdown in public sector investment. The risks to global growth and thus to UK exports may be weighted somewhat to the downside at present in the light of the possibility of a hard landing in the US. This is not our main scenario, however, and might be offset by stronger growth in Euroland and continued strength in Asia. The future path of oil prices also remains a considerable source of uncertainty for the world economy.

Growth in the UK **manufacturing sector** is expected to continue to lag behind the services sector in 2007-08. **Business and financial services** are likely to continue to lead the way in the short term, although this

Table 1.1 – Summary of UK economic prospects

Indicator (% change on previous year)	HM Treasury forecasts (December 2006)		Independent forecasts (February 2007)		PwC Main scenario (March 2007)	
	2007	2008	2007	2008	2007	2008
GDP	2.75 to 3.25	2.5 to 3	2.5	2.3	2.75	2.5
Consumer spending	2.25 to 2.75	2.25 to 2.75	2.3	2.1	2.5	2.25
Investment	5.25 to 5.75	3.25 to 3.75	4.6	3.1	6	3.75
Manufacturing output	1.75 to 2	1.75 to 2.25	1.2	1.2	1.5	1.75
CPI (Q4)	2	2	2.0	2.0	1.75	2

Source: HM Treasury, Survey of Independent Forecasts (average values), PwC scenarios rounded to the nearest quarter of a percent. Investment refers to total fixed investment.

Figure 1.2 – Alternative GDP growth scenarios



Source: ONS, PricewaterhouseCoopers

is vulnerable to any major adverse shocks to global financial markets, following up the correction in late February.

Our main scenario for UK GDP growth would be consistent with **inflation** (CPI) moving back towards or possibly somewhat below its 2% target rate by the end of 2007 as UK retail energy prices come down during the course of the year, following earlier declines in wholesale prices. In this case, official short-term **interest rates** are assumed to rise to 5.5% in the short term but then remain on hold, broadly in line with market expectations. This is far from certain, however, given the risks surrounding both international and UK growth prospects. Indeed both inflation and interest rates are subject to particularly large uncertainties at present relative to the experience of recent years.

Largest city economies in the world in 2005 and 2020

Cities tend to be ranked in size according to their populations, but to assess the relative size of their economies we also need to

take account of their average income per capita levels. Doing this in a consistent and comprehensive way at a global level is challenging, but in Section III below we have combined data from a number of reputable sources (e.g. the OECD, the UN and the World Bank as well as national statistical agencies) to produce a ranking by GDP at Purchasing Power Parity (PPP) exchange rates of the largest 100 urban economies in the world in 2005. The precise rankings are dependent on the definitions² and data sources adopted, but looking at GDP gives a much better indication of relative economic size than just looking at population.

Overall, our analysis re-emphasises the economic significance of the world's largest cities. The top 30 such cities ranked by GDP accounted, according to our estimates, for around 16% of world GDP in 2005 and this share rises to around 25% for the top 100 cities (in total our analysis covers around 150 cities, as listed in full in the Annex to Section III below).

¹ Business investment is the largest component of total fixed investment, which also includes housebuilding and government investment. In recent years, however, government investment has been the fastest growing category within total fixed investment.

At present, as shown in Table 1.2, the mega-cities of the major developed economies continue to lead the global GDP rankings. Only five emerging economy cities are currently in the top 30 (Mexico City, Buenos Aires, Sao Paulo, Moscow and Rio de Janeiro), but our illustrative projections suggest that all except Rio will move up the GDP rankings by 2020 and be joined in the top 30 by fast-growing cities such as Shanghai, Mumbai, Istanbul and Beijing.

London is projected to grow somewhat faster than leading rivals such as Tokyo, New York, Chicago and Paris, moving up to 4th place by 2020 according to our illustrative projections, but other 'old Europe' cities like Milan, Madrid and Rome seem likely to slide down the rankings as the emerging mega-city economies of Asia and Latin America rise. Smaller UK cities such as Birmingham, Manchester and Leeds, while continuing to grow at a respectable rate in absolute terms, are also projected to fall down the relative GDP rankings by 2020 as they are overtaken by faster growing cities in emerging economies.

Economic impact of increased migration to the UK

As discussed in detail in Section IV below, UK population growth has accelerated significantly since the turn of the century, driven primarily by higher net immigration, and an unexpectedly high inflow from the 'A8' Eastern European countries that joined the EU on 1 May 2004 has added to this trend. Available estimates indicate that up to half a million workers may have come to the UK from the A8 since May 2004, although Labour Force Survey data suggest that perhaps around half of these may since have returned home. These migrants tend to be aged 18-34 with high employment rates relative to UK averages for this age group, but also comparatively low wages despite relatively good education and skills levels.

It seems likely that migration has contributed to a somewhat higher level of trend GDP

Table 1.2 – Top 30 urban agglomeration GDP rankings in 2005 and illustrative projections to 2020 (using UN definitions and population estimates)

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)
1	Tokyo	1191	Tokyo	1602	2.0%
2	New York	1133	New York	1561	2.2%
3	Los Angeles	639	Los Angeles	886	2.2%
4	Chicago	460	London	708	3.0%
5	Paris	460	Chicago	645	2.3%
6	London	452	Paris	611	1.9%
7	Osaka/Kobe	341	Mexico City	608	4.5%
8	Mexico City	315	Philadelphia	440	2.3%
9	Philadelphia	312	Osaka/Kobe	430	1.6%
10	Washington DC	299	Washington DC	426	2.4%
11	Boston	290	Buenos Aires	416	3.6%
12	Dallas/Fort Worth	268	Boston	413	2.4%
13	Buenos Aires	245	Sao Paulo	411	4.1%
14	Hong Kong	244	Hong Kong	407	3.5%
15	San Francisco/Oakland	242	Dallas/Fort Worth	384	2.4%
16	Atlanta	236	Shanghai	360	6.5%
17	Houston	235	Seoul	349	3.2%
18	Miami	231	Atlanta	347	2.6%
19	Sao Paulo	225	San Francisco/Oakland	346	2.4%
20	Seoul	218	Houston	339	2.5%
21	Toronto	209	Miami	331	2.4%
22	Detroit	203	Toronto	327	3.0%
23	Madrid	188	Moscow	325	4.0%
24	Seattle	186	Mumbai (Bombay)	300	6.0%
25	Moscow	181	Madrid	299	3.2%
26	Sydney	172	Detroit	287	2.3%
27	Phoenix	156	Istanbul	287	5.2%
28	Minneapolis	155	Seattle	269	2.5%
29	San Diego	153	Beijing	259	6.6%
30	Rio de Janeiro	141	Metro Manila	257	5.9%

Source: PwC estimates and projections using UN population data and definitions (see Section III below for further details of data sources and methodology used).

growth. As such, inflationary pressures and so interest rates are likely to have been somewhat lower than would otherwise have been expected. Unless migration continues at recent high rates, however, this effect is likely to erode over time.

Focusing only on recent A8 migration, the net fiscal impact seems likely to have been positive, since these workers are mostly relatively young with few dependents and so are not likely to make major calls on the public services.

We also considered the impact of increased migration on national income per capita. This should be positive, but will be less (in percentage terms) than the impact on total GDP both due to a higher total population and due to some of the income earned by migrant workers being sent back home to their families. The benefits of higher national income per capita may also be offset to some degree by increased transport congestion and pressures on housing supply.

² In particular, we use the UN definitions of urban agglomerations from their latest World Urbanization Prospects report (2005 revision). We do, however, consider the impact of using alternative definitions in the detailed analysis in Section III below.

II – UK Economic prospects

Introduction

In this section of the report, we review the most important developments in the economy since the last UK Economic Outlook was published in November 2006. We then present and discuss our own future scenarios for the UK economy and compare these with HM Treasury and independent forecasts. The analysis is divided into the following sub-sections:

II.1 Recent developments and the current situation

II.2 Economic growth prospects

II.3 Prospects for inflation and interest rates

II.4 Sectoral and regional prospects

II.5 Longer term prospects

II.6 Summary and conclusions

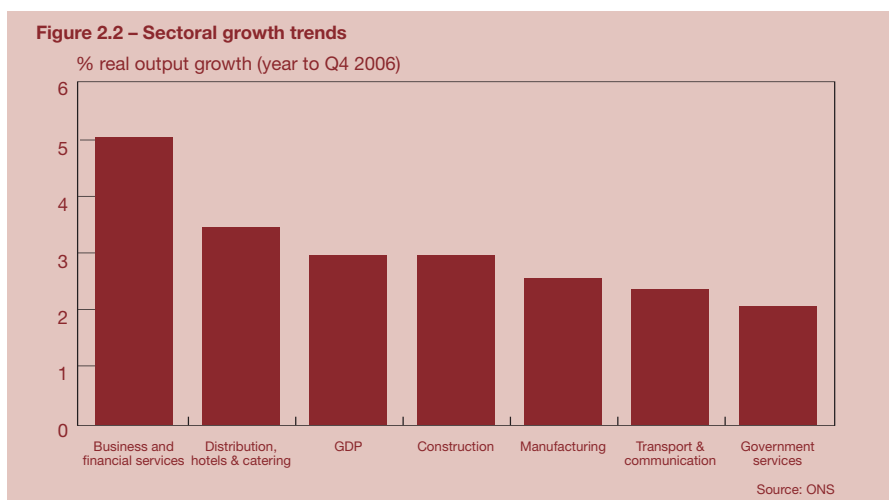
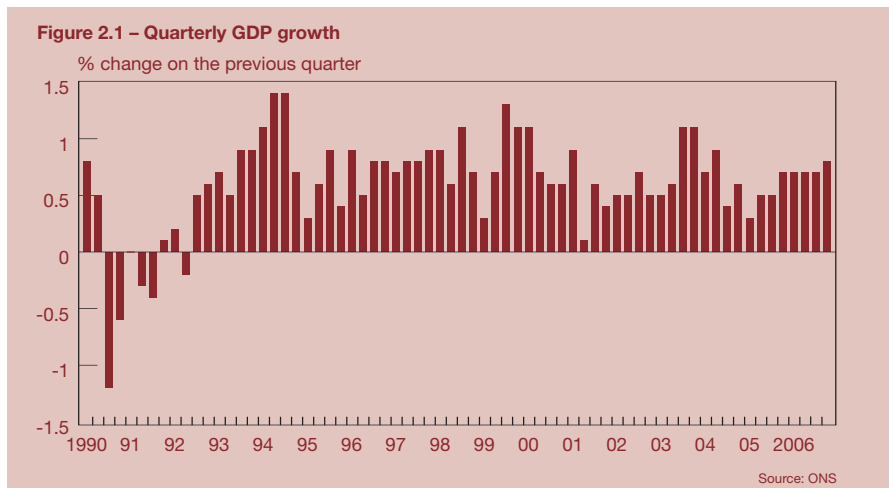
The analysis is supported as usual by a review of global trends and prospects (Appendix A). Historic trends in selected UK economic indicators are included for reference in Appendix B.

II.1 Recent developments and the current situation

Growth of GDP and major industry sectors

UK GDP grew by 0.8% in the fourth quarter (Q4) of 2006, a marginal acceleration from the 0.7% quarterly growth experienced over the previous four quarters (see Figure 2.1). The level of GDP in Q4 2006 was 3.0% higher than in the same quarter a year earlier, leading to average overall growth in 2006 of 2.7%. This represents a significant pickup in economic growth compared to 2005, when annual average GDP growth was just 1.9%.

Looking in more detail at individual industry sectors (see Figure 2.2), we can see that performance continues to vary materially in terms of annual output growth rates. The service sector continues to grow strongly while industrial production as a whole



actually contracted slightly in Q4 relative to the previous quarter (although it was up by 0.8% on a year earlier). Within the industrial production sector:

- there was a 0.6% fall in the output of the **mining, oil and gas** sector relative to the previous quarter (and a 9.0% year-on-year fall due to earlier declines in North Sea oil production);
- the supply of **electricity, gas and water** fell by 1.7% between the third and fourth quarters of 2006 and was down 4.4% on a year earlier; and
- output in the **manufacturing** sector was flat in the fourth quarter of 2006 relative to the previous quarter, although up by 2.6% on a year earlier.

Construction output is estimated to have risen by 0.9% in the fourth quarter compared to the third quarter of 2006 and

was up by 3.0% on a year earlier. This strong momentum looks likely to carry on into early 2007, with the Chartered Institute of Purchasing & Supply (CIPS) construction survey indicating a continued robust expansion of activity in January.

Services output rose by 1% between the third and fourth quarters of 2006, a marginal increase on the 0.8% growth rate recorded in the previous quarter. Compared to the same quarter of 2005, services output was up by 3.6%. The CIPS service sector business activity index fell slightly in January but remained strong by historic standards (see Figure 2.3). Within the services sector, key trends were as follows:

- the **business services and finance** sector grew by a healthy 1.1% in the fourth quarter of 2006, although this was down from 1.4% in the previous quarter; the December CBI/PwC financial services survey also indicated that confidence

was generally lower in Q4 than Q3 across most of the industry sub-sectors, although the overall trend in activity remains positive;

- the **distribution, hotels and catering** sector posted rapid growth of 1.4% in the fourth quarter of 2006, up from just 0.2% in the previous quarter; this acceleration was driven by faster growth in both wholesale and retail trade, with end of year retail sales volumes benefiting from strong trading around the Christmas period;
- the **transport, storage and communications** sector grew by 1.1% in Q4 2006, up sharply from 0.3% growth in the previous quarter; and
- **government and other services** output rose by an estimated 0.5% in Q4 2006, the same as in the third quarter.

Drivers of GDP growth

Strong domestic demand growth was offset by a small negative contribution to GDP growth from net exports in the year to Q4 2006 (see Figure 2.4).

Domestic demand

Figure 2.5 shows GDP, consumer spending and investment growth over the period since 1999. **Consumer spending growth** has continued to recover gradually from the sharp slowdown witnessed in 2005. Growth in the year to Q4 2006, at 2.6%, was the fastest seen since the last quarter of 2004. With growth in consumer expenditure exceeding disposable income growth, the **household savings ratio** fell in Q3 2006 for the third consecutive quarter, partly reversing the increase of the previous six quarters (see Figure 2.6).

Other indicators of consumer spending and confidence present a mixed picture, although on balance they seem to suggest that consumer spending growth remained relatively robust during the final quarter of 2006:

- **retail sales volume growth** was modest for most of the second half of 2006, but picked up in December in the run up to

Figure 2.3 – Purchasing managers' index of business activity

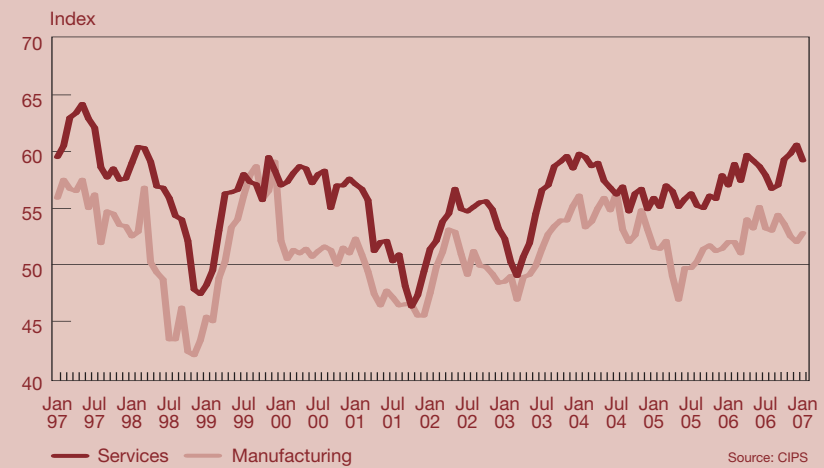
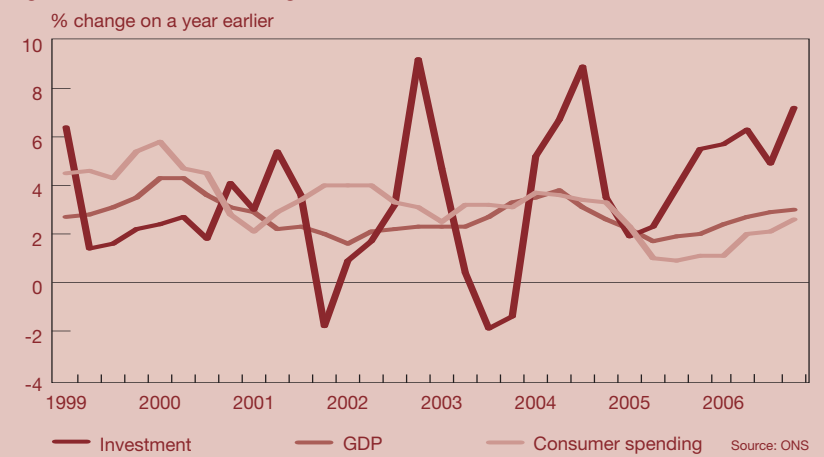


Figure 2.4 – Drivers of growth



Figure 2.5 – Domestic demand growth



Christmas before falling back again in January (see Figure 2.7);

- **consumer confidence** (as measured by the regular survey by GfK, a leading international market research firm) rose slightly from -8 to -7 in January 2007, but remains comparatively weak, standing four percentage points lower than in January 2006; however, the 'Climate for

Major Purchases' component of the GfK index rose in January;

- **house price inflation** crept gradually upwards during 2006, although remaining well below the peaks seen in earlier years of this decade (see Figure 2.8); the Nationwide house price index registered its smallest monthly increase in eight months in January 2007, however,

suggesting that recent interest rate rises may be beginning to slow the market (by contrast, the Halifax index rose in January but this followed a decline in December, so the underlying trend is similar to that indicated by the Nationwide index); and

- **mortgage lending** growth slowed somewhat during the second half of 2006, with the number of mortgage approvals falling in December 2006 compared with the previous month; the January survey by the Royal Institute of Chartered Surveyors (RICS) also showed some signs of a softening housing market in terms of both prices and sales activity levels.

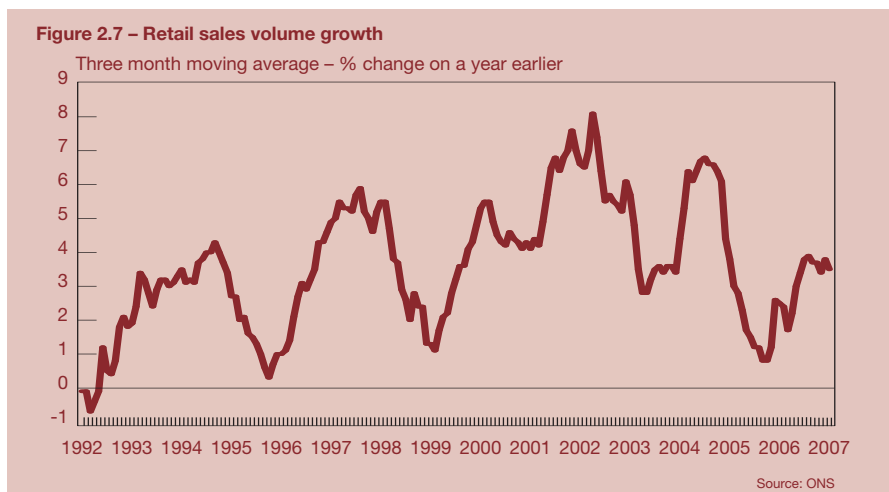
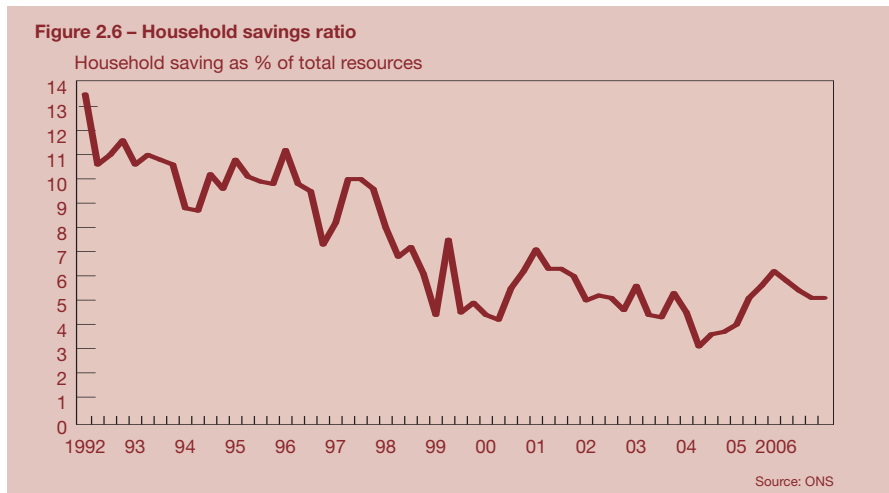
Fixed investment¹ achieved healthy growth of 2.5% in Q4 2006, taking it to a level 7.2% higher than a year earlier (see Figure 2.5). This was driven by strong growth in **business investment**, which increased by 11.1% in the year to the fourth quarter of 2006. Q1 2007 growth is also likely to have been strong, with the Bank of England Agents' Summary of Business Conditions indicating strong investment intentions in both the manufacturing and service sectors in January 2007.

Real government consumption grew by 0.4% in Q4 2006 and was up by 1.5% on the same quarter a year earlier. As confirmed in the December 2006 Pre-Budget Report, government consumption growth is likely to slow progressively over the next few years.

Stockbuilding is estimated to have fallen in Q4 2006. As always, however, these initial stockbuilding estimates include alignment adjustments and may be subject to significant revision at a later date.

The trade deficit and current account balance

The **trade deficit** has remained relatively stable in recent quarters, although the longer term trend still seems to be for the deficit to widen (see Figure 2.9). Export volumes fell by around 1% and imports by 0.2% in Q4 2006 compared to the previous quarter, but these contractions reflect lower trade in commodities associated with VAT



MTIC (Missing Trader Intra-Community) fraud.² Excluding this effect, both export and import volumes have been on a rising trend, although the strong pound seems to have dampened export growth recently.

The **current account deficit** as a whole stood at 2.9% of GDP in Q3 2006, up from 2.6% of GDP in the second quarter due to a lower surplus on investment income. There

have, however, been no problems as yet in financing this level of deficit, which in any event is less than half of the level of the US current account deficit as a share of GDP.

Inflation and the labour market

Consumer price inflation (CPI), which is the Bank of England's current target measure,

¹ Fixed investment is made up of business investment, private housebuilding and general government investment.

² This refers to so-called 'carousel fraud', where (sometimes fictitious) goods are exported to claim VAT refunds, but then imported again to a trader that then disappears without paying the VAT due. This is estimated to have cost several billion pounds in lost VAT revenue during 2006, as well as seriously distorting official trade statistics. But it appears to have fallen back sharply since July 2006.

rose significantly above its 2% target rate to 3.0% in December 2006, an 11-year high, but then fell back to 2.7% in January 2007 (see Figure 2.10).

Within the overall consumer price index, service price inflation remains higher than goods price inflation, although the two have converged to some degree since October. Goods price inflation rose to 2.3% in December 2006, with an increase in fuel duty contributing to higher fuel prices, before dropping back to 2.0% in January 2007. Service price inflation increased from a 26-month low of 2.9% in August 2006 to 3.8% in December 2006 before dropping back to 3.6% in January 2007. As the second line in Figure 2.10 shows, however, the biggest upward influence on the CPI over the past year has been the rise in domestic electricity and gas bills, excluding which the CPI index was still below 2% in January 2007, despite some upward trend since May 2006.

RPIX (the Retail Prices Index excluding mortgage interest payments) inflation rose from 3.4% in November 2006 to 3.8% in December. It then fell back to 3.5% in January 2007, but was still some way above its previous target level of 2.5%. This increase was again driven primarily by rising fuel costs during 2006. The headline RPI inflation rate similarly rose from 3.9% in November 2006 to 4.4% in December 2006, in part reflecting higher mortgage payments resulting from the November quarter-point interest rate rise, before easing to 4.2% in January 2007. Future inflation prospects are discussed further in Section II.3 below.

Producer input price inflation has fallen back considerably from the high levels seen over the past two years. Reflecting moderating oil prices, producer input price inflation fell from 18.1% in December 2005 to -1.6% in January 2007 (see Figure 2.11). **Producer output price inflation**, in contrast, increased from 1.6% in October 2006 to 2.1% in January 2007, suggesting that manufacturers were attempting to rebuild margins following earlier increases in input costs. The outlook for further increases is mixed, with the December CBI survey indicating that producer price pressures remain high, while the December CIPS manufacturing survey suggested that

Figure 2.9 – Current account and trade balance

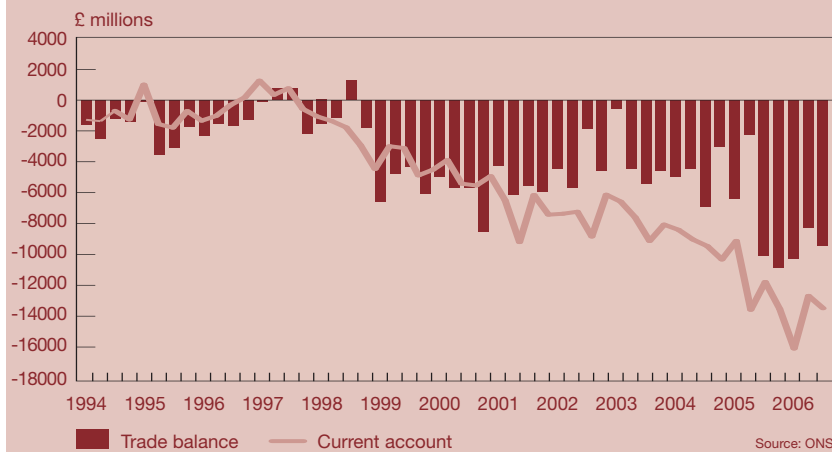


Figure 2.10 – Inflation (CPI) and recent effect of electricity and gas bills

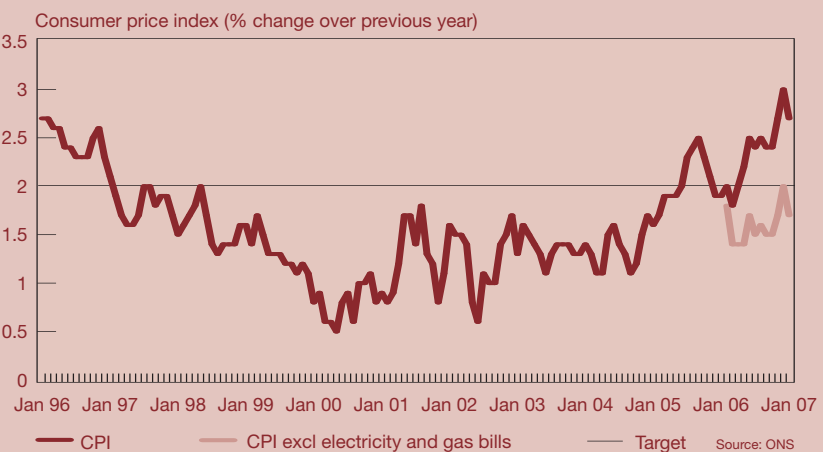
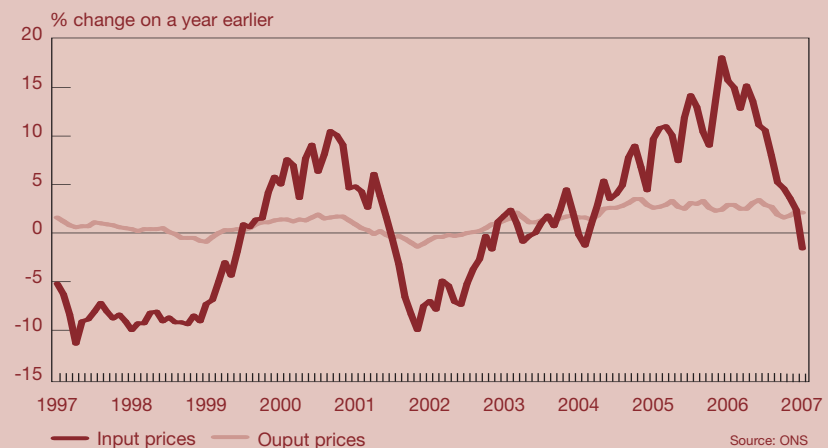


Figure 2.11 – Producer prices



inflationary pressures had eased, although they did then pick up again somewhat in January. Much here depends on the future trend in wholesale energy prices.

Employment was 51,000 higher in Q4 2006 than in the previous quarter, leading to a working age employment rate of 74.5%. Declines in employment in manufacturing and in the distribution, hotels and restaurants sector continue to be more than offset by

job gains in other services sectors (particularly education, health and public administration).

Several recent labour market indicators suggest that the earlier trend of increasing unemployment may be levelling out. The old claimant count measure of unemployment fell by 13,500 in December to 925,800, which was its fourth consecutive monthly decline. The broader Labour Force Survey

measure of unemployment also fell slightly to 5.5% of the labour force in Q4 2006 from 5.6% in the previous quarter. These figures suggest that job creation has recently been broadly keeping pace with the expanding labour force³, which is being fed by continued net inward migration (as discussed further in Section IV below).

Most regional labour markets (but particularly London and the Midlands) witnessed some rise in unemployment rates in the year to Q4 2006 (see Figure 2.12), although rates still tend to be lower in the South⁴, except in London. The employment rate in Q4 2006 was 78.7% in the South East (excluding London, where it was only 69.7%) and 78.4% in the South West; this compares with only 71.2% in the North East. In this sense, the North-South divide is still evident, although there are considerable variations in labour market performance within all regions. Regional prospects are discussed further in Section II.4 below.

Average earnings growth decelerated in the second half of 2006, with the headline annual rate standing at 4.0% in the three months to December 2006 compared to a year earlier, down from the recent peak of 4.4% seen in the three months to July 2006 (see Figure 2.13). If bonuses are excluded, thus removing the effects of high City bonuses and thereby giving a better idea of underlying trends, earnings growth has remained even more subdued, standing at 3.7% in the three months to December 2006 as compared to the same period a year earlier. On the other hand, the latest Income Data Services survey pointed to some pick-up in wage settlements in January 2007, possibly reflecting the recent sharp rise in headline RPI inflation.

Monetary and fiscal policy developments

In an announcement that caught the markets by surprise, UK official interest rates were raised to 5.25% in January 2007. The Bank cited limited spare capacity in the economy and high and rising inflation as the main reasons behind their decision. Rates were left on hold in February, although the Inflation Report published later that month suggested that inflation would only remain

Figure 2.12 – Regional unemployment rates

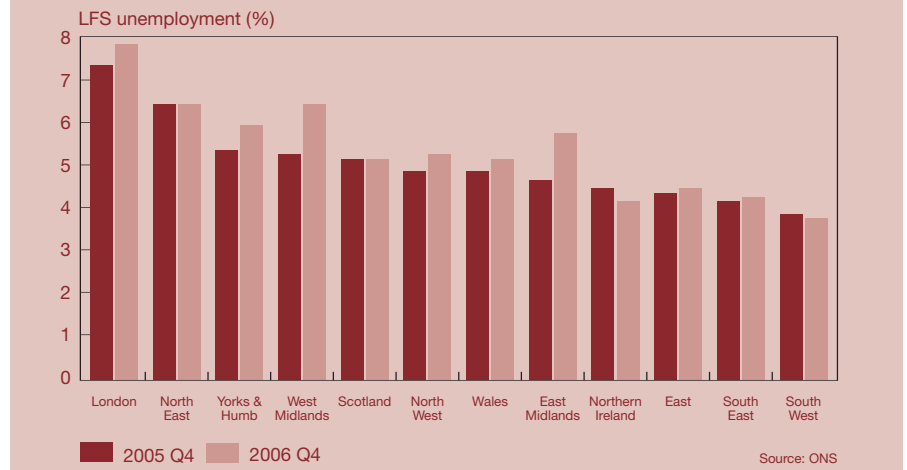


Figure 2.13 – Average earnings growth (including bonuses)

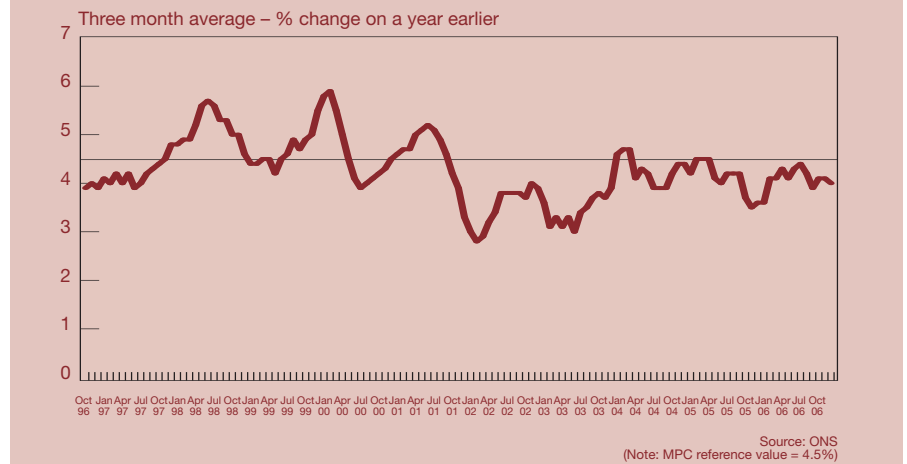
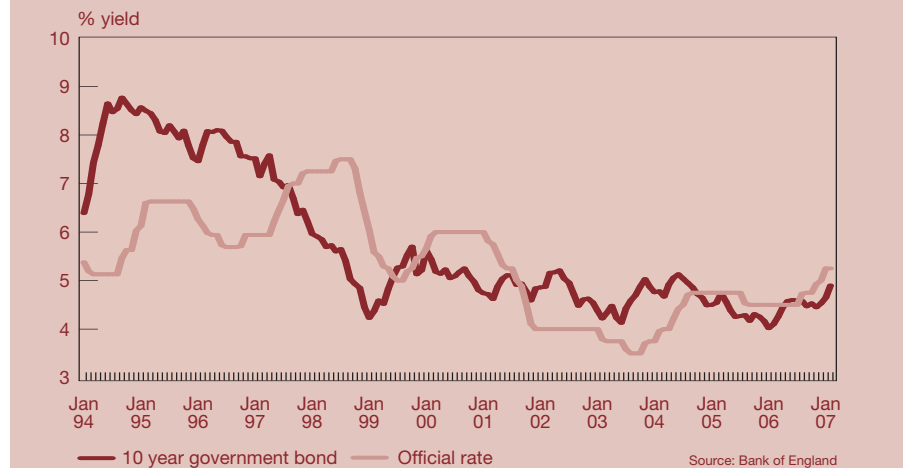


Figure 2.14 – Short and long term interest rates



on target in the medium term if interest rates rose to 5.5% in line with market expectations. Long-term interest rates remain low by historic standards, although they picked up somewhat in early 2007 (see Figure 2.14). Future interest rate prospects are considered in more detail in Section II.3 below.

Turning to the public finances, the Treasury projects a gradual move back to current budget surplus in the medium term, but this relies both on relatively robust revenue projections and on tight spending controls from 2008/9 onwards. Evidence for the first ten months of 2006/7 suggests that revenues are only slightly below forecast levels this financial year, but public

³ Although it should be noted that labour force growth slowed in Q4 2006. If this accelerates again, then the recent fall in unemployment may not be sustained unless employment growth also speeds up.

⁴ By 'South' we generally refer in this report to the standard planning regions of the South East (excluding London in this case), the South West and East Anglia. By the 'North' we generally refer to the North West, Yorkshire and Humber, and the North East region.

spending has risen faster than planned. Nonetheless, the Treasury looks almost certain to meet the Golden Rule of borrowing on average only to invest over the current economic cycle, which is now set to finish at the end of the current fiscal year according to revised estimates published in the December 2006 Pre-Budget Report (PBR). The Spring 2007 Budget is expected to confirm the need for tight public spending controls over the three years to 2010/11, but not to make major changes to overall tax levels.

II.2 – Economic growth prospects

Independent forecasts

Average independent forecasts (as published in the February 2007 survey by HM Treasury) are for real GDP growth to decelerate gradually from an estimated 2.7% in 2006 to 2.5% in 2007.

As shown in Table 2.1, the latest average independent growth forecast for 2007 is just below the 2.75–3.25% range indicated by the Treasury in its December 2006 Pre-Budget Report. The Treasury expects growth to slow marginally in 2008, predicting an annual growth rate of around 2.5–3%. The latest consensus of independent forecasters is for 2.3% growth in 2008, although the margin of error is large looking so far ahead hence the difference between this and the Treasury forecast is not significant relative to the uncertainties involved.

As Table 2.1 illustrates, the difference between the Treasury and average independent forecasts for GDP growth in 2007 reflects a combination of:

- consumer spending growth remaining modest at 2.3% according to the average independent forecast, which is at the lower end of the Treasury's 2.25–2.75% range;
- fixed investment growth declining to 4.6% in 2007 according to independent forecasts, compared to the Treasury's 5.25–5.75% range; and
- broadly stable manufacturing output growth of 1.2% in 2007 according to

Table 2.1 – HM Treasury and independent forecasts for the UK economy

Indicators (% real growth)	Estimate	HM Treasury forecast (December 2006)		Average Independent forecast (February 2007)	
	2006	2007	2008	2007	2008
GDP	2.7	2.75 to 3.25	2.5 to 3	2.5	2.3
Manufacturing output	1.3	1.75 to 2	1.75 to 2.25	1.2	1.2
Consumer spending	2.0	2.25 to 2.75	2.25 to 2.75	2.3	2.1
Fixed investment	6.0	5.25 to 5.75	3.25 to 3.75	4.6	3.1
Government consumption	1.9	2.5	2.5	2.4	2.2
Change in stockbuilding (contribution to % GDP growth)	0.2	0	0	-0.1	0
Domestic demand	2.9	2.75 to 3	2.25 to 2.75	2.6	2.2
Exports*	11.2 (6)	0.5 to 1 (5 to 5.5)	4.75 to 5.25	-0.7	4.7
Imports*	11.5 (6.25)	0.25 to 0.5 (4.25 to 4.75)	4.25 to 4.75	0.1	4.2
Current account (£ billion)	-33.8	-37.5	-38.75	-34.8	-36.4
Unemployment (m) claimant count - Q4	0.96	n/a	n/a	0.98	1.01

*Export and import growth were both distorted upwards by missing trader fraud in 2006, while their 2007 growth rates will be distorted downwards for the same reason. The Treasury gives alternative export and import growth estimates for 2006–7 excluding missing trader fraud effects, which are shown in brackets above.

Source: ONS for 2006, HM Treasury Pre-Budget Report (December 2006) and Comparison of Independent Forecasts (February 2007)

the average independent forecast, as compared to the Treasury's forecast of an acceleration to growth of around 1.75–2.25%.

It should be noted that independent GDP growth projections range from 2.0% to 2.9% for 2007⁵, reflecting the uncertainties surrounding these projections.

Risks facing the UK economy

On the international front, average independent forecasts suggest continued relatively healthy world trade growth of 7.0% in 2007, while the IMF projects global GDP growth somewhat above its long-term average at 3.5% in 2007⁶. There are, however, some important downside risks facing the global economy (as discussed in more detail in Appendix A) that would also, potentially, have an impact on the UK:

- **oil prices** have eased since July 2006 but capacity constraints remain tight; any supply disruptions in this context would be likely to lead to renewed price rises that could add to inflationary pressures, potentially pushing up **interest rates**,

which are already on an upward trend in most parts of the world;

- the **large US current account trade deficit** remains a source of concern, with the possibility of a disorderly adjustment associated with a sharp decline in the dollar; disruption to global financial markets is also an important risk, as indicated by the correction seen in late February;
- the weaker **US housing market** is expected to translate into a slower pace of US consumer spending growth in 2007;
- the **Euroland** economy performed relatively strongly in 2006 but remains potentially vulnerable to less favourable global economic conditions; in particular, if the US suffered a hard landing and/or there was a significant fall in the dollar against the euro, this could be damaging to Euroland exporters, who continue to play an important role in the recovery there, particularly in Germany; and
- fresh **geopolitical shocks** could derail global growth; Iraq remains unstable and nuclear developments in Iran are a

⁵ There is one outlier, Economic Perspectives, which is forecasting growth of only 1.1% in 2007, which we have excluded from the range quoted here.

⁶ This figure is aggregated using market exchange rates. Using PPP weights, which give a much greater weight to fast-growing emerging markets such as China and India, the IMF projects world GDP growth to be 4.9% in 2007, significantly above its long-run average rate.

potential source of conflict, while the emergence of an Avian influenza pandemic remains a 'wild card' risk, both in the UK and internationally.

There are also upside risks, however, associated with the continued strength of economic growth in China and India.

Important uncertainties also remain on the domestic front. On the downside, consumer spending remains vulnerable to further interest rate rises, especially in a context of a possible cooling housing market and high household debt levels. On the upside, the outlook for business investment remains strong given healthy corporate profitability and it is certainly possible, therefore, that consensus forecasts of investment growth could be exceeded here.

In summary, international and domestic risks to growth in 2007 appear broadly balanced at present. Nonetheless, important uncertainties remain.

Alternative UK growth scenarios

Our **main scenario** for the UK economy, as summarised in Table 2.2, has the following features:

- GDP growth moderates gradually from 3% in the year to Q4 2006 to around 2.75% in 2007 and 2.5% in 2008 (see main scenario in Figure 2.15); this reflects the impact of tighter monetary and fiscal policy, together with a slight slowdown in global economic growth in 2007;
- this GDP growth profile is associated with continued subdued consumer spending growth of around 2.5% in 2007 and 2.25% in 2008, reflecting the impact of higher interest rates, high debt levels and a cooling house market;
- investment expenditure is expected to remain strong, rising by around 6% in 2007 before slowing to a still-robust 3.75% in 2008; this scenario reflects decelerating but still reasonably strong public sector investment plans combined with continued strong business investment growth; and

Table 2.2 – Main scenario for the UK economy

% change unless stated	2003	2004	2005	2006	2007	2008
GDP growth	2.7	3.3	1.9	2.7	2.75	2.5
Consumer spending	3.0	3.5	1.3	2.0	2.5	2.25
Government consumption	3.5	3.2	3.1	1.9	2.25	2.25
Fixed investment	0.4	6.0	3.4	6.0	6	3.75
Change in stock-building (% GDP)	0.2	0.1	-0.1	0.2	0	0
Domestic demand	2.7	3.8	1.9	2.9	3	2.5
Net exports (% of GDP)*	-0.1	-0.6	0	-0.4	-0.25	0

*Export and import figures have both been distorted by the effects of missing trader fraud recently, so we focus here on net exports, which are less affected by this distortion.
Source: ONS for historic data to 2006, PwC main scenario for 2007 and 2008 (rounded to nearest quarter of a percentage point).

Figure 2.15 – Alternative GDP growth scenarios



Source: ONS, PricewaterhouseCoopers

- the contribution of net trade to overall GDP growth is projected to be slightly negative in 2007 and broadly neutral in 2008.

Our main scenario for GDP growth is slightly higher than the latest average independent forecast for 2007 and about the same for 2008, but is at the bottom end of the Treasury's forecast ranges for both 2007 and 2008. Given the margins of error involved in such forecasts, however, particularly for 2008, these differences are not large.

In recognition of these uncertainties, we also present two alternative growth scenarios (see Figure 2.15):

- 'High growth', in which the housing market regains momentum and, combined with stronger earnings growth, contributes to significantly faster consumer spending growth. At the same time, a soft landing in the US and a robust upturn in Euroland and Asia boost UK exports and support a revival in the

manufacturing sector. In this case, UK growth might accelerate to around 3.5% in 2007 and 2008.

- 'Low growth', in which unemployment rises, house prices fall back markedly and this negative wealth effect, together with high levels of household debt, serves to cool consumer spending significantly. At the same time, this scenario assumes that the US economy suffers a hard landing, causing a knock-on deceleration in Euroland and Asia. These developments would push UK companies operating in trade-exposed areas, particularly manufacturing, to delay or abandon spending plans, with the result that UK business investment and export growth would decelerate sharply. In this scenario, UK growth might average only around 2% in 2007 and 1.5% in 2008, although an outright recession should be avoided given the scope for interest rates to be reduced in response.

As discussed above, the risks around our main scenario for growth seem broadly balanced at present, as reflected in the fact that our high and low growth scenarios are broadly symmetrical around our main scenario in Figure 2.15.

II.3 – Prospects for inflation and interest rates

As shown in Table 2.3, both the latest Treasury forecast and the average view among independent forecasters is that inflation (measured using the CPI) will fall back to around 2%, the Bank of England's target rate, by the end of 2007 and then remain around that level in 2008. The Bank of England's latest forecast is broadly similar, although they see headline CPI dipping below 2% in late 2007 and early 2008 due to the effect of expected UK retail energy price falls during the course of this year.

In our main scenario, we also expect headline inflation, as measured by CPI, to trend downwards in the coming year as earlier electricity and gas price rises fall out of the index and indeed are replaced by price falls during the course of this year. In this main scenario, we project headline CPI inflation to decline to just below 2% by the end of 2007 due to retail energy price effects, and then to rise back to around 2% by the end of 2008 on the assumption that energy prices then stabilise. This scenario also assumes that continued strength in the exchange rate will constrain import price inflation.

Figure 2.16 shows this main scenario for CPI inflation, as well as two alternative scenarios that are broadly consistent with the alternative growth scenarios discussed in Section II.2 above and with alternative high/low paths for UK retail energy prices⁷. Under these alternative scenarios, CPI inflation could fall to around 1% by the end of 2007 in a 'low inflation scenario', but could remain well above target in our 'high inflation' scenario and begin rising again towards 3% by the end of 2008.

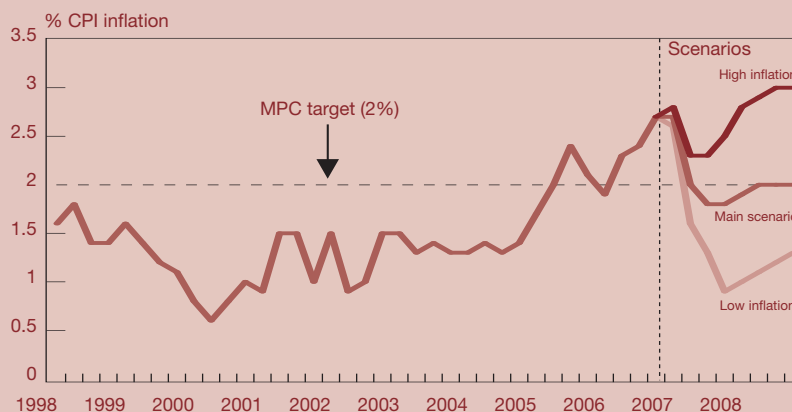
Figure 2.17 shows illustrative profiles for the official UK short-term interest rate in 2007

Table 2.3 – Inflation, earnings growth and interest rate projections

Indicator	HM Treasury (December 2006)		Consensus forecasts (February 2007)			
	2007	2008	Average		Range*	
			2007	2008	2007	2008
CPI (%: Q4)	2	2	2.0	2.0	1.4 to 3.0	1.7 to 2.4
Earnings growth (% annual average)	n/a	n/a	4.3	4.2	3.5 to 5.4	3.5 to 4.7
BoE official rate (%: Q4)	n/a	n/a	5.2	5.0	4.5 to 5.8	4.3 to 6.1

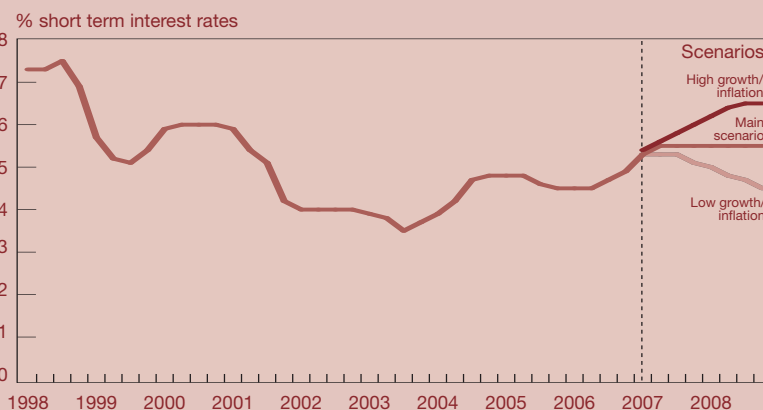
*Excluding one or two outliers
Source: HM Treasury Pre-Budget Report (December 2006) and Comparison of independent forecasts (February 2007).

Figure 2.16 – Alternative inflation scenarios



Source: ONS, PricewaterhouseCoopers

Figure 2.17 – Illustrative short term interest rate scenarios



Source: Bank of England, PwC scenarios

and 2008 in each of our three composite growth/inflation scenarios. We can see that, in our main scenario, the official rate is assumed to rise to 5.5% in the short term and then remain on hold. In a 'high growth/inflation' scenario, by contrast, interest rates could rise to around 6.5% by the end of 2008, but might fall back to only around 4.5% by that time if the 'low growth/inflation' scenario emerges. Clearly, there are particularly large uncertainties surrounding both inflation and interest rate projections at present.

II.4 – Sectoral and regional prospects

Figure 2.18 illustrates our main scenario for sectoral output growth in 2007 and 2008. Projected divergences in growth rates between sectors remain significant, with manufacturing growth picking up gradually but continuing to lag behind the service sectors. The business services and finance sector is again expected to see the highest average growth rates in both 2007 and 2008 in our main scenario. The growth rates of the distribution and transport and communication sectors are projected to

⁷ We implicitly assume here that higher global and UK GDP growth tends to push up energy demand and so energy prices in the high growth/inflation scenario, and vice versa in the low growth/inflation scenario. If higher energy prices instead reflected adverse supply-side shocks, this could result in slower economic growth and an intermediate outcome for inflation. But, for the sake of clarity, we focus here on more extreme high/low inflation scenarios where retail energy price changes are driven primarily by demand conditions and/or by corporate decisions unrelated to macroeconomic conditions.

accelerate marginally in 2007, before slowing somewhat in 2008 in line with the economy generally.

Illustrative estimates of regional growth prospects in 2007 and 2008 based on our UK main scenario are shown in Figure 2.19. In this scenario, North-South regional growth differentials are projected to remain in 2007 and 2008, although they may become slightly less marked over time as manufacturing recovers somewhat. The South East is still expected to be the fastest growing UK region, with the slowest growth rate being in the North East.

II.5 – Longer term prospects

Table 2.4 summarises the latest long-term consensus forecasts, based on a medium-term survey carried out by HM Treasury in February 2007 for the period from 2007 to 2010. Average annual UK GDP growth over this period is expected to be around 2.5–2.6%. This is slightly lower than the Treasury's new 2.75% trend growth estimate for this period, as published in the December 2006 Pre-Budget Report (see Section IV below for further discussion of this revised trend growth assumption, which was driven by higher expected net migration to the UK). The consensus forecasts in Table 2.4 suggest that domestic demand growth will be similar to overall GDP growth over the period to 2010, implying a broadly neutral contribution from net trade. We would expect a continued relative decline in manufacturing as a share of GDP in the long run, given ever-increasing competition from lower cost producers in Asia and elsewhere. Consumer spending growth is expected to be relatively moderate for several years, reflecting high levels of household debt and recent rises in interest rates, but business investment growth should be somewhat stronger than overall GDP growth.

Inflation (on the CPI measure) is projected to remain around its 2% target rate in the longer term. This implies average real interest rates of around 3%, assuming that short term nominal interest rates average around 5% in 2007-10, as implied by the average independent forecasts shown in Table 2.4.

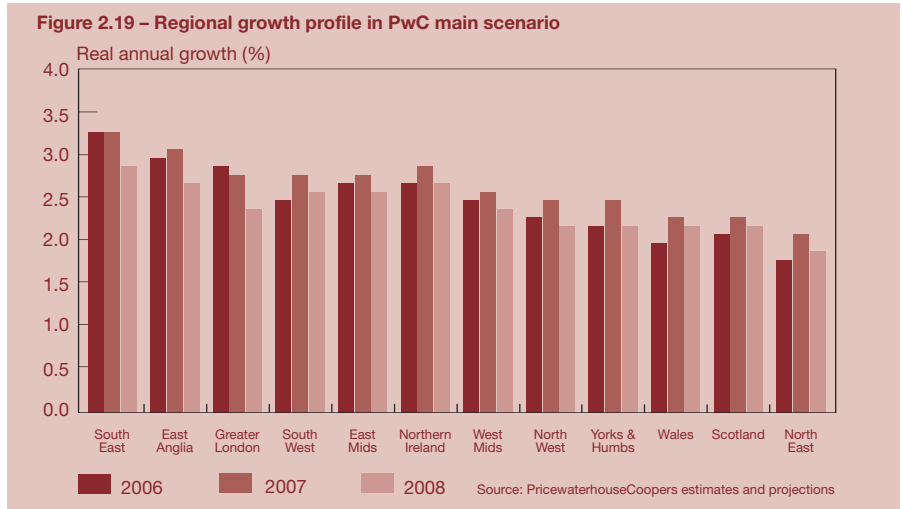
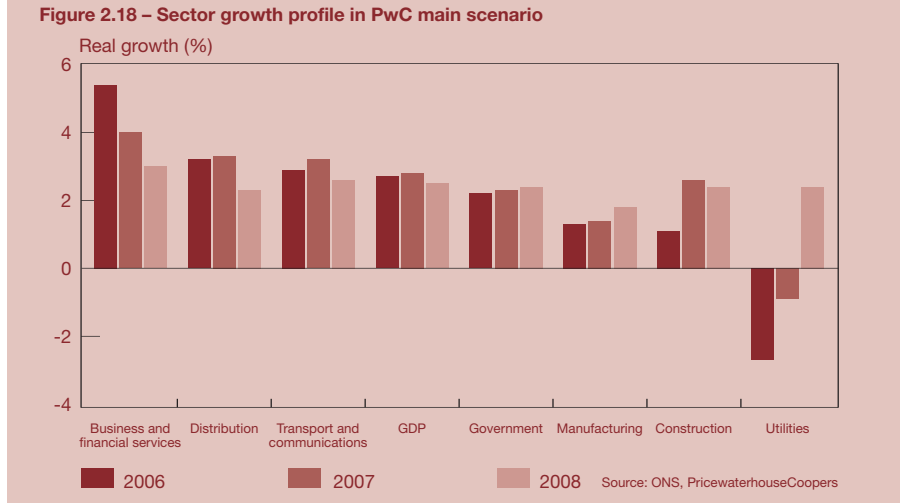


Table 2.4 – Long-term independent forecasts for UK economy

% growth unless stated	2005	2006	2007	2008	2009	2010
GDP	1.9	2.7	2.5	2.4	2.6	2.6
Domestic demand	1.9	2.9	2.6	2.5	2.7	2.7
Consumer prices (CPI)	2.1	2.3	2.2	2.0	2.0	2.1
Retail prices (RPIX)	2.3	3	2.8	2.5	2.5	2.5
Short term interest rate (%)*	4.3	5	5.1	4.9	5.0	4.9

*Bank of England official rate (average for year rounded to nearest 0.1%)
Source: ONS for 2005-6, Treasury comparison of independent medium-term forecasts (February 2007). Note that the average projections for 2009-10 are based on a smaller sample of forecasters than the average independent forecasts for 2007-8 shown in Tables 2.1 and 2.3 above (see Treasury website for details).

II.6 – Summary and conclusions

In our main scenario, annual UK GDP growth moderates gradually from 3% in the year to Q4 2006 to around 2.75% in 2007 and around 2.5% in 2008. Consumer spending growth is expected to remain moderate at around 2.25-2.5% per annum in this scenario, but business investment should be significantly stronger than this given recent healthy corporate profitability levels. CPI inflation is projected to return to

around its 2% target rate by the end of 2008 in this scenario, assuming that there is no significant renewed upward trend in oil and gas prices. We assume that base rates peak at 5.5% in this scenario and then remain on hold.

There are still many uncertainties associated with this main scenario, although the risks to growth appear broadly balanced at present. The uncertainties surrounding inflation and interest rates are particularly significant at present.

III – Which are the largest city economies in the world and how might this change by 2020?¹

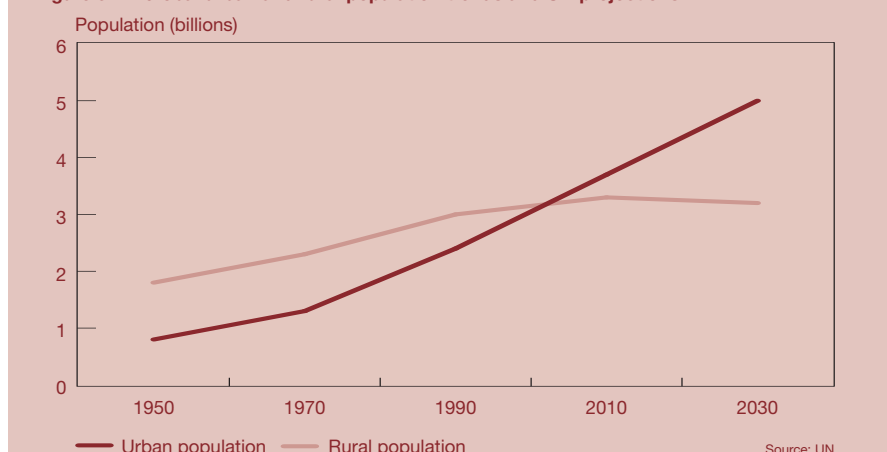
Rankings of global cities by population are common, but while population statistics are important, they are only part of the story: leading cities such as London, New York, Paris and Tokyo are major economies in their own right of a size greater than medium-sized national economies such as Sweden and Switzerland. Cities are also centres of innovation, creativity and culture, as well as focal points for government, finance, business services and corporate headquarters in their countries (and sometimes also their regions in the case of financial centres like London in Europe or Tokyo in Asia, or political centres like Brussels in the EU).

Despite this, data are much less readily available on the overall size of city economies in terms of their total output, particularly outside the OECD countries². This article aims to fill this gap by presenting some new estimates by PricewaterhouseCoopers LLP (PwC) of the size of the largest 100 city economies in the world in 2005 as measured by their estimated Gross Domestic Product (GDP). This analysis shows a significantly different picture from rankings by population, with the advanced economy cities ranking much higher by GDP than by population due to their higher average income levels. We also, however, provide some illustrative projections of how these GDP rankings might change by 2020, which allows us to consider how far fast-growing cities in emerging market economies like China, India and Brazil will challenge the dominance of current leading global cities like New York, Tokyo, Paris and London.

The discussion below is organised as follows:

- Section III.1 provides a long-term historic perspective on population trends for the largest global cities;
- Section III.2 summarises the data and methodology used in the analysis to estimate the size of city economies as measured by GDP;

Figure 3.1 – Global urban and rural population trends and UN projections



- Section III.3 presents and discusses our estimates of the largest city economies in 2005;
- Section III.4 presents and discusses our illustrative projections for how these rankings might change between 2005 and 2020, with a particular focus on the rise of emerging economy cities;
- Section III.5 highlights the uncertainties surrounding our projections and discusses some of the key factors underlying the relative growth rates of city economies; and
- Section III.6 summarises and draws conclusions from the analysis.

A full listing of our ranking of the largest city economies by GDP in 2005 and 2020 is provided in the Annex.

III.1 – Long-term historic trends in city populations

Urbanisation has been one of the major global themes of the past century and all the indications are that major cities will provide an increasing focus for global economic activity over the course of this century. In 1900, there were only 16 cities in the world with more than 1 million inhabitants, mostly in the advanced economies; now there are over 400 such cities according to United Nations (UN) estimates, around three-quarters of which

are in low and middle-income countries. In 1950, the rural population of the world was around twice the urban population, but by 2010 the UN estimates that the urban population will be greater and by 2030 it projects a total global urban population of around 5 billion compared to just over 3 billion in rural areas (see Figure 3.1).

Rankings of cities by population are available over long periods of time. Indeed Tertius Chandler, in his book *Four Thousand Years of Urban Growth: An Historical Census* (1997, St David's University Press), goes as far back as estimating that Memphis in Egypt was the largest city in the world in 3100BC with a population of 'well over 30,000'. Later holders of this 'title' include Babylon (from 1770BC and later again around 600BC when its population was over 200,000), Alexandria (around 300BC), Changan in China (c.200-25BC), Rome (c.25BC-340AD with a population of around 500,000 in 100AD), Constantinople (c.340-570AD with a population of around 400,000), Cordoba in Spain (c.935AD), Fez in Morocco (c.1170AD) and Cairo (c.1315AD)³. For much of the period from the 14th to the 18th centuries, Chandler estimates that the largest city in the world was in China (Hangzhou, Nanking or Beijing, with the latter having a population of over a million by 1800). London took over as the largest city in 1825 with a population then of around 1.35 million, rising rapidly to over 6 million by 1900. London's position was then usurped by New York in around

¹ The article was written primarily by John Hawksworth, with significant additional input from Thomas Hoehn. The article also draws on earlier research by Meirion Gyles and forms part of PricewaterhouseCoopers' wider research and consultancy programme on city economies.

² Some data are available for selected OECD and non-OECD cities on relative wages and costs of living, but no systematic global data source is readily available for GDP per capita at a city level as far as we are aware.

³ Note that these cities in Spain and the Middle East are estimated to have had populations of around 200-300,000 at their peak, much lower than Rome at its peak, so there is not a monotonic upward trend in city size over the course of history.

1925, which in turn was overtaken by Tokyo from around 1965 onwards.

A number of interesting academic studies have been carried out using long-term trends in city populations. De Long and Shliefer (1993)⁴, for example, identify political regimes and taxation systems as key drivers of European city population growth in the period from 1000 to 1800, concluding that cities with non-absolutist regimes and relatively low taxation levels tended to grow faster on average. Drewett, Hoehn and Sacks (1991)⁵ show how European city population growth in 1750-1970 was related to national economic growth.

The long-term historic estimates produced by Chandler and others, although fascinating in tracking the shifting patterns of human civilisation over the millennia, are inevitably only approximations as you go further back in time. More systematic rankings of urban agglomeration populations have been produced by the UN for the period since 1950. Table 3.1 shows the **top 30 urban agglomerations by population** in 1950, 1970, 1990 and 2005 to illustrate how these rankings have evolved over time. Notable points are that:

- Tokyo and New York remained the two largest urban agglomerations between 1950 and 1990 (although swapping places after around 1965), but Mexico City (which was only 17th in 1950) has overtaken New York in terms of population during the past ten years;
- London was still the third largest city in 1950, but has slid down the rankings progressively since then to only 25th in 2005 (with its population remaining broadly unchanged over this period); Manchester and Birmingham were in the top 30 cities in 1950 but would not rank in the top 100 by population now⁶;
- other leading European cities seeing sharp declines in their population rankings between 1950 and 2005 include Paris (5th to 21st), Moscow (6th to 20th) and Berlin (from 13th to well outside the top 30);

Table 3.1 – Trends in top 30 urban agglomerations by population: 1950-2005

Ranking in 1950	Pop. (m) 1950	Ranking in 1970	Pop. (m) 1970	Ranking in 1990	Pop. (m) 1990	Ranking in 2005	Pop. (m) 2005
1. New York	12.3	Tokyo	23.3	Tokyo	32.5	Tokyo	35.2
2. Tokyo	11.3	New York	16.2	New York	16.1	Mexico City	19.4
3. London	8.4	Osaka-Kobe	9.4	Mexico City	15.3	New York	18.7
4. Shanghai	6.1	Mexico City	8.8	Sao Paulo	14.8	Sao Paulo	18.3
5. Paris	5.4	Paris	8.4	Mumbai	12.3	Mumbai	18.2
6. Moscow	5.4	Los Angeles	8.4	Osaka-Kobe	11.0	Delhi	15.0
7. Buenos Aires	5.1	Buenos Aires	8.1	Kolkata	10.9	Shanghai	14.5
8. Chicago	5.0	Sao Paulo	7.6	Los Angeles	10.9	Kolkata	14.3
9. Kolkata	4.5	London	7.5	Seoul	10.5	Jakarta	13.2
10. Beijing	4.3	Moscow	7.1	Buenos Aires	10.5	Buenos Aires	12.6
11. Osaka/Kobe	4.1	Chicago	7.1	Rio de Janeiro	9.6	Dhaka	12.4
12. Los Angeles	4.0	Shanghai	7.1	Paris	9.3	Los Angeles	12.3
13. Berlin	3.3	Kolkata	6.9	Cairo	9.1	Karachi	11.6
14. Philadelphia	3.1	Rio de Janeiro	6.6	Moscow	9.1	Rio de Janeiro	11.5
15. Rio de Janeiro	3.0	Mumbai	5.8	Delhi	8.2	Osaka-Kobe	11.3
16. St Petersburg	2.9	Beijing	5.6	Shanghai	8.2	Cairo	11.1
17. Mexico City	2.9	Cairo	5.6	Manila	8.0	Lagos	10.9
18. Mumbai	2.9	Seoul	5.3	London	7.7	Beijing	10.7
19. Detroit	2.8	Tianjin	4.6	Jakarta	7.7	Manila	10.7
20. Boston	2.6	Philadelphia	4.4	Chicago	7.4	Moscow	10.7
21. Cairo	2.5	St Petersburg	4.0	Beijing	7.4	Paris	9.8
22. Manchester	2.4	Detriot	4.0	Karachi	7.1	Istanbul	9.7
23. Tianjin	2.4	Jakarta	3.9	Istanbul	6.6	Seoul	9.6
24. Sao Paulo	2.3	Manila	3.5	Dhaka	6.5	Chicago	8.8
25. Birmingham	2.2	Delhi	3.5	Tehran	6.4	London	8.5
26. Shenyang	2.1	Madrid	3.5	Bangkok	5.9	Guangzhou	8.4
27. Rome	1.9	Shenyang	3.5	Lima	5.8	Bogota	7.7
28. Milan	1.9	Barcelona	3.5	Tianjin	5.8	Tehran	7.3
29. San Francisco	1.9	Hong Kong	3.5	Hong Kong	5.7	Shenzhen	7.2
30. Barcelona	1.8	Tehran	3.3	Chennai	5.3	Lima	7.2

Source: UN World Urbanization Prospects (2005 revision)

- conversely, major risers between 1950 and 2005 include Mumbai (18th to 5th), Sao Paulo (24th to 4th) and 'new entrants' like Jakarta (9th in 2005), Dhaka (11th), Karachi (13th) and Lagos (17th), all of which were well outside the top 30 in 1950; and
- notably, however, the major Chinese cities⁷ have not seen such rapid population rises as those in other leading emerging markets; both Shanghai (4th to 7th) and Beijing (10th to 18th), while increasing their populations significantly in absolute terms, have slid down the rankings between 1950 and 2005, particularly in recent decades due to China's one child policy.

Population, however, is only one of the factors determining the size of city

economies as measured by GDP: the other is average income per capita. We describe below how we have gone about producing such estimates for the leading cities in the world.

III.2 Data and methodology used to derive city GDP estimates and projections

The first question to be addressed in any study of this kind is: **how should you define a city?** While national boundaries are clear and change relatively rarely, city definitions differ significantly across countries and evolve over time as the city expands and absorbs surrounding neighbourhoods. For the purposes of this study we have generally adopted UN definitions of 'urban agglomerations' (for short, these are

⁴ De Long, J.B. and A. Shliefer, 'Princes and Merchants: European City Growth before the Industrial Revolution', Journal of Law and Economics, 36 (1993), p.671-702.

⁵ Roy Drewett, Thomas Hoehn and Seymour Sacks 'The Crowding and Uncrowding of European Cities: Secular population trends 1750-1986'; in Innovation and Urban Population Dynamics; K.P. Strohmeier and C. W. Matthiessen (eds.), London, 1991.

⁶ Although, as shown in the Annex, Manchester and Birmingham still rank in the top 100 cities by GDP.

⁷ It is worth noting in passing that some recent media reports have claimed that Chongqing in China is now the most populous city in the world. However, as pointed out by Thomas Brinkhoff on his website (www.citypopulation.de), this is incorrect since it refers to the province of Chongqing, which is not a single urban agglomeration. In fact the urban agglomeration of Chongqing ranks only 29th on Brinkhoff's definitions and is outside the top 30 in the UN population rankings.

sometimes also referred to below as ‘urban economies’ or just as ‘cities’ where the context makes this appropriate), but it should be recognised that the UN population estimates rely on information provided by national statistical agencies and are therefore not based on fully standardised definitions across countries.

To illustrate the effect of adopting alternative definitions, we also consider in Section III.3 below the impact on our 2005 GDP estimates of using an alternative set of urban agglomeration population estimates compiled by Professor Thomas Brinkhoff (see his website at www.citypopulation.de for details) that also provide global coverage and have been used in a number of previous studies⁸. The UN urban population data (from its 2005 World Urbanization Prospects report) were selected as our primary source, however, as they have the advantage of providing both a time series of historic data by city/urban area back to 1950 and projections to 2030 for total urban population and to 2015 for individual cities/urban areas. We also used UN national population projections in deriving our national GDP per capita projections, so it was more consistent to use UN data here than the Brinkhoff estimates, which include some historic estimates back to 1970 but not forward projections. In the majority of cases where they differ, it appears that the UN adopts narrower definitions than Brinkhoff, which tends to make the UN estimates correspond more closely to what might generally be considered to be a city, as opposed to a cluster of closely-related cities or towns. But there is no ‘right’ answer here, so it is important to recognise that our GDP rankings are sensitive to the particular definitions used, as discussed further in Section III.3 below.

To establish our list of **candidate urban agglomerations** to be ranked in the global top 100 by economic size in either 2005 or 2020, we first included all urban agglomerations (using UN definitions) with a population of more than 3 million in 2005 (105 areas in total). We then added:

- other urban agglomerations projected to be in the top 100 by population in 2020 (using UN projections for 2015

Table 3.2 – Data sources for city GDP estimates and projections

Variable	Sources for 2005 estimates	Sources for 2020 projections
Urban area population	UN World Urbanization Prospects report (2005)	UN projections to 2015 extrapolated forward by PwC to 2020
GDP per capita for OECD urban areas	OECD Competitive Cities report (2006) estimates for 2002, extrapolated forward to 2005 using OECD data for 1995-2002, plus data on the city-national differential where available from individual national statistical offices	National projections for GDP per capita growth from PwC World in 2050 model to 2020, with adjustments to reflect historic differentials between city and national growth where OECD data available (for 44 countries in 1995-2002 period)
GDP per capita for non-OECD countries	Direct estimates from national statistical offices where available (e.g. China) or adjusted World Bank national data to reflect typical ratios of GDP per capita in major cities relative to national averages based on comparators with similar characteristics (e.g. cities of similar population in countries with similar income levels). Asian Development Bank data used for some Asian cities	National projections for GDP per capita growth from PwC World in 2050 model to 2020 for countries where available, with other countries being based on closest available comparators, with some judgemental adjustments to reflect particular national characteristics where appropriate. City GDP per capita growth assumed to be in line with national average for non-OECD countries due to lack of city-level data.

extrapolated to 2020 as described below); and

- other OECD urban agglomerations with populations over 1 million, as covered by the recent OECD report on Competitive Cities (2006).

This procedure gave a total of 151 candidate urban agglomerations for further analysis. Based on a review of our results, we are confident that this should cover all urban agglomerations (on UN definitions) likely to rank in the top 100 by GDP in 2005, and probably also in 2020 (although the latter is obviously subject to more uncertainty). The Annex shows results for all the cities, although it should be noted that we cannot be sure these are the largest 151 cities given that our aim was just to identify the top 100.

We chose to use GDP at Purchasing Power Parity (PPP) exchange rates as our measure of economic size. The reason for using PPPs rather than market exchange rates is to correct for differences in price levels between economies, which are due in particular to the relatively low cost of non-traded goods and services in emerging economies. By using PPPs, we can compare the volume of goods and services produced in each urban agglomeration more accurately. Using current market

exchange rates instead would tend to understate the scale of the outputs of goods and services produced by emerging economy cities.

Our primary estimates of city output are based on combining UN population estimates for 2005 with estimates of income per capita, as summarised in Table 3.2. For the OECD countries, we began with the city-level GDP per capita estimates for 2002 in the OECD’s recent Competitive Cities report (2006) and then projected these forward to 2005 based on national GDP per capita growth over this period plus an adjustment to reflect the observed city-national GDP per capita growth differential in 1995-2002 for OECD cities for which these historic data were available (in other cases, unadjusted national growth data were used).

For non-OECD cities, data are not readily available from a single source. In some cases (e.g. China) GDP per capita estimates at city level were available from national sources, but in many cases we were only able to make approximate estimates based on plausible ratios of city to national GDP per capita (the latter sourced from the World Bank) based on comparisons with cities at similar income levels for which direct income per capita estimates were available⁹. As such, the 2005 urban

⁸ The other alternative we considered was to use the OECD definition of metropolitan areas from their recent report on ‘Competitive Cities’ (2006). But, unlike the UN data and the Brinkhoff estimates, this would not have covered non-OECD countries and also did not provide historic and projected population estimates on a consistent basis.

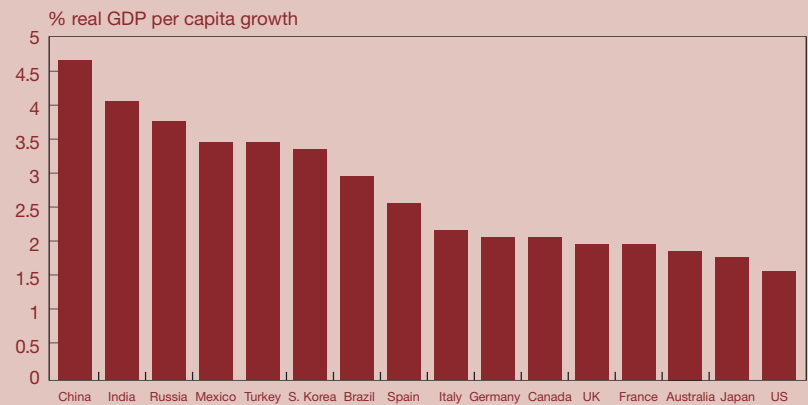
⁹ Typically, these ratios are in the range from 1.5 to 3, with higher values tending to be observed in the lowest income countries where urban-rural income differentials are particularly large.

agglomeration GDP estimates should only be taken as broadly indicative of relative economic size for the non-OECD countries. Nonetheless, they provide a much better indication of relative economic size than just looking at population data.

As Table 3.2 also shows, our illustrative projections for city GDP in 2020 combine UN population projections¹⁰ (extrapolated forward from 2015 to 2020 in a linear fashion) with our own estimates of national income per capita growth trends from our previous World in 2050 report¹¹. As illustrated for selected countries in Figure 3.2, these latter projections show consistently higher income per capita growth in the emerging economies, with China and India coming out top. It is notable here that US GDP per capita growth is projected to be slower than that in the other major economies. This is due to the assumption in our model that other countries will tend to catch up gradually with initially higher economy-wide labour productivity levels in the US. It should be noted, however, that after taking account of its higher projected population growth (including immigration), overall US GDP growth is nonetheless projected to be higher than in any of the other G6 countries.

For the OECD urban agglomerations where historic income growth trends were available, we assumed that differences between national and urban GDP per capita growth rates in 2006-20 were half those in 1995-2002. This was based on the assumption that historic growth differentials would be gradually eroded over time, since otherwise there would be implausibly rapid or slow growth of the major cities relative to their economies as a whole. For all the other urban agglomerations, including non-OECD cities, we assume (in the absence of other data) that their income per capita growth is in line with national average projections. This is, in fact, in line with the average historic trend for the OECD cities for which data are available¹². In practice, of course, income per capita growth rates will vary more than this at city level, but we have no readily available data on which to predict such variations.

Figure 3.2 – Projected real GDP per capita growth by country: 2006-20



Source: PwC World in 2050 model

Table 3.3 – Top 30 urban agglomerations by estimated GDP in 2005 using UN population estimates and definitions

GDP rank	City	Estimated GDP in 2005 (\$bn at PPPs)	Components of estimated GDP	
			Population (millions)	GDP per capita (\$k at PPPs)
1	Tokyo	1191	35.2	33.8
2	New York	1133	18.72	60.5
3	Los Angeles	639	12.3	51.9
4	Chicago	460	8.81	52.3
5	Paris	460	9.82	46.8
6	London	452	8.51	53.2
7	Osaka/Kobe	341	11.27	30.2
8	Mexico City	315	19.41	16.2
9	Philadelphia	312	5.39	57.9
10	Washington DC	299	4.24	70.6
11	Boston	290	4.36	66.5
12	Dallas/Fort Worth	268	4.66	57.4
13	Buenos Aires	245	12.55	19.5
14	Hong Kong	244	7.04	34.7
15	San Francisco/Oakland	242	3.39	71.4
16	Atlanta	236	4.3	54.8
17	Houston	235	4.32	54.3
18	Miami	231	5.43	42.6
19	Sao Paulo	225	18.33	12.3
20	Seoul	218	9.65	22.6
21	Toronto	209	5.31	39.4
22	Detroit	203	4.03	50.4
23	Madrid	188	5.61	33.5
24	Seattle	186	2.99	62.3
25	Moscow	181	10.65	17.0
26	Sydney	172	4.33	39.8
27	Pheonix	156	3.42	45.7
28	Minneapolis	155	2.56	60.7
29	San Diego	153	2.85	53.6
30	Rio de Janiero	141	11.47	12.3

Source: UN for population estimates; PricewaterhouseCoopers GDP estimates drawing on data from UN, World Bank, OECD and national sources.

¹⁰Earlier UN city population projections were criticised, with good reason as events turned out, by Paul Bairoch ('Employment and large cities: problems and outlook', International Labour Review, vol 121, No. 5, Sept-Oct 1982).

However, the UN's projection methodology has been revised and updated since then, notably to account for the tendency of the largest cities to grow more slowly than smaller cities as diseconomies of scale set in for mega-cities.

¹¹J. Hawksworth, The World in 2050: How big will the large emerging economies get and how can the OECD compete?, PricewaterhouseCoopers, March 2006. Available to download from <http://www.pwc.com/extweb/pwcpublications.nsf/docid/56DD37D0C399661D852571410060FF8B>

¹²It should be noted here that, particularly for smaller economies, the largest cities may play a dominant role in their overall national economies, so one would not expect a large divergence between income growth in these cities and the average for their economies as a whole.

III.3 Estimated urban economy rankings for 2005

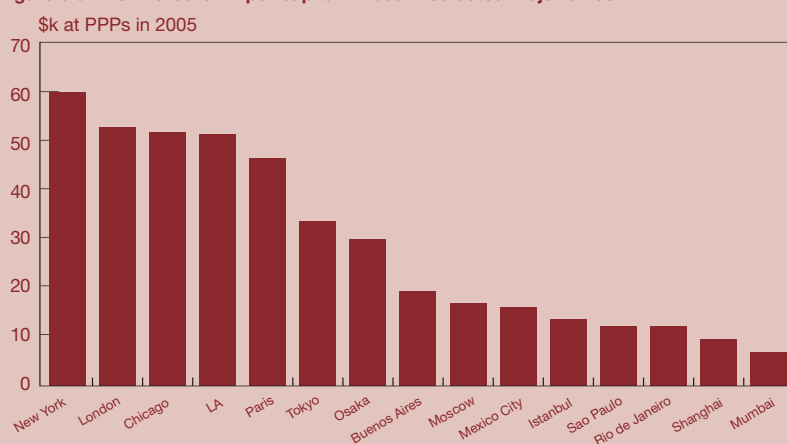
We have used the methodology described above to produce GDP estimates for our 151 candidate urban agglomerations in 2005. As noted above, it should be recognised that these estimates are reliant on the definitions adopted by the UN, and the GDP per capita estimates are subject to significant margins of error for the non-OECD cities. They should, however, at least be broadly accurate in order of magnitude terms and taking account of income per capita certainly produces a much better indication of the relative size of urban economies than just looking at population data.

Subject to these caveats, Table 3.3 shows our estimates of the size of the top 30 urban agglomerations (on UN definitions) in 2005, ranked by GDP at PPPs using the methodology described above. A full listing of GDP estimates for the 151 cities covered by our analysis is provided in the Annex. It is interesting to note that, in total, our estimates suggest that the largest 100 cities accounted for around 25% of global GDP at PPPs in 2005, with the top 30 cities alone accounting for around 16% of world GDP in that year. This emphasises the concentration of global economic activity in the world's largest cities.

The most striking point to note is that, while 22 of the top 30 urban areas by population in 2005 were from emerging/developing economies (see Table 3.1 above), only 5 of these emerging economy cities (Mexico City, Buenos Aires, Sao Paulo, Moscow and Rio de Janeiro) were in the top 30 according to our GDP estimates¹³. This reflects the much higher GDP per capita levels in the major developed economy cities than in the major emerging market cities, as illustrated for a selection of cases in Figure 3.3. Indeed, based on OECD estimates, 23 of the top 30 cities ranked by GDP per capita at PPPs in 2005 were from the US.

Looking at the top of the 2005 GDP rankings in Table 3.3, we can see that Tokyo is narrowly ahead of New York, with both having economies worth over \$1 trillion in 2005 (broadly similar to national economies such as Spain and Canada). Los Angeles is in clear third place with Chicago, Paris and

Figure 3.3 – Estimated GDP per capita in 2005 in selected major cities



Source: PwC estimates based on OECD, World Bank and national data sources

Table 3.4 – Comparison of estimated GDP of largest urban agglomerations with GDP of selected national economies

Country/Urban Agglomeration	Estimated GDP in 2005 (\$bn at PPPs)
UK	2230
Russia	1560
Tokyo	1191
Spain	1134
New York	1133
Canada	1061
Australia	643
Los Angeles	639
Poland	534
Chicago	460
Paris	460
London	452
Philippines	409
Osaka/Kobe	341
Belgium	337
Mexico City	315
Sweden	280
Switzerland	256

Source: World Bank for national GDP estimates (except ONS for UK); PwC for urban agglomeration GDP estimates using UN definitions (as in Table 3.3 above). These estimates are from different sources and so will not be fully consistent, but should be broadly comparable in order of magnitude terms.

London vying for the next three places (each of which has an estimated GDP higher than national economies such as Belgium, Sweden and Switzerland, as illustrated in Table 3.4). Aside from London and Paris, only two other European cities (Madrid and Moscow) make the lower reaches of the top 30.

Mexico City is the only emerging economy city in the top 10 when ranked by GDP, but Buenos Aires is not far behind in 13th place and Sao Paulo, Moscow and Rio de Janeiro are also ranked in the top 30. The full top 100 list in the Annex shows, however, that there are a number of emerging economy cities just outside the top 30, including

Shanghai (32nd), Istanbul (34th), Mumbai (37th), Manila (42nd), Beijing (44th), Cairo (45th), Jakarta (46th) and Kolkata (49th). In the next section, we consider how far these and other emerging economy cities might rise up the rankings by 2020.

Before looking forward, however, we also need to consider the effect of using the alternative urban agglomeration definitions and population estimates produced by Brinkhoff (2006), as discussed above. Table 3.5 shows an alternative top 30 GDP ranking using Brinkhoff's population estimates¹⁴, which are generally based on a broader definition of what constitutes an urban agglomeration than the UN

¹³This is despite using PPP rather than market exchange rates in order to avoid underestimating the scale of the outputs of the emerging economy cities.

¹⁴In the absence of any other data, we continue to use the same GDP per capita estimates for urban agglomerations that broadly match each other in the two data sets, given that we are only attempting a broad comparison between the two sets of rankings.

estimates. The first column of the table shows a comparison between the two sets of rankings from which we can note in particular that:

- 28 of the top 30 cities appear in both sets of rankings¹⁵, but some of the individual rankings vary markedly depending on the definitions used;
- in particular, Brinkhoff uses significantly wider definitions than the UN for Washington DC (including Baltimore, which is treated as a separate urban agglomeration by the UN), Seoul (including the surrounding metropolitan areas not included by the UN) and Johannesburg (including East and West Rand, which are treated as separate urban agglomerations by the UN); as a consequence, these urban agglomerations rank much higher in Table 3.5 than in Table 3.3.

As noted above, there is no correct answer here, although we prefer to focus on the UN definitions since, unlike the Brinkhoff estimates, they are linked to population projections that are consistent with those used in our other national growth modelling work. Generally speaking, the UN definitions also tend to correspond more closely to what would generally be considered as a city, as opposed to a cluster of cities. But it is certainly important to bear in mind that our precise GDP rankings are dependent to a significant extent on our use of UN definitions, even if our overall top 30 would not be much affected by using the Brinkhoff estimates instead. To some extent, this definitional issue focuses more attention on how the rankings might change in the future, and on the general balance of developed versus emerging economy cities at the top of the rankings, rather than the individual GDP estimates or rankings. These more dynamic issues are the focus of the next section of the report.

III.3 Projected urban economy rankings for 2020 and growth rates since 2005

Rankings by economic size in 2020

Table 3.5 – Alternative Top 30 urban agglomerations by estimated GDP in 2005 using population estimates and definitions by Thomas Brinkhoff

GDP rank (using UN data in brackets)	City	Estimated GDP in 2005 (\$bn at PPPs)	Components of estimated GDP	
			Population (millions)	GDP per capita (\$k at PPPs)
1 (2)	New York	1325	21.9	60.5
2 (1)	Tokyo	1157	34.2	33.8
3 (3)	Los Angeles	934	18	51.9
4 (6)	London	638	12	53.2
5 (10)	Washington DC*	575	8.15	70.6
6 (15)	San Francisco/Oakland	518	7.25	71.4
7 (4)	Chicago	510	9.75	52.3
8 (7)	Osaka/Kobe	508	16.8	30.2
9 (20)	Seoul**	503	22.3	22.6
10 (5)	Paris	466	9.95	46.8
11 (11)	Boston	379	5.7	66.5
12 (8)	Mexico City	370	22.8	16.2
13 (9)	Philadelphia	347	6	57.9
14 (12)	Dallas/Fort Worth	345	6	57.4
15 (17)	Houston	293	5.4	54.3
16 (22)	Detroit	292	5.8	50.4
17 (16)	Atlanta	279	5.1	54.8
18 (13)	Buenos Aires	262	13.45	19.5
19 (14)	Hong Kong	257	7.4	34.7
20 (19)	Sao Paulo	248	20.2	12.3
21 (18)	Miami	237	5.55	42.6
22 (24)	Seattle	234	3.75	62.3
23 (25)	Moscow	234	13.75	17.0
24 (21)	Toronto	213	5.4	39.4
25 (28)	Minneapolis	207	3.4	60.7
26 (23)	Madrid	187	5.6	33.5
27 (65)	Johannesburg***	180	7.4	24.3
28 (27)	Phoenix	178	3.9	45.7
29 (32)	Shanghai	174	18.15	9.6
30 (26)	Sydney	173	4.35	39.8

*Includes Baltimore in Brinkhoff estimates (but not in UN estimates)
 **Much broader definition in Brinkhoff estimates (compared to UN)
 ***Includes East and West Rand in Brinkhoff estimates (but not in UN estimates)
 Source: T. Brinkhoff (www.citypopulation.de, 2006) for population estimates; PricewaterhouseCoopers GDP estimates drawing on data from Brinkhoff (2006), World Bank, OECD and national sources.

Table 3.6 shows our projections of the top 30 urban economies in 2020 measured by GDP at PPPs (in 2005 US dollars), with the rankings in 2005 shown in brackets for comparison. The full GDP rankings for both years are given in the Annex. These are based on UN definitions and population projections, since Brinkhoff does not produce population projections using his alternative definitions. As such, the rankings in Table 3.6 should be compared with those in Table 3.3, not those in Table 3.5.

The largest six urban economies (on UN definitions) remain the same as in 2005, although London overtakes Chicago and Paris to move into 4th place. As you might expect, however, the dominant trend is for emerging economy cities to rise up the rankings: Mexico City rises from 8th to 7th

and Buenos Aires from 13th to 11th. Shanghai (32nd to 16th), Mumbai (37th to 24th), Istanbul (34th to 27th), Beijing (44th to 29th) and Manila (42nd to 30th) are notable 'new entries' in the top 30. Lower down the list (see Annex), notable 'climbers' include Jakarta (46th to 33rd), Delhi (51st to 34rd), Guangzhou (60th to 36th), Kolkata (49th to 38th), Bangkok (55th to 46th), Bogota (58th to 52nd) and Monterrey (66th to 54th).

Perhaps equally predictably, the main 'fallers' within the top 100 are the cities of 'old Europe' like Rome (33rd to 45th), Milan (40th to 48th), Vienna (50th to 65th) and Berlin (69th to 86th). Within the UK, Birmingham (71st to 79th) and Manchester (73rd to 82nd) slip down the rankings but remain in the top 100, while Leeds is

¹⁵Shanghai and Johannesburg appear in the top 30 using Brinkhoff's population estimates, replacing San Diego and Rio de Janeiro.

projected to fall from 85th to 108th. This is not because these cities are stagnating – all three are expected to see their economies grow by around 2-2.2% per annum in real terms over this period; but they cannot hope to keep pace with the fast-growing economies of the emerging world.

The theme of the rise of emerging markets also comes out from an analysis of the number of cities in the top 50/100 by country in 2005 and 2020, as set out in Table 3.7. We can see that, although there is not that much turnover in the rankings (with just 5 new entries in the top 50 and 9 in the top 100), the emerging economies are the clear gainers. India in particular has 3 of its cities projected to rise into the top 100 between 2005 and 2020, while China and Brazil each have 2 new entries in the top 100 (the other two are from Vietnam and Nigeria). European cities are again the main losers here: as well as Leeds, those projected to fall out of the top 100 include Naples, Helsinki, Zurich, Amsterdam, Copenhagen and Budapest.

Another way to illustrate this point is to note that the total estimated GDP of the 80 emerging market cities we considered (defined for the purpose of this calculation as those with GDP per capita below \$20,000 per annum at PPPs in 2005) account for around 27% of the total GDP in 2005 for all 151 cities in our full list. By 2020, however, the projected share of these same 80 cities rises to around 35% of the total (although it should be noted that some of these 80 cities will have risen out of the emerging markets category in terms of their income levels by that date).

Rankings by economic growth in 2006-20

An even clearer way to see the shifts in global economic weight towards the emerging markets is to look at rankings by projected economic growth between 2005 and 2020. As Table 3.8 shows, there are no advanced economies represented in the top 30 fastest growing cities, as compared to 10 from China (with Changchun and Guangzhou topping the table), 9 from India and 2 each from Indonesia, Vietnam and Bangladesh.

Table 3.6 – Top 30 urban agglomerations by estimated GDP in 2020 using UN population definitions and projections

2020 GDP rank (2005 in brackets)	City	Estimated GDP in 2020 (\$bn at 2005 PPPs)	Population in 2020 (millions)	Average real GDP growth (% pa: 2006-2020)
1 (1)	Tokyo	1602	35.45	2.0%
2 (2)	New York	1561	20.33	2.2%
3 (3)	Los Angeles	886	13.45	2.2%
4 (6)	London	708	8.61	3.0%
5 (4)	Chicago	645	9.73	2.3%
6 (5)	Paris	611	9.85	1.9%
7 (8)	Mexico City	608	22.36	4.5%
8 (9)	Philadelphia	440	5.99	2.3%
9 (7)	Osaka/Kobe	430	11.30	1.6%
10 (10)	Washington DC	426	4.76	2.4%
11 (13)	Buenos Aires	416	13.68	3.6%
12 (11)	Boston	413	4.89	2.4%
13 (19)	Sao Paulo	411	21.45	4.1%
14 (14)	Hong Kong	407	8.10	3.5%
15 (12)	Dallas/Fort Worth	384	5.28	2.4%
16 (32)	Shanghai	360	18.81	6.5%
17 (20)	Seoul	349	9.57	3.2%
18 (16)	Atlanta	347	4.99	2.6%
19 (15)	San Francisco/Oakland	346	3.81	2.4%
20 (17)	Houston	339	4.91	2.5%
21 (18)	Miami	331	6.11	2.4%
22 (21)	Toronto	327	6.08	3.0%
23 (25)	Moscow	325	10.91	4.0%
24 (37)	Mumbai (Bombay)	300	23.81	6.0%
25 (23)	Madrid	299	6.13	3.2%
26 (22)	Detroit	287	4.49	2.3%
27 (34)	Istanbul	287	11.84	5.2%
28 (24)	Seattle	269	3.40	2.5%
29 (44)	Beijing	259	14.06	6.6%
30 (42)	Manila	257	14.12	5.9%

Source: PricewaterhouseCoopers projections

Indeed, the highest advanced economy cities in the full growth rankings are Singapore in 79th place and Hong Kong in 82nd place. Lisbon (85th), Madrid (89th) and Stockholm (90th) also score relatively well in the developed economy city growth league. London (92nd) also just makes the top 100 and, as shown in Figure 3.4, it ranks significantly higher on growth than the other advanced economy mega-cities such as Los Angeles (134th), New York (135th), Tokyo (140th) and Paris (144th). Manchester, Leeds and Birmingham are further down the list than London, however, reflecting the relatively stronger performance of London since the mid-1990s, which we assume to persist (albeit to a somewhat lesser degree) in the future as London continues to benefit from its status as one of the leading global financial and business service centres,

which seems unlikely to be eroded over the period to 2020.

Figure 3.4 provides some further insight on key trends by comparing projected cumulative economic growth rates over the period 2006-20 for the eight largest emerging economy cities and the eight largest advanced economy cities (ranked by estimated GDP in 2005 in each case). Shanghai (158%), Mumbai (139%) and Istanbul (115%) are projected to achieve particularly impressive economic growth here relative to their fellow 'mega-cities', but the other five emerging economy cities are also projected to rack up cumulative GDP growth of around 70-90%, compared to an average of only around 40% for the eight advanced economy mega-cities (although London tops this latter list with 56% projected growth).

III.4 Key uncertainties and factors underlying relative city growth rates

It should be recognised, however, that even though we believe that our general conclusion on the rise of the emerging market economies and cities should be robust, any such growth rankings can only be illustrative for individual cities. Given the objective of providing a comprehensive global ranking, our analysis is necessarily somewhat mechanical and relies both on the UN population projections, which are subject to widening margins of error over time as with any such long-term projections¹⁶, and on the assumption that our earlier work on national GDP per capita projections provides a good basis for city-level projections.

In practice, some cities may do significantly better than their national economies and some may lag behind. Equally, not all of the emerging economies may fulfil the potential identified in our World in 2050 report, whether due to political and/or macroeconomic instability, infrastructure constraints, energy supply problems or environmental crises. Avoiding these pitfalls, both at national and local level will be critical to the long-term economic success of these cities.

It should also be noted that economic size, although significant, is not a panacea. As noted recently by Joel Kotkin¹⁷, Singapore has established itself as a global financial centre to a greater extent than larger Asian cities like Bangkok, Manila and Jakarta. Similarly, Dubai has been more successful than Cairo. The same author notes that Mexico City, the largest emerging economy city in the world based on our analysis, is burdened by problems of crime, congestion and pollution that make smaller but better-run and faster-growing cities like Monterrey and Guadalajara more attractive to entrepreneurs and ambitious workers.

Within the developed world, it seems clear that the most successful cities will be those that have comparative advantages in intangible business, financial and consumer services that are not so easily emulated by

Table 3.7 – Number of cities in global top 50/100 by country (GDP rankings using UN population definitions and projections)

Countries	Number of cities in 2005 in:		Number of cities in 2020 in:	
	Global top 50	Global top 100	Global top 50	Global top 100
US	20	23	17	23
Japan	2	3	2	3
Germany	0	3	0	3
UK	1	4	1	3
France	1	2	1	2
Italy	2	4	2	3
Canada	2	3	2	3
Total: G7	28	42	25	40
Other advanced economies	9	21	7	15
Total: advanced	37	63	32	55
China	2	4	3	6
India	2	4	3	7
Brazil	2	5	2	7
Russia	1	2	1	2
Mexico	1	3	1	3
Indonesia	1	1	1	1
Turkey	1	2	1	2
Total: E7	10	21	12	28
Other emerging economies	3	16	6	17
Total: emerging economies	13	37	18	45
All countries	50	100	50	100

Source: PricewaterhouseCoopers estimates and projections (see Annex for full listings)

the rising stars of China, India or Brazil. Prominent examples include the continued pre-eminence of London, New York and Tokyo in global financial services, or of Los Angeles in the media and entertainment sector, but it also applies to smaller but possibly faster growing cities that specialise in new technologies where distance is not an issue and the most talented individuals are looking for a better quality of life than the mega-cities can offer. The comparatively rapid projected growth rates (by developed country standards) of cities such as Atlanta, Dublin, Stockholm and Seattle reflect these kind of more qualitative factors.

More formally, our projections show a negative correlation between initial economic size (GDP) and subsequent projected growth, but this is very much driven by lower initial GDP per capita in emerging economies. After correcting for differences in initial GDP per capita, regression analysis does not indicate any statistically significant relationship between initial population levels and subsequent

projected GDP growth¹⁸. These are only projections, of course, so this is a feature of our analysis that may or may not be borne out by actual experience. Without time series of historic GDP for a sufficient range of cities we are unfortunately not able to test these relationships using actual data.

It is also important to note that, while cities may compete for inward investment in some respects, they are also important trading partners for each other to the extent that they specialise in different areas of economic activity. A larger global market can still be of great potential benefit to those 'old Europe' cities that are likely to slide down the relative GDP rankings. Historic capital cities such as Rome, Vienna and Berlin, for example, should benefit from increased tourist revenues from the residents of cities in the emerging economies, while London and Frankfurt should benefit from increased financial services trade, and Paris and Milan should find new markets for their fashion industries.

¹⁶In addition to the earlier research by Bairoch (1982) cited above, this point is also explored in some detail in a more recent paper by Barry Cohen ('Urban Growth in Developing Countries: A Review of Current Trends and a Caution Regarding Existing Forecasts', World Development, vol 32, no 1, pp 23-51, 2004).

¹⁷J. Kotkin, The City: A Global History (Phoenix: London, 2005). Similar arguments on the potential disbenefits of greater city size beyond some threshold were set out by Bairoch (1982, op. cit).

¹⁸In fact, cities with larger populations have, after allowing for differences in initial GDP per capita levels, slightly higher projected growth rates in our model, but not to a statistically significant degree (t-statistic = 1.1).

III.5 Summary and conclusions

Cities tend to be ranked in size according to their populations, but to assess the relative size of their economies we also need to take account of their average income per capita levels. Doing this in a consistent and comprehensive way at a global level is challenging, but we have pieced together data from a number of reputable sources (e.g. the OECD, the UN and the World Bank as well as national statistical agencies) to produce a ranking by GDP at Purchasing Power Parity (PPP) exchange rates of the largest 100 urban economies in the world in 2005. The precise rankings are dependent on the definitions and data sources adopted, but looking at GDP gives a much better indication of relative economic size than just looking at population.

Overall, our analysis re-emphasises the economic significance of the world's largest cities. The top 30 such cities ranked by GDP accounted, according to our estimates, for around 16% of world GDP in 2005 and this share rises to around 25% for the top 100 cities.

At present, the mega-cities of the major developed economies continue to lead the global GDP rankings, with the top six in 2005 being Tokyo, New York, Los Angeles, Chicago, Paris and London (using UN definitions). Only five emerging economy cities are currently in the top 30 (Mexico City, Buenos Aires, Sao Paulo, Moscow and Rio de Janeiro), but our illustrative projections suggest that all except Rio will move up the GDP rankings by 2020 and be joined in the top 30 by fast-growing cities such as Shanghai, Mumbai, Istanbul and Beijing. London is projected to grow somewhat faster than leading rivals such as Tokyo, New York, Chicago and Paris, moving up to 4th place by 2020 according to our illustrative projections.

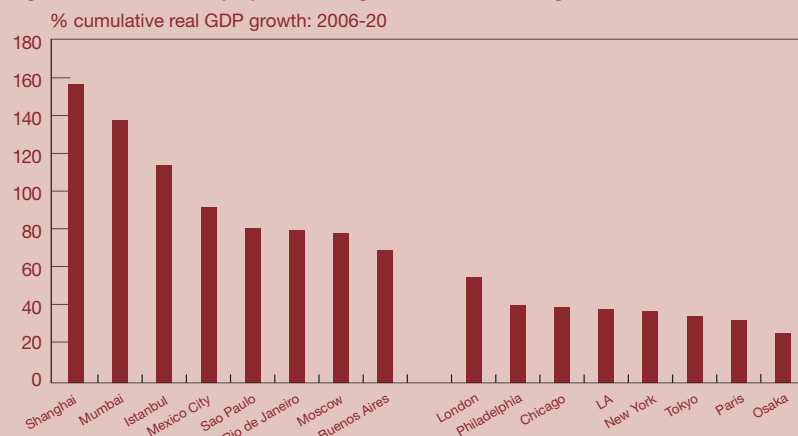
Our projections for individual cities are subject to many uncertainties, but our conclusion that the emerging economy cities as a group should increase their relative weight in the global economy seems likely to be robust. But the cities of the established developed economies should see this as more of an opportunity than a threat as it gives opportunities for

Table 3.8 – Top 30 urban agglomerations by projected average real GDP growth in 2006-20 (using UN population definitions and projections)

Growth rank	City	Country	Average real GDP growth in 2006-20 (% per annum)
1	Changchun	China	6.9%
2	Guangzhou	China	6.9%
3	Bandung	Indonesia	6.7%
4	Beijing	China	6.6%
5	Hanoi	Vietnam	6.6%
6	Surat	India	6.5%
7	Ho Chi Min City	Vietnam	6.5%
8	Shanghai	China	6.5%
9	Jakarta	Indonesia	6.5%
10	Kinshasha	D.R. Congo	6.4%
11	Jaipur	India	6.4%
12	Xian	China	6.4%
13	Wuhan	China	6.4%
14	Tianjin	China	6.3%
15	Nairobi	Kenya	6.3%
16	Pune	India	6.3%
17	Luchnow	India	6.3%
18	Chittagong	Bangladesh	6.3%
19	Shenyang	China	6.3%
20	Kanpur	India	6.3%
21	Chengdu	China	6.3%
22	Chongqing	China	6.3%
23	Lagos	Nigeria	6.2%
24	Ahmadabad	India	6.2%
25	Bangalore	India	6.2%
26	Delhi	India	6.2%
27	Addis Ababa	Ethiopia	6.2%
28	Hyderabad	India	6.1%
29	Kabul	Afghanistan	6.1%
30	Dhaka	Bangladesh	6.1%

Source: PricewaterhouseCoopers projections using UN population definitions

Figure 3.4 – Cumulative projected GDP growth to 2020 for mega-cities



Source: Top 8 emerging economy and Top 8 advanced economy cities

them to specialise further in those areas (e.g. business and financial services, entertainment and media, fashion, cultural tourism) where they have potential comparative advantages in fast-growing

global markets. Competition between cities, as between nations, should not be seen as a zero sum game.

Annex: Full City GDP rankings for 2005 and 2020

Table 3.9 sets out in full our urban agglomeration GDP rankings and estimates/projections for 2005 and 2020 (using UN population estimates and urban agglomeration definitions). The table includes all 151 candidate cities that we have considered, although it should be noted that we are not claiming that these are the largest 151 city economies in the world, just that these should encompass the top 100 ranked by GDP in both 2005 and 2020, which was our primary focus here.

The final two columns show projected average real GDP growth rates between 2005 and 2020 and a ranking by growth from 1 to 151. Both these latter two columns refer to the cities ranked by projected GDP in 2020 rather than in 2005 (i.e. the list of cities in the fourth rather than the second column in the table).

Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates)

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
1	Tokyo	1191	Tokyo	1602	2.0%	140
2	New York	1133	New York	1561	2.2%	135
3	Los Angeles	639	Los Angeles	886	2.2%	134
4	Chicago	460	London	708	3.0%	92
5	Paris	460	Chicago	645	2.3%	129
6	London	452	Paris	611	1.9%	144
7	Osaka/Kobe	341	Mexico City	608	4.5%	63
8	Mexico City	315	Philadelphia	440	2.3%	128
9	Philadelphia	312	Osaka/Kobe	430	1.6%	147
10	Washington DC	299	Washington DC	426	2.4%	124
11	Boston	290	Buenos Aires	416	3.6%	78
12	Dallas/Fort Worth	268	Boston	413	2.4%	125
13	Buenos Aires	245	Sao Paulo	411	4.1%	69
14	Hong Kong	244	Hong Kong	407	3.5%	82
15	San Francisco/Oakland	242	Dallas/Fort Worth	384	2.4%	116
16	Atlanta	236	Shanghai	360	6.5%	8
17	Houston	235	Seoul	349	3.2%	87
18	Miami	231	Atlanta	347	2.6%	105
19	Sao Paulo	225	San Francisco/Oakland	346	2.4%	123
20	Seoul	218	Houston	339	2.5%	111
21	Toronto	209	Miami	331	2.4%	122
22	Detroit	203	Toronto	327	3.0%	93
23	Madrid	188	Moscow	325	4.0%	72
24	Seattle	186	Mumbai (Bombay)	300	6.0%	35
25	Moscow	181	Madrid	299	3.2%	89
26	Sydney	172	Detroit	287	2.3%	127
27	Pheonix	156	Istanbul	287	5.2%	44
28	Minneapolis	155	Seattle	269	2.5%	113
29	San Diego	153	Beijing	259	6.6%	4
30	Rio de Janiero	141	Metro Manila	257	5.9%	36
31	Barcelona	140	Rio de Janiero	256	4.1%	70
32	Shanghai	139	Sydney	256	2.7%	100
33	Melbourne	135	Jakarta	253	6.5%	9
34	Istanbul	133	Delhi	229	6.2%	26
35	Denver	130	Pheonix	228	2.5%	107
36	Singapore	129	Guangzhou	227	6.9%	2
37	Mumbai (Bombay)	126	Minneapolis	224	2.5%	114
38	Rome	123	Kolkata (Calcutta)	224	5.9%	37
39	Montreal	120	San Diego	220	2.4%	115
40	Milan	115	Singapore	218	3.6%	79
41	Baltimore	110	Cairo	212	5.3%	43
42	Metro Manila	108	Barcelona	201	2.4%	117
43	St Louis	101	Melbourne	200	2.6%	101
44	Beijing	99	Denver	190	2.6%	106
45	Cairo	98	Rome	187	2.9%	95
46	Jakarta	98	Bangkok	180	4.8%	54
47	Tampa/St Petersburg	97	Montreal	180	2.8%	98
48	Pusan	95	Milan	174	2.8%	97
49	Kolkata (Calcutta)	94	Tehran	172	4.5%	61
50	Vienna	93	Riyadh	167	5.0%	47

Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates) continued

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
51	Delhi	93	Pusan	165	3.8%	77
52	Tel Aviv-Jaffa	92	Bogota	163	4.3%	66
53	Santiago	91	Santiago	160	3.8%	76
54	Cleveland	90	Monterrey	157	4.8%	55
55	Bangkok	89	Baltimore	157	2.4%	121
56	Tehran	88	Tel Aviv-Jaffa	153	3.5%	80
57	Portland	87	St Petersburg	151	3.9%	75
58	Bogota	86	St Louis	146	2.5%	112
59	St Petersburg	85	Tampa/St Petersburg	142	2.5%	109
60	Guangzhou	84	Johannesburg	131	3.4%	84
61	Pittsburgh	80	Lisbon	130	3.3%	85
62	Riyadh	80	Cleveland	129	2.4%	119
63	Lisbon	79	Belo Horizonte	129	4.6%	58
64	Vancouver	79	Portland	128	2.6%	102
65	Johannesburg	79	Vienna	127	2.1%	137
66	Monterrey	78	Karachi	127	5.8%	39
67	Stockholm	76	Dhaka	126	6.1%	30
68	Cape Town	75	Lima	123	4.2%	68
69	Berlin	75	Vancouver	121	2.9%	94
70	Athens	73	Cape Town	121	3.3%	86
71	Birmingham	72	Stockholm	121	3.2%	90
72	Fukuoka	72	Guadalajara	119	4.6%	57
73	Manchester	69	Pittsburgh	115	2.4%	120
74	Lima	67	Tianjin	112	6.3%	14
75	Belo Horizonte	65	Jiddah	111	4.8%	53
76	Guadalajara	60	Bangalore	110	6.2%	25
77	Hamburg	58	Dublin	99	4.8%	56
78	Turin	58	Ho Chi Min City	98	6.5%	7
79	Lyon	56	Birmingham	96	2.0%	143
80	Jiddah	55	Wuhan	96	6.4%	13
81	Karachi	55	Fukuoka	96	2.0%	142
82	Dhaka	52	Manchester	96	2.2%	132
83	Munich	50	Hyderabad	92	6.1%	28
84	Dublin	49	Chennai (Madras)	91	6.0%	34
85	Leeds	48	Athens	91	1.5%	148
86	Warsaw	48	Berlin	88	1.1%	150
87	Tianjin	45	Ankara	87	5.0%	48
88	Bangalore	45	Chongqing	87	6.3%	22
89	Porto Alegre	44	Lyon	85	2.8%	96
90	Helsinki	43	Turin	84	2.5%	108
91	Naples	43	Porto Alegre	82	4.3%	67
92	Budapest	43	Brasilia	82	5.1%	45
93	Zurich	42	Warsaw	80	3.5%	81
94	Ankara	42	Ahmadabad	78	6.2%	24
95	Amsterdam	42	Hamburg	78	2.0%	141
96	Auckland	41	Recife	77	4.4%	65
97	Copenhagen	41	Pune	76	6.3%	16
98	Recife	41	Lagos	76	6.2%	23
99	Rotterdam	40	Salvador	75	4.6%	60
100	Brussels	39	Munich	73	2.6%	104

Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates) continued

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
101	East Rand	39	Fortaleza	73	4.6%	59
102	Brasilia	38	Algiers	73	5.0%	46
103	Salvador	38	Hanoi	73	6.6%	5
104	Wuhan	38	Bandung	69	6.7%	3
105	Chennai (Madras)	38	Naples	69	3.2%	91
106	Ho Chi Min City	38	Curitiba	68	4.9%	51
107	Hyderabad	38	Shenyang	68	6.3%	19
108	Fortaleza	37	Leeds	67	2.2%	131
109	Prague	36	Lahore	67	5.9%	38
110	Chongqing	35	Alexandria	66	5.4%	41
111	Algiers	35	East Rand	65	3.5%	83
112	Medellin	34	Medellin	65	4.4%	64
113	Taegu	34	Helsinki	65	2.7%	99
114	Curitiba	33	Izmir	62	4.9%	50
115	Ahmadabad	32	Auckland	61	2.6%	103
116	Oslo	31	Zurich	61	2.4%	118
117	Izmir	31	Amsterdam	60	2.5%	110
118	Lagos	30	Prague	58	3.2%	88
119	Pune	30	Surat	57	6.5%	6
120	Alexandria	30	Rotterdam	57	2.4%	126
121	Cologne	29	Copenhagen	56	2.1%	138
122	Lahore	28	Brussels	55	2.2%	133
123	Caracas	28	Chengdu	51	6.3%	21
124	Hanoi	28	Khartoum	51	5.6%	40
125	Shenyang	27	Caracas	50	3.9%	74
126	Puebla	27	Budapest	49	0.9%	151
127	Lille	27	Puebla	48	4.0%	73
128	Bandung	26	Xian	48	6.4%	12
129	Casablanca	24	Casablanca	47	4.5%	62
130	Khartoum	23	Taegu	45	1.9%	145
131	Surat	22	Oslo	44	2.2%	130
132	Baghdad	22	Changchun	42	6.9%	1
133	Chengdu	21	Kanpur	41	6.3%	20
134	Xian	19	Cologne	40	2.0%	139
135	Kanpur	17	Baghdad	39	4.0%	71
136	Yangon	16	Chittagong	39	6.3%	18
137	Chittagong	16	Jaipur	38	6.4%	11
138	Changchun	15	Lille	37	2.1%	136
139	Jaipur	15	Luchnow	35	6.3%	17
140	Luchnow	14	Yangon	33	4.8%	52
141	Luanda	12	Luanda	29	6.0%	33
142	Abidjan	11	Kinshasha	25	6.4%	10
143	Pyongyang	10	Faisalabad	24	6.0%	32
144	Faisalabad	10	Abidjan	22	4.9%	49
145	Kinshasha	10	Kabul	22	6.1%	29
146	Krakow	10	Nairobi	20	6.3%	15
147	Kabul	9	Addis Ababa	18	6.2%	27
148	Nairobi	8	Kano	14	5.4%	42
149	Addis Ababa	7	Dar es Salaam	13	6.0%	31
150	Kano	7	Krakow	13	1.9%	146
151	Dar es Salaam	5	Pyongyang	13	1.5%	149

Note: the final two columns on growth relate to the cities ranked by 2020 GDP
Source: PricewaterhouseCoopers estimates and projections using UN urban agglomerations definitions and population estimates

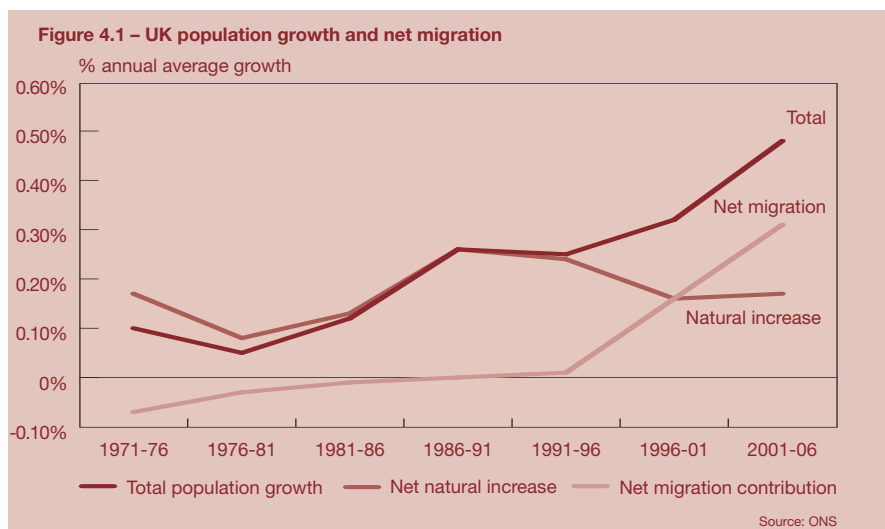
IV – The economic impact of increased net migration to the UK

As is evident from recent comments by the Treasury and the Bank of England, the impact of migration on the labour market and economic growth has become an increasingly significant issue for fiscal and monetary policy. In particular, the Treasury cited increased expected future net migration to the UK as the main reason for its decision in the December 2006 Pre-Budget Report (PBR) to increase its best estimate of future trend GDP growth from 2.5% to 2.75%. Professor David Blanchflower of the Monetary Policy Committee (MPC) has also recently argued¹ that the rapid increase in migration from Eastern Europe to the UK following EU enlargement in 2004 has boosted the supply potential of the economy relative to demand, so reducing inflationary pressures and the need for higher interest rates. While not all MPC members may agree fully with Blanchflower's conclusion, the significance of migration for UK monetary policy is now widely recognised.

It therefore seems timely to look at this issue in more detail. We cannot hope to discuss all aspects of this complex economic debate in the present article, but we do aim to cover the key macroeconomic issues arising, drawing on the conclusions of recent research that has been carried out on this topic. We focus solely on the economic impact of migration, not wider social or political issues.

The discussion below is organised as follows:

- Section IV.1 reviews the evidence on the recent impact of increased migration on the UK labour market (i.e. employment, unemployment and wages);
- Section IV.2 assesses the potential impact on trend GDP growth;
- Section IV.3 reviews the implications for inflation and interest rates;
- Section IV.4 discusses the implications for the public finances and fiscal policy;
- Section IV.5 discusses the impact on national income per capita and economic welfare more generally; and



- Section IV.6 summarises and draws conclusions from the analysis.

IV.1 – Impact of increased immigration on the UK labour market

A commonly held view is that increased immigration may increase unemployment by displacing indigenous workers. Most economists would be sceptical of this argument. First, they would point out that much immigration occurs to fill job vacancies arising from domestic skills gaps, in which case there should be no adverse impact on domestic unemployment. Second, even if immigration is competitive with domestic labour with similar skills, this will tend to keep wages lower than would otherwise be the case, so increasing the demand for labour and also allowing interest rates to be kept lower while still hitting the same inflation target (as discussed further in Section IV.3 below). Both these factors will tend to boost investment and output. With constant returns to scale, output should rise in line with the increase in labour supply and the unemployment rate should be unchanged².

Blanchflower *et al.* (2007) provide an empirical analysis of these arguments, focusing on the impact of increased immigration from the 'A8' Central and Eastern European countries³ that joined the EU on 1 May 2004. They begin by noting that the UK population grew only very modestly by just 4.9% between 1971 and

1999, more slowly than all other Western European countries except Germany (and much more slowly than the US, Canada or Australia). Between 1999 and 2006, however, the UK population has grown by a further 3.2% (i.e. around two and a half times as fast on an annual average basis⁴), driven primarily by increased net immigration⁵.

Figure 4.1 illustrates these shifting trends for five year period averages since 1971. We can see that net migration actually made a negative contribution to UK population growth between 1971 and 1986, but has made an increasingly positive contribution since 1996 and has been around twice as important as the net natural increase (i.e. births minus deaths) over the past five years.

Scale and characteristics of recent migration from the A8 countries

According to Total International Migration (TIM) statistics from the ONS that are based primarily on data from the International Passenger Survey (IPS), around 35% of this net immigration in 2005 related to the A8 countries. Cumulatively, the IPS data suggest that total inflows from the A8 to the UK amounted to around 132,000 between January 2004 and December 2005, or around 112,000 after netting off outflows. The IPS only covers 'long-term' migrants intending to stay more than a year, however, and also only covers the principal air and

¹ D. G. Blanchflower, J. Salaheen and C. Shadforth, "The Impact of the Recent Migration from Eastern Europe on the UK Economy" Bank of England working paper, January 2007.

² This latter argument was succinctly explained by Charles Bean, the Bank of England's chief economist, in a lecture on 'Economists and the Real World' at the London School of Economics, 29 January 2003.

³ Poland, Hungary, Czech Republic, Slovakia, Slovenia, Estonia, Latvia and Lithuania.

⁴ UK population growth averaged 0.17% per annum in 1971-99, but accelerated to 0.45% per annum in 2000-2006

⁵ Significant net immigration from Commonwealth countries has played an important role in this trend, as well as the recent increase in migrants from the A8 countries.

sea routes plus the Channel Tunnel (e.g. only inflows via Heathrow, Gatwick and Manchester airports are covered, while airline data suggest that many of those entering the UK from the A8 arrive at other regional airports). The ONS have plans to extend this coverage, but for the moment it seems likely that the IPS data may significantly underestimate actual inflows from the A8.

Blanchflower *et al.* therefore consider three other data sources, as summarised in Table 4.1. For the full period from May 2004 to September 2006, data on the number of people registering for National Insurance (NI) numbers (extrapolated by the authors from data for the shorter period from April 2004 to March 2006) and for the Workers' Registration Scheme (WRS) both suggest gross inflows of workers from the A8 countries of the order of around 500,000. However, Labour Force Survey (LFS) estimates suggest that only around half of these workers may still have been in the UK in September 2006, given that many will have only come for short working visits and then returned home. The fact that the population of Poland, which has accounted for 63% of the A8 workers registering with the WRS, decreased by only 17,000 (0.04%) between 2004 and 2005 also provides some indication that net flows may have been much lower than gross flows due to a large number of short-term returnees. Unfortunately there is no systematic data source available that allows these movements to be tracked, so considerable uncertainty remains around these estimates.

Further analysis of these various data sources suggests that migrants from the A8 countries are relatively young (82% aged 18-34 according to the WRS and 43% aged 18-24) with few dependents accompanying them. They are 58% male, relatively well educated but mostly in relatively lower skilled occupations such as factory operatives, catering and agriculture and, as such, tend to be relatively low paid (18% less than non-immigrants on average according to analysis of LFS data, and 20% less than non-A8 immigrants). Overwhelming they have come to work, not claim benefits. To the extent that their unemployment rate is slightly above average, this is explained by their relative

Table 4.1 – Estimated number of immigrants from A8 countries since 2004

Source	Available data (000s)	Coverage	Period covered	Adjusted data for period since A8 accession
National number Insurance (NI) registrations	382	All those registering for tax or benefit purposes (including self-employed)	April 2004 to March 2006	515
Workers Registration Scheme (WRS)	487	Employed workers (excluding self-employed)	May 2004 to September 2006	487
Labour Force Survey (LFS)	265	All aged 16-64 (staying > 6 months)	May 2004 to September 2006	265
Total International Migration (TIM) based largely on International Passenger Survey (IPS)	132	All long-term migrants (intending to stay > 1 year)	January 2004 to December 2005	215

Source: Blanchflower, Saleheen and Shadforth (2007), Table E. The adjusted figures in the final column are estimates by these authors, not PricewaterhouseCoopers.

youth (since unemployment rates tend to be relatively high for 18-24 year olds in particular).

How has recent A8 immigration affected the UK labour market?

Casual observation might suggest that it has boosted labour supply relative to labour demand and so contributed to the recent tendency for annual earnings growth to be relatively subdued (generally just under 4% excluding bonuses) and for both employment and unemployment to show a rising trend over the past two years (the LFS shows employment up by 558,000 in August-October 2006 compared to two years earlier, with unemployment up by 306,000 over this same period). The fact that much of the recent increase in unemployment has been in younger age groups might also suggest a possible link with A8 immigration which, as noted above, is heavily weighted to younger workers.

However, there could clearly be other factors contributing to these recent labour market trends, including in particular:

- increased labour market participation by older workers (probably in part to compensate for lower projected pensions than earlier anticipated, although other factors such as shifts in labour demand and anti-age-discrimination legislation may also have had an effect);

- the lagged effect of the modest downturn in the economy during 2005; and
- a possible constraining effect on earnings growth from the threat of outsourcing/offshoring to cheaper locations abroad.

Blanchflower *et al.* provide one possible test of the effect of immigration on unemployment by looking at whether the UK regions⁶ with the highest increase in unemployment rates in the year to Q3 2006 were also those where migration had increased the most between 2005 and 2006. In fact, however, they found this relationship was negative (but statistically insignificant) for total unemployment. For 18-24 year olds alone, they did find a weakly positive relationship (see Figure 4.2), but this was also statistically insignificant, suggesting that immigration trends explained at most only a small part of the recent upward trend in youth unemployment. These results were consistent with an earlier study by Gilpin *et al.* (2006)⁷, which found 'no discernible statistical evidence' that increased A8 migration had made a significant contribution to the recent rise in claimant count unemployment.

In terms of wage effects, there is some evidence as mentioned above that A8 immigrants themselves earn relatively low wages, and so will have held average earnings growth down to some degree, but

⁶ It could be argued, however, that migration effects operate primarily at the level of local labour markets, which might not show up when looking at data for regions as a whole. We are not, however, aware of any quantitative research yet on the local labour market effects of recent A8 migration.

⁷ Gilpin, N., M. Henty, S. Lemos, J. Portes and C. Bullen (2006), 'The impact of free movement of workers from Central and Eastern Europe on the UK labour market', DWP Working Paper no. 29.

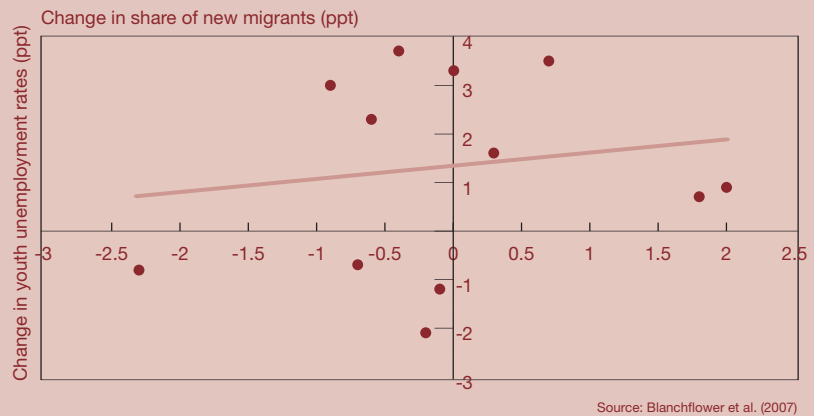
probably only by around 0.1 percentage points per annum over the past two years based on our calculations. There is little evidence of a significant impact of immigration generally on native UK employee wages from recent studies⁹. Rather it seems that immigrants generally tend to be imperfect substitutes for native workers, so reducing their impact on native wages, but again it is too early to have detailed studies on the specific impact of the latest wave of A8 immigrants. Earlier studies of the effects of major step increases in immigration around the world surveyed by Blanchflower *et al.* (2007) do not, however, point to large effects on native wages or employment rates, although some US studies suggest that lower skilled native workers tend to lose out from immigration to some degree, whereas higher income households benefit from the downward effect on goods and services prices because of the availability of lower paid immigrant workers. But, in general, most studies on this issue do not point to large effects.

In summary, there is evidence that the recent rise in UK immigration from the A8 has boosted total labour supply by more than 200,000 workers since April 2004 and possibly by as much as 500,000. This does seem to have played an important role in boosting UK employment levels, which rose by more than 550,000 in the two years to autumn 2006. There may have also been some slight upward effect on youth unemployment rates, but overall the available evidence suggests that immigration has not been the main factor driving the rise in unemployment over the past two years, which is more likely to have been a lagged response to the slowdown in UK economic growth during 2005. Since they are themselves relatively low paid, increased immigration from the A8 may have helped to hold down average earnings growth over the past two years, but there is no strong evidence of this depressing the wages of native workers (or indeed their employment rates).

IV.2 Migration and trend growth

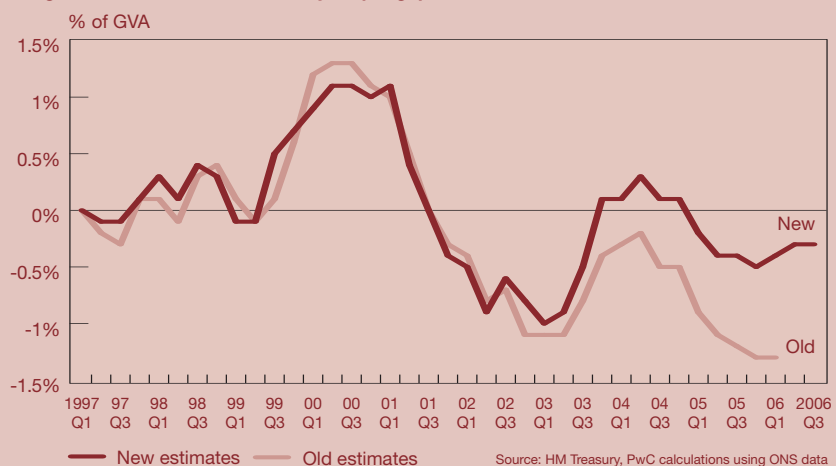
The upward revision in historic UK economic growth estimates in the 2006

Figure 4.2 – Regional changes in youth unemployment rates and share of new migrants



Source: Blanchflower *et al.* (2007)

Figure 4.3 – New and old Treasury output gap estimates



Source: HM Treasury, PwC calculations using ONS data

Blue Book caused the Treasury to reduce significantly its estimate of the 'output gap' in 2006/7 from -1.4% of non-oil GVA⁹ (in Budget 2006) to only around -0.2% in the December 2006 PBR (see Figure 4.3). This new estimate is more consistent with other evidence (e.g. from business surveys of capacity utilisation) that suggests only a relatively small amount of spare capacity in the UK economy at present, and with the estimates of other leading analysts such as the IMF and the OECD.

This revision posed a challenge for the Treasury, however, in that it made its previous projection of significantly above trend GDP growth in 2007 and 2008 look less plausible without pushing the level of output well above trend and so prompting interest rate rises. The Treasury argued in the PBR, however, that increased migration justified an increase in its central estimate of future trend growth (in the five years from 2007 to 2011) from 2.5% to 2.75%. This was based on the following general argument:

- previously the Treasury had used the latest 2005 principal population projections from the Government Actuary's Department (GAD), which suggested working age population growth of around 0.4% per annum on average in 2007-11, compared to the 0.65% average in 2001-6; this reflected the number of women born in the post-1945 baby boom who would reach state pension age from 2006 onwards;
- the GAD's principal projection was, however, based on the assumption that net migration would decline from its 2004 peak of 223,000 to an average of 145,000 per annum from 2007 onwards; although migration did fall to 185,000 in 2005, the Treasury argued that it seems more likely to remain at this level in future than to decline further (see Figure 4.4); and
- on this basis, the Treasury assumed that working age population growth would average around 0.6% per annum in 2007-11, only slightly below the average

⁹ See, for example, Dustmann, C., F. Fabbri and I. Preston (2005), 'The impact of immigration on the British labour market', *Economic Journal*, 115 (November), F324-F341.

⁹ The Treasury uses non-oil Gross Value Added (GVA) rather than GDP in its trend growth and output gap calculations to avoid distortions arising from variations in North Sea oil and gas output, which tend to be largely unrelated to the general economic cycle.

of 0.65% in 2001-6, rather than falling to 0.4% per annum as previously assumed.

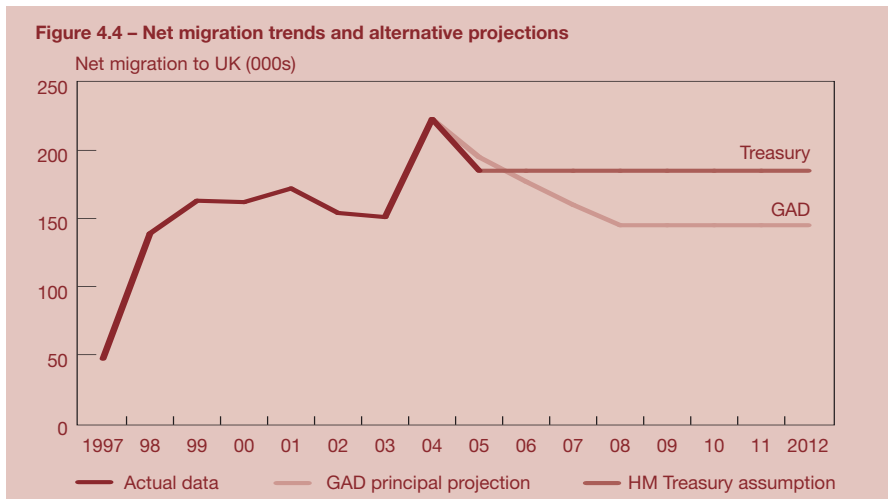
In addition, the Treasury argued that:

- the latest upwardly revised productivity growth data for 2001-6 provided support for the Treasury's earlier estimate that trend productivity per hour growth was around 2.25% per annum; and
- there was no good reason to change the earlier Treasury assumptions that a small trend decline in average hours per worker (-0.2% per annum) would be offset by the effect of a trend increase in the proportion of the working age population in employment (+0.2% per annum).

Assessment of Treasury analysis

In relation to migration trends, the Treasury's argument certainly has some merit, particularly when it is borne in mind that the GAD projections were based on IPS/TIM migration data which, for the reasons discussed above, may tend to understate actual net immigration, particularly from the A8 since 2004. Earlier GAD population projections certainly did not anticipate the extent of the rise in immigration in 2004-5 and the Treasury's assumption is still some way below the alternative 'high migration' scenario put forward by the GAD in 2005, which envisaged net migration running at an average of 205,000 per annum from 2007 onwards. The Treasury's migration assumption is therefore well within the plausible range.

Nonetheless, it could be argued that there are sufficiently large uncertainties around future migration trends to justify waiting a while longer before making this change, at least until the ONS updates its official population projections in Autumn 2007 (having taken over this role from the GAD last year). This would allow more data to accumulate on: how far earlier growth in A8 migration rates can be sustained now that the immediate post-accession increase has occurred; what early indications are on migration from Romania and Bulgaria now they have joined the EU (but under a more restrictive regime as regards migration to



the UK than for the A8); and how this additional migration is impacting the wider UK labour market.

In relation to this latter point, there are clearly still uncertainties as to how far the relatively low wages of recent A8 migrants (as noted above) are reflective of lower than UK average productivity levels. This may not be the case, since casual observation (and indeed a recent employer survey by the Institute of Directors) suggest that A8 migrants may be more productive than UK workers in comparable occupations. To the extent, however, that A8 migrants tend to work in lower productivity occupations, this could have at least a marginal 'batting average' effect that might shave a small amount off trend productivity growth during the period when migration remains particularly high. Similarly, as noted above, there could be at least a small effect from migration in pushing up youth unemployment, even if these effects are not statistically significant in econometric tests.

More generally, there is a question as to whether the assumed 0.2% contribution to trend GDP growth from a rising employment rate can be sustained. The last two years have seen the total UK employment rate remain relatively flat, but it remains to be seen how far this is a cyclical pause or an indication that structural limits to the earlier trend rise in the UK employment rate are being reached.

Furthermore, even if the upward trend in the UK employment rate resumes, the new people coming into the labour market (aside from immigrants) will often be from groups

such as older workers, students and lone parents who frequently work part-time rather than full-time. This could tend to reduce average hours worked across the economy as a whole, possibly by faster than the earlier trend rate of decline, which is assumed by the Treasury to continue in 2007-11.

In summary, the Treasury's arguments for a higher future trend growth rate clearly have some force and may well turn out to be correct in time. Their new 2.75% central estimate is certainly well within the plausible range. But there are still considerable uncertainties both about future migration trends and about wider labour market and productivity developments. In these circumstances, there might have been a case for waiting a little longer for additional evidence to become available before revising up assumed future trend growth to 2.75%. That having been said, however, it can be noted that the Treasury did use a more cautious assumption of 2.5% trend growth in its PBR fiscal projections¹⁶.

IV.3 – Implications for inflation and interest rates

The implications for inflation depend on the extent to which higher migration affects the balance between aggregate supply and aggregate demand. Clearly there are implications for both since migrant workers both produce and consume goods and services. An increased labour force will generally also encourage increased investment to equip these extra workers, which will also add to aggregate demand

¹⁶Previously the Treasury used a 2.25% trend growth assumption for the period beyond 2006, which did look very conservative, although this was offset by what most independent commentators considered to be an implausibly high initial negative output gap estimate.

(although there could also be some reduction in the average capital intensity of production due to the availability of additional relatively low cost migrant labour).

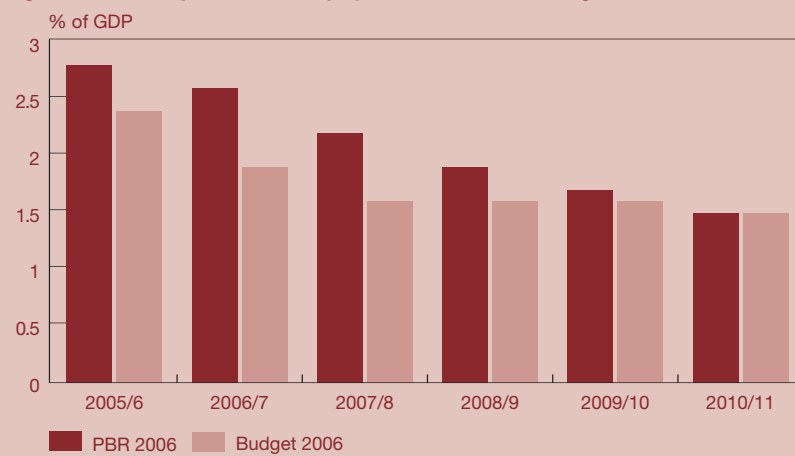
To the extent that migrant workers from relative low income countries such as the A8 will tend to send a proportion of their incomes home to help their families, however, the normal presumption would be that the initial effect would be to boost aggregate supply by somewhat more than aggregate demand, so tending to reduce inflationary pressures and allow the MPC to keep interest rates lower than would otherwise have been the case. Quantifying this effect is very difficult given the large range of other factors affecting inflation and interest rates, but statements in past MPC minutes and Inflation Reports support the view that migration has had some such effect in recent years.

Unless there is a permanent increase in the rate of inward migration, however, the effect on interest rates (and inflation) would be expected to be temporary, since lower interest rates should eventually move aggregate demand up into line with aggregate supply.

IV.4 – Implications for the public finances and fiscal policy

The practical significance of higher forecast future net immigration for the public finances is that the Treasury kept its GDP forecasts for the next few years broadly unchanged in the PBR, at the same time as it revealed a new much lower initial output gap estimate (see Figure 4.1 above). As such, tax revenue forecasts were also kept broadly unchanged in the PBR (apart from North Sea oil revenue projections, which were revised down for reasons unconnected with the general UK economic position). While the initial structural budget deficit is now estimated to be significantly higher due to the smaller output gap, this difference gradually disappears over the course of the projection period (see Figure 4.5). In practice, therefore, the fiscal policy impact of the new migration assumption was relatively small when considered together

Figure 4.5 – Treasury estimates and projections of structural budget deficit



with the effect of the output gap revision made at the same time in the PBR.

If we just look at the impact of higher assumed net immigration in the future without also considering the effect of the smaller initial output gap, however, then we can see that by 2011/12 it implies that GDP will be around 1.25% higher than it would otherwise have been and that, since tax revenues are around 40% of GDP, the latter will be around 0.5% of GDP higher than otherwise in 2011/12. Since the public spending plans pencilled in for the years beyond 2007/8 were left largely unchanged in cash terms in the PBR, however, this implies that future spending will be somewhat lower on a per capita basis (and as a share of GDP) than would have been the case without the revised migration assumption.

In other words, the Treasury does not seem to be making any allowance for the possible demands on public spending from the additional migrants factored into its GDP growth and revenue projections. To the extent, however, that these are mostly workers aged 18-34 with few dependents in the UK (as the analysis of A8 migrants above suggests), this may be reasonable, since this age group should not make heavy demands on health or education services and, if they are working, are unlikely to be major social security benefit recipients. As such, we would expect this group to be particularly strong positive net contributors to the public finances¹, at least to the extent that they are working in the formal economy and so paying taxes. Nonetheless, at least at the margin, the public spending

settlement pencilled in by the Treasury does look a little tighter than before to the extent that it must now cover a larger projected UK population.

IV.5 – Effects on national income per capita and general economic welfare

The impact of additional migration on GDP per capita will necessarily be less marked than its impact on total GDP. For example, the Treasury's new trend growth assumption implies that total GDP will be around 1% higher by 2010 than otherwise due to increased migration, but this is entirely due to a 1% rise in the working age population. Since the latter is around 60% of the total population, the implied rise in GDP per capita due to additional migration would be around 0.4% by 2010.

In addition, it is normal in welfare comparisons to look at national income per capita, which adjusts GDP for net overseas income flows. Since recent A8 migrant workers in particular may tend to send a significant proportion of their incomes back home, this is likely to imply a rise in national income per capita of somewhat less than 0.4%. Nonetheless, there should still be some positive effect on national income per capita from increased migration in this case.

Income per capita levels are not, however, the only element in economic welfare. Other economic effects to consider (excluding wider social impacts) might include:

¹ This is consistent with earlier studies showing a positive net fiscal contribution of migrants generally, such as Gott C. and K. Johnson (2002), *The Migrant Population in the UK: Fiscal Effects*, Home Office Research, Development and Statistics Directorate Occasional Paper No. 77. For the most recent A8 migrants, the likelihood of a positive net fiscal contribution seems even greater given their average age and typical lack of dependents, as well as the fact that most seem likely to return home rather than settle here on a long-term basis.

- increased congestion on roads and public transport; and
- increased pressures on constrained housing supply, tending to push up house prices and rents.

These two effects seem likely to be negative, particularly as migrants tend to be focused in the areas of the UK with the highest population density, such as London and other major cities. These negative effects may offset to some degree the positive impact on national income per capita from higher migration, although quantifying this trade-off would be difficult and is beyond the scope of this article.

IV.6 – Summary and conclusions

UK population growth has accelerated significantly since the turn of the century, driven primarily by higher net immigration, and an unexpectedly high inflow from the A8 Eastern European countries that joined the EU on 1 May 2004 has added to this trend. Available estimates indicate that up to half a million workers may have come to the UK from the A8 since May 2004, although Labour Force Survey data suggest that perhaps around half of these may since have returned home. These migrants tend

to be aged 18-34 with high employment rates relative to UK averages for this age group (and so low benefit receipts), but also comparatively low wages despite relatively good education and skills levels. There is some indication from regional data that recent A8 migration may have boosted youth unemployment rates slightly, but there is no significant evidence of adverse effects on overall unemployment levels.

Recent increases in migration certainly provide some support for the Treasury's upward revision to its estimate of future trend growth from 2.5% to 2.75%. There are, however, still considerable uncertainties around both future migration trends and their likely impact on UK employment and productivity growth, so a case might also have been made for waiting for additional evidence to accrue before revising up estimated future trend growth.

It seems likely that migration has added to both aggregate supply and aggregate demand, but probably with a greater effect on the former. As such, inflationary pressures and so interest rates are likely to have been somewhat lower than would otherwise have been expected. Unless migration continues at recent high rates, however, this effect is likely to erode over time.

The practical impact on fiscal policy is limited because the Treasury's assumption of higher future trend growth due to increased migration is offset by a lower estimate of the current amount of spare capacity in the economy. Focusing only on recent A8 migration, however, the net fiscal impact seems likely to have been positive, since these workers are mostly relatively young with few dependents and so are not likely to make major calls on the public services. Nonetheless, public spending projections do not appear to have been revised up at all in the PBR to reflect higher future assumed migration, which suggests that (on a per capita basis) the squeeze on public spending growth pencilled in for the next spending review period will be tighter than earlier projected.

Finally, we considered the impact of increased migration on national income per capita. This should be positive, but will be less (in percentage terms) than the impact on total GDP both due to a higher total population and due to some of the income earned by migrant workers (particularly from the A8) being sent back home to their families. Higher national income per capita may also be offset to some degree by increased transport congestion and pressures on housing supply.

Appendix A – Global Economic Outlook

This appendix reviews recent developments and assesses short-term prospects for the major global economies other than the UK. We consider in turn North America, Europe, the Asia-Pacific region and Latin America (see Table A.1 for a summary of recent growth and inflation projections for the countries covered). To give an overview of the importance of each economy in the global market, its estimated share of total world GDP (at average market exchange rates in 2005) is also shown in the table.

Global Overview

The IMF estimates that the world economy grew by around 3.8% (at market exchange rates) in 2006, up from 3.4% in 2005 and comfortably above its long-run historic average (see Figure A.1). Inflation, however, has crept upwards as a result of this relatively strong growth, combined with the effect of high energy and commodity prices, prompting central banks around the world to tighten their monetary policy stances.

The general outlook for 2007 is for continued relatively robust growth in much of the world, albeit at a slower rate than 2006. The latest IMF estimates suggest that world economic growth will decelerate marginally to around 3.5% this year. We broadly share this relatively benign view of global prospects although there are, of course, a range of possible economic and political shocks that could change this outlook, as discussed below.

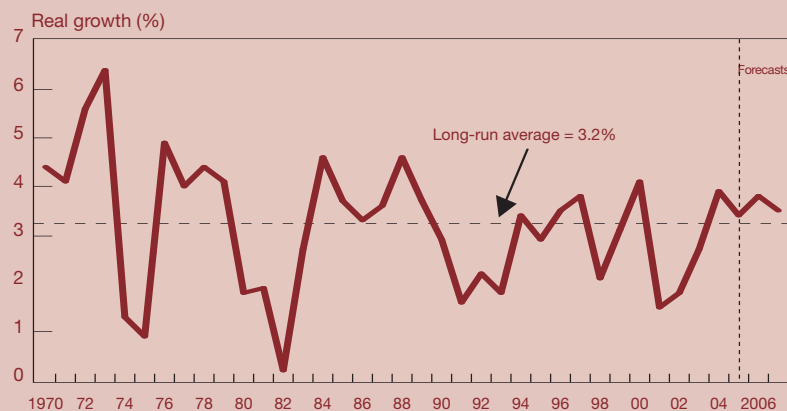
After reaching record nominal¹ highs of close to \$80 per barrel in early August, oil prices fell back during the second half of the year (see Figure A.2). Recent price moderation was aided by mild winter weather in the US and Europe, which eased demand for heating fuel (though this was partly reversed in early February). However, by historic standards, prices remain high and recent movements have added to price volatility and uncertainty. The outlook for 2007 is for oil prices to remain relatively high, although probably at lower levels than the record heights seen in mid-2006. While capacity constraints have eased somewhat

Table A.1 – Global economic prospects

Country	Share of World GDP (%:2005)	GDP growth (%)			Consumer price inflation (%)		
		2006 est.	2007	2008	2006	2007	2008
USA	28.1	3.3	2.7	2.7	3.2	1.9	2.4
Canada	2.5	2.8	2.6	2.8	2.0	1.8	2.2
Germany	6.3	2.5	1.6	2.1	1.8	2.1	1.5
UK	4.9	2.7	2.8	2.5	2.3	2.1	2.0
France	4.8	2.0	1.9	2.1	1.9	1.6	1.7
Italy	3.9	1.8	1.5	1.7	2.2	1.8	1.9
Spain	2.5	3.7	3.2	2.8	3.6	2.5	2.6
Netherlands	1.3	2.9	2.8	2.5	1.7	2.0	2.2
Japan	10.2	2.2	2.2	2.0	0.3	0.4	0.8
China	5.0	10.7	9.7	9.5	1.5	2.0	2.4
India ¹	1.8	8.5	7.8	7.7	6.0	5.6	5.5
Australia	1.6	2.5	2.9	3.1	3.5	2.6	2.4
South Korea	1.8	4.9	4.6	5.0	2.2	2.6	2.9
Russia	1.7	6.7	6.0	5.7	9.0	8.5	7.5
Turkey	0.8	5.0	4.5	5.4	9.6	8.5	7.0
Poland	0.7	5.5	5.1	4.9	1.3	2.4	2.6
Czech Republic	0.3	5.9	5.0	4.8	2.1	2.5	2.8
Hungary	0.2	3.9	2.5	2.9	4.0	5.0	3.5
Brazil	1.8	2.9	3.5	3.5	3.1	3.9	3.7
Mexico	1.7	4.5	3.3	3.6	4.1	3.7	3.6
Argentina	0.4	8.0	6.5	6.2	9.8	10.1	10.0

¹Data for India refers to fiscal years beginning 1st April
Source: National statistical offices; PricewaterhouseCoopers main scenario projections for 2007 and 2008 (but note that the latter are subject to wide margins of error at this stage). World Bank for GDP shares (at market exchange rates) in 2005.

Figure A.1 – World GDP growth



Source: World Bank up to 1997, IMF for 1998-2007 (using market exchange rates to aggregate world GDP)

in recent months, continued strong global energy demand growth, particularly from China, India and other emerging economies, is keeping the market relatively tight. In this context any shocks to supply, for example a disruption to one or more of the major Middle Eastern producers, could lead to renewed increases in oil prices. Such a scenario remains a significant

downside risk for global economic growth prospects, while also being a potential source of inflationary pressures.

Large global trade imbalances continue to dominate the international economic landscape, with the US current account deficit estimated at around 7% of GDP in 2006 (c.\$900 billion) and Chinese trade

¹ Average world growth would be significantly higher using GDP at purchasing power parity (PPP) exchange rates, since this would give much greater weight to fast growing emerging markets such as China and India, whose market exchange rates are well below PPP rates. On this alternative basis, the IMF estimates world GDP growth to have been 5.1% in 2006 and forecasts 4.9% in 2007. However, from the perspective of assessing the total size and growth of global markets for Western companies operating in hard currencies, market exchange rates are more immediately relevant.

² In real terms, however, dollar oil prices in mid-2006 were still below their 1980 peak levels, while sterling oil prices have been mitigated by the recent weakness of the dollar against the pound.

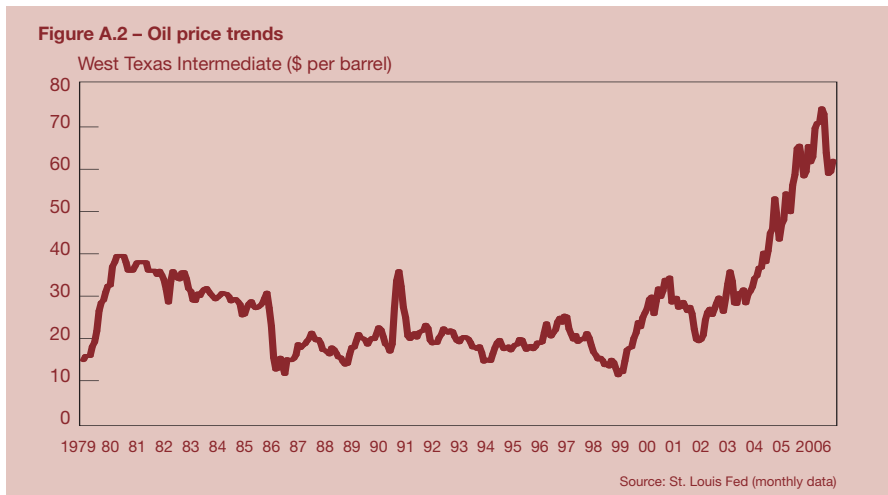
surpluses hovering around all-time highs. The prospect of a rapid unwinding of these imbalances, perhaps through a sharp shift away from US assets by overseas investors and an associated steep decline in the dollar against other major currencies, cannot be ruled out. This was also feared at the start of 2006, however, but did not emerge on a significant scale, despite a moderate decline in the dollar on a trade-weighted basis.

The **slowing US housing market** also poses some significant risks given its potential to reduce consumer spending growth. Recent data, however, suggest that the slowing market is not affecting consumer spending as much as originally anticipated.

Given that it is the UK's largest export market, the **Euroland** economy represents a particularly important source of international risk. While Euroland growth was generally relatively strong in 2006, the economies of France, Germany and Italy are all expected to slow in 2007 as recent ECB interest rate rises begin to take effect. Underlying structural problems remain significant in all three economies and are contributing to growth in Western Europe that is expected to continue to lag behind that in the other main economic regions in 2007-8 (see Figure A.3).

As always, **geopolitical shocks** remain a downside risk to global growth prospects, with Iraq, Iran and North Korea all being potential flashpoints. The recent localised outbreak of bird flu in the UK is a reminder that a global **avian flu pandemic** also remains a potential 'wild card' risk for the global economy.

There are, however, also a number of **positive factors** that point to continued strength in the world economy. The US economy was stronger than earlier expected in the fourth quarter of 2006 despite the housing slowdown, while both the Euroland and Japanese economies appear stronger than for some years. China, India and the rest of the Asian emerging market economies retain significant upward momentum and could well exceed consensus growth forecasts for 2007. Corporate profitability is also relatively healthy across most of the OECD, which



suggests that the underlying trend in stock markets may remain reasonably healthy despite the correction seen in late February.

In summary, our main scenario envisages a marginal deceleration in global growth in 2007, with the expected US slowdown feeding through to somewhat slower European growth, but with growth continuing apace in China and India.

As outlined above, however, there are still considerable uncertainties that need to be borne in mind.

North America

The US economy grew by an estimated 3.3% in 2006, up from 3.2% in 2005, but annualised growth was only 2.2% in Q4 2006 (see Figure A.4). Consumer spending grew strongly in Q4, but the weakening housing market led to a continued contraction in residential investment.

The strength of consumer spending in Q4 partly reflected the continued strength of the labour market. The unemployment rate was just 4.5% in December, only slightly above the five year low of 4.4% recorded in October. Employment growth has remained reasonable and wage growth picked up again in late 2006, boosting household spending power.

Latest US inflation data suggest that strong demand has partly offset the effect of the fall in oil prices last summer. The headline rate of consumer price inflation fell from July to October as oil prices slipped back, but then rose again to 2.5% in December before falling back to 2.1% in January. The Federal Reserve's preferred core inflation measure (which excludes food and energy costs) remained higher at 2.7% in January.

Interest rates were again kept on hold at 5.25% at the Federal Reserve's January meeting. The high rate of core inflation, reasonably robust demand growth, rising

wages and higher unit labour costs seem likely to keep interest rates on hold for the next few meetings. Earlier market expectations of interest rate cuts later in 2007 have been scaled down accordingly and a further rate rise cannot be entirely ruled out if inflation remains high, although this is not our main scenario projection.

Prospects of a slowing economy, falling interest rate differentials, currency diversification by foreign investors and worries over the US current account deficit could cause some further weakness in the US dollar, although this is subject to considerable uncertainty as with any such exchange rate movements.

In our **main scenario**, growth in the US economy is expected to slow from 3.3% in 2006 to around 2.5-3% on average in 2007 and 2008, although any projections for the latter year are obviously subject to a wide margin of error at this early stage. The housing market slowdown is likely to filter through to other areas of the economy and lead to more modest consumer spending growth in 2007, but this could be offset by recent relative labour market strength.

The **Canadian** economy has shown signs of slowing in recent quarters, with weak residential investment and robust imports acting as a drag on the economy. The Bank of Canada decided to keep its target for the overnight interest rate at 4.25% in January given the continued strength of the Canadian dollar and the expectation that the easing of energy prices should help to contain inflation in 2007. Growth is likely to average around 2.5-3% in Canada in 2007-8 in our main scenario.

Euroland

The **Euroland** economy decelerated in Q3 2006, growing by 0.5% relative to the previous quarter after posting strong growth during the first half of the year. Euroland's overall Q3 performance was driven primarily by a pick-up in consumer spending, while investment growth moderated after growing strongly during the first half of 2006. Preliminary estimates, however, suggest that Euroland GDP growth then accelerated again to 0.9% in

Figure A.4 – US GDP growth

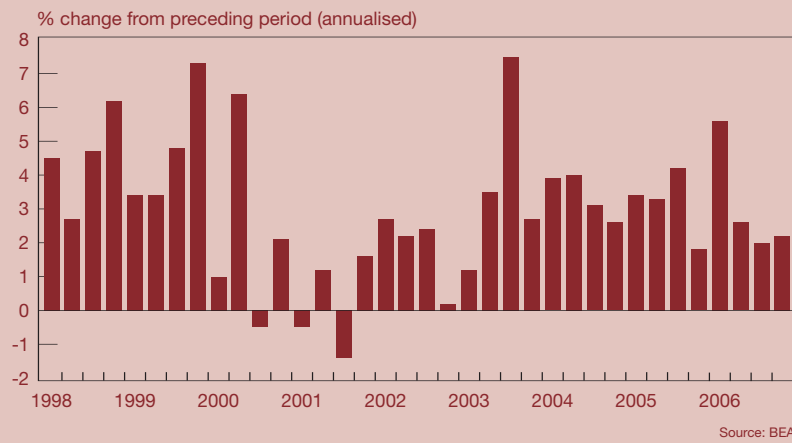


Table A.2 – Outlook for European GDP growth (%)

Country/region	2006 est.	PwC Main scenario	
		2007	2008
Germany	2.5	1.6	2.1
France	2.0	1.9	2.1
Italy	1.8	1.4	1.5
Spain	3.7	3.2	2.8
Netherlands	2.9	2.8	2.5
Euroland	2.7	2.1	2.2
<i>Plausible range</i>	-	<i>1.5-2.75</i>	<i>1-3.5</i>
UK	2.7	2.8	2.5
Sweden	4.4	3.3	2.6
Switzerland	2.8	2.0	1.8
Western Europe	2.7	2.1	2.2
Poland	5.5	5.1	4.9
Czech Republic	5.9	5.0	4.8
Hungary	3.9	2.5	2.9

Source: PwC estimates for 2006 and main scenario projections for growth in 2007 and 2008 (note that the latter are subject to wide margins of error at present, as indicated by the 2008 range shown for Euroland)

Q4 2006, giving average annual growth of 2.7% for 2006 as a whole.

German GDP grew by 0.8% in Q3 relative to Q2 2006, which represented a slight moderation after growth of 1.2% in the second quarter. Growth is estimated at a healthy 0.9% in Q4 2006, due in part to consumers bringing forward purchases ahead of the 1 January 2007 VAT hike from 16% to 19%, although there is likely to be an offsetting dip in spending in Q1 2007 as a result of this tax increase.

France was the weakest performer of the larger Euroland economies in Q3, with GDP growth grinding to a halt. A sharp contraction in manufacturing output lay behind the overall economic stagnation, although the services sector grew modestly. But preliminary estimates suggest that the

French economy resumed growth of around 0.6-0.7% in Q4 2006. The **Italian** economy also weakened in Q3, with growth slipping to only 0.3% following a contraction in investment and exports, but then recovered in Q4 2006, with estimated growth of 1.1% on the previous quarter. Italy is nonetheless expected to remain the slowest growing of the major European economies in 2007 (see Table A.2 for details). **Spain** continues to be the fastest growing of the larger Euroland economies, expanding by around 3.7% on average in 2006 according to preliminary estimates.

The German Ifo index, which is generally seen as a key leading indicator for Euroland as a whole, improved for the third month in a row in December to stand at its highest level in over fifteen years, although it did then drop back somewhat in January. Other

indicators have also generally been upbeat, with European Commission (EC) business confidence surveys being consistent with strong Q4 activity in the Euroland. Industrial confidence remained flat in December but was still above the previous peak recorded in 2000. The Euroland manufacturing and services PMI indices have also remained relatively strong. Consumer confidence also continued its trend rise in late 2006, despite a series of interest rate hikes by the ECB.

Euroland headline inflation fell below the ECB's target range ceiling in September 2006, and has remained below 2% through to January 2007. Inflationary pressures have eased as a result of the fall in oil prices since July 2006. Nevertheless, recent comments by the ECB suggest strongly that rates will rise to 3.75% in March and they currently seem likely to increase further to 4% or higher by the end of the year.

Euroland GDP growth is projected to slow to an average of just over 2% in 2007-8 (see Table A.2) as governments tighten fiscal policy and past and expected future ECB interest rate rises begin to squeeze consumer spending and investment growth.

Elsewhere in Europe, the **Swedish** economy grew rapidly in Q3 2006, supported by employment growth and high confidence levels. Interest rates were raised six times in 2006, which is likely to cause a gradual moderation of growth in 2007-8. Swiss GDP growth slowed for the second consecutive quarter in Q3, with the dominant financial market services sector contracting. Nonetheless, the Swiss National Bank decided to raise interest rates by 25bp in December, despite a relatively low rate of headline inflation.

The Eastern European economies continue to grow significantly faster than the EU average. The **Polish** economy grew by 1.6% in Q3 relative to the second quarter, driven by a pick-up in exports and investment, and annual growth is expected to be around 5% in 2007, similar to that in the **Czech Republic**. In **Hungary**, however, austerity measures are expected to result in a marked slowdown in GDP growth to only around 2.5% in 2007.

Asia-Pacific

The Japanese economy accelerated in Q4 2006, growing by 1.2% relative to the previous quarter, as compared to 0.5% growth in Q3. Consumer spending picked up relatively strongly in Q4 after contracting in the previous quarter.

Headline inflation declined to 0.1% in December and this continued subdued level of inflation prompted the Bank of Japan to maintain official short-term interest rates at just 0.25% in January.

Recent vibrant business investment growth looks set to continue in the short run, while labour market conditions should support some growth in consumer spending during 2007. This should provide some protection against any downturn in export growth. In our main scenario, we expect Japanese GDP to grow by around 2% in both 2007 and 2008.

The **Chinese** economy achieved year-on-year growth of 10.4% in Q4 2006, giving an average GDP growth rate for the year as a whole of 10.7%, the fastest rate since 1995. Growth has been driven by surging investment and exports. In the process of defending its largely fixed exchange rate, China has continued to amass foreign exchange reserves, which now exceed US\$1 trillion in total. This has led to rapid growth in both the money supply and credit, fuelling concerns that excess liquidity may lead to overheating, particular as regards investment spending.

In response to these fears, the Chinese authorities increased both interest rates and bank reserve requirement ratios in 2006. These measures appear to have begun to take effect, with fixed asset investment growth decelerating during 2006. Share prices in Shanghai also fell back sharply in late February, sparking a global correction. With export growth also likely to slow, reflecting easing demand from the US, we expect Chinese GDP growth to slow slightly to around 9.7% in 2007 and 9.5% in 2008.

The **Indian** economy grew by a robust 9.2% in the year to Q3 2006. Booming property prices, buoyant consumer credit growth and rising wages provided a boost to consumer spending in 2006, but also contributed to increased inflationary

pressures. The Reserve Bank of India is likely to increase its key interest rate in 2007 in order to slow the pace of economic growth and bring inflation under control.

In 2007, weaker demand for exports of Indian goods is likely to be offset by continued growth in services exports. In our **main scenario** we expect the Indian economy to grow by around 8.5% in fiscal year 2006/07 and 7.8% in 2007/08.

The **Australian** economy expanded by a modest 0.3% in the third quarter of 2006. Consumer spending and exports were the drivers behind this expansion as investment contracted in Q3. The recent drought had a significant negative impact on the agricultural sector, the output of which fell by 9.3% in the third quarter. The unemployment rate stood at 4.5% in January, a 30-year low, but inflation remains high as a result of rising commodity prices and tight labour market conditions. The Reserve Bank of Australia's key interest rate was raised to 6.25% in November 2006 in an attempt to dampen these inflationary pressures.

In our **main scenario**, demand for Australian exports is likely to remain firm, reflecting continued dynamic growth in the economies of its principal Asian trading partners, but we expect that recent interest rate hikes and the impact of the drought will constrain GDP growth to just under 3% in 2007.

Latin America

The **Latin American** economies as a group grew by an estimated 5% in 2006, up from 4.3% in 2005. High world prices for the region's commodity exports played a significant role in this acceleration. We estimate that the **Brazilian** economy expanded by 2.9% in 2006, driven by strong consumer spending and business investment growth. Growth of around 3.5% is anticipated in both 2007 and 2008.

Argentina experienced rapid growth of around 8% in 2006, but seems likely to slow somewhat to around 6.5% in 2007. The **Mexican** economy also performed strongly with growth of around 4.5% in 2006. Reflecting the high degree of dependence on the slowing US economy, however, Mexican growth seems likely to decelerate somewhat this year.

Appendix B - UK economic trends: 1979-2006

Annual averages	GDP growth	Household expenditure growth	Manufacturing output growth	Inflation (RPIX)	3 Month interest rate (% annual average)	Current account balance (% of GDP)	PSNB* (% of GDP)
1979	2.6	4.7	-0.2	12.6	13.9	-0.5	4.7
1980	-2.1	0.0	-9.5	16.9	16.6	0.8	4.3
1981	-1.4	0.0	-6.6	12.2	14.0	1.9	3.5
1982	1.9	0.7	-0.0	8.5	12.2	0.8	2.6
1983	3.5	4.1	2.1	5.2	10.1	0.4	3.5
1984	2.6	2.1	3.6	4.5	10.0	-0.4	3.7
1985	3.6	3.7	2.7	5.2	12.3	-0.2	2.9
1986	4.0	6.5	1.3	3.6	10.8	-0.9	2.3
1987	4.6	5.4	4.6	3.7	9.6	-1.8	1.5
1988	5.0	7.6	6.8	4.6	10.4	-4.2	-0.8
1989	2.2	3.4	3.8	5.9	14.0	-5.1	-0.8
1990	0.8	0.8	-0.1	8.1	14.7	-4.0	1.6
1991	-1.4	-1.6	-5.3	6.7	11.5	-1.8	3.1
1992	0.2	0.5	-0.1	4.7	9.5	-2.1	6.4
1993	2.3	2.7	1.5	3	8	-1.8	7.9
1994	4.3	2.8	4.7	2.3	5.5	-1.0	6.8
1995	2.9	1.7	1.5	2.9	6.7	-1.2	5.8
1996	2.8	3.9	0.4	3	6.0	-0.9	4.1
1997	3.0	3.5	2.1	2.8	6.9	-0.1	2.1
1998	3.3	3.8	0.7	2.6	7.3	-0.4	-0.1
1999	3.0	4.7	0.7	2.3	5.4	-2.4	-1.2
2000	3.8	4.5	2.4	2.1	6.0	-2.6	-1.7
2001	2.4	3.1	-1.4	2.1	5.1	-2.2	-1.0
2002	2.1	3.6	-2.6	2.2	4.0	-1.6	1.6
2003	2.7	3.0	0.12	2.8	3.6	-1.3	3.3
2004	3.3	3.5	2.0	2.2	4.7	-1.6	3.2
2005	1.9	1.3	-1.1	2.3	4.7	-2.2	3.2
2006 e	2.7	2.0	1.3	2.9	4.9	-2.5	3.0
Average over economic cycles**							
1979-89	2.4	3.5	0.8	7.5	12.0	-0.8	2.5
1989-2000	2.3	2.5	1.0	3.8	7.7	-2.0	2.6

*Public Sector Net Borrowing (calendar years), ** peak-to-peak for GDP relative to trend

Source: NS

