GLAECONOMICS

London's Economic Outlook: Spring 2007

The GLA's medium-term planning projections

Transport for London

LONDON DEVELOPMENT AGENCY

MAYOR OF LONDON

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GLA Economics provides expert advice and analysis on London's economy and the economic issues facing the capital. Data and analysis from GLA Economics form a basis for the policy and investment decisions facing the Mayor of London and the GLA group. The unit is funded by the Greater London Authority, Transport for London and the London Development Agency.

Contents

1. Executive summary

The Greater London Authority's (GLA) tenth London forecast[i], suggests that:

- London's Gross Value Added (GVA) should grow at 2.6 per cent in 2007, rising to 2.8 per cent in 2008 and 3.0 per cent in 2009.

- London is likely to see above trend growth in employment throughout the period 2007 to 2009.

- London household spending will probably grow more slowly than GVA throughout the forecast period. Household spending is also forecast to grow more slowly than household income throughout the forecast period.

Table 1.1 summarises this report's forecasts and provides an average of independent forecasts.

Table 1.1: Summary of forecasts

Annual growth rates (per cent)	**2006**	**2007**	**2008**	**2009**
London GVA (constant 2003 £ billion)	3.3	2.6	2.8	3.0
Consensus (average of independent forecasts)		3.2	2.8	3.3
London civilian workforce jobs	2.0	1.2	1.4	1.5
Consensus (average of independent forecasts)		1.2	0.9	1.2
London household spending (constant 2003 £ billion)	2.8	1.7	2.0	2.6
Consensus (average of independent forecasts)		2.7	2.4	2.9
London household income (constant 2003 £ billion)	2.6	3.1	4.3	3.1
Memo: Projected UK RPIX[ii] (Inflation rate)	2.9	2.8	2.5	2.5
Projected UK CPI[iii] (Inflation rate)	2.3	2.2	2.0	2.0

Source: GLA Economics' Spring 2007 forecast and consensus calculated by GLA Economics.

2. Introduction

The Spring 2007 edition of *London's Economic Outlook* (LEO) is GLA Economics' tenth London forecast. The forecasts are issued every six months to assist those preparing planning projections for London in the medium term. The report contains the following:

- An overview of recent economic conditions in London, the UK and the world economies with analysis of important events, trends and risks to short and medium-term growth (Section 3).

- The 'consensus forecast' – a review of independent forecasts indicating the range of views about London's economy and the possible upside and downside risk (Section 4). In this document, 'consensus forecast' refers to the average of the four independent forecasters listed under Section 2.1.

- The GLA Economics forecast for output, employment, household expenditure and household income in London (Section 5).

- An in-depth assessment of a topic of particular importance (Section 6). Given that this is the first forecast which uses the GLA Economics' proprietary forecasting model, this issue features a supplement by Volterra Consulting Limited on how the GLA Economics short term forecasting model was developed.

2.1 Note on the forecast

Any economic forecast is what the forecaster views as the economy's most likely future path and as such is inherently uncertain. Both model and data uncertainty as well as unpredictable events contribute to the potential for forecast error. GLA Economics' forecast is based on an in-house model built by Volterra Consulting Limited, explained in further detail in Section 6 of this report. GLA Economics' review of independent forecasts provides an overview of the range of alternative opinions. Independent forecasts are supplied to the GLA for the main macroeconomic variables by the following organisations:

- Cambridge Econometrics (CE)
- The Centre for Economic and Business Research (CEBR)
- Experian Business Strategies (EBS)
- Oxford Economics (OE)

Only the most likely outcomes, which the different forecasting organisations provide, are recorded. Each forecaster may also prepare scenarios they consider less likely but these are not shown here. The low and high forecasts combine the lowest and highest forecasts respectively taken from each year separately and which, may therefore, come from different forecasters. High and low estimates therefore may not represent the view of any one forecaster over the whole of the forecast period.

Economic forecasting is not a precise science. These projections provide an indication of what is most *likely* to happen, not what will *definitely* happen.

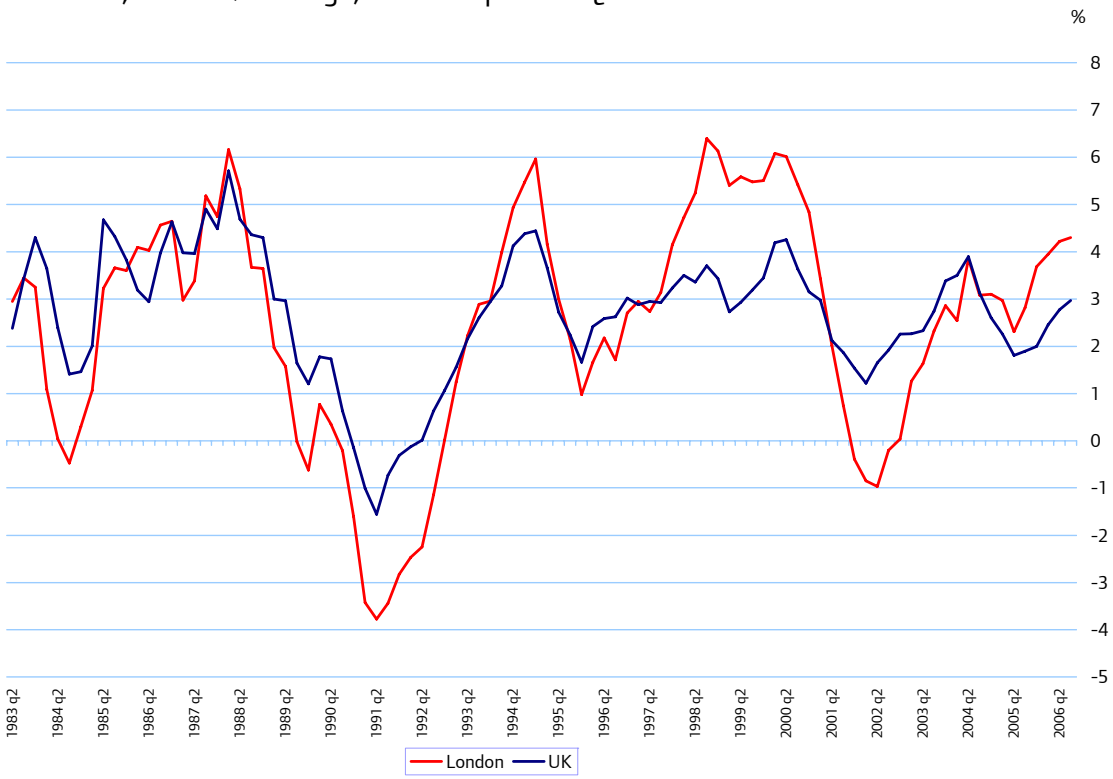
3. Economic background: World growth remains strong although global interest rates increase

This section provides an overview of recent developments in the London, UK and world economies.

3.1 The London economy

London's economy continues to outperform the UK significantly in terms of annual GVA growth. Annual output in London grew at 4.3 per cent in quarter three of 2006, slightly up on the previous quarter. Annual output in the UK as a whole grew at 3.0 per cent in quarter three. Annual economic growth has been positive in London since 2002 and stronger than the UK as a whole since the fourth quarter of 2004.

Figure 3.1: Output growth – London and UK
Real GVA, annual % change, last data point is Q3 2006



Source: Experian Business Strategies

London's financial services sector continues to perform strongly. London handles more of the world's deals in over the counter derivatives, global foreign equities, eurobonds and foreign exchange than any other financial centre.[iv] The January 2007 edition of the International Financial Services, London's (ISFL's) City Indicators Bulletin shows that on an annual trend 13 out of the 14 indicators rose between Q4 2005 and Q4 2006.

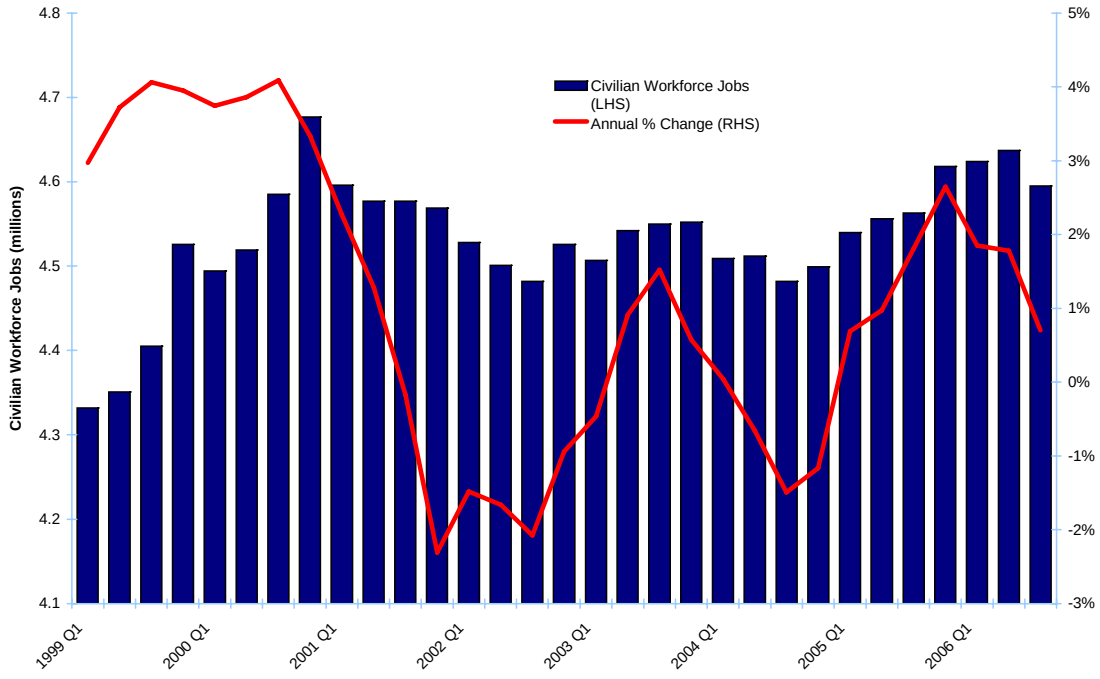
Growth in activity in the capital's financial markets is expected to continue well into 2007. In the past four years, the total funds raised in Initial Public Offerings (IPOs) on the London Stock Exchange has increased by almost a thousand per cent, compared to

around 170 per cent for New York. Similarly, the Alternative Investment Market (AIM) has increased funds raised by just over 600 per cent.[v] A McKinsey report[vi] shows that it is London's relative lack of restrictive regulation that is giving it the edge over New York.

London's attractiveness as a place to do business was reinforced in the Confederation of Business Industry's (CBI's) fourth 'London Business Survey', in which 96 per cent of business respondents said that London is a "good" or "very good" place to do business compared to other world cities. London stood out from other world cities in terms of its networking opportunities and the depth of its talent pool. However, London fared less well in terms of the quality and reliability of its transport network, requiring greater investment in transport infrastructure to keep pace with its growth.

The strong performance in the financial and business services sector has boosted the City of London's office market with rising take-up, lower vacancy rates and higher rents. According to the Central London Office Market View vacancy rates fell to 4.3 per cent in December, the lowest rate since 2001.[vii]

Figure 3.2: London civilian workforce jobs
Level and annual % change, last data point is Q3 2006

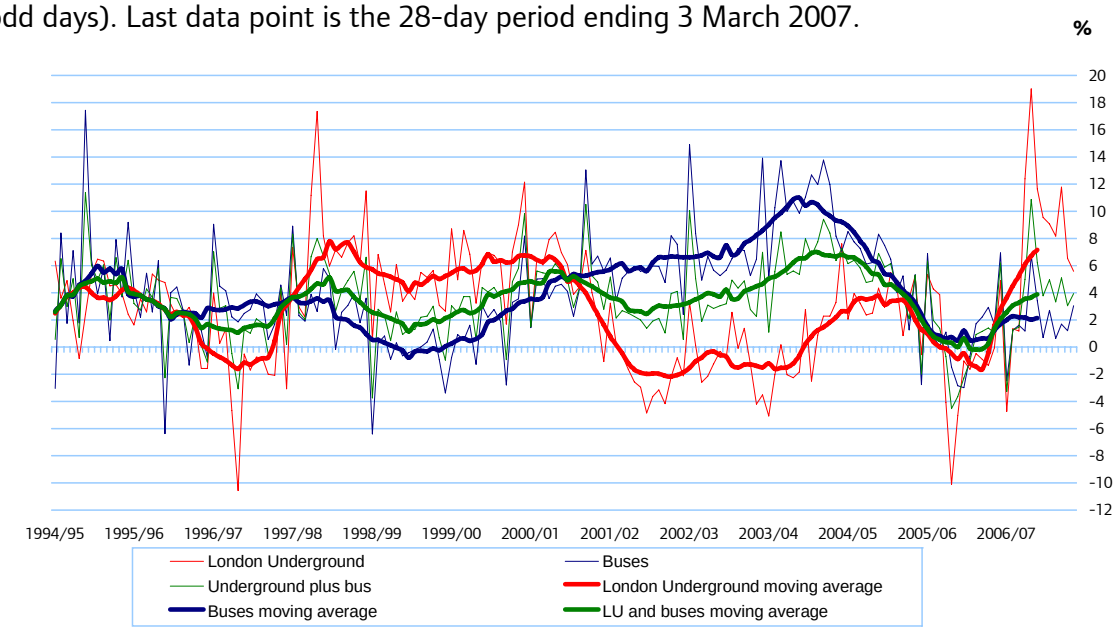


Source: Office for National Statistics

Annual employment growth in London is slowing but there has been continued year on year growth since quarter one 2005. The total number of workforce jobs in London was almost 4.6 million in quarter three 2006 (see Figure 3.2).

Public transport usage, a useful indicator of economic activity in London, has been increasing. There has been a particularly strong pick up in underground usage recently (see Figure 3.3).

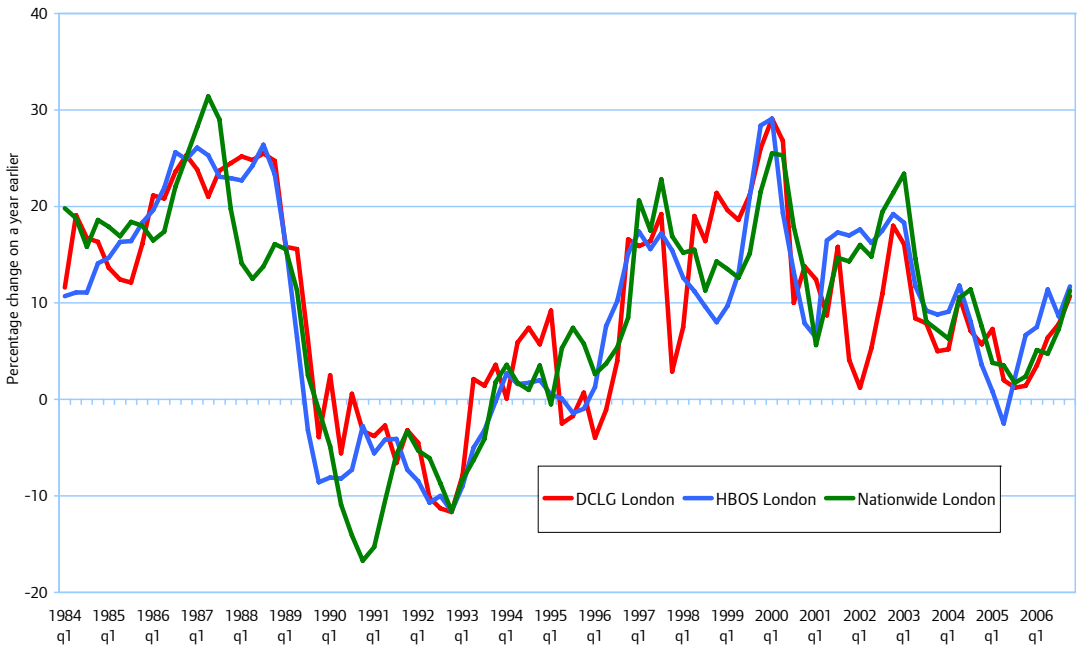
Figure 3.3: London public transport usage
Annual % change in passengers using London Underground and buses (adjusted for odd days). Last data point is the 28-day period ending 3 March 2007.



Source: Transport for London

House price inflation in London picked up in 2006, after a slowdown in 2005, ending the year just above 10 per cent on most measures (see Figure 3.4).

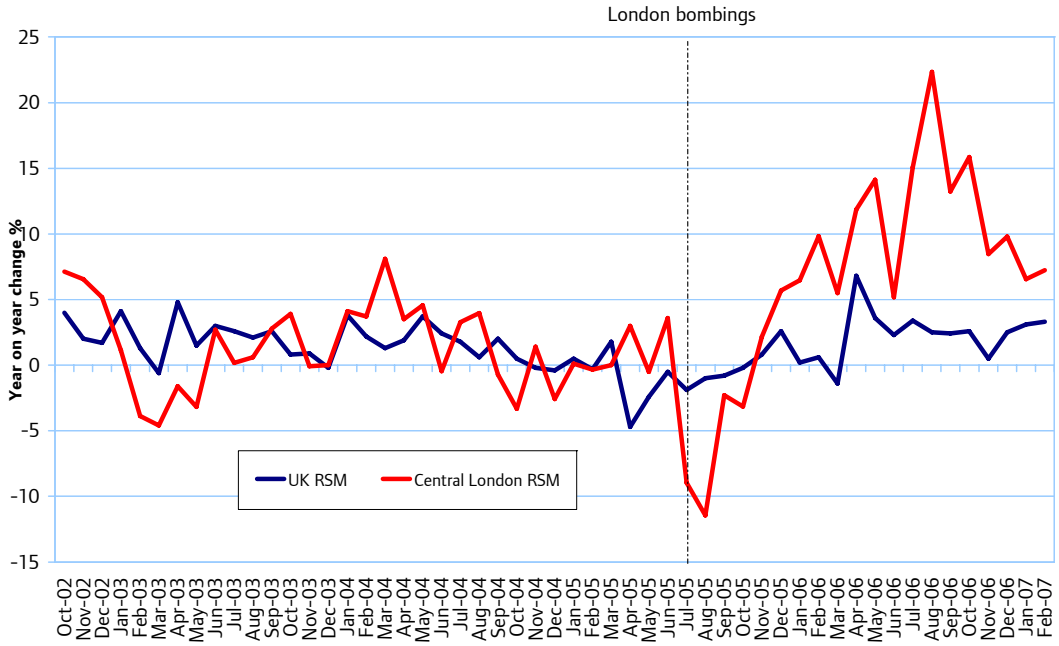
Figure 3.4: House price inflation in London
Last data point is Q4 2006



Source: DCLG, Halifax Bank of Scotland, Nationwide

The retail sector in Central London has continued to perform well. Retail sales in Central London as monitored by the London Retail Consortium (Figure 3.5) show strong year on year growth since December 2005, far outstripping the performance of the UK as a whole.

Figure 3.5: Retail sales growth – Central London and the UK
Annual % change, last data point is February 2007

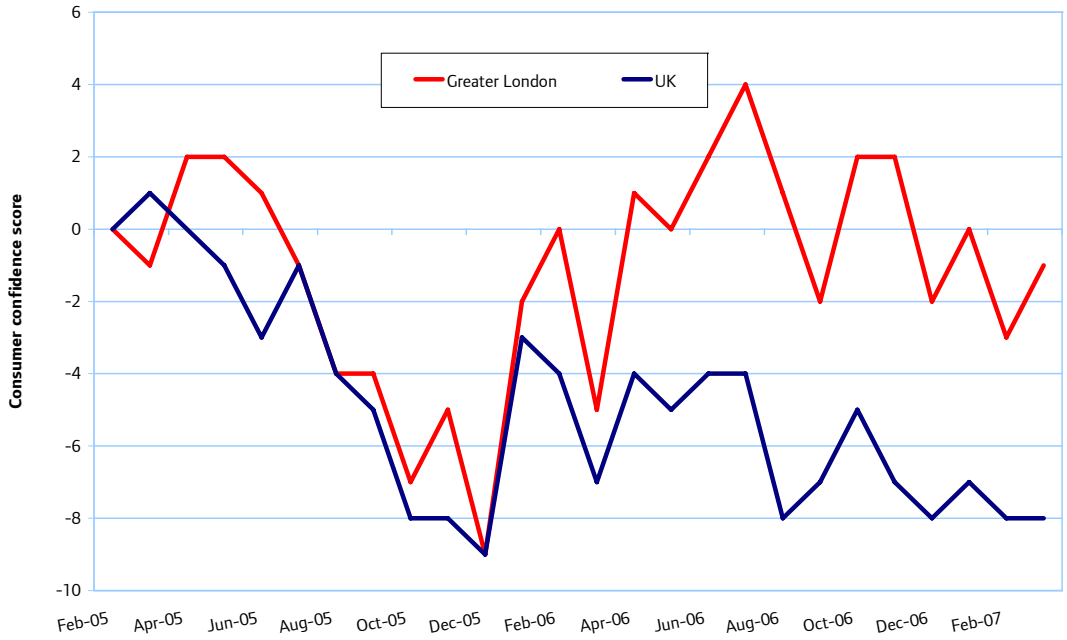


Source: UK Retail Sales Monitor – BRC/KPMG, Central London Retail Sales Monitor – London Retail Consortium

Central London retail sales have been helped by rising overseas visitor numbers. Visit London's Visitor Index[viii] saw growth in eleven out of the twelve months in 2006 and performance in 2006 matched that seen in 2004. At the national level both overseas visitor numbers and their expenditure saw strong growth in 2006.

GfK NOP's regional consumer confidence index shows that consumer confidence in both London and the UK as a whole has been on a downward trend since summer 2006. The index reflects people's views on their financial position and the general economic situation over the past year and their expectations for the next 12 months. Confidence in London remains above that for the UK as a whole. The downward trend in confidence since summer 2006 is likely to reflect rising energy bills and interest rates, as well as uncertainty regarding prospects for inflation.

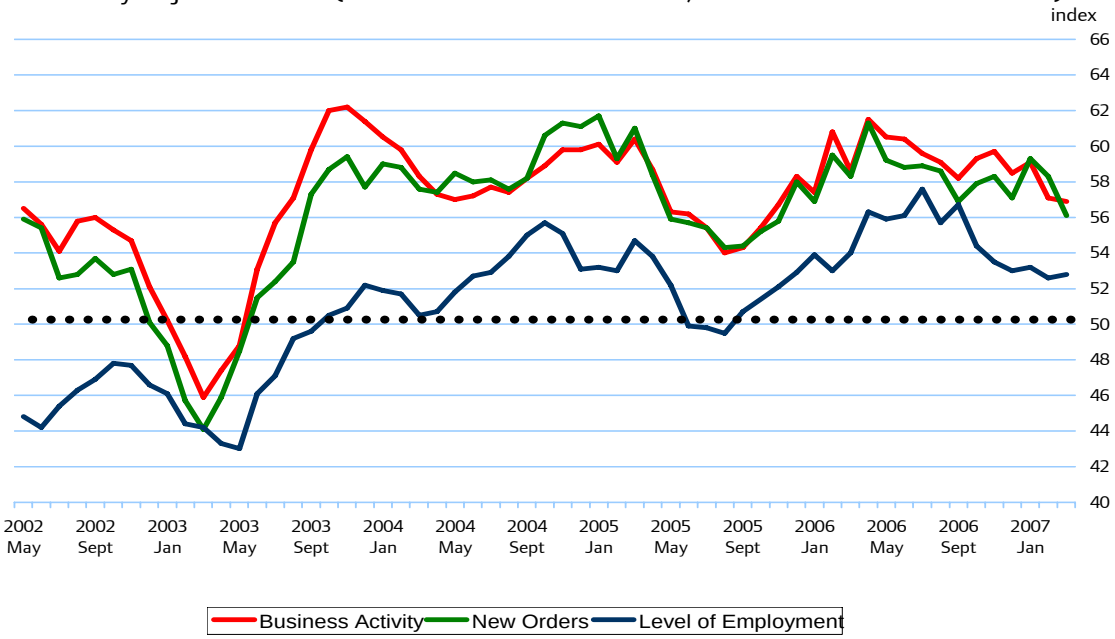
Figure 3.6: GfK NOP's regional consumer confidence index
Last data point is March 2007



Source: GfK NOP on behalf of the European Commission

Business survey results indicate that the rate of London's expansion remains strong though this has eased slightly since spring 2006. Figure 3.7 shows that PMI's surveys of seasonally adjusted business activity, new orders and the level of employment all remain well above 50, which indicates growth.

Figure 3.7: Recent survey evidence on London's economic climate
Purchasing Manager's Index (PMI) survey, last data point is March 2007
Seasonally adjusted index (above 50 indicates increase, below 50 indicates decrease)



Source: Purchasing Manager's Index/Royal Bank of Scotland

A report by PricewaterhouseCoopers (PWC) in its UK Economic Outlook, March 2007 examined the relative economic output of the largest cities in the world and how this might change between 2005 and 2020. London is projected to grow somewhat faster than its main rivals such as Tokyo, New York, Chicago and Paris over the period rising from sixth to fourth in PWC's rankings.[ix] The dominant trend however is for emerging economy cities to rise up the rankings, which will provide new opportunities in expanding markets for London's businesses.

3.2 The UK economy

UK Gross Domestic Product (GDP) rose by an estimated 0.7 per cent in the first quarter of 2007, which is the same rate as in the previous two quarters. The annual growth rate in the first quarter of 2007 was 2.8 per cent, compared with 3.0 per cent in the fourth quarter of 2006. This growth was driven by the service sector. The recent above-trend growth has given rise to concerns of a lack of spare capacity in the economy despite the increase in the labour supply resulting from inward migration.

Table 3.1: HM Treasury and consensus forecasts for the UK economy (March 2007)

Annual % change, unless otherwise indicated

	Average of Independent Forecasters		Budget March 2007	
	2007	2008	2007	2008
GDP growth (per cent)	2.6	2.3	2 ¾-3 ¼	2 ½-3
Inflation rate (Q4: per cent)				
CPI	1.9	2.0	2	2
RPI	3.1	2.5	-	-
Claimant unemployment (Q4: mn)	0.95	1.01	-	-
Current account (£bn)	-37.4	-39.2	-37	-39 ¼
PSNB (2007-08, 2008-09: £bn)	36.0	34.4	34.0	30.0

Note: CPI = Consumer Price Index, RPI = Retail Price Index, mn = million, bn = billion

Source: HM Treasury Comparison of Independent Forecasts, March 2007

HM Treasury Financial Statement and Budget report Chapter C: The Public Finances

Both the IMF and the Confederation of British Industry forecast healthy growth of 2.9 per cent this year. This is an upward revision from the IMF's forecast of 2.7 per cent in September.[x] The IMF did nonetheless signal the need for vigilance regarding inflation, underlined the need for wage restraint, and also the need for fiscal consolidation.

Table 3.2 shows that business services and finance saw buoyant growth in 2006 of 5.4 per cent. The manufacturing sector also picked up in 2006, turning the negative growth of 2005 into 1.5 per cent growth in 2006.

Table 3.2: Recent growth in broad industrial sectors of UK economy
Annual % change

	2006					
Industrial sectors	**Q1**	**Q2**	**Q3**	**Q4**	**2005**	**2006**
Agriculture, forestry, and fishing	-0.6	-2.9	-1.6	-1.9	2.4	-1.8
Mining & quarrying inc oil & gas extraction	-6.7	-10.8	-6.5	-7.6	-9.5	-7.9
Manufacturing	-0.1	1.4	1.9	2.7	-1.0	1.5
Electricity, gas and water supply	0.5	-3.9	-3.5	-4.5	-0.2	-2.8
Construction	-0.1	-0.1	1.9	2.9	1.5	1.1
Distribution, hotels and catering	2.7	3.7	3.3	3.4	1.2	3.3
Transport, storage and communication	3.4	3.7	2.9	2.5	4.3	3.1
Business services and finance	4.9	5.5	5.8	5.3	4.3	5.4
Government and other services	2.4	2.0	1.6	1.8	2.0	2.0

Source: Office for National Statistics

Table 3.3 shows that there was a pick-up in annual household spending growth from the first quarter of 2006. Investment spending saw robust growth in 2006 and business investment rose sharply at the end of 2006 reaching the fastest quarterly rate of growth for eight years. The Bank of England expects the rate of investment growth to continue to exceed GDP growth. By contrast, annual growth in government spending moderated somewhat in 2006, with slightly weaker growth than in recent years.

Table 3.3: UK domestic expenditure growth
Annual % change

	2005		2006			
Expenditure	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Households	1.1	1.1	0.9	2.1	1.9	2.5
Non-Profit Institutions	3.0	3.7	4.7	6.3	6.8	7.2
General Government	3.8	3.0	3.0	2.1	2.0	2.4
Gross Fixed Capital Formation	3.6	4.7	5.2	6.8	5.6	8.2

Source: Office for National Statistics

The UK's current account deficit widened in 2006 to the equivalent of –3.4 per cent of GDP, compared to –2.4 per cent in 2005, largely due to an increased deficit on trade in goods. Although this deficit of £43.4 billion is the highest recorded in cash terms, as a percentage of GDP, this deficit remains below that reached in 1974 and 1988-1990.

Exports expanded in 2006 despite a rise in sterling. Sterling hit a 14-year high against the US dollar and a four-year high against the euro in January 2007. However, despite this according to the CBI, UK manufacturing orders hit their highest level for 12 years in February.[xi] The outlook for exports looks positive given strong growth in the G7 and, in particular, the Eurozone, which accounts for around 50 per cent of UK exports. Since January, sterling has fallen back against the euro but in April rose above $2 and reached levels last seen in 1981 against the dollar.

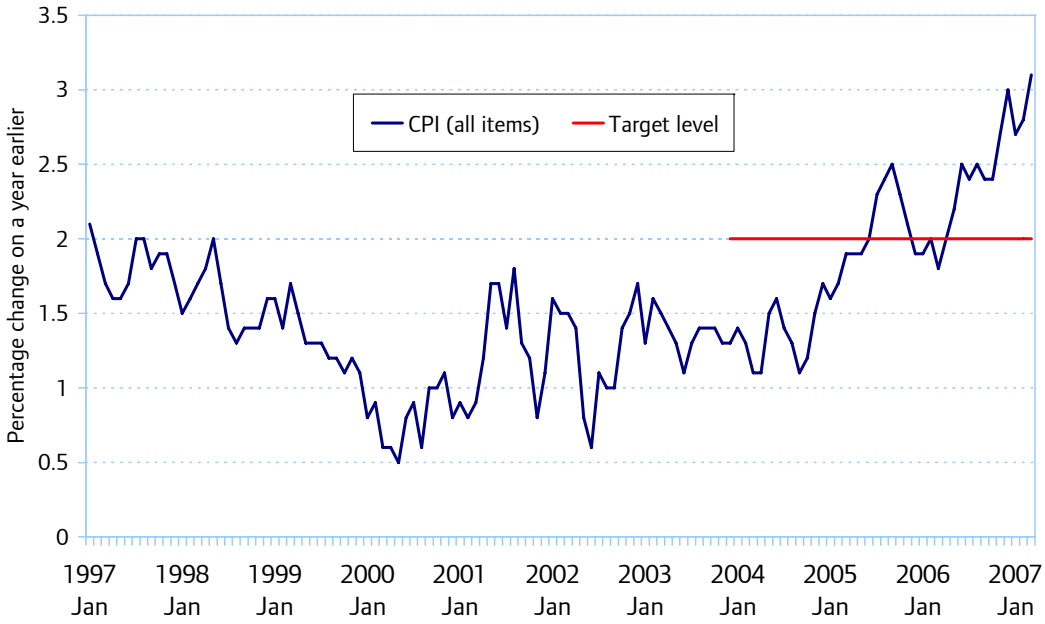
With increasing inflationary pressures, the Bank of England raised interest rates a quarter of a percentage point in August, November and January taking the rate to 5.25 per cent, the same as in the US. Many commentators expect another rise in May and possible further rises later in the year.

Annual consumer price index (CPI) inflation reached 3.1 per cent in March, in part due to increases in food and petrol prices. CPI inflation has risen more than one percentage point above its target level of two per cent. This led the Governor of the Bank of England to write, for the first time ever, an open letter to the Chancellor of the Exchequer explaining why inflation had risen above target and what the Monetary Policy Committee (MPC) propose to do about it. Retail price index (RPI) (which includes mortgage interest payments) inflation rose to 4.8 per cent in March, which is a 15-year high. Inflation is covered in more detail in Box 3.1.

Box 3.1: Inflation past, present and future

CPI inflation rising above target

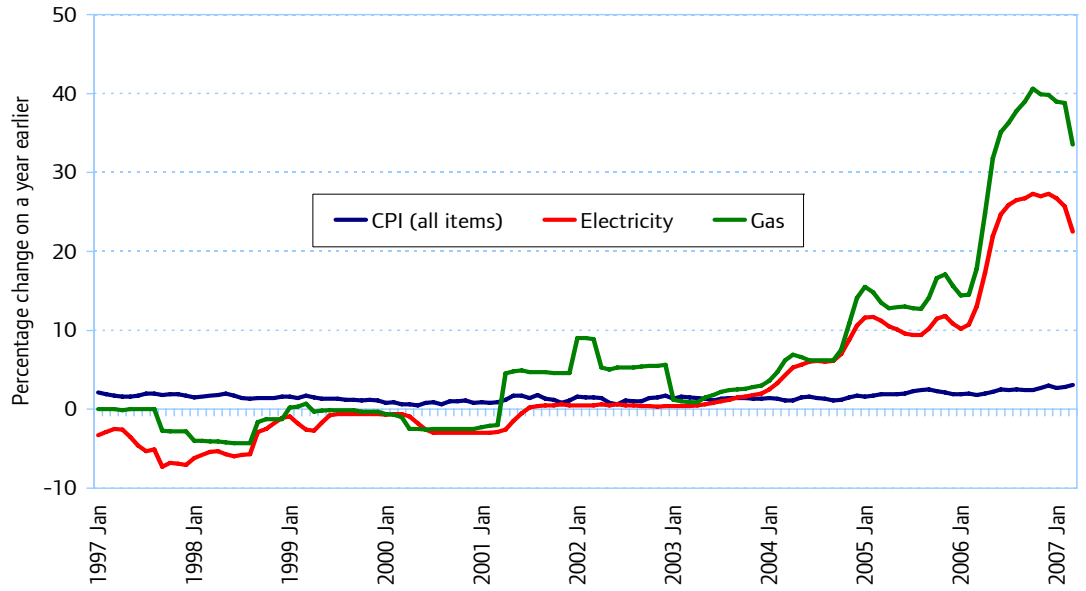
Figure 3.8: Consumer Price Index Inflation



Source: ONS

Consumer Price Index (CPI) inflation was on an upward trend throughout 2006 rising above the Bank of England's target of 2 per cent in May 2006 (see Figure 3.8). In March 2007 CPI inflation reached 3.1 per cent. The upward trend in inflation has been driven principally by higher food and energy prices. Energy price inflation began rising sharply back in 2004 (see Figure 3.9).

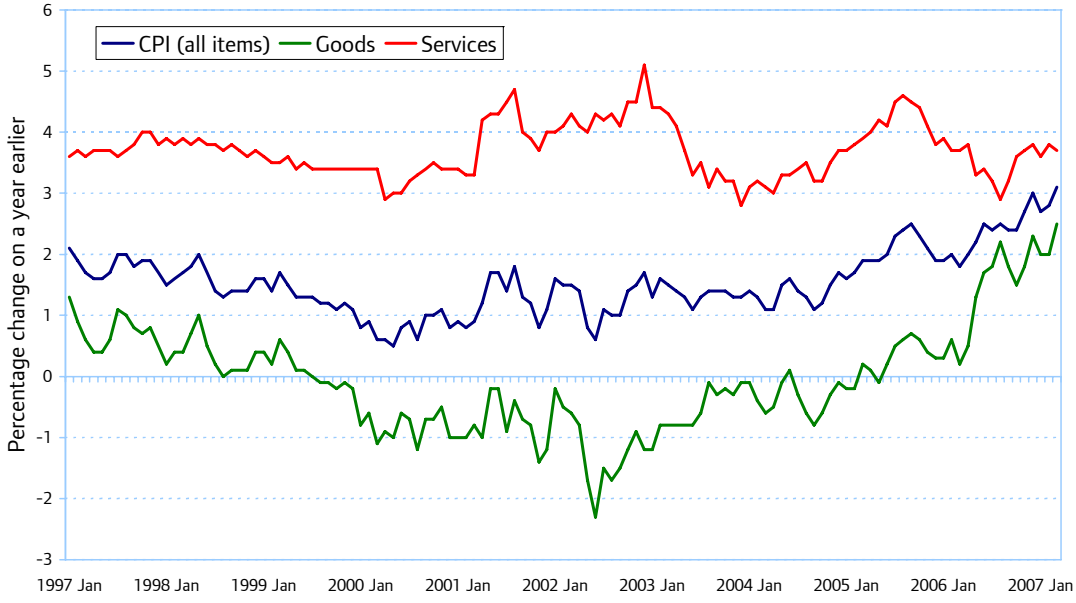
Figure 3.9: CPI electricity and gas inflation



Source: ONS

Figure 3.10 shows that within the CPI, service price inflation (which tends to be domestically generated since in most cases services are not imported) has remained higher than goods price inflation. However, goods price inflation has picked up since 2002 rising to 2.5 per cent in March 2007. Over the majority of 2006 CPI service price inflation and goods price inflation generally moved in opposite directions. This is not surprising because as consumers spending on some items such as electricity increased due to higher prices, they had less money to spend on other items such as luxury services. Weaker demand for these services put downward pressure on CPI service price inflation. These changes in consumer priorities have been unavoidable consequences of the increase in energy prices.

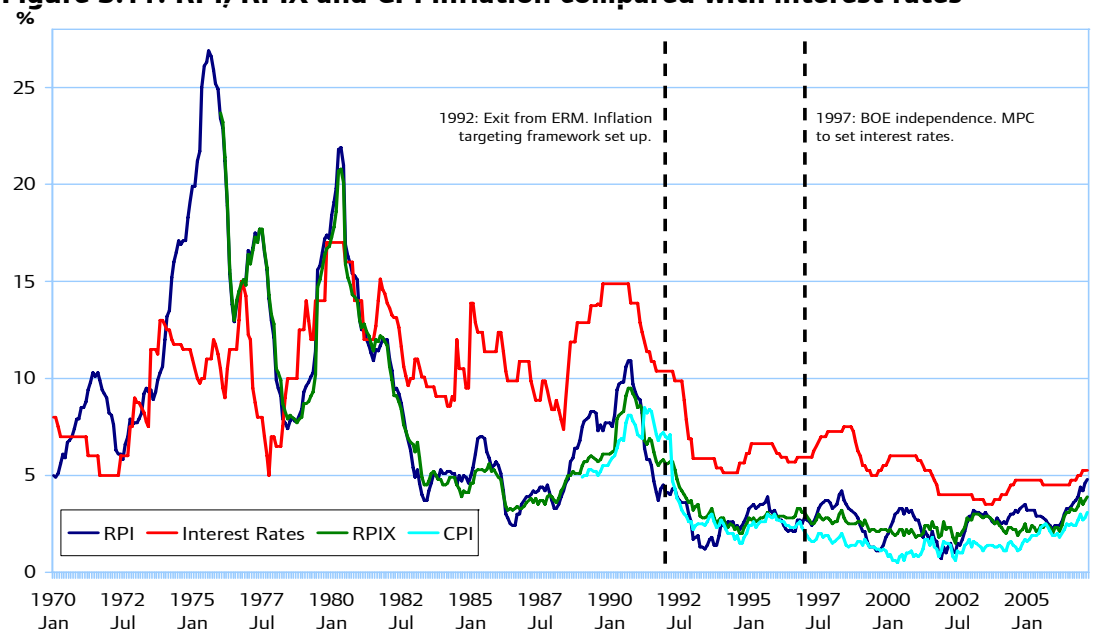
Figure 3.10: CPI goods and services inflation



Source: ONS

Setting the current inflation rate in the long term context

Figure 3.11: RPI, RPIX and CPI inflation compared with interest rates



Source: Interest Rates – Ecowin

RPI, RPIX & CPI – ONS

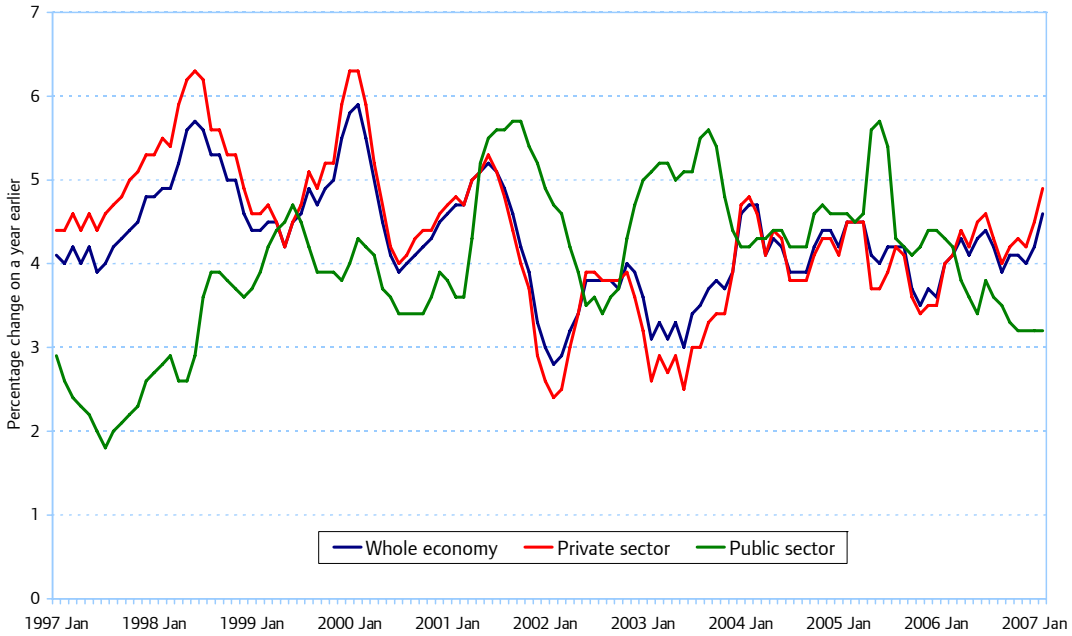
Compared to past performance, the UK's rate of inflation has been relatively low since the start of inflation targeting in 1992. In 1997 control over the setting of interest rates was handed over to the Bank of England's MPC. In the mid and late 1970s, oil price increases caused wage and price spirals that sent retail price inflation to above 20 per cent. In contrast, over the past year inflation has stayed relatively moderate and output growth remained firm despite higher oil prices.

Figure 3.11 shows that inflation performance since 1992 has been significantly more stable than in previous years. Inflation has been low and close to target. RPIX inflation has averaged 2.6 per cent under the inflation-targeting regime, while CPI inflation has averaged 1.8 per cent. Calculations in 1997 suggested that inflation was likely to be more than 1 percentage point away from the target around 40 per cent of the time but, to date, inflation has only deviated by more than one percentage point from the target once (in March 2007).

Near term prospects for CPI inflation

Since the beginning of 2007 reductions in wholesale energy costs are beginning to be passed on to the domestic consumer so the inflationary effect of 2006's higher energy prices should start to disappear from inflation figures later this year. However, the UK economy has strengthened giving firms possible scope to increase other prices. Nonetheless both HM Treasury and Bank of England forecasts suggest that CPI inflation will fall back to around two per cent by the end of 2007 and then remain around that level during 2008.

Figure 3.12: Average earnings growth (including bonuses)
Latest three months on same three months a year earlier



Source: ONS

Higher inflation has so far not passed through into higher regular pay growth. UK annual average earnings growth excluding bonuses (regular pay) was only 3.6 per cent in the three months to February 2007. This is less than the recent peak of 3.9 per cent seen in the three month period to June 2006. However, due in part to buoyant City bonuses this year, UK annual average earnings growth including bonuses increased to 4.6 per cent in the three months to February 2007, its highest rate since March 2004 (see Figure 3.12).

Figure 3.12 also shows that annual average earnings growth in the private sector is currently above that in the public sector. Annual average earnings growth in the public sector has fallen and the Chancellor has accepted recommendations by independent pay arbitrators for below inflation pay rises for much of the public sector. This will put downward pressure on CPI inflation over the coming year, which seems set to fall back to around its two per cent target.

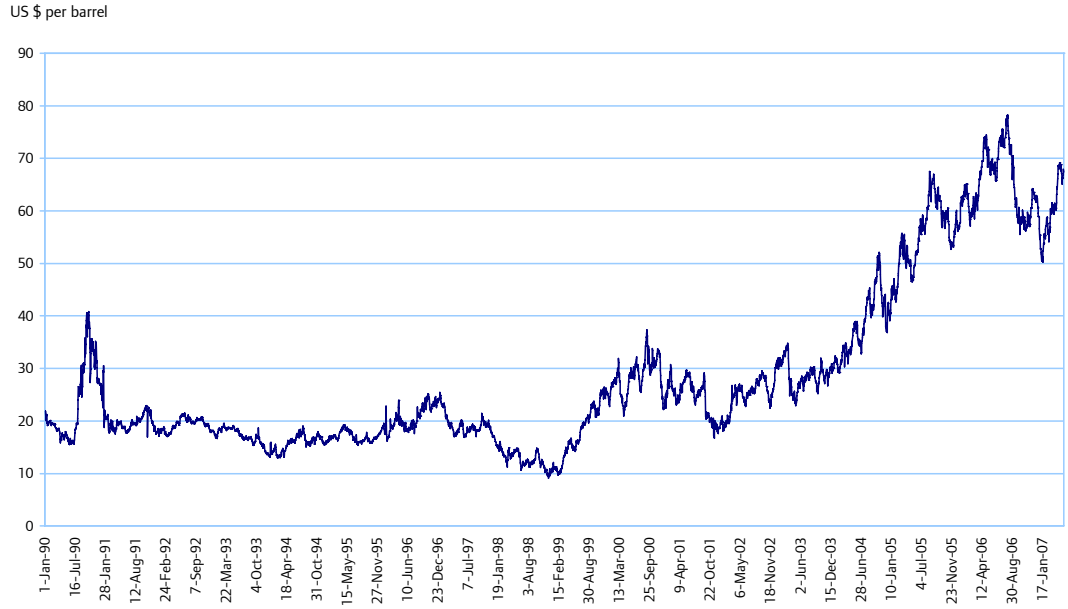
During 2006 there was strong employment growth in the UK. Total employment reached 29 million in 2006, the highest figure since comparable records began in 1971.[xii] Although there was also a rise in unemployment, this appears to have stabilised. Latest data suggest there was a net inflow of migrants of over 400,000 between 2004 and 2005, driven primarily by the enlargement of the European Union. Recent migrant inflows have increased the UK's labour supply and have probably reduced inflationary pressure.[xiii]

3.3 The world economy

The world economy continued its robust growth in 2006, growing at 5.4 per cent. Growth is expected to slow slightly in 2007 to around 4.9 per cent.[xiv] World trade was also buoyant in 2006 growing by 9¾ per cent.[xv]

The global economy has remained strong despite a slowing of the US economy at the end of 2006. The slowdown in the US continues to be moderated by a pick-up in the Eurozone and Japan. Growth continues apace in India and China, but inflationary pressures remain. Oil prices (see Figure 3.13) are still above their 10-year average of around $32 a barrel and seem likely to remain so.[xvi]

Figure 3.13: Brent crude oil price



Source: FT.com

The **US** grew by a strong 3.3 per cent in 2006. However, growth in the final quarter of 2006 was slower than expected largely due to reduced inventories and consumer spending. The future course of the US economy is particularly difficult to predict at present, nonetheless more moderate growth is forecast for 2007. The IMF forecast US growth of 2.2 per cent in 2007.[xvii]

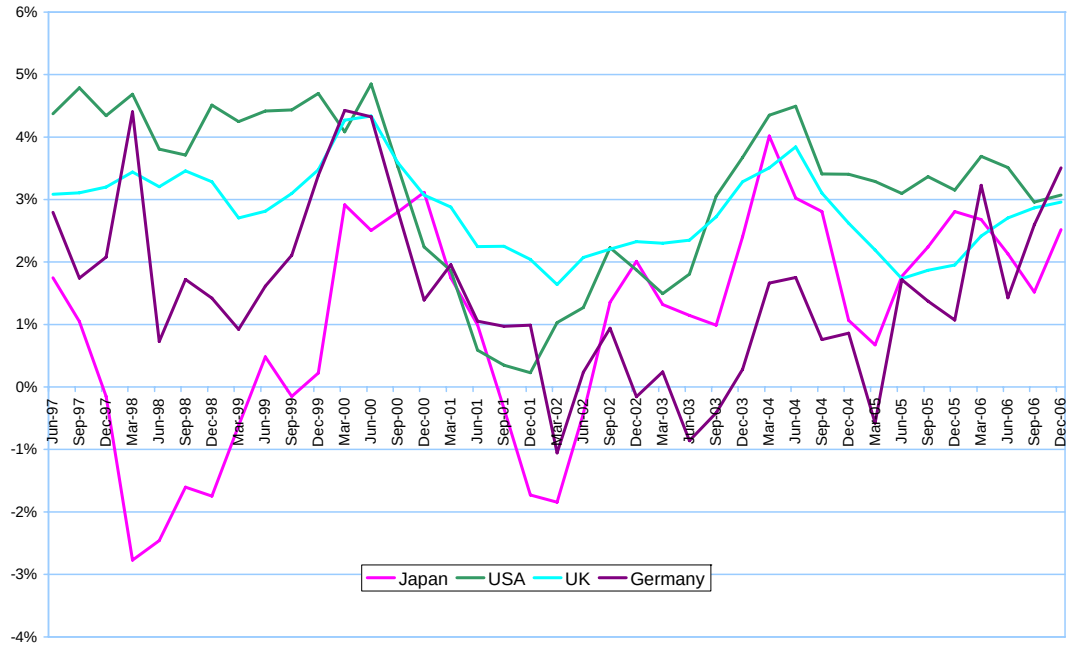
Interest rates have been kept on hold in the US at 5.25 per cent since mid-2006 following two years of monetary tightening. With an easing of inflation due to reduced energy prices and slowing growth, further monetary tightening is not expected. The housing market continues to slow, with spending on new home-building falling 19.1 per cent in quarter four of 2006.[xviii] There are also increasing concerns about the state of the sub-prime mortgage market (lending to people with poor credit histories) with the number of loan defaults rising. In addition both business and consumer confidence look weak.[xix]

The US current account deficit continued to rise in 2006 for the fifth year running, reaching 6.5 per cent of GDP. Around a third of this deficit is the result of trade imbalances with China. The trade deficit has been fuelled by both last year's rise in oil prices (given that the US is the world's largest consumer of oil), and an influx of imports from China. The deficit means that the US was borrowing more than $2 billion each day to finance its trade gap. However some rebalancing is expected to take place due to the weakening in the dollar.

By contrast activity in the **Eurozone** has been picking up. GDP in the European Union as a whole grew by 2.9 per cent in 2006, with growth in the Eurozone at 2.7 per cent.[xx] In the final quarter of 2006, Eurozone quarterly GDP growth was faster than that in the US for the first time in five years. The OECD projects annual growth in the Eurozone of around 2.25 per cent in 2007 and 2008.[xxi] Business investment is increasing and unemployment fell below eight per cent for the first time since 2001.

Inflation in the Eurozone picked up in 2006 peaking at 2.6 per cent around the middle of the year. This was due largely to the direct effect of rising energy prices. In response to inflationary pressures, the European Central Bank (ECB) raised interest rates by a quarter of one per cent in December 2006 and again in March 2007, taking the ECB rate to 3.75 per cent. The inflation rate fell back to 1.8 per cent by January 2007 and was stable in February. Although second-round effects on wages have not yet materialised, concerns about wage inflation remain. Further monetary tightening by the ECB is expected.

Figure 3.14: GDP growth in selected industrialised countries
Real GDP, annual % change



Source: Ecowin

Japan has seen stronger than expected growth, reporting annual growth of 2.3 per cent in 2006, the fastest rate for three years. This pick up has been driven by business investment and exports. Interest rates were increased from 0.25 per cent to 0.5 per cent in February 2007. Over the next couple of years interest rates are expected to rise further, but only at a slow and gradual pace.

3.4 Emerging market economies

China continues to boom with annual growth of 10.7 per cent in 2006. In spite of the Chinese government's attempts to dampen this pace, it was the highest rate since 1995.[xxii] China accounted for around a third of world growth. Chinese exports rose year on year by 52 per cent in February, the fastest rate for over a decade.[xxiii]

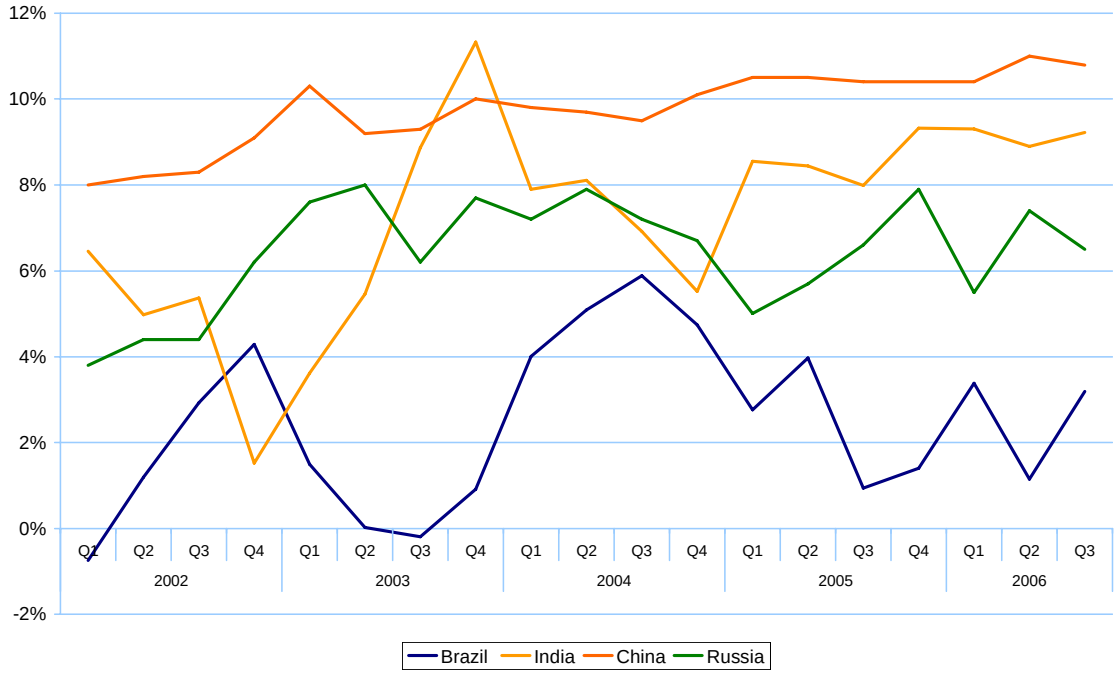
Consumer price inflation rose to 2.7 per cent in February[xxiv] from 0.9 per cent a year earlier, driven by increasing food prices (particularly world grain prices). With inflation in China now picking up, the need for further exchange rate flexibility to allow the yuan to appreciate further is even greater. Indeed China's exchange rate was a topic for discussion at a meeting of the G7 in February, as China's trade surplus reached a near record level in the same month. Currently, China operates currency controls that only allow the yuan to move up or down by 0.3 per cent from a daily fixed rate.

The implication of the pick up in inflation for the domestic Chinese economy is the need for monetary tightening. Indeed in March, China raised its lending and deposit rates for the third time since April 2006 in an effort to check investment and credit growth. The other question is whether inflation in China will translate into export price increases, which could have potentially significant implications for global inflation and global interest rates. China has played an important role as a deflationary force for the world economy, but this may begin to change going forward.

As can be seen in Figure 3.15, annual growth in **India** stood at 9.2 per cent in the third quarter of 2006. The Indian government expected the same rate of growth for the financial year to March 2007.[xxv] Investment, consumption and export demand are all buoyant. Although the service sector is growing strongly, the agriculture sector, which employs around 60 per cent of India's population and accounts for around a fifth of GDP, by contrast is expected to grow much more slowly at less than three per cent.

Property prices and consumer credit are booming and wages are rising. As in China, inflation is also picking up in India, at 6.7 per cent,[xxvi] driven in part by higher food and consumer good prices. This is above the government's target and led to a rise in interest rates at the end of March. India's rate of growth is widely expected to moderate from 2007 onwards.

Figure 3.15: GDP growth in selected emerging market economies
Annual % change



Source: Ecowin

Russia continues to grow strongly with annual growth of six per cent for the fourth consecutive year in 2006. Investment has been particularly strong and high commodity prices contributed to a large current account surplus. However, inflation remains relatively high at 8.25 per cent in January.

3.5 Risks to the world economy

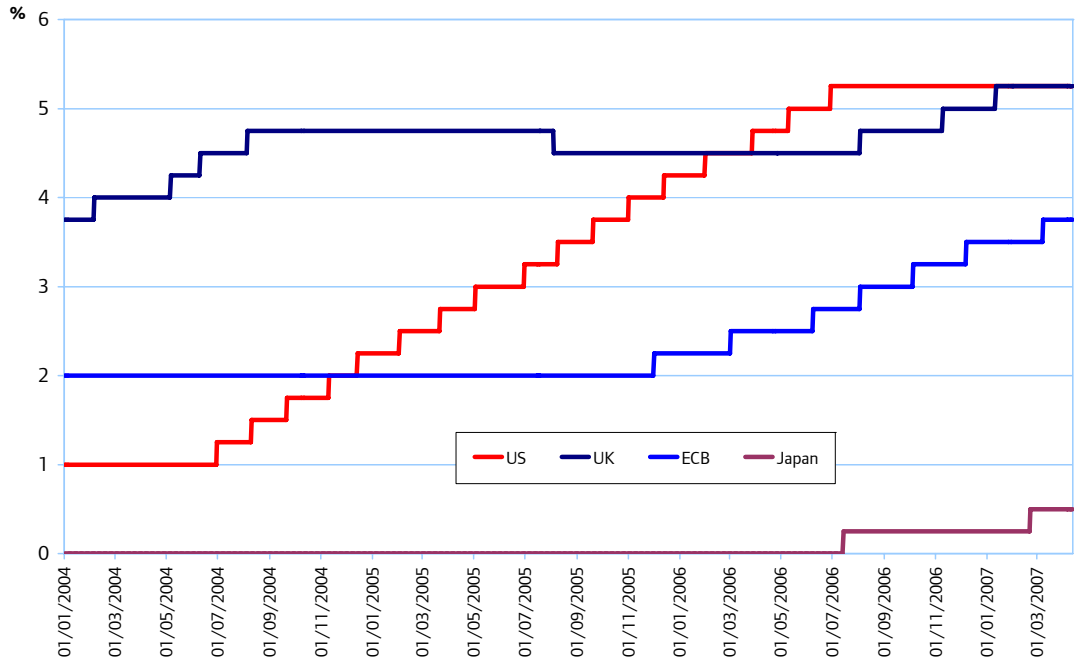
Despite the healthy growth of the world economy, there remain downside risks to the global outlook.

The first is a concern that there will be a further sharp slowing of the US economy which would have consequences for the global economy. With a slowing of growth at the end of 2006 and mounting concerns about the housing market, particularly in the sub-prime mortgage market, this could impact on the world economy. Any slowing in the US is likely to impact the UK given its links with the US economy in terms of trade, financial services activity and foreign direct investment (FDI) as well as links in corporate and consumer confidence.

Although oil prices have moderated since their peak in summer 2006 and any sharp slowdown in the US will add to this trend, uncertainty remains around their future path given ongoing geopolitical tensions in the Middle East. On the back of these tensions oil prices have already picked up since January 2007 and possible higher oil prices remain a downside risk to the world economy in 2007.

Although inflationary pressure has eased in the US there is mounting inflationary pressure elsewhere. Inflation has picked up in India and China, as well as in the UK. Further global monetary tightening is anticipated, particularly in the rapidly growing emerging economies, which could put a brake on their pace of growth. However, this may help to rebalance some of the global imbalances that have persisted over recent years.

Figure 3.16: Central Bank Interest rates



Source: Ecowin

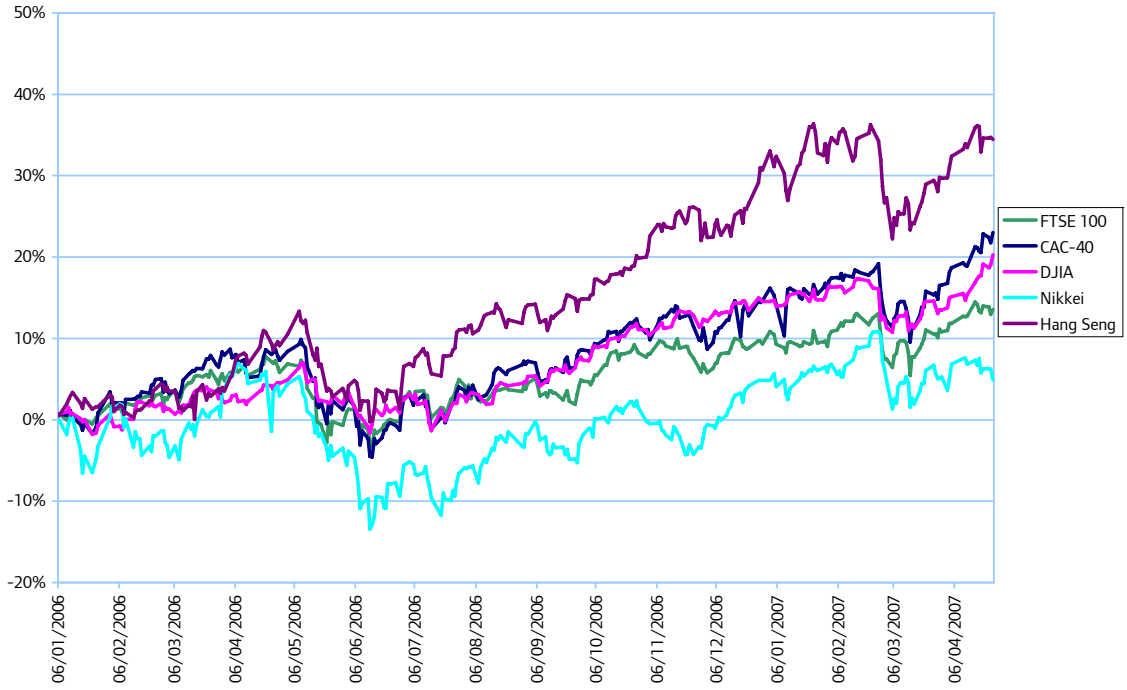
Large global trade imbalances persist with both the US current account deficit and the Chinese trade surplus at record highs. A disorderly unwinding could occur through a sudden shift away from US assets by overseas investors alongside a steep fall in the dollar. Some commentators suggest that the imbalances reflect the immaturity of financial markets and the lack of saving vehicles in developing economies. The recent legislation passed in China to increase private property rights may be a first step in improving domestic investment opportunities.

Stock markets around the world have seen some jitters in recent months as outlined in Box 3.2. However, the general consensus seems to be that the falls at the end of February and beginning of March were a correction to previous rapid increases, rather than a serious downturn in sentiment. Nonetheless a further sudden loss of confidence across the world's stock markets remains a downside risk.

Box 3.2: Stock markets remain high following recent jitters

World stock market jitters began on 27 February. The first trigger was a large sell-off on China's stock market after rumours of a new capital gains tax. The sell-off spread around the world showing both the strong influence that the Chinese economy has over world markets and concern among investors that stock markets had risen too high, too quickly. The falls were compounded by various events over the next few days. Alan Greenspan said that there was a "one-third probability" of a recession in the US, which further worried investors. And the yen rose in value against the dollar. This caused those who had invested in the "carry trade" (borrowing at low interest rates in Japan to invest in higher-yielding assets in other currencies) to lose out. These global events caused the FTSE 100 to lose around two per cent of its value on 27 February and fall further in the following days. After a short period of stabilisation the markets fell again on the back of worries about the US housing market where the sub prime-mortgage industry is in "freefall".[xxvii]

Figure 3.17: Stock markets % change since the beginning of 2006



Source: FT

Figure 3.17 shows the performance of a number of the main global stock markets since the beginning of 2006. The chart not only shows how closely the main markets are integrated but also that in spite of the end of February/beginning of March falls, performances are still strong. All the indexes are higher than they were at the beginning of 2006. In China the Shanghai index rose by 130 per cent last year.[xxviii]

After a strong 2006 the FTSE 100 hit six-year highs in February 2007 on the back of takeover speculation surrounding some of its largest companies such as J.Sainsbury. Figure 3.18 shows the FTSE 100 back to August 1994. The chart clearly shows an overall rise of the FTSE 100 since 2003. The index fell in May 2006 by around 500 points after the Bank of Japan raised interest

rates to 0.25 per cent from zero per cent which impacted upon the 'carry trade'. This was a greater fall than the one seen at the end of February 2007. The correction in May 2006 did not last long and the index continued to rise quickly afterwards. It remains to be seen whether the falls in end February/early March 2007 will lead to further dramatic falls but the early signs are that the market has stabilised above 6,000. By the close of 13 April the FTSE 100 had actually reversed all its losses during the end of February and the beginning of March. On 16 April 2007 the FTSE 100 closed above 6,500 for the first time since autumn 2000. Meanwhile the Dow Jones closed at an all time high of over 13,000 on 25 April and then closed at another all time high on 26 April.

Figure 3.18: FTSE 100

Source: FT

3.6 Summary

The London economy continues to outperform the UK in terms of annual output growth. This strong performance has been led by the financial and business services sector. House price inflation has been higher in London than the UK and retail sales growth in central London has also outperformed the UK. The outlook for the capital over the medium term remains positive with above trend growth expected. Nonetheless London's performance would be sensitive to any major downturn in global stock markets.

The UK economy saw above trend growth in 2006 and, as with London, this has been driven by a strong performance in the service sector. Business investment also picked up strongly in 2006 after a period of weaker growth. However, inflationary pressure has increased and at least one further rise in interest rates is expected. There is uncertainty surrounding the extent to which there remains spare capacity in the economy, although inward migration has increased the labour supply and mitigated inflationary pressure to some degree.

The world economy remains robust in spite of a moderation of growth in the US economy. The Eurozone has picked up, as has Japan. The emerging economies of China and India continue to grow at a rapid pace, although inflation in these economies is on the rise. Oil prices have moderated since the summer of 2006 but remain way above their average over the last ten years. The future path of oil prices remains uncertain given continuing geopolitical tensions, and hence remain a risk to the global outlook. Other downside risks include a faster than anticipated slowdown in the US, which would impact on the global economy, and any disorderly unwinding of global imbalances. Jitters on world stock markets at the end of February/early March, although short lived, are a reminder of how interdependent the global economy has become and how quickly a loss in confidence can spread.

4. Review of independent forecasts

What the forecasts provide

In Section 5, GLA Economics' forecast of four economic indicators is provided: workforce employment, real output, private consumption (household expenditure) and household income in London. In this section the consensus view on the first three of these indicators is summarised, drawing on forecasts from outside (independent) organisations.[xxix] Both annual growth rates and 'standardised' absolute levels are reported. All the data is in real terms (constant prices).

Additionally, both the consensus and GLA Economics' own forecasts provide predictions of employment and output growth in six broad sectors:

- manufacturing
- construction
- transport and communications
- distribution, hotels and catering
- finance and business services
- other (mainly public) services.

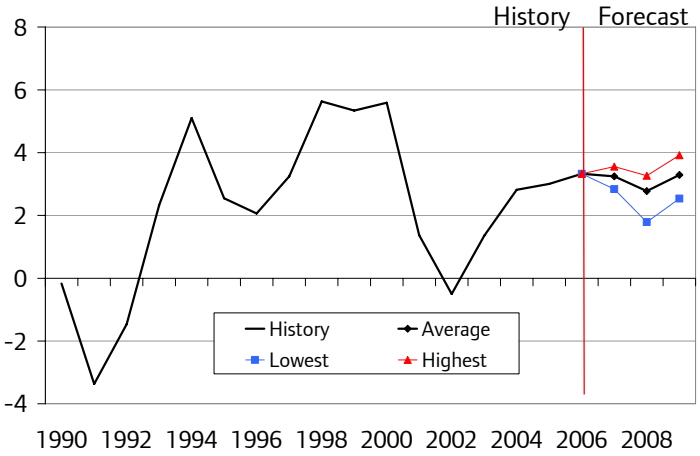
Output

(London GVA, constant prices (2003 base year), £ billion)

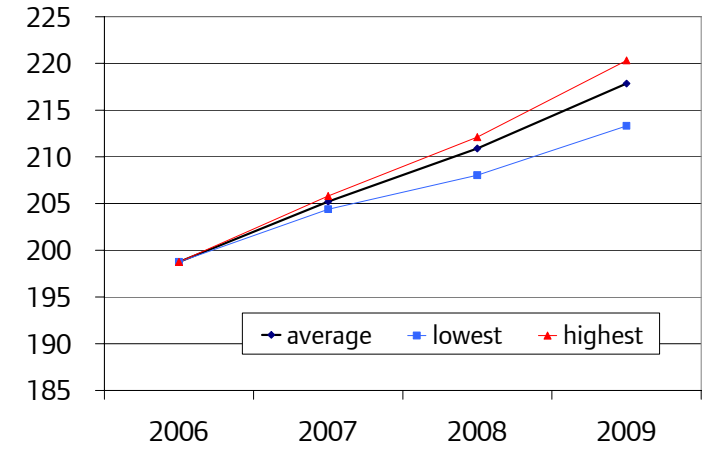
The consensus (mean average view) is for real output to grow above trend over the medium term: 3.2 per cent in 2007, 2.8 per cent in 2008 and 3.3 per cent in 2009.

The spread of predicted growth rates (over the medium term) is relatively wide, with one forecaster predicting growth of only 1.8 per cent in 2008 whereas another predicts 3.3 per cent.

Annual growth (per cent)



Level (constant year 2003, £ billion)



Annual growth (per cent)			
	2007	2008	2009
Average	3.2	2.8	3.3
Lowest	2.8	1.8	2.5
Highest	3.6	3.3	3.9

Level (constant year 2003, £ billion)			
	2007	2008	2009
Average	206	212	219
Lowest	204	208	213
Highest	208	214	223

History: Annual growth (per cent)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-0.2	-3.4	-1.5	2.3	5.1	2.6	2.1	3.2	5.6	5.3	5.6	1.4	-0.5	1.4	2.8	3.0	3.3

History: Level (constant year 2003, £ billion)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
136.7	132.1	130.1	133.2	139.9	143.5	146.5	151.2	159.7	168.3	177.7	180.1	179.2	181.6	186.7	192.4	198.7

Employment

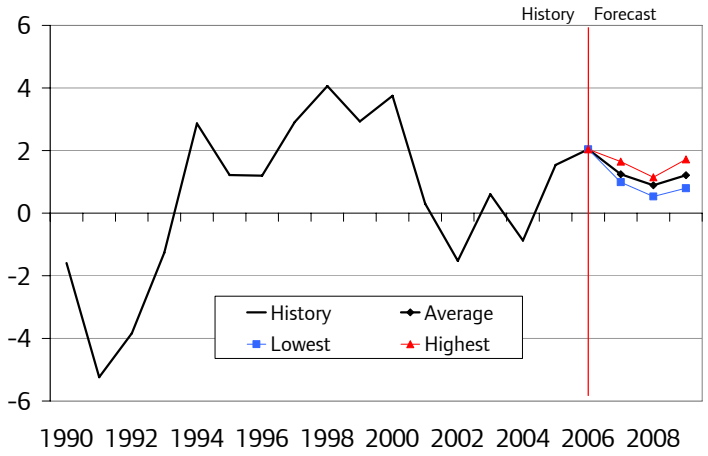
(London workforce jobs)

London's labour market showed strong growth in 2006 with workforce jobs growth at 2.0 per cent.

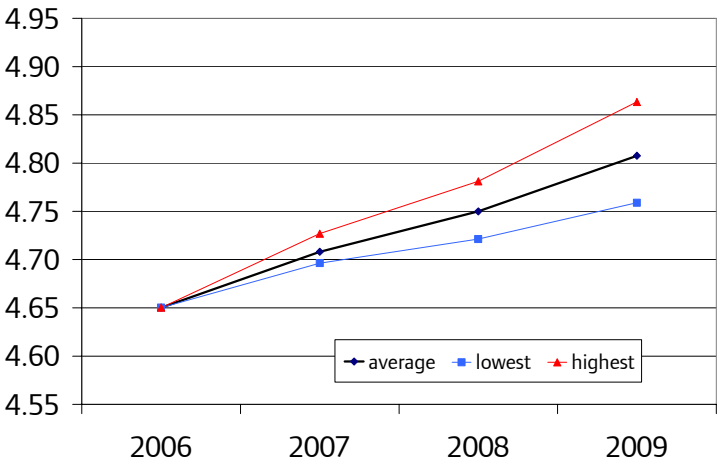
The consensus view is for workplace employment to continue to grow at or above trend in the medium term, albeit at a slightly lower rate: 1.2 per cent in 2007, 0.9 per cent in 2008 and 1.2 per cent in 2009.

The independent forecasters are in broad agreement on the path of employment growth in London: the spread of total jobs in 2009 ranges from 4.75 million to 4.86 million.

Annual growth (per cent)



Level (millions)



Annual growth (per cent)			
	2007	2008	2009
Average	1.2	0.9	1.2
Lowest	1.0	0.5	0.8
Highest	1.6	1.1	1.7

Level (millions)			
	2007	2008	2009
Average	4.70	4.75	4.80
Lowest	4.69	4.72	4.75
Highest	4.72	4.77	4.86

History: Annual growth (per cent)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-1.6	-5.2	-3.8	-1.3	2.9	1.2	1.2	2.9	4.1	2.9	3.7	0.3	-1.5	0.6	-0.9	1.5	2.0

History: Level (millions)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
4.20	3.98	3.83	3.78	3.89	3.94	3.98	4.10	4.27	4.39	4.56	4.57	4.50	4.53	4.49	4.56	4.65

Household expenditure

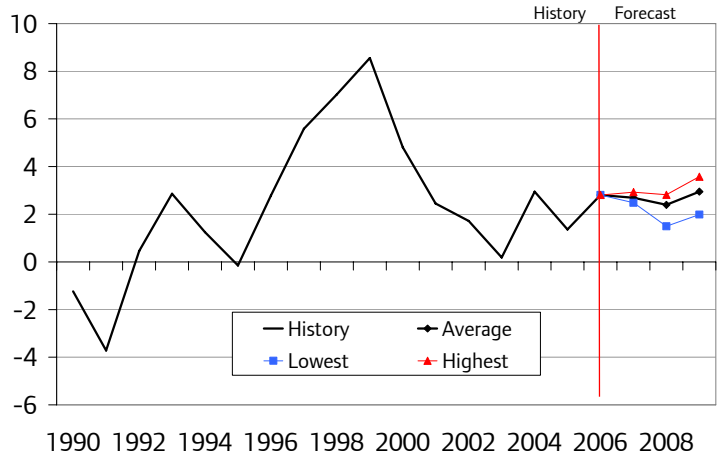
(London household spending, constant year 2003, £ billion)

Growth in household expenditure was a healthy 2.8 per cent in 2006.

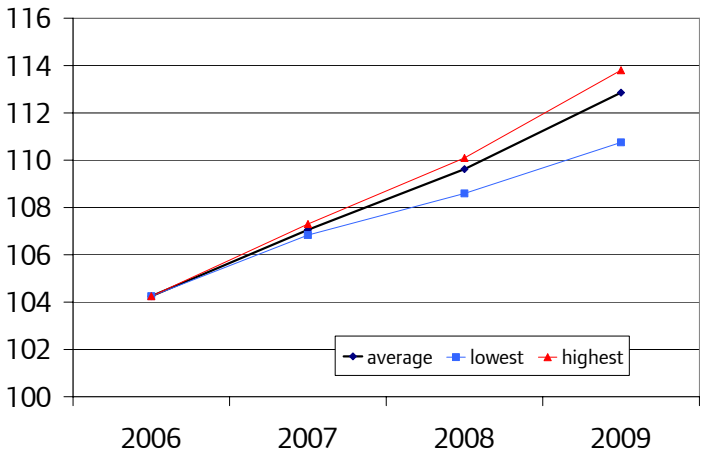
The average of independent forecasters is for growth to remain at this magnitude over the medium term: 2.7 per cent in 2007, 2.4 per cent in 2008 and 2.9 per cent in 2009.

Even the most pessimistic forecasts expect household expenditure to increase to over £110 billion by 2009.

Annual growth (per cent)



Level (constant year 2003 £ billion)



Annual growth (per cent)			
	2007	2008	2009
Average	2.7	2.4	2.9
Lowest	2.5	1.5	2.0
Highest	2.9	2.8	3.6

Level (constant year 2003, £ billion)			
	2007	2008	2009
Average	107	109	113
Lowest	107	108	111
Highest	107	110	114

History: Annual growth (per cent)

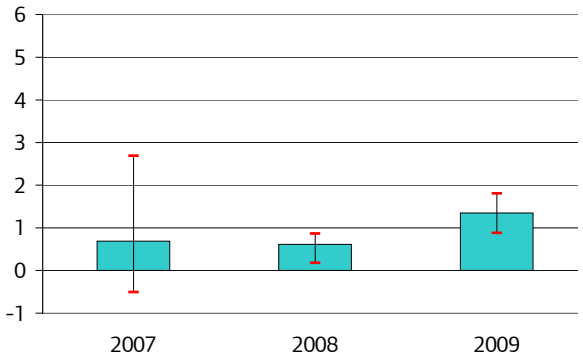
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-1.2	-3.7	0.5	2.9	1.2	-0.1	2.8	5.6	7.0	8.6	4.8	2.4	1.7	0.2	2.9	1.4	2.8

History: Level (constant year 2003, £ billion)

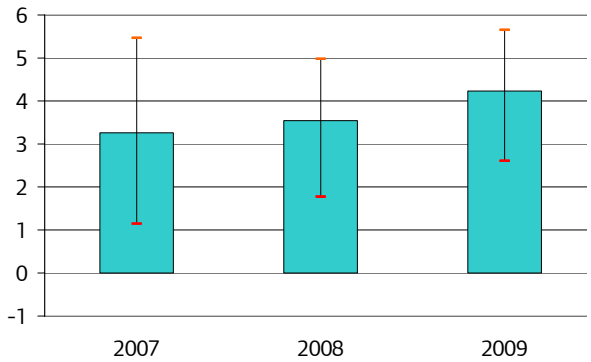
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
70.0	67.4	67.7	69.7	70.5	70.4	72.4	76.4	81.8	88.8	93.1	95.4	97.0	97.2	100.0	101.4	104.2

Output growth by sector (per cent annual change)
Growth is expected across all sectors over the medium term. The highest growth is expected in the financial and business services sector, and the transport and communications sector. Manufacturing growth is expected to be sluggish.

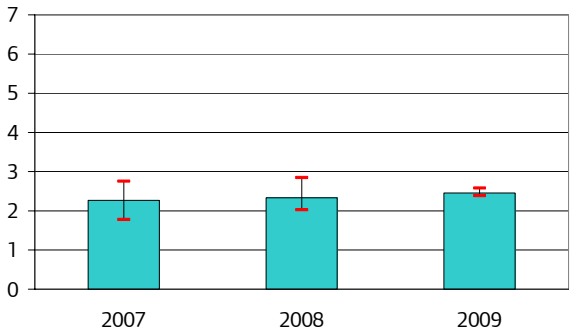
Manufacturing



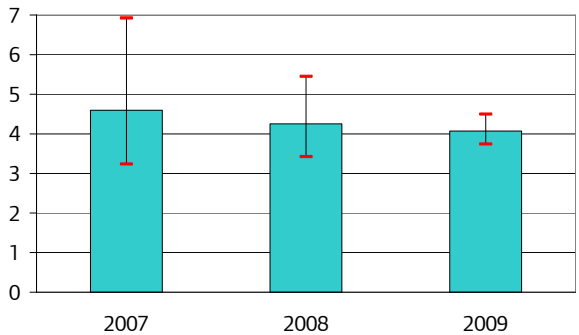
Construction



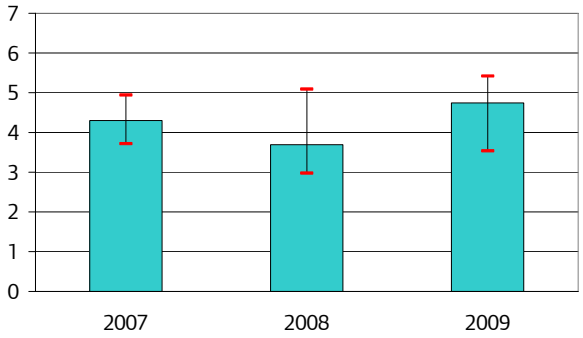
Distribution, hotels and catering



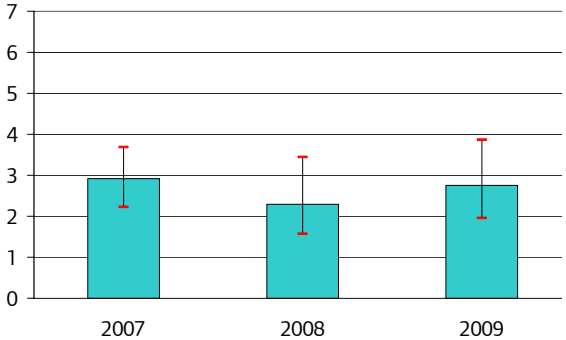
Transport and communications



Finance and business



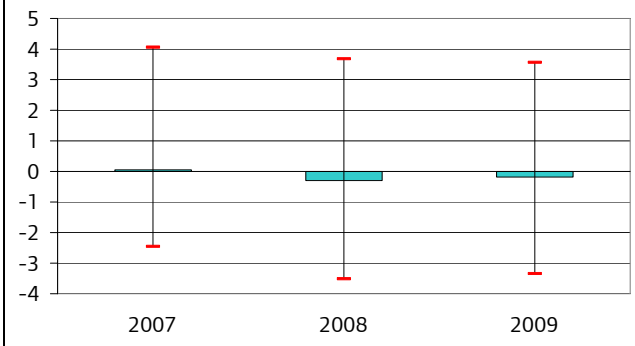
Other (mainly public) services



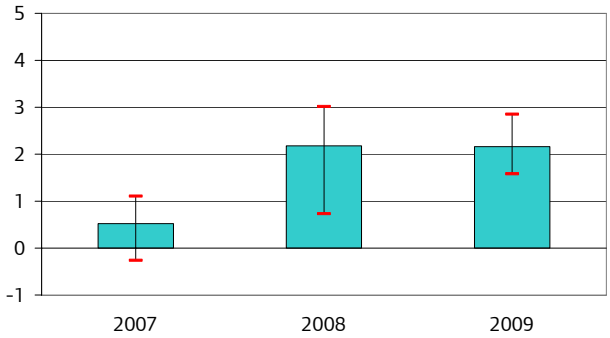
		2007	2008	2009			2007	2008	2009
Manufacturing	*Average*	0.7	0.6	1.3	**Construction**	*Average*	3.3	3.5	4.2
	Lowest	-0.5	0.2	0.9		*Lowest*	1.1	1.8	2.6
	Highest	2.7	0.9	1.8		*Highest*	5.5	5.0	5.7
Distribution, hotels and catering	*Average*	2.3	2.3	2.5	**Transport and communications**	*Average*	4.6	4.3	4.1
	Lowest	1.8	2.0	2.4		*Lowest*	3.2	3.4	3.7
	Highest	2.8	2.8	2.6		*Highest*	6.9	5.5	4.5
Finance and business	*Average*	4.3	3.7	4.7	**Other (mainly public) services**	*Average*	2.9	2.3	2.8
	Lowest	3.7	3.0	3.5		*Lowest*	2.2	1.6	2.0
	Highest	4.9	5.1	5.4		*Highest*	3.7	3.4	3.9

Employment growth by sector (per cent annual change)
Forecasted employment growth shows a mixed pattern across the sectors. Strong employment growth is expected in financial and business services and construction. Slow or negative employment growth is expected in manufacturing and distribution.

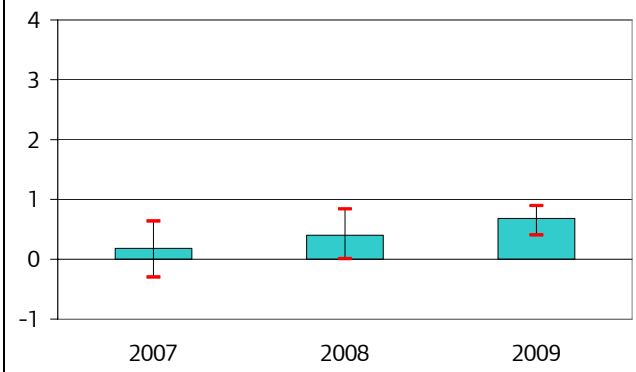
Manufacturing



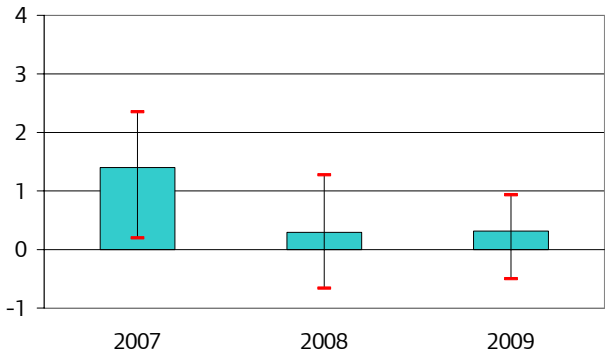
Construction



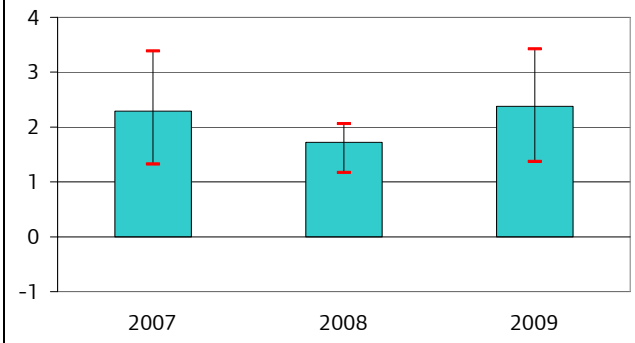
Distribution, hotels and catering



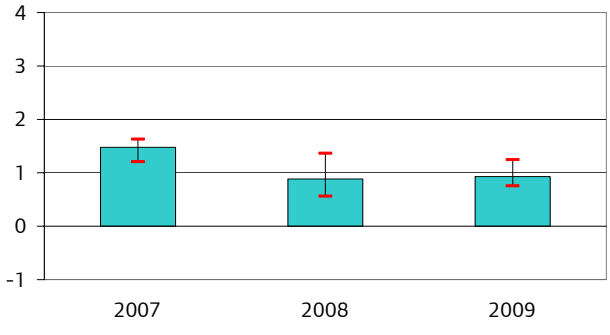
Transport and communications



Finance and business



Other (mainly public) services



		2007	2008	2009			2007	2008	2009
Manufacturing	*Average*	0.1	-0.3	-0.2	**Construction**	*Average*	0.5	2.2	2.2
	Lowest	-2.4	-3.5	-3.3		*Lowest*	-0.3	0.7	1.6
	Highest	4.1	3.7	3.6		*Highest*	1.1	3.0	2.9
Distribution, hotels and catering	*Average*	0.2	0.4	0.7	**Transport and communications**	*Average*	1.4	0.3	0.3
	Lowest	-0.3	0.0	0.4		*Lowest*	0.2	-0.7	-0.5
	Highest	0.6	0.8	0.9		*Highest*	2.4	1.3	0.9
Finance and business	*Average*	2.3	1.7	2.4	**Other (mainly public) services**	*Average*	1.5	0.9	0.9
	Lowest	1.3	1.2	1.4		*Lowest*	1.2	0.6	0.8
	Highest	3.4	2.1	3.4		*Highest*	1.6	1.4	1.2

5. The GLA Economics forecast

5.1 Assumptions and methods

This forecast combines the GLA's long-term trend projections for employment and population with medium-term assumptions about the growth of the UK economy derived from HM Treasury's comparison of independent forecasts.

The model is constrained for the year 2020 to London-based employment projections derived from the long-term growth rate of London's workforce. The UK assumptions comprise the medium-term growth rates of UK total output. The GLA's long-term employment projections for London have been updated from those underlying the London Plan and updated projections were published in February 2007.[xxx]

5.2 Detailed assumptions for the UK

Table 5.1 shows the assumptions adopted by the GLA for its forecast and compares them to HM Treasury's Budget 2007 forecast. Note that the GLA forecast is based on assumptions up to 2020, though the forecast itself only goes up to 2009.

Table 5.1: UK economic assumptions
(annual percentage growth rates)

		2007	2008	2009
GLA forecast[xxxi]	GVA	2.4	2.5	2.6
	Consumption	2.4	2.7	2.9
Budget Report March 2007	GVA	2¾-3¼	2½-3	2½-3
	Consumption	2¼-2¾	2¼-2¾	2¼-2¾

5.3 Projections and forecasts

It is necessary to distinguish carefully between the GLA's long-term employment projections and this forecast which contains the GLA's medium-term planning projections. Trend projections, by definition, do not incorporate cyclical variations and constitute estimates of jobs and output at comparable points in the cycle. The actual course of output and employment will vary around this trend. Trend projections are essential for planning to provide capacity (such as office space, housing and transport) to accommodate the needs of the economy throughout and at the peak of the cycle, not just at its low points. For business planning (for example, in deciding the timing of investments and the likely course of revenue) estimates of actual numbers of jobs and actual output at any point in time are required. The medium-term planning projections provide these estimates.

As time progresses and more data become available, it becomes possible to identify turning points in the data: whether underlying trends are continuing or new trends are being established. While the forecast is calibrated to the GLA's employment projections for 2020, it provides early warnings of significant deviations from these projections because it accounts for the most recent data and incorporates the latest estimates of UK growth rates.

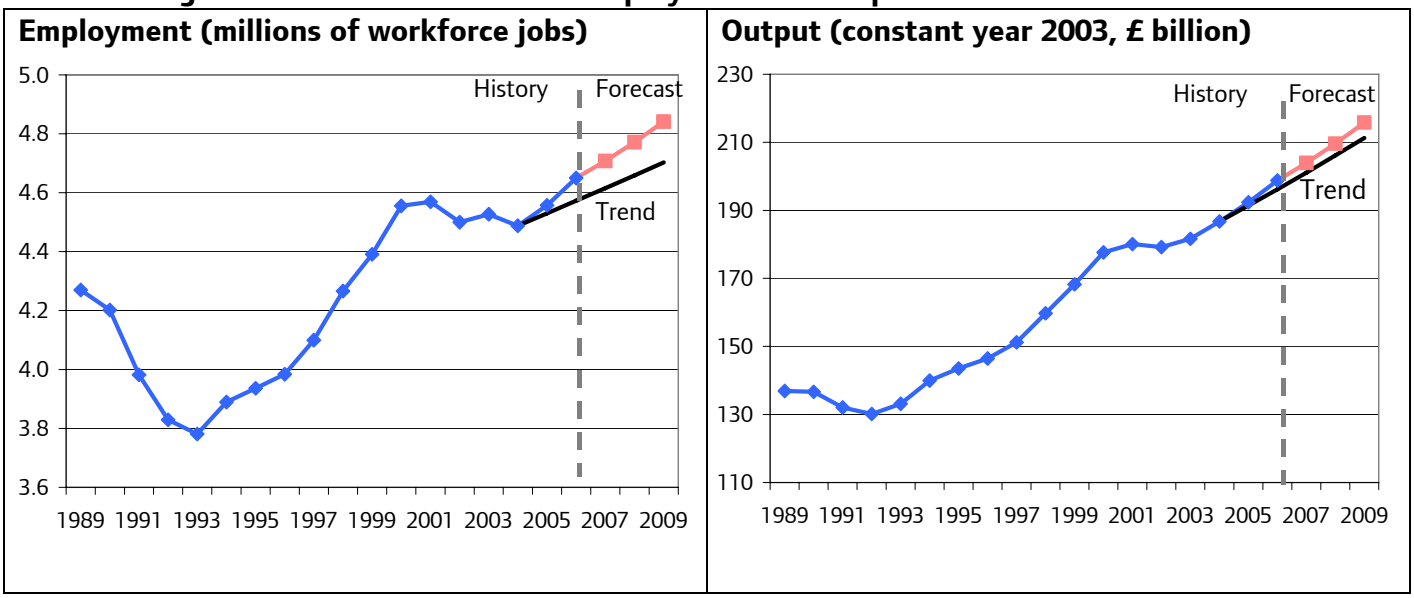
In 2007 the GLA commissioned new employment projections from Volterra Consulting which now form the trend projection on which the medium-term forecast is based. The start point for the trend projection has moved forward to 2004, from 2003 in previous publications. For this reason 2004 is taken as the start point for all trend (long-term) projections. For comparison purposes, absolute (level) trend projections are derived by applying the trend growth rates to the latest-available historical data for 2004. These levels may differ from the absolute levels for GVA, employment and household expenditure published elsewhere as a result of revisions to historical data as better information becomes available.

5.4 Results

Output is expected to grow at or close to three per cent a year throughout 2007-2009, slightly above the long-term trend of 2.5 per cent a year. Employment is also forecast to grow above the trend rate.

Following strong growth in 2006, household spending growth is expected to moderate. Household income growth is forecast to grow strongly throughout the forecast period.

Figure 5.1: Trend and forecast employment and output



Source: GLA Economics' calculations

Table 5.2: Forecast and historical growth rates

Annual % change

	2001	2002	2003	2004	2005	2006	2007	2008	2009
GVA	1.4	-0.5	1.4	2.8	3.0	3.3	2.6	2.8	3.0
Workforce jobs	0.3	-1.5	0.6	-0.9	1.5	2.0	1.2	1.4	1.5
Household spending	2.4	1.7	0.2	2.9	1.4	2.8	1.7	2.0	2.6
Household income	4.6	1.1	2.7	0.5	2.6	2.6	3.1	4.3	3.1

Table 5.3: Forecast and historical levels

(constant year 2003, £ billion except jobs)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
GVA	180.1	179.2	181.6	186.7	192.4	198.7	204	210	216
Workforce jobs (millions)	4.57	4.50	4.53	4.49	4.56	4.65	4.7	4.8	4.8
Household spending	95.4	97.0	97.2	100.0	101.4	104.2	106	108	111
Household income	106.1	107.3	110.2	110.8	113.7	116.7	120	125	129

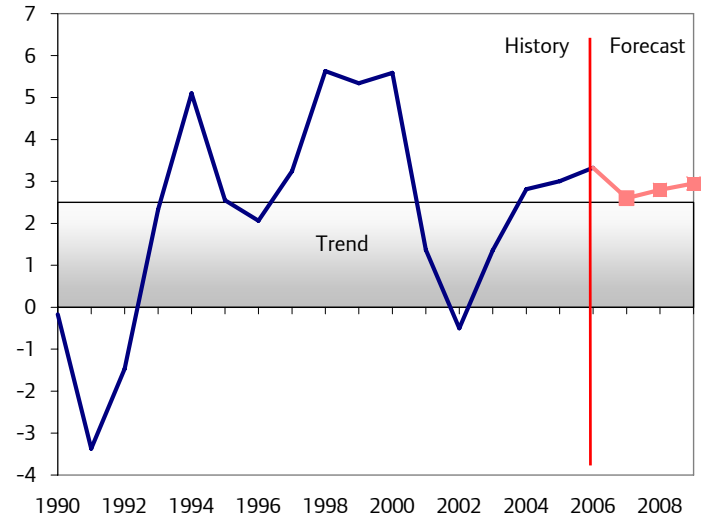
Output

(London GVA, constant year 2003, £ billion)

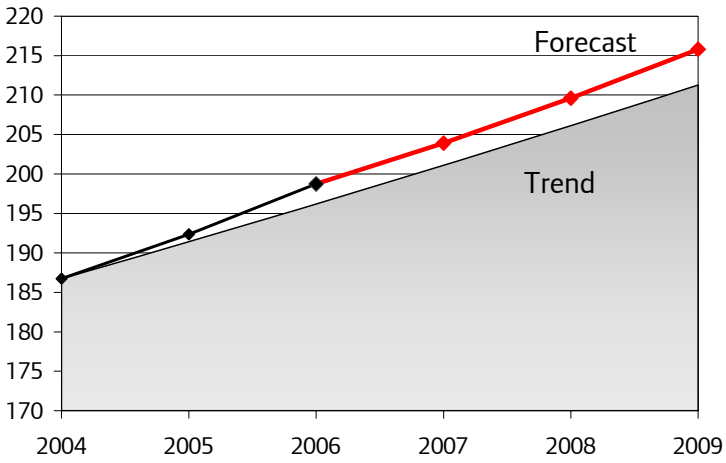
London real GVA growth is forecast to grow consistently above trend over the short-to-medium term. Projected growth rates are 2.6 per cent in 2007, rising to 2.8 per cent in 2008 and 3.0 per cent in 2009.

The GLA forecast is slightly below the consensus average growth forecast in both 2007 and 2009.

Annual growth (per cent)



Level (constant year 2003, £ billion)



Growth (annual per cent)				
	2006	**2007**	**2008**	**2009**
GLA	3.3	2.6	2.8	3.0
Consensus		3.2	2.8	3.3

Level (constant year 2003, £ billion)				
	2006	**2007**	**2008**	**2009**
GLA	199	204	210	216
Consensus		206	212	219

History: Annual growth (per cent)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-0.2	-3.4	-1.5	2.3	5.1	2.6	2.1	3.2	5.6	5.3	5.6	1.4	-0.5	1.4	2.8	3.0	3.3

History: Level (constant year 2003, £ billion)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
136.7	132.1	130.1	133.2	139.9	143.5	146.5	151.2	159.7	168.3	177.7	180.1	179.2	181.6	186.7	192.4	198.7

Employment

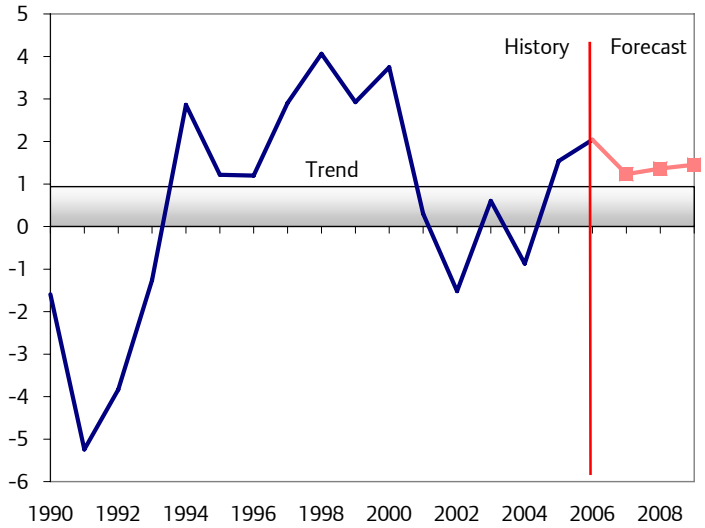
(London workforce jobs)

London's employment is forecast to grow well above trend over the medium term, albeit at a slightly lower annual rate than in 2006.

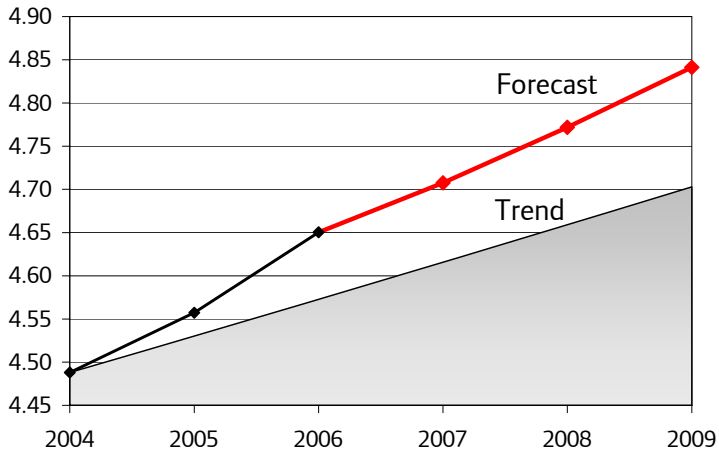
The GLA forecast for employment growth is slightly higher than the consensus average in 2008 and 2009.

By 2009, London is expected to have 4.84 million workforce jobs.

Annual growth (per cent)



Level (millions of workforce jobs)



Growth (annual per cent)				
	2006	**2007**	**2008**	**2009**
GLA	2.0	1.2	1.4	1.5
Consensus		1.2	0.9	1.2

Level (millions of workforce jobs)				
	2006	**2007**	**2008**	**2009**
GLA	4.65	4.71	4.77	4.84
Consensus		4.70	4.75	4.80

History: Annual growth (per cent)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-1.6	-5.2	-3.8	-1.3	2.9	1.2	1.2	2.9	4.1	2.9	3.7	0.3	-1.5	0.6	-0.9	1.5	2.0

History: Level (millions)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
4.20	3.98	3.83	3.78	3.89	3.94	3.98	4.10	4.27	4.39	4.56	4.57	4.50	4.53	4.49	4.56	4.65

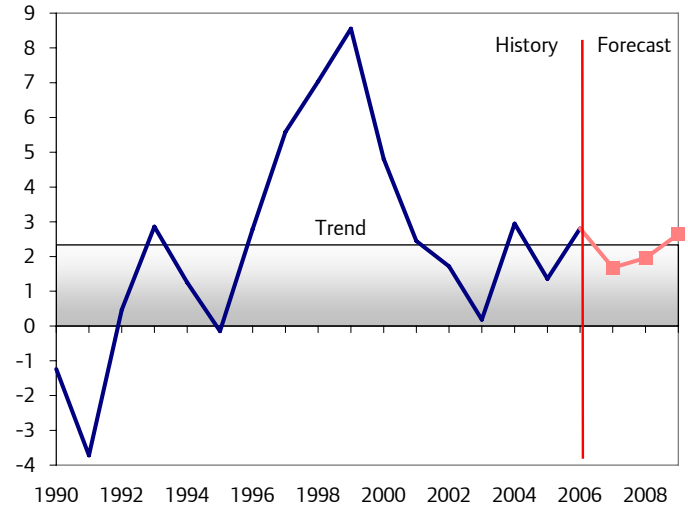
Household expenditure

(London household spending, constant year 2003, £ billion)

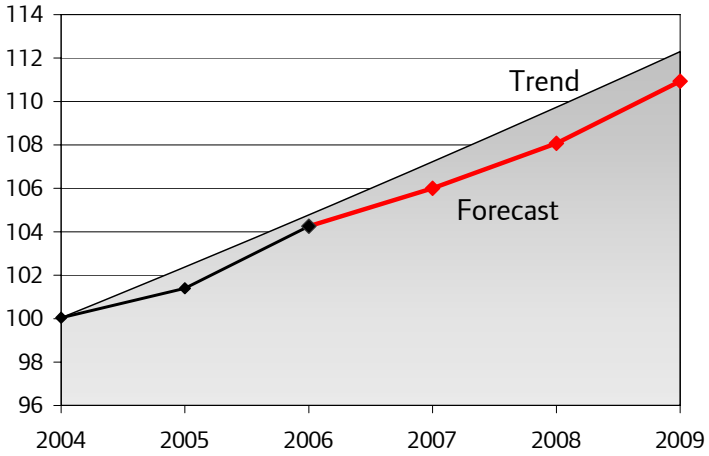
Growth in London household spending is forecast to dip down to 1.7 per cent in 2007, before recovering back to 2.0 per cent in 2008 and 2.6 per cent in 2009.

This places the GLA forecast below the consensus average.

Annual growth (per cent)



Level (constant year 2003, £ billion)



Growth (annual per cent)				
	2006	**2007**	**2008**	**2009**
GLA	2.8	1.7	2.0	2.6
Consensus		2.7	2.4	2.9

Level (constant year 2003, £ billion)				
	2006	**2007**	**2008**	**2009**
GLA	104	106	108	111
Consensus		107	109	113

History: Annual growth (per cent)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-1.2	-3.7	0.5	2.9	1.2	-0.1	2.8	5.6	7.0	8.6	4.8	2.4	1.7	0.2	2.9	1.4	2.8

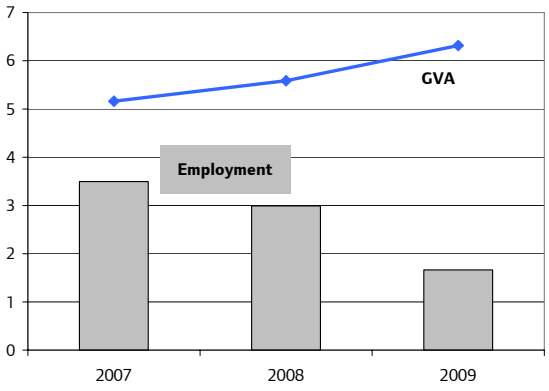
History: Level (constant year 2003, £ billion)

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
70.0	67.4	67.7	69.7	70.5	70.4	72.4	76.4	81.8	88.8	93.1	95.4	97.0	97.2	100.0	101.4	104.2

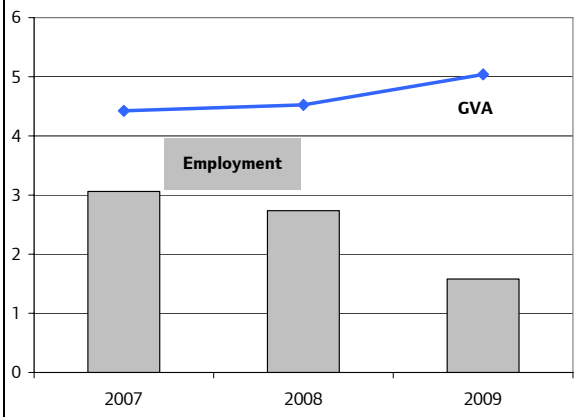
Output and employment growth by sector (per cent annual change)

Financial services

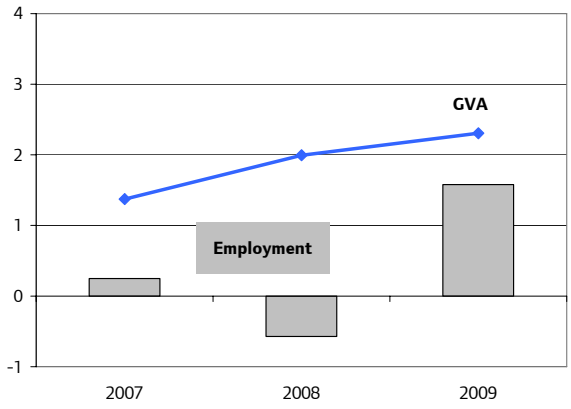
Business services



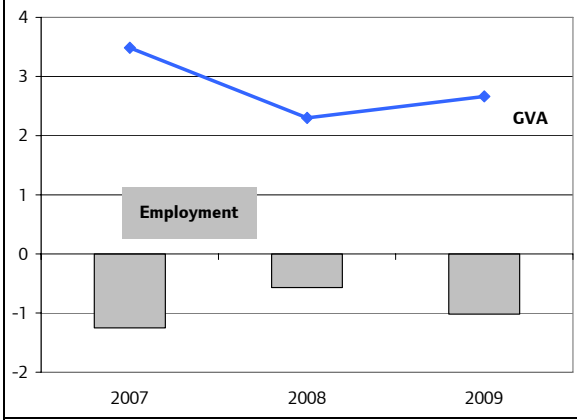
Finance and business (combined)



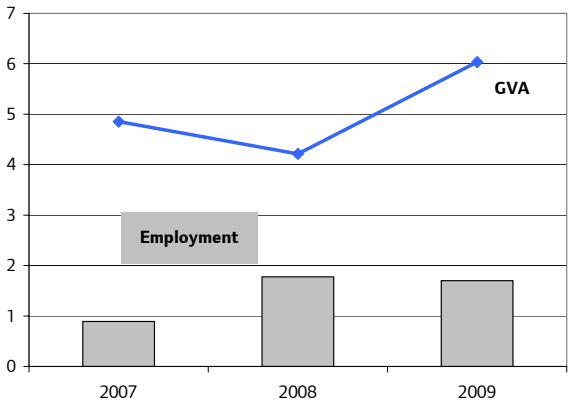
Distribution, hotels and catering



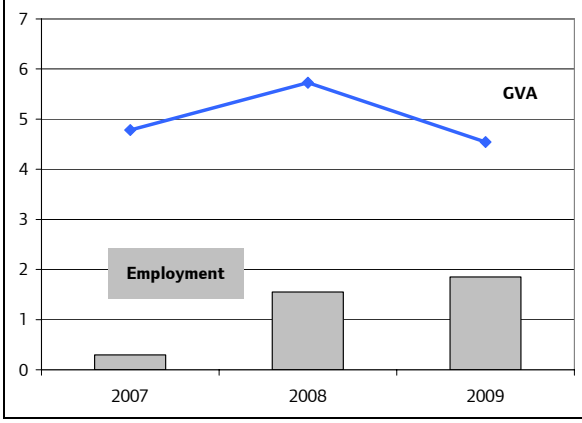
Manufacturing



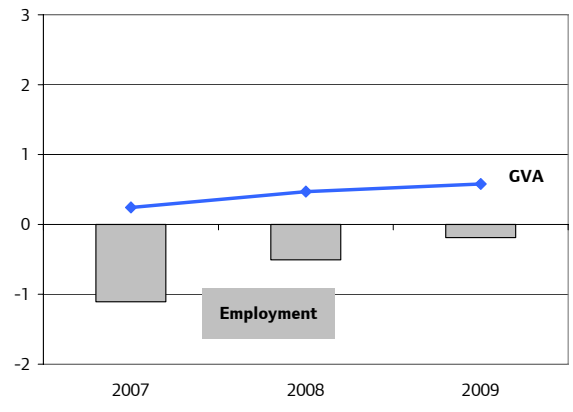
Construction



Transport and communications



Other (mainly public) services



Output and employment growth by sector (per cent annual change)

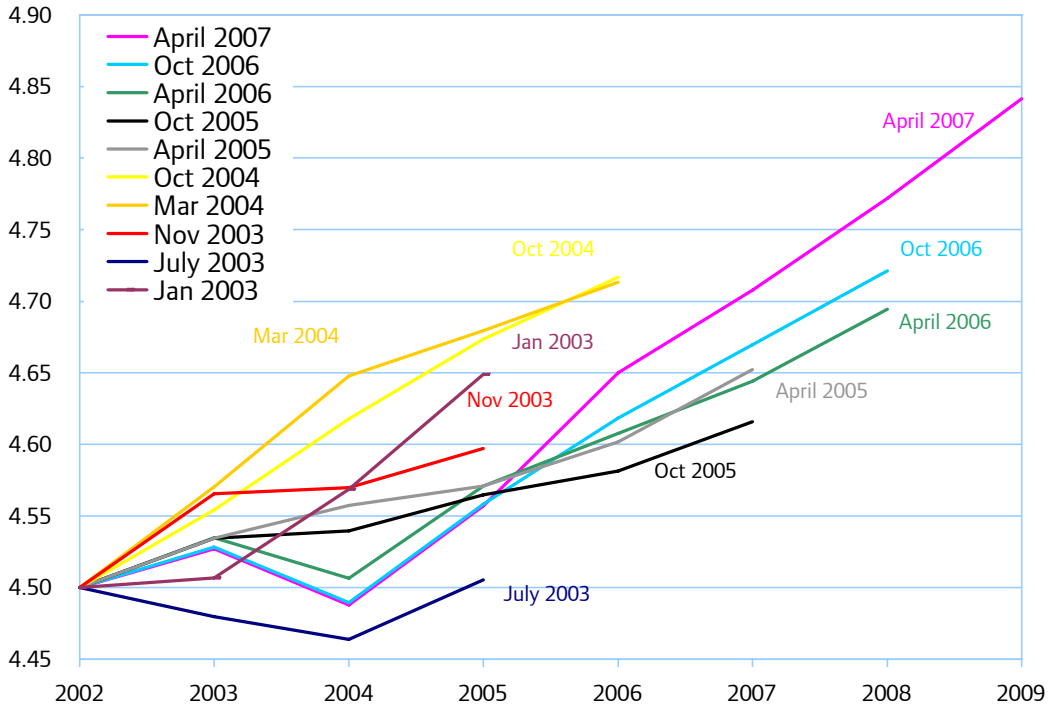
	2006	2007	2008	2009
Financial services				
Output	8.3	3.3	2.9	3.2
Employment	1.4	1.7	2.2	1.5
Business services				
Output	5.3	5.2	5.6	6.3
Employment	2.7	3.5	3.0	1.6
Financial and business services combined				
Output	6.4	4.4	4.5	5.0
Employment	2.4	3.1	2.7	1.6
Distribution, hotels and catering				
Output	2.1	1.4	2.0	2.3
Employment	1.1	0.2	-0.6	1.5
Transport and communications				
Output	3.0	4.8	5.7	4.5
Employment	2.7	0.3	1.6	1.8
Other (mainly public) services				
Output	2.2	0.2	0.5	0.6
Employment	2.1	-1.1	-0.5	-0.2
Manufacturing				
Output	0.3	3.5	2.3	2.7
Employment	0.8	-1.3	-0.6	-1.0
Construction				
Output	3.8	4.9	4.2	6.0
Employment	0.6	0.9	1.8	1.7
(Memo: non-manufacturing)				
Output	3.5	2.5	2.8	3.0
Employment	2.1	1.4	1.4	1.5

5.5 Comparison with previous forecasts

This section compares the current forecast with previous forecasts in this series. Since the base years for the forecasts change and the base data is continuously revised, the forecasts have been rebased into a common base year for the comparison in Figures 5.2 and 5.3.

The most recent forecast for London's workforce jobs growth is higher than in previous forecasts. However, April 2007's real output growth forecast is a touch lower than in the October 2006 forecast.

Figure 5.2: Employment – latest forecast compared with previous forecasts
(millions of workforce jobs)

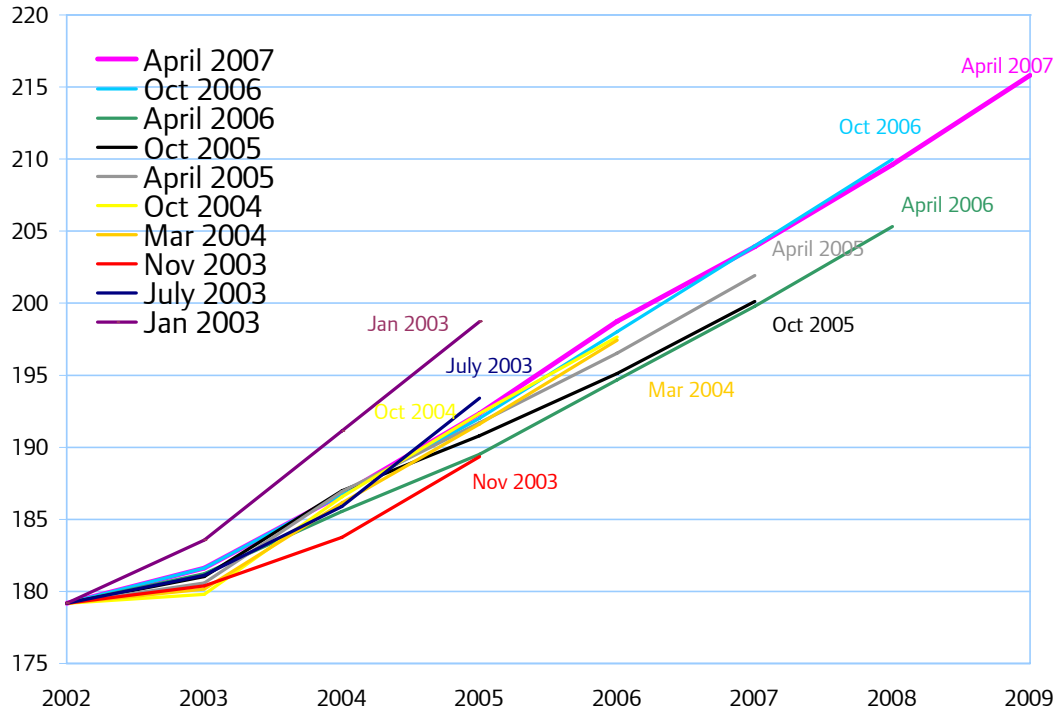


Source: Various London's Economic Outlooks

Table 5.4: Comparisons with previous published forecasts
(London workforce jobs, per cent annual growth)

Forecast	2003	2004	2005	2006	2007	2008	2009
April 2007					1.2%	1.4%	1.5%
Oct 2006				1.3%	1.1%	1.1%	
April 2006				0.8%	0.8%	1.1%	
Oct 2005			0.6%	0.4%	0.8%		
April 2005			0.3%	0.7%	1.1%		
Oct 2004		1.4%	1.2%	0.9%			
Mar 2004		1.7%	0.7%	0.7%			
Nov 2003	1.5%	0.1%	0.6%				
July 2003	-0.5%	-0.4%	0.9%				
Jan 2003	0.2%	1.4%	1.8%				

Figure 5.3: Output – latest forecast compared with previous forecasts
(constant year 2003, £ billion)



Source: Various London's Economic Outlooks

Table 5.5: Comparisons with previous published forecasts
(London GVA, per cent annual growth)

Forecast	2003	2004	2005	2006	2007	2008	2009
April 2007					2.6%	2.8%	3.0%
Oct 2006				3.1%	3.0%	3.0%	
April 2006				2.7%	2.6%	2.8%	
Oct 2005			2.0%	2.3%	2.6%		
April 2005			2.6%	2.5%	2.7%		
Oct 2004		3.8%	3.1%	2.7%			
Mar 2004		3.3%	2.9%	3.0%			
Nov 2003	0.7%	1.9%	3.0%				
July 2003	1.1%	2.6%	4.1%				
Jan 2003	2.4%	4.1%	4.0%				

6. Forecasting London's economy – a new approach

By Paul Ormerod, Matthew Salisbury and Joseph G Wiltshire, Volterra Consulting

Forecasts are required by organisations in both public and private sectors. These can range from broad macro-economic aggregates such as GDP growth, inflation and unemployment, which are the focus of much of the work of the Treasury, to very detailed micro-level predictions. The latter could be the market share of a brand, for example, or detailed employment forecasts by local authority area, or even at the level of individual postcodes. In London, how employment and output are expected to change in the immediate future is of obvious interest to planners, public bodies and businesses seeking to make strategic plans or investment decisions. This being the case, it is essential that a considered, evidence-based and, as far as possible, robust set of forecasts be produced by the GLA.

GLA Economics recently worked with Volterra Consulting to develop their approach to short-term forecasting of the London economy. This section details the issues that had to be considered as part of this project, including just how successful any forecasting approach can be, what approaches can be taken to short-term forecasting, and the technical issues around the production of forecasts.

6.1 Forecasting accuracy

The record of regular economic forecasts now stretches back for over 30 years. There is a substantial body of literature on the accuracy of the forecasting record, which all, it must be stressed, relates to short-term (one or at most two years ahead) projections of macro-economic aggregates such as GDP. There is very little systematic evaluation of either longer-term macro forecasts or more detailed forecasts at whatever time-scale.

The forecasting record of one-year ahead projections for variables such as GDP growth is very poor by scientific standards. The errors in growth rate forecasts can be large compared to the growth rates of the data. For example the predictions of the Treasury over the 1971-1996 period have been at least as good as those of other forecasters, but the mean absolute annual forecast error for these one-year ahead predictions was 1.45 per cent of GDP, compared to an actual mean absolute change of 2.10 per cent. [xxxii]

6.2 Reasons for a poor forecasting record

It is worthwhile to summarise some of the main reasons why the economic forecasting record is so poor. Certainly, a wide range of approaches have been tried, spanning different economic theories and different emphases of statistical methodology, but none of these factors can be shown to have been unequivocally superior to its rivals.

Measurement errors in data

One plausible reason is thought to be the fact that almost all economic data outside financial markets is measured with error. This is because the data is an estimate rather

than a definitive number or set of numbers. The Office for National Statistics collect a variety of survey data to help them estimate, for example, gross value added and employment data.

An additional feature of much economic data is that it is often revised over time so that the initial estimates of what happened in a particular period changes as more information becomes available. There are several occasions on which this has notoriously influenced policy and/or political outcomes. During 1992, for example, the American economy was emerging from recession, but the initial estimates of output growth suggested that the recovery was very weak. Bill Clinton used this very effectively in the Presidential election campaign, claiming that 'it's the economy, stupid'. However, the most recent estimates now suggest that recovery was strong, with output expanding by 3.3 per cent in 1992 compared to 1991.

There is no definitive study of the likely magnitude of the measurement errors, but the classic account of the British national economic accounts[xxxiii] suggests very clearly that the more disaggregated the data, the greater the measurement error is likely to be. It is important to be aware of this, particularly when using data at a regional or sub-regional level.[xxxiv]

Delay in release of economic data

Importantly, economic data is almost always made available with time lag. For example, at the time of writing, the latest official estimates of employment at local authority level relate to the year 2003. A key part of any economic forecast, at whatever level and over whatever time scale, is to estimate where the economy has been in the period between the latest data published, and where the forecast begins.

Shortage of observations

Returning more directly to the reasons for the poor forecasting record, outside financial markets the number of observations that are available for any particular series tends to be relatively small. Official estimates of GDP in the UK, for example, go back only to 1955. Both for employment in general and for regional and local data, the series are even shorter, going back no further than 1971 and more often to various years in the 1980s.

In general, a wide variety of techniques can be used to build models for employment and GDP projections, despite the shortage of observations. However, conventional statistical theory implies that the shortage will affect the potential degree of accuracy of forecasts, no matter what technique is used. The potential forecasting error according to such theory depends upon three things:

- How well the model fits the actual data. The better it fits, the lower is the range of potential forecast error.
- How many observations there are. The more there are, the lower is the range of potential forecast error.

- The values which the 'drivers' of the model take in the future. The further these are away from the values experienced in the period over which the model is estimated, the wider is the range of potential forecast error. Also the smaller the number of actual observations, in general, the more likely this is to obtain.

The most important sources of forecasting error do not, however, arise from the above, important though they may be. In calculating the formula for the potential range of prediction error around any model, classical statistical theory assumes that the model is 'the' correct representation of the data.

6.3 Different methodologies

Approaches to economic forecasting range from highly theoretical models, which have little relation to the historical data, through to purely atheoretical, statistically selected relationships. As pointed out by the Bank of England in the reviews of their models, there is a trade-off between consistency with economic theory and fitting the historic data well.[xxxv] The GLA approach focused towards the latter – using a statistical approach that fits the historic data well, but where the relationships are theoretically intuitive. It is absolutely key when taking a statistical approach that a fascination with high statistical fit between model and data does not mean that intuitive reasoning around economic relationships is thrown out of the window. If an obsession with statistics prevails, the exercise is fundamentally compromised, resulting in 'data mining', where the relationships are modified until they match the observed data, as opposed to the good practice of testing reasonable hypotheses founded in economic logic against the observed data. The reasons that this statistical approach was viewed as superior for short-term forecasting were:

- The model was to be used for producing short-term forecasts. Approaches that focus on economic theory are based around the notion of equilibrium. Over a short-term horizon, factors that have proven to be important in the past are more important than an overarching view of a theoretical equilibrium position which the regional economy may move to in the long term.

- It is not clear that models with a high level of theory content perform any better going forward than statistical models.

- Theory-based models add an enormous amount of complexity into the modelling process. For the extra complexity and cost involved, it is not clear that a better performing model would be produced.

- The statistical approach is based around benchmarking London against the UK. The approach is to look for a core relationship between London and the UK for each variable to be modelled and to try to identify additional variables which are reasonable a priori modifiers to this relationship and also have ex post explanatory power when subjected to statistical analysis.

- The aim in taking this statistical approach is to estimate non-spurious, stable and unbiased relationships between the variables that are to be forecast and the variables proposed as determinants.

6.4 Required projections and time horizons used

The required projections were for London employment growth and London GVA growth, at the aggregate level and for the following sectors:

Table 6.1: Breakdown of Sectors to be forecast

Sector
Business
Construction
Retail
Wholesale
Hotel & Catering
Financial
Manufacturing
Other (largely private) Services
Remainder
Education & Health
Tax Paid
Transport & Communications

Also required were projections for the growth of London Household Income and Spending.

Time horizon of the forecasts
The model is for short-term projections. The focus is on the period two years ahead, although exactly how far ahead the generated projections are taken is up to the user. How short-term fluctuations return to projected longer-run trend growth for each variable, where GLA had long-term projections, was also considered, with the time frame for this reversion to be set according to the judgement of GLA Economics staff. These are in the aggregate levels of employment and GVA and in the sector employment levels.

6.5 Statistical methodology

In section 6.5, the statistical approach taken is outlined and explained. Section 6.5 is written for the interested general reader, and although detailing some technical approaches, does not assume any background specialisation in statistics or econometrics.

Plots

The first thing to do when considering a possible relationship between variables is to do a scatter plot of the variables against each other. This is a simple, straightforward way to see if there is any basis for a relationship between variables.

Correlation

The next thing to do is to plot the simple correlation between them. This is another basic way to look for a relationship between variables. The 'correlation coefficient' ranges from –1 (where two variables move in perfect opposition to each other) to +1 (where two variables move identically).

Regression

If analysis of plots and correlations suggest a relationship, then next step is to run a regression. This allows to both test for and estimate any relationship. A regression relationship consists of a 'dependent variable' (whose movements we are trying to explain) and any number of 'independent variables' (which are considered potentially important in explaining the dependent variable). Regressions allow the consideration of more than one independent variable. We needed to decide which variables had a relationship with the dependent variable and which were unimportant. Also, as each regression was estimated from a reasonably small number of data points, given we are using annual data dating back only to 1983 in most cases, it was important that models were not over-parameterised. The number of independent variables should not be high relative to the number of data points used in the estimation, or what is identified does not represent a relationship, but just the data set. For example, use 10 different variables to explain the variation in one variable shown by 10 data points and you may well get a perfectly fitting model. It won't, however, represent any fundamental relationships and will be useless for forecasting.

Our approach was to 'test downward' for variables to be included in the regression. This involved beginning with a large number of potential explanatory variables, and then removing those with low power to arrive at a robust relationship. This judgement was made on the basis of the t-statistic on the coefficient and a consideration of an ANOVA table. The full range of statistical tests are explained further in the annex to this section.

6.6 Results

In January 2007 the models were successfully completed and a spreadsheet tool was developed, allowing forecasts to be generated based on GLA Economics views of key national level economic variables and allowing judgement to be overlaid onto model based forecasts. A fully transparent piece of work, where the statistical relationships and their relative strengths was clear and unambiguous, was produced. GLA Economics staff can now use the spreadsheet to include their own view on the determinants of the forecasts and on any appropriate adjustments that need to be made.

Given these inputs, the spreadsheet automatically produces the projections of the required variables, including London household income and spending, resulting from the statistical models. The spreadsheet also produces integrated projections which revert the short term projections to the long term trend given by the long term projections that the GLA already have. The time period for reversion is chosen by the user.

6.7 Conclusions

The aim of the project was to produce short-term forecasts that are based on transparent, understandable and robust modelling, which would give the GLA ownership and control over the short-term forecasts that they produce. This was successfully achieved, reducing the dependence of the GLA on external forecasts for which the drivers are unclear and any judgements inherent within are not taken by GLA staff.

Annex: Statistical tests and the problem of endogeneity

P-values

To test if an independent variable is significant in determining the dependent variable we look at the p-value on each coefficient in the estimated regression. This gives an idea of how likely it is that the true coefficient is equal to 0. A coefficient of zero means no relationship between the dependent variable and the independent variable in question. P-values are given in decimals and the traditionally used cut off point, or critical value, is 0.05. If the p-value is less than or equal to 0.05 then there is a 5 per cent or less chance that the independent variable has no relationship with the dependent variable.

ANOVA

In conjunction with p-values, we used an Analysis of Variance (ANOVA). This breaks down how much of the variation in the dependent variable is explained by the first dependent variable included in the regression and then shows the marginal improvement in explanatory power added by the inclusion of each additional variable. This technique gives another input into the decision on whether or not to include a variable in the regression model. If a variable adds almost no explanatory power to the model then this should not be included. Also, by switching the order of inclusion of independent variables in a regression and looking at the ANOVA table each time we can determine which independent variables are most influential in determining the dependent variable.

R-Squared statistic

The R-Squared statistic tells how much of the past variation in the dependent variable is explained by the regression. It provides an idea of the overall 'goodness of fit' of the model. This should always be looked at when producing a regression model – it tells you if the model is likely to be of any use or not. The R-Squared statistic ranges between 0 (meaning the model has no explanatory power) and 1 (meaning the model explains the past perfectly).

Regression diagnostics

If the model is a good one then there will be no systematic pattern to the errors (the amount by which the models predictions of the independent variables miss the actually observed values). To test this we do a range of things to look for any systematic pattern in the retrospective errors of the model. The errors between the actual and the fitted values produced by a regression are also referred to as the residuals of the regression.

White's test for heteroskedasticity

Heteroskedasticity occurs when errors are related to each other. In this case one of the assumptions that lie behind the technique of regression analysis is violated. The consequence is that, although estimated coefficients are still unbiased, we cannot be as certain about the range in which the true coefficient lies. More importantly, any sign of a systematic relation in the errors of the regression indicate that there may be something missing from the regression. Where heteroskedasticity occurs, it may do so

for a reason which we cannot do anything about – the typical example is financial time series, where a rare disturbance can often lead to further or sustained disturbance from an observed pattern. Heteroskedasticity can however be a sign of a misspecification of the model – an omitted variable or an inappropriate functional form. The most important thing when heteroskedasticity is detected is to understand what the reason is for this correlation in the error terms.

First we need to establish if the regression model suffers from this problem. Along with our other methods of analysing whether or not there is any pattern in the residuals, we use White's test for heteroskedasticity. This tests the hypothesis that there is no relationship between errors and the output is a p-value as mentioned above. If the p-value is less than or equal to 0.05 we reject the hypothesis that there is no problem with heteroskedasticity.

Plots of residuals against fitted values
If the errors are related to the independent variables then the estimated regression coefficients will be biased and the regression model is misspecified. This plot indicates whether or not this is likely to be a problem.

Plots of actual against fitted values
This plot indicates whether or not the regression model systematically over or under estimates the actual values. Also it informs us if any outlier data points are heavily influencing the regression, if there are particular years that do not fit the model or if there may have been a structural break in the nature of the relationships.

Autocorrelation function (ACF) of the residuals
If there is autocorrelation – where past values influence current values – in the errors then there is remaining autocorrelation in the dependent variable. This means there is a heteroskedasticity problem and a structural relation in the data that is not accounted for by the model.

Functional form
To test if the estimated regression equation had the correct functional form we performed the Ramsey Reset test, a standard econometric test for functional form. In essence, this test takes the regression and then runs it again including additional independent variables, which are the squared and cubed values of the initial independent variables. A statistical test is then performed to see if the inclusion of these additional variables improves the fit of the regression.

'Real Time' modelling
To assess the robustness of the relationships indicated by the regression results we conducted an exercise to assess the stability of the estimated coefficients through time. We started by using just the first 10 years of data and estimated the regression equations, noting the coefficients and their p-values. Where the first year of data is 1983, this gives us the model as if it were being developed in 1994. We then re-ran the regressions including the next year's data, and so on until we had estimated the final

model, noting the coefficients and their p-values at each stage. This tells us if the regression model is stable through time.

Trends

Non-stationary variables are subject to the problem of spurious regression.[xxxvi] Levels or log levels tend to be non-stationary variables. Dependent variables are growth rates and so we would expect stationarity. This is confirmed by inspection of the plots of variable movements through time.

Endogeneity

The problem of endogeneity or, as it is sometimes called, simultaneous equation bias, is a common one in economic analysis. In the analysis of economic variables it is almost impossible to find any truly exogenous variables – variables whose value is determined entirely independent of the system being modelled. A frequently cited example is the relationship between Consumption and Income. Neither can be said to be determined entirely independently from the other.

This is a problem because in regression analysis the independent variables (or regressors), by definition, are assumed to be determined by factors other than those in the system being modelled, i.e. the dependent variable. If this assumption does not hold, the estimators will not be consistent – as the observed sample increases in size, the estimated coefficient will not converge on the 'true' coefficient, which defines the relationship between the two variables (Greene, 2003). The relationship will be misspecified and therefore not reliable for forecasting purposes.

Given the nature of economic variables, definitions of 'exogeneity' in econometric analysis tend to be pragmatic – focusing on whether there is a statistical basis to expect the 'independent' variable chosen to cause bias in the estimation of coefficients. The following quote describes this approach and suggests a method.

"With reference to time-series applications (although the notion extends to cross sections as well), variables $\boldsymbol{x}_t$ *are said to be* ***predetermined*** *in the model if* $\boldsymbol{x}_t$ *is independent of all subsequent structural disturbances* ε_{t+s} *for all* $s > 0$*. Variables that are predetermined in a model can be treated, at least asymptotically, as if they were exogenous in the sense that consistent estimates can be obtained when they appear as regressors."*

Greene, W.H, *Econometric Analysis*, Fifth Edition, Prentice Hall 2003, p.382

We can reasonably expect that consideration of two-year ahead periods should be enough to observe the effects of any endogeneity in the regressor. Therefore if we consider the observed residuals of a model from time t +1 and t +2 and test to see if either of these are correlated with the independent variables in the model at time t, then this will tell us if we can consider our regressors as predetermined variables. We test for a relationship by regressing the independent variable on the residuals, leading one and two periods. If the coefficient on the residual leads are statistically

insignificant from 0, then we cannot reject the null hypothesis that the regressor variables are predetermined and we can be confident that endogeneity is not biasing our model.

Further, an additional and more straightforward way of addressing this problem would be to make use of the 'Real time' modelling approach that we have developed to assess the stability of our models. Using this approach we can generate a set of one year ahead predictions that would have been given had our modelling approach used only data up to the year for which the prediction is generated. For each of our models we are estimating using data up to and including 2003. However, we can generate a 'real time' prediction for 1994 by estimating the same model using data up to and including 1993. We then create the prediction by applying these estimated coefficients to the 1994 values for the regressor variables. If we roll this technique forward we have 'real time' predictions and actual values for a number of years. If endogeneity does cause upward bias of estimated coefficients, then we would observe that our 'real time' predictions would be consistently above actual values.

To analyse if any models suffer from an endogeneity induced bias we performed these two tests. Only 3 of the 24 models estimated showed a statistically significant relationship between leading residuals and regressor variables. For these three models, the second of the two tests, comparing 'real time' predictions with actual values, indicated that there had been no consistent bias in the estimated values. As such we don't view endogeneity as a problem which is likely to cause bias in our models.

Appendix A: Explanation of terms and some sources

Definitions, differences, and revisions

Forecasting organisations use varying definitions of the regional indicators they supply. It is not therefore always possible to assign a completely consistent meaning to the terms used.

Throughout this report, as far as is compatible with the individual definitions applied by the forecasters, 'employment' refers to 'workforce employment' as defined in, *Labour Market Trends*. *London's Economic Outlook: December 2003* and The GLA's *Workforce Employment Series* provide a more detailed explanation of this term.

Forecasters' definitions are broadly compatible with this but in some cases differences arise from the treatment of small items such as participants in government training schemes or the armed forces. The GLA uses civilian workforce employment throughout.

Output refers to GVA, a term introduced by the 1995 revision of the European System of Accounts (ESA95). Some forecasters still estimate GDP which can differ slightly from GVA. Imputed rental income from the ownership of property is included in some cases but not in others. GLA Economics' *London's Economic Outlook: December 2003* provides a more detailed explanation of this term.

Estimates of nominal regional GVA are available up to 2005 from the ONS. No official estimates of real regional GVA are available because of the difficulties in producing authoritative regional price deflators, although the ONS has now produced regional price indexes for the year 2004.[xxxvii] Most regional forecasters supply their own estimates of London's real GVA. The real London GVA figures used in the GLA Economics' forecast are supplied by EBS.

GVA estimates are less reliable than employment estimates because there is no independent source of information from which to judge the size of total sales by London-based agents. ONS estimates are calculated by the factor incomes method, beginning from wages paid to people with workforce jobs located in London. Profits are imputed on the basis of these earnings estimates from knowledge of national sectors of employment. Most regional forecasters adopt a variant of this technique.

Consumption refers to private consumption, otherwise known as household expenditure; in some cases the expenditure of non-profit organisations is included and in other cases it is not.

Appendix B: Glossary of acronyms

bn	Billion
BRC	British Retail Consortium
CE	Cambridge Econometrics
CEBR	The Centre for Economic and Business Research
CIPS	The Chartered Institute of Purchasing and Supply
CPI	Consumer Price Index
EBS	Experian Business Strategies
ECB	European Central Bank
EU	European Union
FDI	Foreign Direct Investment
FT	Financial Times
GDP	Gross Domestic Product
GLA	Greater London Authority
GVA	Gross Value Added
HBOS	Halifax Bank of Scotland
HM Treasury	Her Majesty's Treasury
ILO	International Labour Organisation
IMF	International Monetary Fund
IPO	Initial Public Offering
LEO	London's Economic Outlook
LFS	Labour Force Survey
LHS	Left Hand Scale
mn	Million
MPC	Monetary Policy Committee
OE	Oxford Economics
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
OPEC	Organisation of Petroleum Exporting Countries
PMI	Purchasing Managers' Index
PSNB	Public Sector Net Borrowing
Q2	Second Quarter
R&D	Research and Development
RHS	Right Hand Scale
RPIX	Retail Price Index (excluding mortgage interest payments)
RPI	Retail Price Index
TfL	Transport for London
US	United States of America

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Footnotes

[i] The forecast is based on an in-house model built by Volterra Consulting Limited.
[ii] RPIX = Retail price index excluding mortgage interest payments. Although not part of the GLA Economics forecast for London, for reader information HM Treasury Consensus Forecast, February 2007 of the RPIX UK inflation rate are reported. Up to December 2003, the Bank of England's symmetrical inflation target was annual RPIX inflation at 2.5 per cent.
[iii] CPI = Consumer Price Index. Although not part of the GLA Economics forecast for London, for reader information HM Treasury Consensus Forecast, February 2007 of the UK CPI inflation rate are reported. Since December 2003 the Bank of England's symmetrical inflation target has been annual CPI inflation at two per cent.
[iv] The Economist, A special report on Britain - Living by their wits, 3 February 2007
[v] City News Monitor, 21 February 2007
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[xxiii] BBC, "Chinese market gold rush goes on", 4 March 2007
[xxiv] BBC, "Food pushes up inflation in China", 13 March 2007
[xxv] BBC, "Booming India expects 9.2% growth", 7 February 2007
[xxvi] Standard Chartered Weekly, 28 February 2007
[xxvii] The Economist, Rising damp, 10 March 2007
[xxviii] BBC, "Chinese market gold rush goes on", 4 March 2007
[xxix] Most forecasters do not yet provide forecasts of household income.
[xxx]GLA Economics, February 2007, Working Paper 20: Employment projections for London by sector and borough.
[xxxi] For 2007: the median of new forecasts from HM Treasury, February 2007, Comparison of Independent Forecasts. For 2008 onwards: the average of medium-term forecasts from the same publication.
[xxxii] C.Mellis and R.Whittaker, (1998), 'The Treasury forecasting record: some new results', *National Institute Economic Review*, 164, pp.65-79
[xxxiii] Rita Maurice, *National Accounts: Concepts, Sources and Methods*
[xxxiv] In the UK regional accounts, 11 separate 'regions' are identified, of which Scotland is one. The word 'region' here is used purely to describe the geographical boundaries for which the estimates are prepared and has no wider political implications.
[xxxv] 'Report on modelling and forecasting at the Bank of England', Pagan, A., Bank of England Publications
[xxxvi] See Hamilton, J (1994), *Time Series Analysis*, for more details on spurious regression and non-stationarity in time series variables
[xxxvii] Fenwick D and Wingfield D, 2005, Relative Regional Consumer Price Levels in 2004, Economic Trends No. 615, ONS, February 2005

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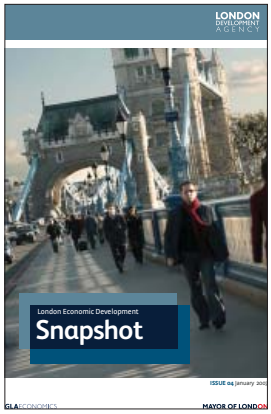

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Vietnamese

Nếu bạn muốn có văn bản tài liệu
này bằng ngôn ngữ của mình, hãy
liên hệ theo số điện thoại hoặc địa
chỉ dưới đây.

Greek

Αν θέλετε να αποκτήσετε αντίγραφο του παρόντος εγγράφου στη δική σας γλώσσα, παρακαλείστε να επικοινωνήσετε τηλεφωνικά στον αριθμό αυτό ή ταχυδρομικά στην παρακάτω διεύθυνση.

Turkish

Bu belgenin kendi dilinizde
hazırlanmış bir nüshasını
edinmek için, lütfen aşağıdaki
telefon numarasını arayınız

Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦੀ ਕਾਪੀ ਤੁਹਾਡੀ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੀਦੀ ਹੈ, ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਹੇਠ ਲਿਖੇ ਪਤੇ 'ਤੇ ਰਾਬਤਾ ਕਰੋ:

Hindi

यदि आप इस दस्तावेज की प्रति अपनी
भाषा में चाहते हैं, तो कृपया निम्नलिखित
नंबर पर फोन करें अथवा नीचे दिये गये
पते पर संपर्क करें

Bengali

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলিপি
(কপি) চান, তা হলে নীচের ফোন্ নম্বরে
বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

Urdu

اگر آپ اِس دستاویز کی نقل اپنی زبان میں
چاھتے ھیں، تو براہ کرم نیچے دئے گئے نمبر
پر فون کریں یا دیئے گئے پتے پر رابطہ کریں

Arabic

إذا أردت نسخة من هذه الوثيقة بلغتك، يرجى
الاتصال برقم الهاتف أو مراسلة العنوان
أدناه

Gujarati

જો તમને આ દસ્તાવેજની નકલ તમારી ભાષામાં
જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર
ફોન કરો અથવા નીચેના સરનામે સંપર્ક સાધો.