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Table of contents

Executive summary 8

Assessment and recommendations 11

Chapter 1. **Supporting the recovery and rebalancing the economy** 21
Getting back to balance 22
Understanding the weaknesses of previous fiscal rules could help create a robust framework 35
Structural reforms should support growth and rebalancing 37
The UK banking sector was severely affected by the crisis and further reforms are essential 38
The domestic financial regulatory and supervisory framework needs to be strengthened further 39
Implementation issues and further reforms 42
Notes 46
Annex 1.A1. Progress in structural reform 49

Chapter 2. **Improving the functioning of the housing market** 53
Recent developments in the housing market 54
Improving the efficiency and resilience of the housing market 63
Notes 79

Chapter 3. **Reforming education in England** 85
International test scores suggest that educational outcomes have not improved . 86
Better targeted pre-schooling can support social mobility and increase educational efficiency 90
Primary and secondary education in England, the United Kingdom and the OECD . . 93
Efficiency in primary and secondary education is low and has fallen 97
The extensive focus on grades in the school system is a cause of concern 100
More attention to composition and quality of inputs could improve outcomes . . 102
Inefficient deprivation funding leads to underachievement among disadvantaged students 105
Strong reliance on admission based on residency hampers user choice 106
Supply must be more flexible if substantial user choice is to be exercised 107
Participation in upper secondary education is low 109
Higher caps on tuition fees should provide room for increasing the number of study places 110
Notes 114
Annex 3.A1. Determinants of PISA scores 119
Annex 3.A2. Estimation of wellbeing determinants 126

Chapter 4. **Climate-change policy in the United Kingdom** 129
Rising to the climate challenge 130
Recent progress on emissions has been significant but a step change is needed to achieve ambitious targets 130
Major policy instruments 138
Adaptation to climate change 152
Notes 155

Glossary 161

Boxes

1.1. The determinants of inflation in the United Kingdom 28
1.2. UK fiscal policy and targets 33
1.3. Basel III and new European initiatives 41
1.4. Recommendations on macroeconomic and financial policy 45
2.1. How does private consumption relate to housing wealth? 59
2.2. How do house prices relate to fundamentals? 64
2.3. The top-down planning system did not allow enough homes to be built 69
2.4. Encouraging local communities to promote development 70
2.5. Building the right type of housing in the right places 72
2.6. Recommendations on housing 79
3.1. Wellbeing in the United Kingdom 87
3.2. Different measures of disadvantage 92
3.3. The English and UK primary and secondary school system in an OECD context . 95
3.4. Grades, test scores and productivity in the education sector 99
3.5. School choice, competition and educational outcomes in the Netherlands . . 108
3.6. Recommendations on education in England 113
4.1. Contributions to international climate-change policies 139
4.2. A timeline of UK climate-change policies 140
4.3. Price *versus* quantity instruments to promote renewable energy 151
4.4. Recommendations on climate change and adaptation policies 154

Tables

1.1. Main economic indicators for the United Kingdom 23
2.1. Contributions to change in real house prices 65
3.1. Institutional setup of primary and secondary schools in England 94
3.2. Grouping of OECD countries according to setup of primary and secondary educational institutions 96
3.3. Educational outcomes 108
3.A1.1. Descriptive statistics based on PISA 2009 database 120
3.A1.2. Regressions based on PISA 2009 database 121
3.A1.3. Descriptive statistics based on PISA 2006 database 123
3.A1.4. Regressions based on PISA 2006 database 124
3.A2.1. Determinants of life satisfaction in the UK and OECD 127
4.1. Decomposition of energy CO_2 emissions 132
4.2. Average annual growth in energy CO_2 emissions, 1990-2000 and 2000-2005 . . 133
4.3. Non-fossil energy contributions 135

4.4. Top 15 nations by share of the world's climate-related inventions 138
4.5. Implicit rates of carbon taxation, 2001 145

Figures

1.1. Selected indicators 22
1.2. Export performance, prices and costs 24
1.3. Labour market development 26
1.4. Output gap and potential output 27
1.5. Inflation 27
1.6. Phillips curve dynamic inflation projection 29
1.7. Taylor rule interest rates and forecast for the United Kingdom 30
1.8. Fiscal outlook and consolidation 31
1.9. Effectiveness of value added taxes 34
1.10. Sterling spreads 38
1.11. Household and corporate credit availability 39
1.12. Capital adequacy and leverage vs. losses 43
2.1. Housing prices 55
2.2. Ratio of median house price to median earnings 55
2.3. Financial burden on households 56
2.4. First-time buyers share of total loans 56
2.5. Real residential investment 58
2.6. Household wealth and savings 60
2.7. Housing equity withdrawal 60
2.8. Gross household debt 61
2.9. Real house prices 65
2.10. Housing supply is unresponsive to demand pressures 67
2.11. Permanent dwellings completed, by tenure 75
3.1. Educational and social outcomes in the United Kingdom and England 86
3.2. Life satisfaction and GDP per capita across OECD countries, 2008 88
3.3. Life satisfaction in OECD countries 89
3.4. Life satisfaction and other indicators in United Kingdom 89
3.5. Annual spending per capita on pre-primary education for children aged 3 and older 91
3.6. Institutional settings in primary and secondary education 95
3.7. Educational indicators 98
3.8. Test scores in England and Scotland 99
3.9. Educational output, inputs and productivity 100
3.10. Salary after 15 years of experience (minimum training) in relation to earnings for worker with tertiary education 103
3.11. Correlation between students' socio-economic background and school inputs . . . 103
3.12. Correlation between students' socio-economic background and learning time . . . 104
3.13. Deprivation funding and spending in primary and secondary schools 105
3.14. Share of the 15 to 19-years-olds population not in education 110
3.15. Tertiary education in the United Kingdom 111
3.16. UK higher education source and destination of funding 112
3.A2.1. Life satisfaction between 2005-2008 in OECD countries based on United Kingdom coefficients 127

4.1. Total GHG emissions by gas in 2005 131
4.2. Change in total CO_2 emissions in the United Kingdom and the OECD 131
4.3. UK GHG emissions by end-user in 2008 134
4.4. United Kingdom GHG emissions 1990-2009 and targets to 2050 134
4.5. Estimated energy supply balance for the United Kingdom in 2009 136
4.6. Industry R&D expenditure 137
4.7. Index of government "green" energy R&D budgets 137
4.8. Climate policy overlap 143

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BASIC STATISTICS OF THE UNITED KINGDOM (2009)

THE LAND

Area (1 000 km^2)	
Total (2008)	243
Agricultural (2009)	187

Major cities (2008, thousand inhabitants)	
Greater London	7 620
Birmingham	1 017
Leeds	771
Glasgow (local government district)	584

THE PEOPLE

Thousands	
Population	60 930
Net increase (annual average 2001-08)	324
Number of inhabitants per km^2	251

Total labour force (thousands)	31 373
Civilian employment (% of total)	
Agriculture, forestry and fishing	1.0
Industry and construction	23.0
Services	75.6

PRODUCTION

Gross domestic product	
In £ billion	1 395
Per head ($)	35 805

Gross fixed capital investment	
In % of GDP	14.6
Per head ($)	5 226

THE GOVERNMENT

Public consumption (% of GDP)	23.4
General government (% of GDP)	
Current and capital expenditure	50.7
Current revenue	39.9
Net debt	43.7
Last general elections: 6 May 2010	

Composition of House of Commons (seats)	
Conservatives	305
Labour	254
Liberal Democrat	57
Other	30
Total	646

FOREIGN TRADE

Exports of goods and services (% of GDP)	28.0
Main commodity exports (% of total)	
Manufactured goods and articles	23.0
Chemicals	20.6
Mechanical machinery	12.9
Electrical machinery	10.6

Imports of goods and services (% of GDP)	30.1
Main commodity imports (% of total)	
Manufactured goods and articles	27.7
Electrical machinery	14.5
Fuels	11.3
Road vehicles	8.4

THE CURRENCY

Monetary unit: Pound sterling	

February 2011, monthly average of spot rate	
£ per $	0.62
£ per €	0.85

Executive summary

The UK economy emerged from the 2008-09 recession with elevated public and private debt and high unemployment. Strong growth and macroeconomic stability in the run-up to the crisis had hidden a build-up of significant imbalances, influenced by overreliance on debt-finance and the financial sector, and booming asset prices. These imbalances need to be addressed to ensure a sustainable and balanced recovery. The government is pursuing a necessary and wide ranging programme of fiscal consolidation and structural reforms aimed at achieving stronger growth and a rebalancing of the economy over time.

A broad based recovery started in end-2009, but faces significant headwinds during 2011, which can be mitigated by monetary policy remaining supportive. The planned fiscal consolidation is needed to ensure that the fiscal position will be sustainable over time. Nonetheless, it adds to the headwinds from weak real income growth and a fading rebound in global trade. Monetary policy should hence remain expansionary, even if headline inflation is significantly above target, to support the recovery.

While the government's fiscal plans and reforms to the fiscal policy framework have significantly reduced fiscal risks, further improvements to the fiscal framework and reforms to make the financial sector more robust are needed. The government has embarked on an ambitious and necessary fiscal adjustment and strengthening of fiscal institutions, including the welcome creation of the Office for Budget Responsibility. Steps towards establishing a permanent fiscal framework should start to be undertaken as the public finances are returned closer to balance. The creation of a Financial Policy Committee will strengthen macro-prudential policy, but further steps are needed to deal with banks that are "too big to fail".

Reforms to housing policy should aim to increase affordability and mitigate excessive house price volatility by enhancing the supply of available land and reducing the volatility of housing demand. Rigid housing supply and fast-rising demand have fuelled house prices, reducing affordability and contributing to macroeconomic and financial instability. Policies to increase supply should focus on lowering barriers to access to land for housing and providing sufficient incentives for local communities to allow development. The current system of housing taxation is regressive, encouraging excess demand for housing and should be modified to better reflect the value of ownership.

Further reforms are needed to improve education outcomes in England, especially among disadvantaged groups. Despite significantly increased resources, education performance in England measured by PISA scores remains static and uneven, and could be improved by focusing resources more on disadvantaged children. The new pupil premium is a step in the right direction, but funding should be even more transparent. Higher and more equal autonomy across school types, in terms of hiring and pay, would support efficient deployment of resources. The quality of vocational training should be increased.

Legislated tuition fee reforms could be taken further to lower fiscal costs and expand tertiary education.

To meet ambitious climate change targets and reduce emissions, higher and more consistent carbon prices are needed. Climate change is a global challenge, and working for higher, more broadly based and stable carbon prices within the European Union should be a priority. Domestic carbon pricing policies need to be harmonised and streamlined in terms of programmes and prices. More stable conditions for renewable energy providers would support deployment, but more R&D support for new technologies may be needed. Adaptation planning needs to proceed and focus initially on low-regret investment.

Assessment and recommendations

The economy is recovering but headwinds are significant

The global financial crisis and the associated recession ended a 15-year period of continuous growth, rising employment and stable inflation. Significant imbalances had developed, however, in terms of public and external deficits, an excessively leveraged financial sector, high house prices and low household savings. The imbalances exacerbated the downturn during the global recession and contributed to a more pronounced fall in GDP, a larger fiscal deficit and higher inflation than in most of the OECD. A wide range of policies were introduced to support the economy and the financial sector, some of which are now being scaled back.

The broad based recovery that started in end-2009 slowed in the second half of 2010. The recovery is likely to remain subdued in 2011, as the necessary fiscal tightening and a fading rebound in world trade create headwinds, before picking up again in 2012. With general government net lending close to 11% of GDP in 2009, a substantial tightening was vital to achieve a sustainable fiscal position and reassure investors. Fiscal consolidation will impact significantly on government consumption, investment and household income growth in 2011-12. Financial conditions are improving, but the financial sector continues to benefit from crisis-related support schemes and ultra-low policy rates which will eventually be withdrawn. Slow real income growth will hold back household consumption. The response of net trade to the depreciation of sterling and the recovery in export markets has so far been disappointing, although manufacturing exports have picked up strongly from a low base. But, as service exports start to recover, relative export performance is set to improve. Investment has also started to pick up and is likely to grow stronger in response to shrinking excess capacity in manufacturing and low levels of housing investment. All in all, a subdued recovery is expected over the next two years, largely driven by a rebalancing of the economy towards rising net exports and increasing investment.

The labour market has proved to be comparatively resilient in the recession, although unemployment has risen. Labour market adjustment comprised a significant fall in real wages due to high inflation, but also due to nominal wage restraint and shorter average working hours. The labour market recovery is expected to be slow, reflecting a subdued recovery, spare capacity among firms and shrinking public employment. Unemployment is expected to fall gradually. Low skilled workers and youth have been particularly hard hit during the recession, pointing to the importance of maintaining efficient employment services, strengthening work incentives and improving educational outcomes.

Significant global and domestic risks remain to the projection. Household consumption may be weaker than expected in response to sluggish growth in real incomes, a further fall in housing prices or faster-than-expected increases in interest rates. Exports may recover slower or faster, reflecting uncertainty about global demand and the longer term impact of the depreciation of sterling on exports. Furthermore, the ability of financial sector exports to recover their pre-crisis level is uncertain. Business investment may, on the other hand, recover more strongly than expected.

The government is pursuing a necessary and wide ranging programme of fiscal consolidation and structural reforms aimed at achieving stronger growth and a rebalancing of the economy over time. As discussed below, reforms to improve educational outcomes and the functioning of the housing market could raise productivity and long term growth. A simpler welfare-benefit system with stronger work-incentives and stronger support for activation, as outlined in the planned Universal Credit reform and the new Work Programme, could improve labour market outcomes. Furthermore, the required fiscal consolidation will imply that private sector activity will need to lead the recovery. The government has announced reforms to corporate taxation aiming at lowering firms' tax burden. The ongoing Growth Review needs to address a range of obstacles to private sector growth.

Needed fiscal consolidation has started

The fiscal position was weak coming into the recession and worsened rapidly as output dropped and the deficit reached almost 11% of GDP in 2009. In 2010 the fiscal situation started to improve, with temporary support measures ending, initial steps towards fiscal consolidation taken and growth resuming. The government has stepped up the pace of consolidation which has significantly dampened fiscal risks. Altogether, fiscal consolidation, measured as the improvement in the cyclically-adjusted balance, amounting to 8.5% of GDP is planned between 2009/10 and 2015/16. Net debt in relation to GDP is predicted to peak at just below 70%. While fiscal risks remain, the announcement and initial implementation of the consolidation programme strikes the right balance between addressing fiscal sustainability and thereby reducing tail-risks on the one hand, and preserving short-term growth on the other.

Although the government is undertaking significant reforms, the economic efficiency of the tax and spending system could be improved. The United Kingdom has one of the least efficient VAT systems in the OECD, reflecting widespread application of reduced and zero rates. The VAT system became even more unbalanced when the standard rate was increased from 17.5% to 20% in January 2011 while low rates and exemptions remained unchanged. *Ending exemptions and increasing lower rates would provide a more efficient system and raise more revenues, while targeted measures should be directed at compensating poorer households.* Further efficiencies and savings could also be reaped on the spending side by addressing remaining inefficiencies in health care *through addressing excessive remunerations and by increasing competition in health care provision*. Although the government has tried to focus public investment on projects with high economic returns, the large cuts in public investment are a risk to long-term growth. *Channelling more resources to public investment would be warranted, as long as projects offer a viable rate of return. Efficiency-increasing fiscal measures should be in line with the existing profile of fiscal consolidation.* The government has announced that the increase in the state pension age to 66 years will be brought forward

to 2020. *To deal with rising pension costs, a further increase of the effective retirement age should be sought, for example by increasing the State pension age further. Given the political costs related to discretionary changes in the pension age across OECD countries, an automatic adjustment in line with longevity should also be considered.*

The work on a permanent fiscal framework should be a priority

The United Kingdom's previous experience with fiscal rules failed to avert a deterioration in its structural fiscal position. It is therefore encouraging that the government has instituted a set of fiscal policy framework reforms. These include a new fiscal mandate and the creation of an independent Office for Budget Responsibility (OBR), which is in charge of macroeconomic and fiscal forecasting and of evaluating whether the government's policies are in line with its mandate and supplementary debt target. The OBR will support the consolidation process, improve the quality and credibility of information and lay a sound basis for the forward-looking framework.

The fiscal mandate of reaching a cyclically-adjusted balance by the end of a rolling five-year horizon sets an ambitious target, while allowing automatic stabilisers to work fully in response to cyclical fluctuations in activity. Like all forward-looking rules, the framework could be vulnerable to back-loaded consolidation, whereby governments follow lax fiscal policies but promise future prudence. *During the current parliament this does not seem to be a problem given front-loaded fiscal consolidation plans, but a future permanent medium-term framework might best ensure constraints on a shorter horizon than five years, as already suggested by the government.*

In due course, the current mandate aimed at the necessary fiscal consolidation should be replaced by a permanent fiscal framework. *For the permanent fiscal framework the rolling five-year horizon should be retained to minimise time inconsistencies. The framework should also include a larger share of total spending than currently under an expenditure ceiling (leaving out only the most cyclical components) and a forward-looking deficit target. The target should also be set to ensure long-term fiscal sustainability, for example through a debt level target. The OBR should continue to be charged with independently monitoring the consistency of the government's fiscal policy with its mandate and targets.*

By setting up the OBR with a remit to produce the official macroeconomic and fiscal forecasts, the government has addressed one element behind previous fiscal indiscipline in both the United Kingdom and other OECD countries. The OBR's responsibility for forecasts and evaluating whether current policies are consistent with the fiscal targets makes it highly involved in the budget process. In the current setting, the government is responsible for analysing the fiscal impact of new policies and the OBR for judging whether announcements are sufficiently firm and detailed to incorporate in their forecast. Given the current division of labour, the OBR seems reasonably staffed. *However, if the remit was widened or the OBR took a more active role in policy costing, more resources would be needed.*

Monetary policy should remain expansionary but inflation expectations have to be watched closely

Inflation has remained above the Bank of England's (BoE) 2% target during most of the last few years, initially reflecting rising energy prices and high levels of capacity utilisation and

later rising import prices due to the depreciation of sterling, rising energy prices and changes in the VAT rate. The underlying rate of inflation, excluding effects from taxes, reached a trough in early 2010 and is now above 2%. Headline inflation will be boosted all through 2011 by the VAT increase, but is then likely to subside and remain below the target through 2012.

With policy rates close to zero, quantitative easing (QE) at £200 billion (14% of GDP) and liquidity schemes still in place, monetary policy is highly expansionary. This is appropriate given the large output gap, the modest underlying inflation rate and significant headwinds from fiscal contraction and lingering credit constraints. *From this perspective, policy rates should rise only slowly from mid-2011 onwards as long as inflation expectations do not drift too far from the target. QE should be withdrawn in an orderly and pre-announced fashion once policy rates have risen from their current low level. The BoE will, however, need to react sooner if inflation expectations begin to rise considerably or feed through to significant wage increases.*

Despite progress, more financial sector reforms are needed

The UK financial system was severely affected by the financial crisis, which exposed weaknesses in the supervisory, crisis management and resolution frameworks. The authorities have addressed some major weaknesses: the deposit insurance has been strengthened, liquidity management has been reinforced and a special resolution regime for deposit-taking institutions has been established.

The United Kingdom will need to implement the Basel III agreement and European Union legislation enhancing European supervisory architecture and crisis resolution mechanisms. In addition, a new national regulatory framework is being put in place giving the BoE a clear mandate to monitor risks in the financial system as a whole, along with instruments to ensure financial stability. A new Financial Policy Committee in charge of macro-prudential regulation and a Prudential Regulation Authority in charge of micro-prudential regulation will be established within the BoE. A separate Financial Conduct Authority will regulate conduct in financial services and markets. These reforms improve the regulatory and supervisory framework significantly, but leave the "too-big-to-fail" problem to be addressed. The government-appointed Independent Commission on Banking (the Vickers commission) is due to give recommendations in September 2011 on measures to reform the banking system and promote stability and competition, including the issue of separating retail and investment banking functions. Several instruments can be used to encourage "too-big-to-fail" institutions to take fewer risks, including bank levies and additional capital requirements. *More radical reforms, such as breaking up major banks or building a "firewall" between higher risk investment and commercial banking could also be considered.*

The new financial architecture needs to be put in place rapidly

Financial reforms will be phased in over several years and successfully implementing new rules will be challenging for regulators. It is essential that the momentum for reform is maintained as memories of the crisis fade and as lobbying from the financial sector tries to

loosen regulations. Macro-prudential policy instruments will need to be defined and implemented rapidly.

Limiting leverage, that aggravated the impact of the crisis, should be a priority. Capital adequacy ratios based on risk-weighted assets have promoted capital arbitrage, allowing banks to reduce risk-weighted assets using off-balance sheet vehicles and derivatives, increasing leverage and risk-taking. *The leverage ratio should cover all relevant assets, including off-balance sheet exposures. Financial authorities also need to minimise regulatory arbitrage by ensuring consistent regulation of non-bank financial institutions, such as pension funds and insurance companies. They also need to react promptly to evolutions in the relations between traditional banking and "shadow banking" which have played a prominent role in the global financial system in recent years.*

Tight housing supply hampers affordability and increases volatility

A combination of favourable economic and financial conditions and a tight housing supply led to sharp increases in real house prices in the United Kingdom between the mid-1990s and the end of 2007. This resulted in a significant deterioration in affordability and high housing market volatility, which affects the wider economy through various channels. Construction constitutes a volatile and labour-intensive sector of the economy, which contributed significantly to output and job losses during the recession. Unsustainable developments in the mortgage market have also put substantial strains on the financial system.

More flexible planning regulations and reviewing Green Belt designation would increase land availability

The response of housing supply to demand in the United Kingdom has been one of the lowest among OECD countries over the last 20 years. Hence, making the land use planning system more flexible, more predictable and more responsive to market signals, without compromising its social and environmental objectives, is essential. Even though England is a high-density country, especially in the South, there is scope to make more land available for building houses. In particular, Green Belts constitute a major obstacle to development around cities, where housing is often needed. *Replacing Green Belts by land-use restrictions that better reflect environmental designations would free up land for housing, while preserving the environment.*

Providing local communities with sufficient incentives will be key to raising housing supply

The new government has launched a major overhaul of the planning system, replacing top-down building targets with incentives for local communities to allow development. In that context, setting the right level of incentives for local authorities is essential. In the light of often strong local resistance to new construction, it remains to be seen whether the incentives provided by the government, including the New Homes Bonus, will be sufficient to generate numbers of planning permissions compatible with increasing demand. *The*

evolution of housing completions should be monitored very closely and the level of incentives revised if needed. After the recent removal of the regional level of planning, ensuring the continuity of strategic planning of infrastructure and public services is also crucial.

Housing taxation should be reformed to improve efficiency and curb price swings

The council tax is regressive and based on outdated valuations, while the stamp duty penalises mobility by increasing transaction costs. *Ideally, the current council tax and stamp duty should be replaced by a property tax based on market values. As a first step, the council tax could be based on regularly updated property valuations. Furthermore, linking the property tax to market values could substantially dampen cyclical fluctuations of house prices, as rising prices would result in higher taxes, which would slow housing demand growth.*

Focusing pre-school spending in England on disadvantaged children could improve equality and efficiency

Providing high-quality pre-schooling to children from disadvantaged backgrounds can yield high social and economic returns and support social mobility, which appears low in the United Kingdom. The accumulation of both cognitive and non-cognitive skills during early childhood has high knock-on effects, and complementarities for later skill-formation. Enrolment in pre-schooling has expanded rapidly in England, fuelled by the Sure Start and the Early Years programmes.

There is mixed evidence on the effects of the expansion of pre-schooling in England. In general, disadvantaged children stand to gain significantly from pre-school participation. Evidence of effects on non-disadvantaged children is mixed, although some health and behavioural benefits seem to have arisen from the Sure Start programme. To improve pre-schooling outcomes among disadvantaged children while containing costs, overall efficiency needs to increase and resources should be geared more towards disadvantaged families. *Outreach activities focused on disadvantaged families should be expanded. Providing additional support for the neediest, for example through complementing pre-schooling with parent/child support in the home environment, should be considered.*

Additional indicators of educational performance should be developed to complement grades and test scores

Despite sharply rising school spending per pupil during the last ten years, improvements in schooling outcomes have been limited in the United Kingdom. Average PISA scores, measuring cognitive skills of 15-year-olds, have been stagnant and trail strong performers such as Finland, Korea and the Netherlands. The use of benchmarking in England is more widespread than in virtually any other OECD country. Transparent and accurate benchmarking procedures are crucial for measuring student and school performance, but "high-stake" tests can produce perverse incentives. The extensive reliance on National Curriculum Tests and General Certificate of Secondary Education (GCSE) scores for evaluating the performance of students, schools and the school system raises several

concerns. Evidence suggests that improvement in exam grades is out of line with independent indicators of performance, suggesting grade inflation could be a significant factor. Furthermore, the focus on test scores incentivises "teaching to tests" and strategic behaviour and could lead to negligence of non-cognitive skill formation. To address these shortcomings the government should:

- *Further develop value-added indicators of schools' educational output to provide more relevant information to parents, students and regulators.*
- *Increase the emphasis within inspection on teaching and learning including through more lesson observation and assessment of pupils' work, so that inspectors consider this evidence alongside attainment data in reaching their judgements on the effectiveness of schools.*
- *Develop methods to measure educational outcomes through independently collected data as a complement to grades and test scores.*
- *Ensure that universities and employers have a greater say in qualification content and procedures (A-levels and GCSEs).*

Wider user choice for all students requires further reforms

Schooling outcomes in the United Kingdom are among the more unequal in the OECD area. This leaves many students from weaker socio-economic backgrounds with insufficient levels of competence, which hampers their chances in the labour market and higher education. Further reforms are needed to improve the outcomes for students from disadvantaged backgrounds to raise their life chances and overall productivity.

The unequal educational outcomes partly reflect a complex, multi-layered and poorly functioning deprivation funding system for primary and secondary schools in England. The implicit compensation for disadvantaged students that the government provides to local authorities is only partially spent on disadvantaged schools and students. This mismatch partly reflects the complexity of the funding system. By moving to a less complex system and introducing an explicit pupil premium, the government has started to address these problems. The premium is, however, relatively low in an international perspective and it is not clear that it will cover the extra costs of admitting disadvantaged students. *The government needs to ensure incentives are sufficiently large to incentivise schools to admit disadvantaged students. To maximise transparency the government should consider increasing the pupil premium, within the overall budget constraint on public spending, and making it the only source of deprivation funding.*

One way to ensure that schools spend deprivation funds on the disadvantaged student is to improve user choice for these students. User choice remains relatively limited for students from disadvantaged backgrounds, as admission criteria by residence limit choice geographically. Although user choice reforms can have positive effects, they could potentially lead to increased segregation. *The government should therefore experiment with proscribing the use of residence criteria in admission to local government maintained schools in some local authorities and evaluate the effects carefully. Locally maintained schools should have the same opportunities for hiring staff and negotiating wages as academies and Free Schools.*

User choice is also limited by low supply flexibility through entry and exit and high capacity utilisation, leaving locally maintained schools with a captive market. *Entry of new schools should be encouraged even if it temporarily creates some excess capacity. Decisions on*

opening new schools should rely on the quality of the business plan and should not be left to local authorities but to another appropriate body.

The quality of vocational training should be higher to make participation worthwhile

Participation in education and training among 16 to 18-year-olds remains relatively low compared with other OECD countries, partly reflecting weak performance in earlier parts of the school system, but also a confusing and rapidly changing array of often low quality vocational programmes. *The system of vocational education should be simplified. A further focus on high-quality apprenticeships is warranted. Given that the government has abolished the education maintenance allowance, it needs to find alternative measures to efficiently raise incentives for participation for children from low income families.*

The increase in the tuition fee ceiling is reasonable and should pave the way for higher participation in tertiary education

Relative demand for tertiary education is high, partly due to elevated private returns to education. Expanding tertiary education is therefore warranted, but in view of the high levels of public subsidies students should pay a larger share of the costs. The government's proposal to allow universities to increase tuition fees significantly switches some of the costs of funding higher education from taxpayers to graduates. *The government could pursue reforms to further lower the public share of funding, e.g. through lower grants to universities. Some of the proceeds could be used to expand the number of study places. While the proposed changes in the grant and loan system should ensure that universities remain open for students from disadvantaged backgrounds, the government should keep a close eye on this issue.*

International agreements to make carbon prices more uniform, higher and less volatile should be sought

The United Kingdom has set ambitious domestic targets for greenhouse-gas emissions reductions and has introduced a wide range of policies to bring them about. It has also argued strongly for collective action at a global level. Progress on lowering emissions has also been significant, with an additional boost from the recession adding to progress due to the earlier "dash for gas" and cuts in non-CO_2 gases. To address fully the central market failure associated with greenhouse gas emissions and to reach the government's ambitious 2020 and 2050 targets, a step change in policies is needed. *Given the central role of the EUs emissions trading scheme a key element should be to seek tighter quotas within the scheme.*

The consistency of policies needs to be improved if ambitious targets are to be met in a cost effective way

The current framework of climate change policies is complex and reflects different vintages of policies leading to uneven carbon prices across sectors. The low VAT rate on

domestic fuels adds to the distortions. *The government should therefore assess how policy instruments overlap and interact, so that policy-makers can make the effective carbon price across industry sectors and different stages of production more uniform and co-ordinate climate-change, energy and other policies better.* Reforms should focus on simplifying, rationalising and harmonising environmental taxes. *The Climate Change Levy (CCL) and fuel duties should reflect carbon content and the low VAT rate on domestic fuels should be raised to the standard 20%. Furthermore, the CCL and the Carbon Reduction Commitment Energy Efficiency Scheme could be merged and the inefficient Climate Change Agreements should be phased out. The government should also consider ways to lower uncertainty about future carbon prices.*

Incentives for developing and deploying low-carbon technologies need to be sharpened

The government plans to reform the regulation of the electricity market. This provides an opportunity to reduce some of the risks faced by renewable-energy power generators by facilitating longer-term contracts and making grid connection easier. *The United Kingdom has policies such as the Renewables Obligation in place to encourage privately funded R&D. But it would be desirable for the government to increase public spending on R&D for new low-carbon technologies, given the "public good" nature of basic research and the low level of direct publicly-funded UK energy R&D, taking account of fiscal constraints. Support should preferably focus on areas in which the United Kingdom has a comparative advantage at the margin and in the context of international co-ordination of research efforts across technologies to share the burdens of R&D efficiently.*

Investment in low carbon technologies is likely to be below socially efficient levels due to uncertainty about future trajectories of carbon prices and climate change policies more generally, and obstacles to long-term project financing. This calls for public sector financial intermediation. *One option would be to allow the proposed Green Investment Bank to borrow in the debt markets, subject to transparent accounting of the contingent fiscal liabilities that such borrowing would create.*

Adaptation policies should initially focus on low-hanging fruits

There are significant uncertainties related to future climate change impacts and thus about precise adaptation needs. Adaptation policies should therefore focus on building adaptive capacity across the UK economy, with a focus on reducing market failures. *The authorities should develop further an incremental approach to encouraging adaptation, protecting against near-term climate threats that are better understood while retaining options to respond flexibly to the evolution of risks and the knowledge base over coming decades.* It is sensible to continue to focus on the appropriate provision of public goods, including information, better risk-assessment frameworks and more advanced metrics for monitoring and evaluation.

Chapter 1

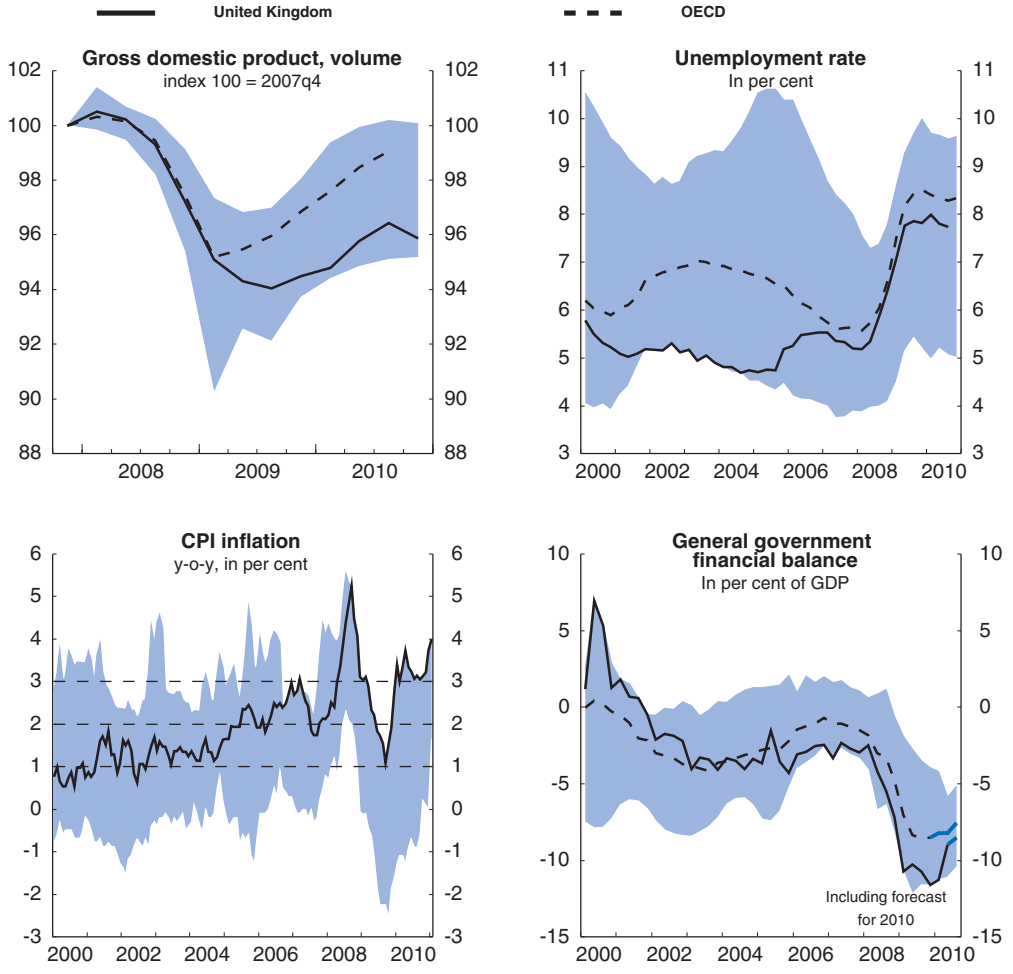
Supporting the recovery and rebalancing the economy

The UK economy is gradually emerging from the recession and has started to rebalance away from overreliance on debt-finance and government spending towards more investment and exports. The government deficit is starting to decline, household and firm balance sheets have strengthened, but the pick-up in exports has been relatively slow despite the depreciation of sterling and the recovery in export markets. Meanwhile, the labour market has proved more resilient than in previous downturns, reflecting more labour hoarding due to falling real wages and shorter working hours. To support the recovery, monetary policy should remain expansionary, as current above target inflation rates essentially reflect temporary factors. If inflation expectations drift too far from the target, however, policy rates would need to rise earlier. The government is pursuing a necessary and wide ranging programme of fiscal consolidation and structural reforms aimed at achieving stronger growth and a rebalancing of the economy over time. Plans for fiscal consolidation, principally focusing on spending cuts, are appropriately ambitious. These plans were needed to ensure fiscal sustainability and have significantly reduced fiscal risks, contributing to lower bond yield spreads and diminished uncertainty. Fiscal plans could, however, be adjusted to better promote efficiency and long-term growth. In due course, the fiscal mandate should be modified into a permanent fiscal framework to guide fiscal policy beyond 2015/16. The UK banking sector was severely affected by the financial crisis and UK authorities have already addressed some weaknesses. Further financial sector reforms, consistent with Basel III and European initiatives to reinforce regulation and supervision, are essential to secure financial stability going forward.

Getting back to balance

As the global crisis unfolded, output fell sharply in the United Kingdom, while unemployment rose and the fiscal deficit ballooned (Figure 1.1). GDP fell by more, and for longer, than the OECD average as the recession laid bare significant accumulated imbalances exacerbated by an overreliance on debt finance. While GDP growth remained comparatively strong up until the crisis, macroeconomic performance in other dimensions had already started to weaken around mid-2000s relative to other large OECD countries (Figure 1.1). Structural fiscal deficits, an excessively leveraged financial sector, high house prices, low household savings and an overvalued currency became a drag on growth and

Figure 1.1. **Selected indicators**[1]



1. The shaded area indicates the maximum and the minimum among the seven major OECD countries.

Source: OECD, *OECD Economic Outlook database.*

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increased vulnerability to shocks. Inflation remained highest among the G7 countries during the recession, driven initially by high levels of capacity utilisation and later by sharply rising import prices and increasing indirect taxes.

The broad based recovery that started at end-2009 slowed in the second half of 2010 and is likely to remain subdued in 2011 as fiscal tightening takes hold and growth in world trade slows down (Table 1.1). Fiscal consolidation will impact significantly on government consumption and investment but is also reducing household income growth through tax increases. Slow real income growth will continue to hamper household consumption even though deleveraging pressures have eased as house prices and overall wealth positions have stabilised and saving rates recovered. The response of net trade to the depreciation of sterling and the recovery in export markets has so far been somewhat disappointing. However, a pick-up in service exports is set to improve relative export performance. Investment has also started to recover and is likely to grow stronger in response to shrinking excess capacity in manufacturing and low levels of housing investment.

Table 1.1. **Main economic indicators for the United Kingdom**

Percentage changes from previous period, unless indicated

	2009 Current prices £ billion	2010	2011	2012
Gross domestic product	1 395.0	1.4	1.5	2.0
Consumption				
Private	910.6	1.1	1.0	1.8
Government	326.9	1.1	–1.7	–1.7
Gross fixed capital formation	203.6	2.8	3.6	4.2
Public sector	41.1	1.5	–11.7	–5.2
Residential	41.3	3.9	8.8	3.3
Business	121.3	2.8	7.0	7.1
Stockbuilding[1]	15.0	1.1	0.2	0.0
Total domestic demand	1 424.7	2.4	1.1	1.4
Exports of goods and services	390.9	5.2	6.0	6.4
Imports of goods and services	420.6	7.9	4.0	4.0
Foreign balance[1]	–29.7	–0.9	0.4	0.6
Current account balance[2]	–23.9	–2.3	–2.4	–2.0
Output gap[3]		–4.6	–4.5	–4.0
Consumer price index		3.3	3.3	1.8
Harmonised underlying inflation		2.9	3.3	1.8
Unemployment rate[4]		7.8	7.7	7.5
Net households saving ratio[5]		–0.0	–1.0	–1.1
Government financial balance[2]		–9.9	–8.8	–7.2
Gross Government debt[2, 6]		81.6	89.7	96.2

1. Contribution to GDP growth.
2. As a percentage of GDP.
3. As a percentage of potential output.
4. As a percentage of labour force.
5. As a percentage of disposable income.
6. National accounts definition.

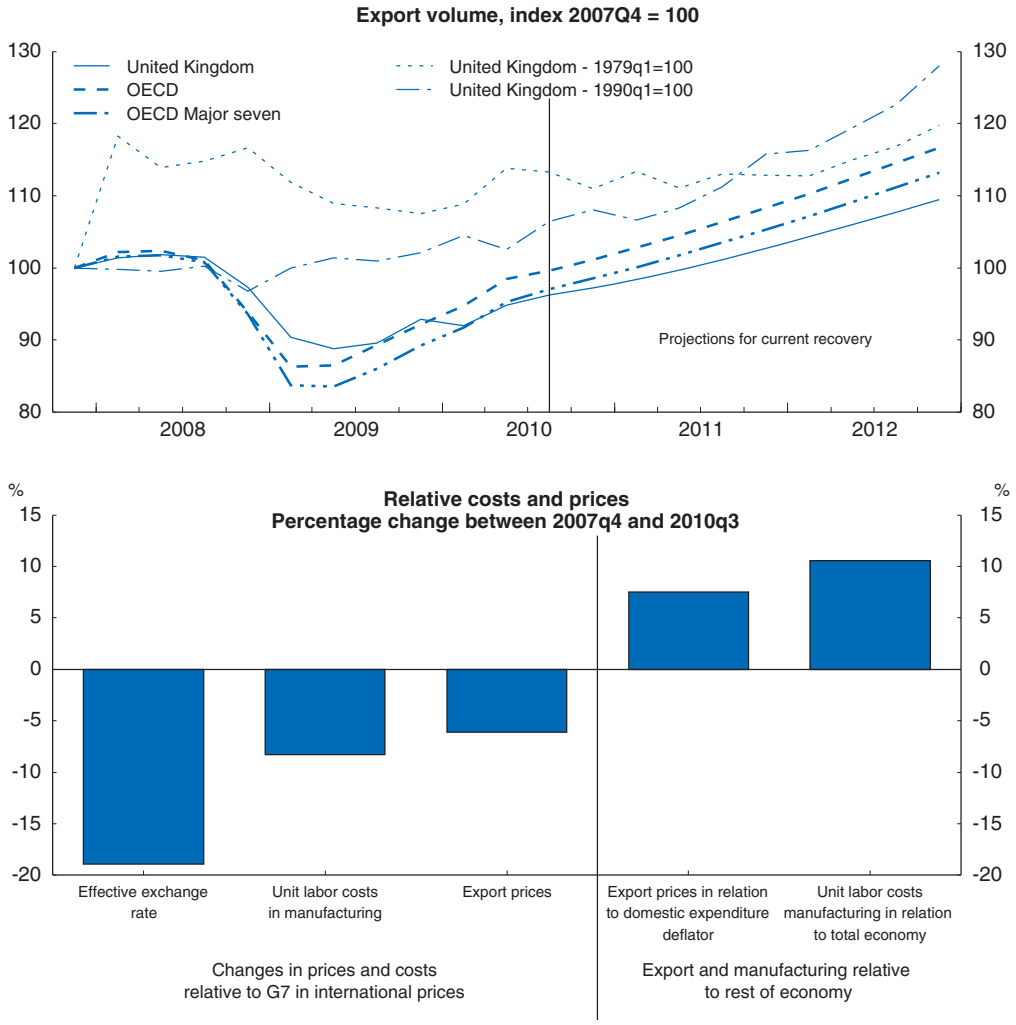
Source: Update, based on the national accounts data released in late January 2011, of the projection presented in the *OECD Economic Outlook No. 88*.

Lacklustre export performance hampers the recovery

Despite a significant rebound, the overall export recovery is weak compared to both other OECD countries and previous recessions (Figure 1.2, first panel). The relatively subdued development reflects a sharp fall in service exports, mostly of financial services

(Bank of England, 2010a). The almost 20% depreciation of sterling since late 2007 has had a fairly small effect on relative export prices (measured in international prices relative to the G7 area) so far. This is partly due to faster rising unit labour costs in manufacturing than in the G7 area as a whole, possibly due to greater labour hoarding during the downturn. The faster rising unit labour costs have left relative cost improvement of less than 10% (Figure 1.2, second panel). A need to improve profit margins has pushed up export prices further, leaving relative export prices only around 5% lower. Improvements in competitiveness have therefore been modest.

Figure 1.2. **Export performance, prices and costs**



Source: OECD, *OECD Economic Outlook 88 database*, Bank of England (2010b) and OECD calculations.

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A lasting rebalancing towards higher net exports requires raising relative profitability in the tradable sector in relation to the non-trading part of the economy. So far, there is limited evidence of this taking place as the rise in export prices compared to the domestic expenditure deflator has been accompanied by a larger increase in relative labour costs in manufacturing (Figure 1.2, second panel). Business surveys indicate that investment

intentions have picked up more in the manufacturing sector than in services and goods export volumes have now risen 22% since their trough in May 2009, which together could herald a step towards rebalancing. While there is little that policies can do to promote this rebalancing in the short term, structural reforms focusing on infrastructure, education, R&D and competitiveness could improve productivity performance and profitability over time.

The labour market response has been cushioned by real wage flexibility

As in many OECD countries, the sharp drop in GDP in the United Kingdom has fed into unemployment to a lesser extent than what historical patterns would have suggested (Figure 1.3, first and second panel). The resilience of the labour market can to some extent be attributed to employers being more willing to maintain employees, which resulted in a modest drop in employment but at the cost of a large fall in labour productivity (Figure 1.3, panels 3 and 4). Indeed, some of the fall in labour productivity may reflect a permanent level change, as some previously highly productive activities may not fully recover. Nevertheless, putting in place policies to support productivity growth should be a priority.

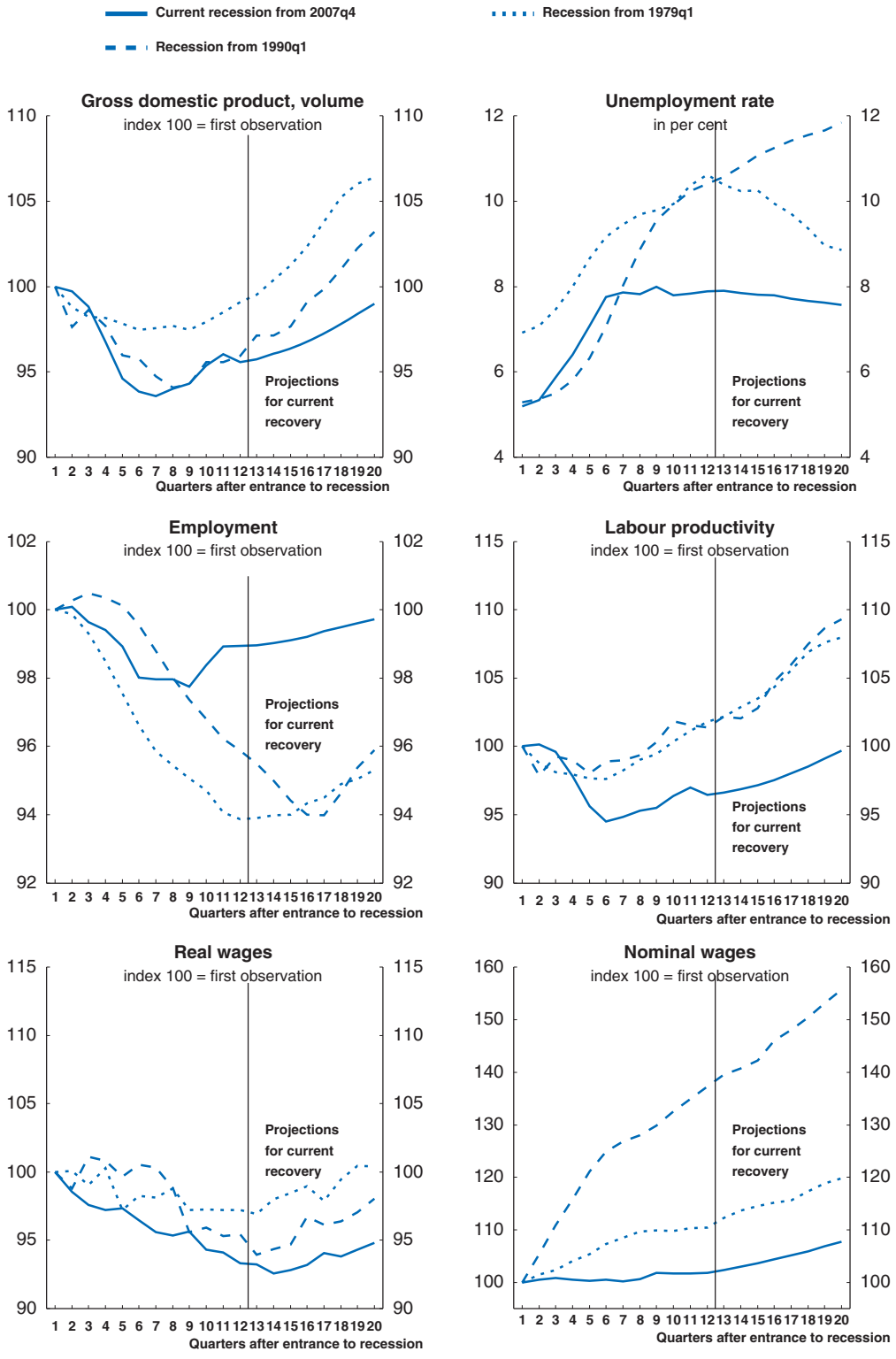
Employers' willingness to maintain employment levels has been supported by sharply falling real wages per person (Figure 1.3, panel 5) as average working hours decreased and real per hour wages fell. This has enabled firms to maintain profitability while shedding less labour than during previous recessions (Faccini and Hackworth, 2010). Nominal wages have increased less than in previous recessions (Figure 1.3, panel 6), but in comparison to the OECD area as a whole the large fall in real wages reflects higher inflation as well as nominal wage restraint.

Low-skilled workers and youth in the United Kingdom have been particularly hard hit during the recession, with falls in employment that significantly exceed the OECD average (OECD, 2010a). As discussed more thoroughly in Chapter 3, structural reforms to improve educational outcomes among disadvantaged youth are the most promising avenue for raising their employment rates. Such reforms take time to bear fruit, however, and need to be supported by an effective activation strategy. With pressure on the employment service likely to remain high, a continued focus on individuals that face a high risk of long-term unemployment is warranted.

Employment is set to improve more slowly than after previous recessions and in the overall OECD area. Falling public employment will hamper the labour market recovery, but in comparison to the aftermath of the recession in the early 1990s, projected cuts are more limited.[1] Subdued private demand and possibly more labour hoarding during the recession will also weigh on the recovery, but private sector employment growth is expected to compensate for the reduction in public sector jobs. Unemployment is expected to fall gradually. The output gap is projected to close only slowly during 2011-12, reflecting the sluggish recovery and resource utilisation will remain low until end-2012 (Figure 1.4, panel 1). The financial crisis and the ensuing recession have reduced potential output, but uncertainty about the permanent impact remains significant. The overall effect on the United Kingdom is estimated by the OECD to be slightly larger than for the average OECD country (Figure 1.4, panel 2). Different estimates of the output gap by end-2010 range from –2.7% to –4.4% of potential GDP.[2]

CPI inflation has remained above the Bank of England's (BoE) 2% target for most of the last three years (Figure 1.5, first panel). Before the recession, high levels of capacity utilisation pushed inflation up. Later, inflation was boosted by rising import prices due to the depreciation of sterling, higher energy prices and increases in the VAT rate (see Box 1.1). Inflation excluding

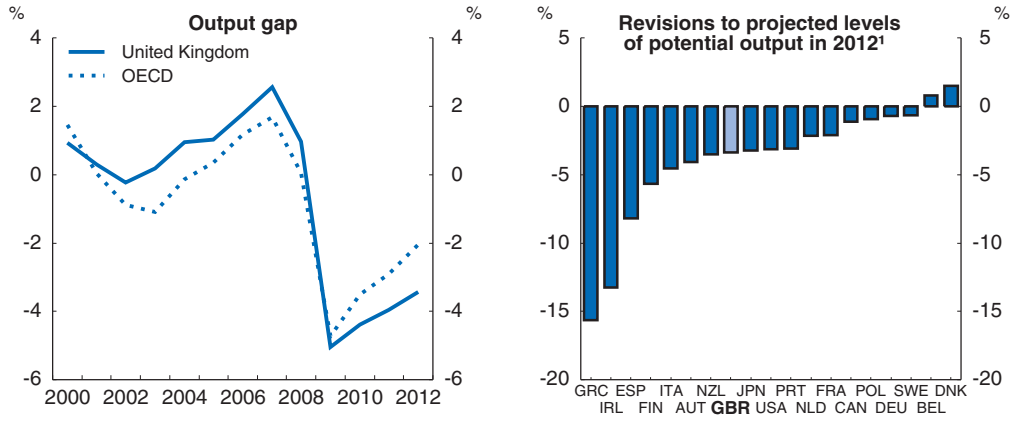
Figure 1.3. **Labour market development**



Source: OECD, *OECD Economic Outlook 88 database* and OECD calculations.

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Figure 1.4. **Output gap and potential output**

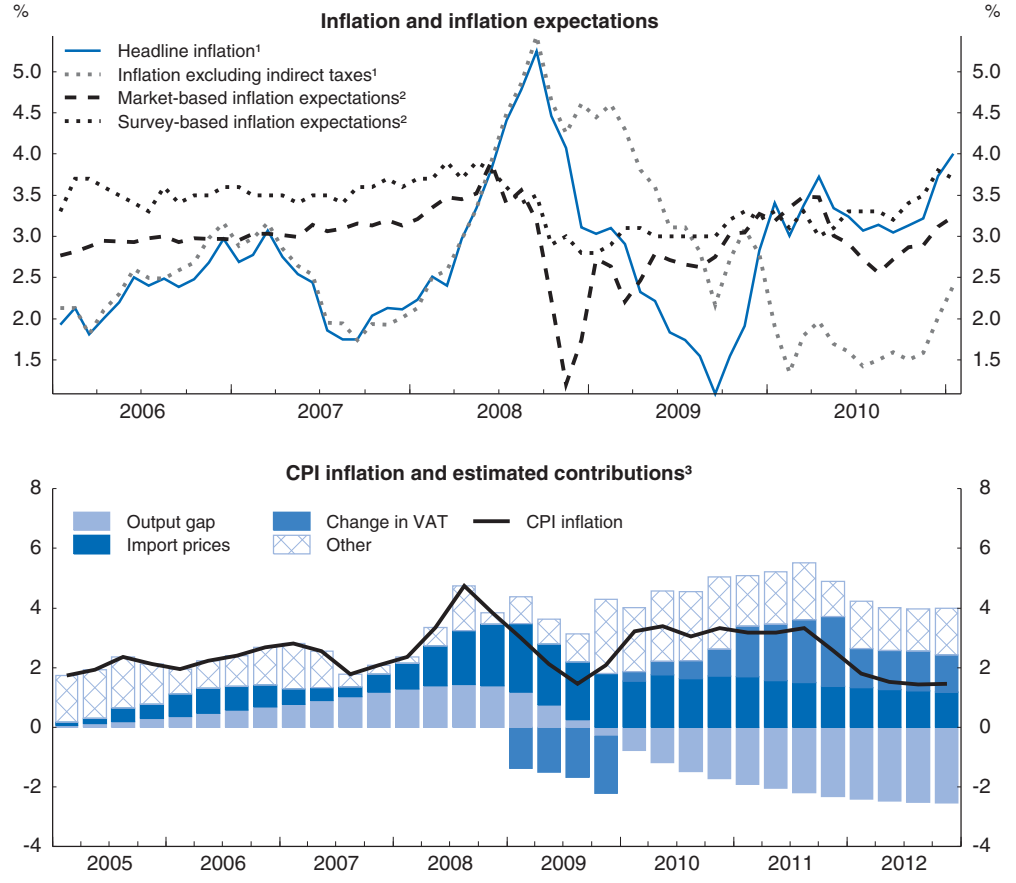


1. Differences in projected level of potential output in 2012 between *OECD Economic Outlook 88* and *OECD Economic Outlook 84*.

Source: OECD, *OECD Economic Outlook 84 and 88 databases*.

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Figure 1.5. **Inflation**



1. Year-on-year percentage change.
2. Implied by yield differentials between 10-year government benchmark bonds and inflation-indexed bonds and surveyed long-term (next 5-10 years) inflation expectations (YouGov Survey).
3. Projection and contributions based on model estimate in Box 1.1.

Source: OECD, *OECD Economic Outlook database*, Bank of England, Office for National Statistics and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376326

indirect taxes reached a trough in early 2010 and is now above 2% (Figure 1.5, first panel). The further rise in the headline VAT rate from 17.5% to 20% in January 2011 will boost headline inflation significantly in 2011 (Box 1.1 and Figure 1.5, second panel). Inflation will remain significantly above the target during 2011 but fall below it in 2012, as effects from import prices and VAT increases start to fade although the impact of the output gap still increases (Figure 1.5, second panel).

Significant global and domestic risks remain to the projection. Household consumption may be weaker than expected in response to sluggish growth in real incomes, a further fall in housing prices or faster-than-expected increases in interest rates. Exports may recover slower or faster, reflecting uncertainty about global demand and the longer term impact of the depreciation of sterling on exports. Furthermore, the ability of financial sector exports to recover their pre-crisis level is uncertain. Business investment may, on the other hand, recover more strongly than expected. Incoming data on inflation suggest that inflation may well be higher than projected, which is also supported by the analysis in Box 1.1.

Box 1.1. **The determinants of inflation in the United Kingdom**

This box estimates a Phillips curve model to assess the impact of economic slack – measured by the output gap – import price inflation and VAT rate changes on consumer price index (CPI) inflation. The estimation sample from 1986Q1 to 2010Q4 corresponds to a period of macro-economic policies oriented towards price stability, even though formal inflation targeting only started in 1997.[1] The following equation has been estimated by Ordinary Least Square:[2]

$$\pi = \underset{(1.8)}{0.91} + \underset{(1.2)}{0.10}\,\pi_{-1} + \underset{(1.2)}{0.10}\,\pi_{-2} + \underset{(2.2)}{0.16}\,\pi_{-3} + \underset{(4.6)}{0.33}\,\pi_{-4} + \underset{(3.9)}{0.25}\,GAP_{-1} + \underset{(3.2)}{0.07}\,\pi^{imp}_{t} - \underset{(-0.7)}{0.02}\,\pi^{imp}_{t-1} + \underset{(3.3)}{0.07}\,\pi^{imp}_{t-2} + \underset{(6.7)}{2.20}\,\Delta VAT_{t}$$

$R^2 = 0.81$; s = 1.39; DW = 1.91

(t values are reported in parentheses)

Where:

π = Quarter-on-quarter CPI inflation rate (annualised)

GAP = Output gap

π^{imp} = Quarter-on-quarter import price inflation

ΔVAT = Change in VAT

Lagged values of inflation, the output gap, import price inflation and VAT have a strong impact on CPI inflation. The sum of lagged values of CPI inflation is below one, which is consistent with the existence of an "anchor" for inflation rates.[3] A one point increase (decrease) in the output gap increases (decreases) annualised inflation by about 0.3% with a one quarter lag. A one point increase (decrease) in import prices adds (subtracts) nearly 0.2% to CPI inflation after four quarters. A one point VAT change generates a 2.2% change in annualised CPI inflation over the quarter in which it takes place.[4]

In the model, inflation is a function of the *level* of the output gap. Hence a negative output gap reduces inflation even if it is shrinking rapidly. An alternative hypothesis is that there are speed limits, *i.e.* that rapid growth pushes inflation up even when the economy is operating below capacity, potentially calling for earlier tightening of monetary policy during strong recoveries. This hypothesis has been tested by introducing *changes* in the output gap into the equation. No evidence of speed limits was found.

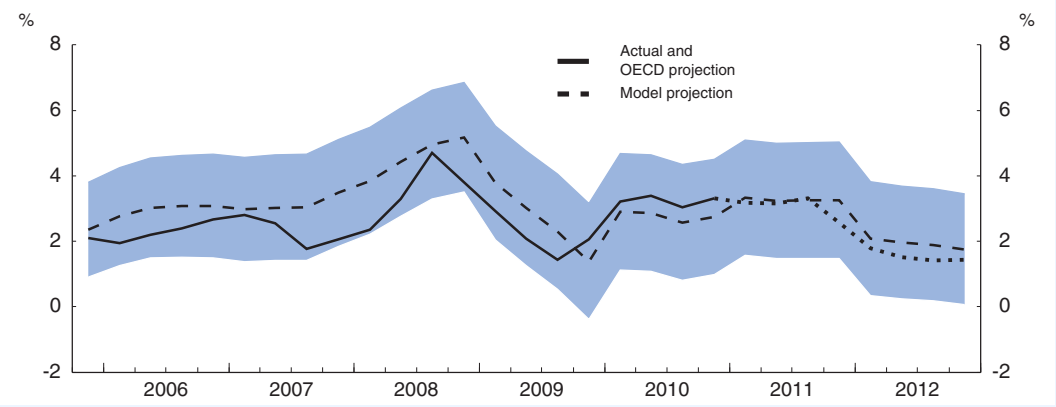
Box 1.1. **The determinants of inflation in the United Kingdom** *(cont.)*

Another possibility is that inflation responds less to negative output gaps than to positive ones, for instance because some prices could be more sticky downwards than upwards. When the output gap variable is replaced by two variables, respectively for negative and positive gaps, the coefficient associated with the positive gap (0.38) is higher than the one of the negative gap (0.15), but the difference is not statistically significant.

A dynamic simulation of the model from 2005Q1 tracks evolutions in CPI inflation reasonably well (Figure 1.6). The simulation produces year-on-year inflation rates close to 3% through 2010, only slightly below the actual outcome. For the period 2010Q4 to 2012Q4, the model has been simulated using OECD projections for exogenous variables. The VAT increase in 2011Q1 pushes year-on-year inflation to above 3% where it remains until the end of the year, before falling back below 2% in 2012.

Figure 1.6. **Phillips curve dynamic inflation projection**[1]

Year-on-year percentage change



1. Model projections are generated by dynamic simulation from 2005Q1. The shaded area shows the 68% confidence interval (corresponding to a one standard deviation from the central estimate).

Source: OECD, *OECD Economic Outlook database* and OECD calculations.

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The Phillips curve model shows that temporary factors broadly explain recent overshoots in CPI inflation despite a sizeable negative output gap. The analysis suggests that once the effect of the 2011 VAT hike dissipates, inflation will move back towards the 2% target. Nevertheless, there are a few caveats to bear in mind. First, estimates of the output gap are very uncertain. If the slack in the economy is over-estimated, inflationary pressures might prove stronger than expected. Second, the recent downturn is exceptional over the estimation period, which could lead the reaction of inflation to the output gap to differ from historical norms. Finally, the estimation period is one of well-anchored inflation expectations. If expectations were to increase significantly as a result of repeated overshooting of the inflation target, inflation dynamics could be altered and inflation could remain higher than the model suggests.

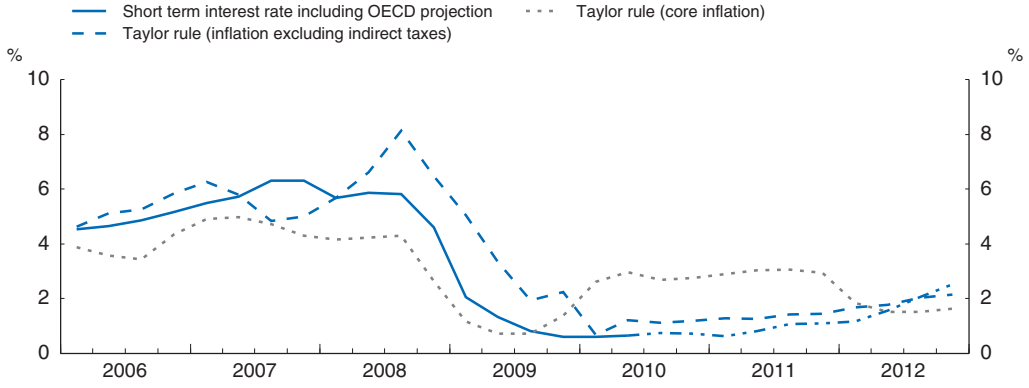
1. Restricting the estimation to the post-1997 period would have implied a too short sample to get robust results. This is also the reason for having CPI rather than core inflation – for which data are only available from 1997 – as the endogenous variable.
2. Seasonal dummies were also included. The number of lags was determined using the Akaike and Schwarz information criteria.
3. The implied anchor is 2.9%, somewhat higher than the 2% BoE target, mainly because the estimation period starts in 1986, while inflation targeting only started in 1997.
4. These estimates are close to those estimated by Dwyer *et al.* (2009).

Monetary policy should remain expansionary despite continued above target inflation

Monetary policy remains highly expansionary. Policy rates are close to zero, quantitative easing (QE) remains at £200 billion (14% of GDP) and liquidity schemes are still in place. This is appropriate as fiscal contraction, lingering credit constraints and private sector retrenchment will continue to create significant headwinds. While core inflation, which includes the effects of the VAT increases, would warrant higher interest rates, policy rates seem reasonably aligned with inflation excluding indirect taxes (Figure 1.7). From this perspective, policy rates should increase only slowly from mid-2011 onwards provided inflation expectations do not drift too far from the target. Once policy rates have risen from their current low level, leaving room for downward adjustment if needed, QE should be withdrawn in an orderly fashion.

Figure 1.7. **Taylor rule interest rates and forecast for the United Kingdom**[1]

Year-on-year percentage change



1. The Taylor rule interest rate (i) is calculated as: i = inflation + equilibrium real interest rate + 0.5 * (inflation – inflation target) + 0.5 * output gap.

Source: OECD, *OECD Economic Outlook database* and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376364

The persistent overshooting of the inflation target raises concerns however, as it may feed into inflation expectations. Inflation has been above the BoE's target for most of the last four years and has also overshot forecasts repeatedly. The Monetary Policy Committee (MPC) has attributed forecast errors to misjudging the impact of exchange rate, higher energy prices and VAT rate changes (Bank of England, 2010b). Some measures of inflation expectations are also elevated (Figure 1.5, first panel), but there is no evidence so far of expectations feeding in to unsustainable wage increases. The BoE will, however, need to react if inflation expectations rise considerably or feed through to significant wage increases. In such a situation, policy tightening may need to proceed at a faster pace than projected.

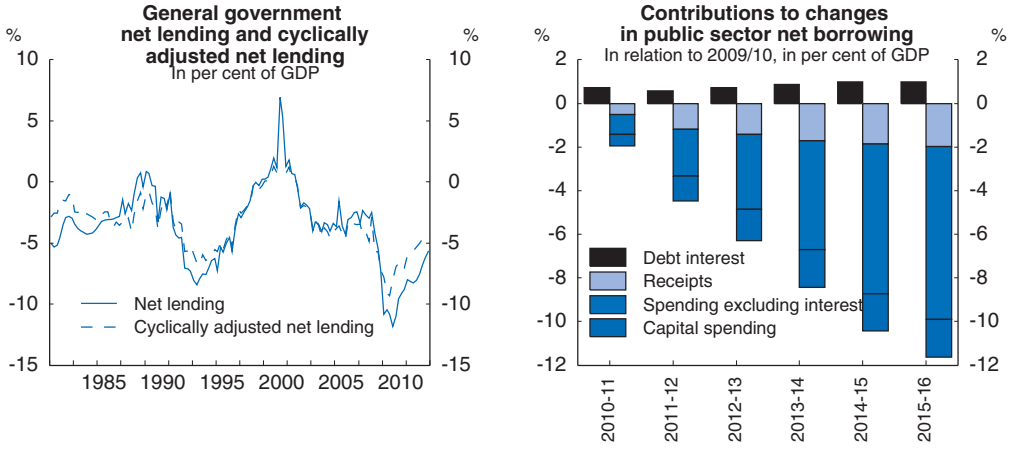
The fiscal outlook has turned the corner but significant challenges remain

The fiscal position was weak coming into the recession and worsened sharply thereafter. Automatic stabilisers, fiscal stimulus and sharply contracting revenue-rich sectors, such as financial services and housing, expanded the fiscal deficit, measured as general government net lending, to almost 11% of GDP in 2009 (Figure 1.8, first panel). The

fiscal situation started to improve in 2010, as temporary support measures ended, initial steps towards fiscal consolidation were taken and growth resumed. The government that took office in May 2010 announced that the planned pace of consolidation inherited from the previous one was insufficient to achieve stable public finances and ensure trust in the fiscal position. It has therefore enacted:

- Additional savings amounting to 0.4% of GDP to be achieved during budget year 2010/11.
- A new fiscal mandate supported by a supplementary debt target, to supersede the previous framework (See Box 1.2).
- An Office for Budget Responsibility (OBR) with the responsibility for macroeconomic and fiscal forecasts for the government and to evaluate if the government had more than a 50% chance to reach its fiscal targets under current policies.
- An emergency budget in June 2010 to accelerate deficit reduction over the medium-term and achieve the fiscal mandate and supplementary debt target.

Figure 1.8. **Fiscal outlook and consolidation**



Source: OECD, *OECD Economic Outlook 88 database* and Office for Budget Responsibility (2010).

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The emergency budget outlined further consolidation measures, focusing mostly on spending. Spending Review 2010 set out how the expenditure cuts will be delivered, supporting the credibility of the Government's fiscal plans (HM Treasury, 2010a). Fiscal consolidation, measured as the change in cyclically-adjusted net borrowing, of about 8.5% of GDP is planned between 2009/10 and 2015/16 (OBR, 2010). Public sector net borrowing is expected to fall by more than 10% of GDP during the same period, mostly due to a sharp decline in current expenditure as a share of GDP (Figure 1.8, second panel), tax increases and lower public investment. Public sector net debt is predicted to peak in 2013/14 at just below 70% of GDP. According to the OBR, the government has a more than 50% chance of achieving its fiscal targets on current policies at the announced target date of 2015/16. In order to ensure the fiscal position is able to withstand moderate economic shocks or deterioration, the government has set its plans to achieve its fiscal targets one year early in 2014/15. While fiscal risks remain, the consolidation programme is designed to ensure that sovereign debt risk will not rise and debt stabilises.

Overall fiscal plans are sound but stronger focus on growth and efficiency should be sought

Although fiscal consolidation will slow growth in the short run as demand is withdrawn, it is unlikely to derail the recovery and indeed could support growth in the long run. The greater reliance on tax increases initially and gradual cuts in public consumption make the negative growth effects somewhat back-loaded, which is welcome. Past experience suggests that budget consolidation concentrated on spending cuts rather than revenue increases is more likely to result in durable retrenchment (See Box 1.2). There is evidence that the composition of fiscal consolidation is important for saving and growth, with spending based consolidation resulting in lower household saving and higher GDP growth (Briotti, 2005; OECD, 2007). A more expansionary monetary stance than what would otherwise have been the case will to some extent cushion the impact. Structural reforms to support growth, efficiency, employment and macroeconomic resilience would facilitate the necessary adjustment.

To garner popular support, fiscal consolidation has to be seen as fair. This means that all areas and groups should be expected to contribute (Henriksson, 2007). Analysis by the Treasury suggests that costs of consolidation, including the effects of public spending, are spread relatively evenly across income quintiles, with the top quintile contributing the most (HM Treasury, 2010a). However, the Institute for Fiscal Studies found the impact of welfare reforms to be regressive once additional policies are included and the horizon is extended to 2014/15 (IFS, 2010). The IFS was, however, unable to evaluate the progressivity of the complete consolidation package.

Fiscal consolidation should, as much as possible, also be pursued in ways that increase efficiency and support longer term growth. Efficiency-enhancing fiscal measures should be pursued, but need to be in line with existing profile of fiscal consolidation. Although the government has tried to focus public investment on projects with high economic returns, the large cuts in public investment are a risk to long-term growth. Channelling more resources to public investment would therefore be warranted, as long as projects offer a viable rate of return. Health spending has been "ring-fenced" in the consolidation programme. An ageing and growing population will contribute to rising demand for health care and the OBR (2010) estimates that ageing will contribute to increases in health care costs equivalent to 0.7% of GDP between 2009-10 and 2019-20. However, calculations by the OECD suggest that efficiency gains equivalent to 3.7% of GDP could be reached in the UK health sector, meaning that efficiency gains in health provision could provide room for funding increasing ageing costs, while bearing down on overall expenditures (OECD, 2010b). Structural reforms increasing competition in health care provision (as the government is implementing) and addressing high remunerations for General Practitioners (GPs) could raise efficiency.

The efficiency of the tax system should also be increased as recently suggested in the Mirrlees Review (Mirrlees *et al.*, 2010). The VAT system in the United Kingdom is among the least efficient in the OECD, due to widespread reduced and zero rates (Figure 1.9). As discussed in Chapter 4, this not only distort consumption and increases compliance and administration costs, but also makes climate change policies less cost-effective due to the lower rate on heating fuel. The distortions in the VAT system have risen further with the hike in the headline VAT rate from 17.5% to 20% in January 2011, which was not matched by increases in reduced rates. A broader based VAT would be desirable. Reforms to the VAT could be undertaken as a part of a wider package, and may need to be accompanied by

Box 1.2. **UK fiscal policy and targets**

The *Code of Fiscal Stability* which was given legal status in 1998 set out five principles for the operation of fiscal policy: transparency, stability, responsibility, fairness and efficiency. The Code required the government to explicitly set out its fiscal objectives and how they should be operationalised (OECD, 2009). To fulfill these requirements, the government set out two operating rules: the golden rule allowed the government to borrow only to cover net investment over the cycle, while the sustainable investment rule required that the level of net public debt should be below 40% of GDP to ensure intergenerational fairness and trust in the fiscal position. However, even though these rules were deemed to have been met over the 1997-2006 cycle, public finances proved weak when the recession hit. The fiscal rules were suspended at end-2008 and replaced by a temporary operating rule to "improve the cyclically-adjusted budget each year, once the economy emerges from the downturn, so it reaches balance and debt is falling as a proportion of GDP once the global shocks have worked their way through the economy in full". The previous government legislated the Fiscal Responsibility Act (2010), which set targets to reduce the deficit as a share of GDP in each year to 2015/16, to halve the deficit by 2013/14, and to set debt as a share of GDP on a downwards path by 2015/16.

The current government replaced the temporary rule by a fiscal mandate to balance the cyclically-adjusted current balance by the end of a five-year rolling horizon. In addition, a supplementary target was introduced stating that "public sector net debt as a percentage of GDP to be falling at a fixed date of 2015/16". Taken together, these targets are significantly more ambitious than those announced by the previous government. Fiscal frameworks need to be tailored to the specific needs of different countries. While frameworks are no substitute for political determination to deal with deficits and debt, they can support sound fiscal policy. The previous *Survey* discussed different options for reformulated fiscal rules in detail. Specific points to highlight are:

- Independent fiscal authorities can support sound public finances by providing unbiased assessments of the economic and fiscal outlook, evaluate whether government policies are in line with set targets and provide analysis to a wider audience. Fiscal authorities come in different shapes and fulfill different roles across OECD countries reflecting diverging policy needs (Hagemann, 2011). The remit of the OBR is to provide macroeconomic and fiscal forecasts and *ex ante* evaluations of whether current policies are in line with the fiscal mandate. This accurately reflects the forward-looking UK mandate and the evidence that fiscal projections were too optimistic in the years running up to the recession (See *e.g.* OECD, 2009).
- Expenditure rules (or more generally discretionary policy rules) can support strong public finances by mitigating time-inconsistency problems and restraining the use of windfall revenues for new spending (Anderson and Minarik, 2006). Such rules will however also restrict the ability of governments to pursue discretionary counter-cyclical policies. The track record of OECD countries to pursue such policies is poor, as many countries, including the United Kingdom, have executed pro-cyclical and deficit-biased policies over the last decades (Egert, 2010). Large and sustained deficits and rising debt levels in many OECD countries have also shifted policy priorities towards sustainable public finances rather than stabilising GDP, thus making more stringent frameworks more appropriate.
- Evidence suggests that a balanced budget rule in combination with an expenditure rule supports fiscal consolidation (Guichard *et al.*, 2007). Actual deficit rules have the advantage of being easy to communicate and evaluate, but tend to make fiscal policy pro-cyclical. Rules focusing on the balance "over the cycle" or the cyclically adjusted balance provide more room for counter-cyclical policies but have proven difficult to evaluate. This suggests a trade-off where fiscally more constrained countries may opt for "harder" rules, while less constrained countries have more leeway for rules that leave room for more discretionary policies. The evaluation issue can at least partly be addressed by independent evaluation of a fiscal authority.

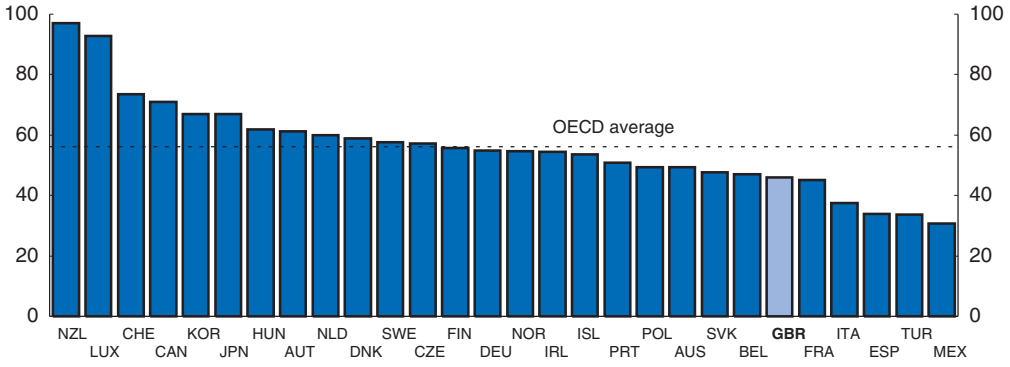
Box 1.2. **UK fiscal policy and targets** *(cont.)*

- Any medium-term fiscal target, whether set in terms of deficit or debt level, should be anchored in long-term sustainability analysis for public finances. This would ensure that due concerns are given to the intergenerational distribution of taxes and spending. More specifically off-balance sheet liabilities, including public sector pension liabilities and future Private Finance Initiative contract payments as well as the proposed Green Investment Bank (see Chapter 4), should be valued fairly and regularly and preferably be brought onto the balance sheet or at a minimum score on fiscal sustainability.

targeted support for the most exposed groups in order to gain public acceptance. As discussed in Chapter 2, there are also strong reasons to reform taxation of housing. Moving to a system where taxes more accurately reflect the value of properties would improve efficiency and help to stabilise house prices over the longer term.

Figure 1.9. **Effectiveness**[1] **of value added taxes**

Per cent, 2009[2]



1. Defined as the effective VAT rate as a per cent of the standard statutory rate, where the effective rate is VAT revenues divided by the potential VAT base (*i.e.* consumption minus VAT).
2. Or latest available year.

Source: OECD, *National Accounts, Revenue Statistics and Tax databases*, December 2010 and OECD calculations.

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Retirement reforms can play an important role in addressing fiscal sustainability. They lower pension costs and raise the level of future output without having an adverse effect on demand in the short run. Like other OECD countries, the United Kingdom faces rising ageing-related spending over the next 15 years (OECD, 2010c). Employment rates among 65 to 74-year-olds are also significantly lower in the United Kingdom than in the average OECD country. Additional increases in the effective retirement age could therefore be warranted, for example by increasing the State pension age further. The government has announced that the rise in the state pension age to 66 years will be brought forward to 2020, which is welcome. An automatic adjustment of the state pension age in line with longevity should be considered.

Understanding the weaknesses of previous fiscal rules could help create a robust framework

The United Kingdom's previous fiscal rules failed to avert a deterioration in its structural fiscal position (Box 1.2). In 2008 the sustainable investment rule and the golden rule were deemed to have been met for the cycle that ended in 2006. Concerns were raised at the time when the dating of the cycle was adjusted and OECD estimates points to a different dating of the cycle (Figure 1.4). In any case, the framework was unable to prevent a substantial worsening of the deficit and the debt level as the cycle reached its zenith, illustrating a major drawback of backward-looking rules (Emmerson, 2008). The vulnerable position forced the government to suspend the framework end-2008 when the recession hit and replace it with a temporary rule with few constraints on fiscal policy. Furthermore, it remains unclear to what extent the golden rule actually has shielded investment from cuts over the cycle. Although public investment has risen significantly during the last few years, fiscal plans by the previous and current government see them falling back during the next few years. A problem with the sustainable investment and the golden rules was the dependence of evaluation on non-observable data, the output gap, to date the cycle. This became particularly problematic as estimates of the output gap were provided by the government rather than by an independent agency.

In June 2010 the current government introduced a fiscal mandate to balance the cyclically-adjusted current balance by the end of a five-year rolling horizon. The mandate is focused on the current budget, which allows for investment expenditure to be financed out of borrowing. In addition, a supplementary target was introduced stating that "public sector net debt as a percentage of GDP to be falling at a fixed date of 2015/16". Taken together, these targets are significantly more ambitious than those announced by the previous government, and the balanced structural current budget target is now projected to be reached in 2014/15, *i.e.* one year ahead of the mandate on current policies (OBR, 2010).

The mandate fills a useful role in the consolidation process by setting an ambitious target while allowing automatic stabilisers to work fully. A medium-term target based on cyclically-adjusted balance is, however, less transparent than a target for the actual balance and is dependent on judgements on the output gap. The fact that estimates of output gaps, fiscal forecasts and judgements on the likelihood of current policies to achieve the mandate are made independently by the OBR mitigates this concern, but does not solve technical difficulties involved. Like all forward-looking rules, the framework could be vulnerable to back-loaded consolidation, whereby governments systematically follow lax fiscal policies but promise future prudence. The government's current fiscal plan which entails front-loaded consolidation is therefore reassuring.

It would be useful to start planning already for a permanent fiscal framework to replace the mandate in 2015/16 when the public finances are closer to balance. A future permanent medium-term framework might best ensure constraints on a shorter horizon than five years, as already suggested by the government. As discussed further below, it would be useful to consider maintaining the current rolling five-year horizon to cover the maximum length of a Parliament.

A supplementary debt target or ceiling should also be considered in a permanent fiscal framework both to enhance credibility of fiscal policy given the potential risks of back-loaded fiscal tightening, but also as debt is an important objective in its own right. Debt targets have a stronger relationship with long term fiscal outcomes, such as fiscal

sustainability, and impose stronger restrictions on fiscal policy than deficit targets. They can therefore underpin fiscal credibility more effectively. At the same time, levels of debt may be easier to manipulate through off-balance sheet transactions and can be more vulnerable to external shocks (such as bailing out banks). A debt target should be set to align the fiscal framework to sustainability (Box 1.2).

The current supplementary target of a falling debt to GDP ratio in 2015/16 seems less useful in achieving fiscal credibility. As long as the government fulfils its fiscal balance target, the debt target can only bind if the economy is in a recession that particular year. This, however, implies a pro-cyclical fiscal policy would have to be implemented to reach the supplementary target, which may lead to less useful stabilisation policies without significantly improving overall credibility.

Empirical evidence suggests that expenditure rules can be a particularly useful tool in fiscal frameworks (Box 1.2). While the Spending Review framework in the United Kingdom since 1998 provides some features of an expenditure rule, it is not as stringent as in some other OECD countries. Firstly, the Spending Review framework does not require an incoming government to set spending limits for the full parliamentary period, although the current government decided to do that in the 2010 Spending Review. The three-year Spending Review cycle is fairly short and means that limits may need to be set in the middle of an election cycle. Requiring an incoming government to set overall spending limits for a full Parliament would be useful and in line with spending frameworks used, for example, in Finland and the Netherlands. Issues of contingency margins and spending caps for different departments under such a framework would have to be addressed.

Secondly, it could be useful to consider reforming expenditure control, introducing, for example, a rolling five-year expenditure ceiling that reaches across parliamentary periods, as is currently the case in Sweden. This would force the government in office to clearly articulate what spending plans it has for the next mandate period and ensure that these plans are consistent with the overall fiscal framework through the OBR's evaluation process. These plans could also form a baseline for the opposition's budgetary plans, improving access to information for the general public on the details of alternative plans. The run-up to the 2010 election is a case in point here, where the timing of the Spending Review just after the election meant that no information on detailed spending plans was available beyond 2010/11. Obviously, such ceilings should not be legally binding for any incoming government.

Thirdly, departmental spending limits only apply to a relatively small share of totally managed expenditures (50% in 2009/10). While there are sound reasons for excluding highly cyclical spending, such as unemployment benefits, there is scope to include further budget lines under a ceiling. In the Netherlands spending ceilings include all central government spending, even unemployment benefits. Sweden has a nominal spending ceiling that encompasses all central governments' spending except interest on government debt. It should be noted though that local government spending is not included under the Dutch and Swedish frameworks.

The establishment of the OBR has been a welcome reform to the government's fiscal framework and is an important development for strengthening the budget process and improving public confidence in the government's fiscal policy. By setting up the independent OBR with the remit of producing official macroeconomic and fiscal forecasts, the government has sought to address past problems of over-optimistic forecasts. Over-

optimistic macroeconomic forecasts have been one driver behind fiscal indiscipline across OECD countries. Although there is little evidence that official GDP forecasts have been unduly optimistic in the United Kingdom overall, this was clearly the case for fiscal forecasts before the recession (OECD, 2009). Other problems specific to the UK framework have been dating of the cycle and evaluation of compliance with set targets. These are partly addressed by giving the OBR the responsibility for estimating the output gap and evaluating whether policies are in line with set targets.

The OBR is headed by a Budget Responsibility Committee and has a staff of roughly 15. Given the current division of labour, the OBR is adequately staffed. Its responsibility in making forecasts and evaluating the consistency of current policies with targets makes it clearly involved in the budget process. On one hand, the OBR's analytical work feeds into policy making. On the other hand, the OBR needs to have access to policy costing of proposed reforms to be able to incorporate them into its forecasts and evaluations. In the current setting, the Treasury and other government departments provide the policy costing and the OBR then judges whether it finds them reasonable or if it needs further information in order to include them in its forecast. This means that the OBR needs the capacity to understand and evaluate the quality of the costing but does not need the resources to perform them. An alternative would be for the OBR to do policy costing of its own, which would require a much larger staff and significant overlap with government departments. If the remit was to be widened or the OBR were to take a more active role in policy costing, additional resources would be needed.

Structural reforms should support growth and rebalancing

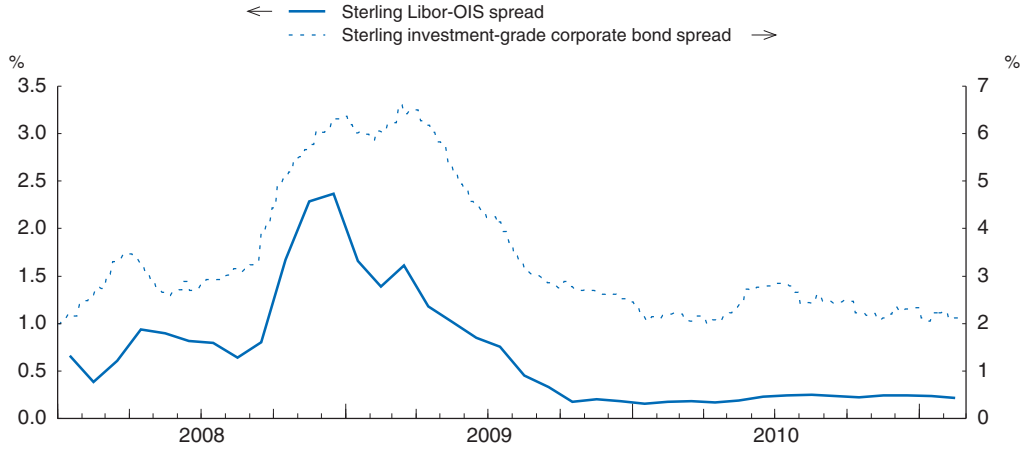
The processes of deleveraging and rebalancing will generate significant changes in the structure of employment and production over the next few years. The required fiscal consolidation implies that private sector activity will need to lead the recovery. This will be facilitated by pursuing structural reforms. The government is already taking forward a wide-ranging programme of reforms, including policies aimed at improving educational outcomes (Chapter 3) and the functioning of the housing market (Chapter 2).[3] Furthermore, the government is undertaking a Growth Review to identify policy reforms that will remove barriers and improve the conditions for business growth, including in the areas of planning, competition, trade and investment, regulation, access to finance and corporate governance.

Efficient labour market adjustment will play an important part in enabling private sector led growth. The government's objective is that the tax and benefit system should reward work and promote economic competitiveness. The June 2010 Budget raised income tax thresholds, lowered the corporation tax, and announced reforms to housing benefits. The government has also announced that it will introduce an integrated working-age credit to replace a plethora of in-work and out-of-work payments. This Universal Credit is intended to enhance work incentives by removing support at a consistent rate as people return to work and increase their earnings. The government is also reforming active labour market policies – the new Work Programme will be introduced in 2011 to offer personalised support to a range of people including long-term claimants of Jobseeker's Allowance and those receiving incapacity benefits. It will pay welfare providers partly through the benefit savings that they secure by supporting individuals to enter and stay in work.

The UK banking sector was severely affected by the crisis and further reforms are essential

The years that preceded the financial crisis were characterised by a rapid expansion in global finance, in which UK banks were particularly active. The size and leverage of banks' balance sheets and their reliance on large scale interbank funding from abroad increased spectacularly. A number of banks – Northern Rock, Bradford and Bingley, Alliance and Leicester and HBOS – used securitisation and interbank funding to finance very rapid growth (Turner, 2009). This contributed to the vulnerability of the UK financial system to the disruption in global financial markets following the collapse of the US subprime mortgage market. The drying up of securitisation and wholesale funding markets led to the failure of Northern Rock and Bradford and Bingley and to difficulties for several other banks.[4] Many banks suffered major losses, and the recession generated further credit problems, in particular in commercial real estate. The government and the Bank of England had to intervene on a massive scale to restore liquidity and support the supply of credit (for the detail of interventions, see OECD, 2009).

Figure 1.10. **Sterling spreads**

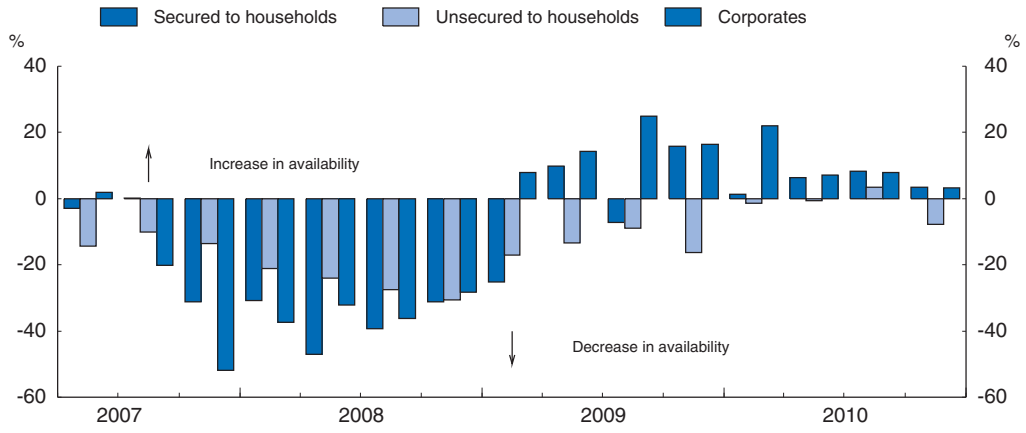


Source: Bank of England and Thomson Reuters Datastream.

Financial market conditions have been improving significantly since mid-2009, but challenges remain. Libor-Overnight Indexed Swap and corporate bond spreads have fallen considerably (Figure 1.10). The main UK banks have returned to profit, improved their capital and funding positions, and significantly reduced their leverage. Nevertheless, the financial system continues to benefit from public support. Banks continue to face several challenges, including the need to refinance substantial amounts of funding in the coming years and to strengthen capital and liquidity buffers. The uncertain economic outlook carries risks. Credit losses could increase, in particular in the commercial property sector, and banks need to be able to provide enough funding to support the economic recovery. Credit conditions have improved for large companies but remain tight for small businesses and households (Figure 1.11).

Figure 1.11. **Household and corporate credit availability**

Net percentage balance



Source: Bank of England Credit Conditions Survey.

StatLink http://dx.doi.org/10.1787/888932376421

The domestic financial regulatory and supervisory framework needs to be strengthened further

The financial crisis uncovered serious weaknesses in financial regulation and supervision, both nationally and internationally. The run on Northern Rock exposed a limited deposit insurance scheme. Up to 2007, only the first £2 000 of deposits at any one bank and 90% of the balance up to £35 000 were covered. The financial crisis also exposed serious liquidity risk management failures in the United Kingdom, as in many other countries. The Turner review, published in March 2009, provides a detailed analysis of the causes of the financial crisis and makes recommendations covering a wide range of issues to foster a stable and effective banking system. Many of these recommendations have been incorporated in international agreements (*e.g.* capital adequacy, leverage ratio, liquidity regulation), while others, such as links between commercial and investment banking or the introduction of loan-to-income or loan-to-value ratios on mortgages, are still being investigated. With a large and complex financial sector, the United Kingdom is a key player in the global financial system. Therefore the engagement of the UK authorities in efforts to build a sound international framework for financial regulation and supervision within the G20, the Financial Stability Board and the European Union is essential.

UK authorities have already taken significant steps to remedy a number of problems. Deposit insurance coverage has recently been extended to 100% of the first £85 000 (£170 000 for joint accounts) and, in any case, the government avoided depositor losses even above the ceiling. Prompt action was necessary to restore depositors' confidence. A new liquidity regime designed to protect customers, counterparties and other market participants from the consequences of imprudent liquidity risk management is being put in place. It sets out the principles of self-sufficiency – including for branches and subsidiaries of foreign banks – and adequacy of liquidity resources. Banks will need to hold buffers of high-quality government bonds and face enhanced reporting requirements. The new regime will discourage reliance on short-term wholesale funding, which proved so harmful in recent years. The United Kingdom moved ahead of international legislation in

this area, which is appropriate, though amendments to the new regime to reflect international standards might be required at a later stage (FSA, 2009).

The Banking Act 2009 sets up a special resolution regime (SRR) for deposit-taking institutions. A SRR is needed to ensure an orderly wind-up of failing banks. The absence of such a regime in the United Kingdom proved problematic when some institutions, notably Northern Rock, faced severe difficulties and the authorities had to rely on emergency measures. The SRR allows the financial authorities to transfer ownership of parts of a failing bank to a private purchaser, a bridge bank or the public sector. The SRR should help the orderly unwinding of small and medium-sized banks, ensuring the continuity of banking activity and protecting taxpayers and depositors' interests (for more details see OECD, 2009). Further mechanisms, especially at the international level, will be needed to deal with the failure of large cross-border institutions.

A new regulatory framework is being implemented to replace the tripartite system introduced between 1997 and 2000 (HM Treasury, 2010b).[5] As in many countries, existing frameworks failed to identify the problems that were building up in the financial system and to deal adequately with the crisis when it erupted. A key objective of the new system is to give a single institution – the Bank of England (BoE) – a clear mandate to monitor risks in the financial system as a whole, and to give it instruments to ensure financial stability. The main features of the regulatory framework are:

- A Financial Policy Committee (FPC) in charge of macro-prudential regulation will be established within the BoE with the majority of members from the BoE.
- A Prudential Regulation Authority (PRA) will be in charge of micro-prudential regulation. To ensure effective co-ordination between macro and micro-prudential regulation, the PRA will also be part of the BoE (headed by the newly created Deputy Governor for prudential regulation).
- Financial Conduct Authority (FCA) will regulate conduct in financial services and markets. This function is separated from prudential regulation as it requires different approaches and cultures. It is now recognised that "even highly competitive markets and extensive information disclosure are insufficient to protect consumer interests" (Turner, 2010).

The new regulatory framework sets clearer objectives for and reinforces accountability of regulatory bodies. It also improves the synergies, consistency and coherence of the regulatory system. The BoE will have a clear responsibility to monitor the financial system as a whole and to identify risks to financial stability with control over macro and micro-prudential instruments to deliver stability. Cross-membership of the FPC and the Monetary Policy Committee (MPC) is designed to promote consistency between financial stability and monetary policy. An inevitable consequence of the proposed institutional arrangement is the concentration of power with the BoE. The risks associated with such a concentration will be mitigated by the presence of external members on the FPC. Still, the bank will need to be as transparent as possible on financial regulation, and it will be critical to ensure effective co-ordination between the BoE and other authorities, including the FCA, the Treasury and supra-national entities.

International agreements are addressing some of the weaknesses

Constructive engagement at the international and European levels is essential to ensure a level playing field in terms of competition and minimise the risk of regulatory arbitrage. Proposals for financial reform at an international level, reflecting the G20 commitment to improve financial stability, are included in the Basel III agreement and several European Commission initiatives (Box 1.3).

Box 1.3. **Basel III and new European initiatives**

The Basel III framework

The Basel Committee of Banking Supervision agreed in September 2010 on a package of reforms to strengthen capital and liquidity standards, generally referred to as "Basel III". The main points are (BIS, 2010):

- Banks' capital requirements are tightened (Pillar 1). The minimum common equity will rise from the current 2% to 4.5%, and its stricter definition will further increase the capital requirement. With the new definition, the previous minimum would be close to 1% (Cecchetti, 2010). The new regulatory capital framework also widens the range of exposures covered, in particular to risks linked to complex trading and derivatives. The minimum common equity requirement is supplemented by a capital conservation buffer of 2.5%, which should impose constraints on dividend and bonus payments when common equity capital falls below 7%. An additional 2.5% counter-cyclical buffer needs to be built up during periods of excessive credit growth.
- Systemically important financial institutions (SIFIs) should have loss absorbing capacity beyond the minimum standards described above. The Basel committee and the Financial Stability Board are examining possible measures in that area, including a capital surcharge for SIFIs, contingent capital and bail-in debt.
- An internationally harmonised leverage ratio of 3% is introduced as a backstop to the risk-based capital requirements.
- Minimum standards for liquidity risk are established. The liquidity coverage ratio aims at ensuring that banks always have a 30-day cover in high quality liquid assets – *e.g.* cash, central bank reserves, government debt in the currency of the country of operation – for emergency situations. The net stable funding ratio monitors banks' asset and liability matching structure to ensure stable funding over a one-year horizon.
- Enhanced standards for bank supervision address weaknesses in risk management, including corporate governance, compensation practices and stress testing (Pillar 2). Greater public disclosure of risk exposures and regulatory capital bases should strengthen market discipline (Pillar 3).

European Union initiatives[*]

Basel III is translated into European legislation via the Capital Requirements Directive (CRD) *and it is important that there is no weakening of standards in the EU's implementation*. The European Union has taken further initiatives to enhance the European supervisory architecture and crisis resolution mechanisms to be adopted by the end of 2011, and implemented by the end of 2012. The main measures are:

- In the acute phase of the financial crisis in March 2009, the European Commission (EC) took emergency measures to maintain depositors' confidence by increasing the coverage from €20 000 to €100 000 by the end of 2010. A thorough revision of the Directive on Deposit Guarantee Schemes (DGSs) was initiated in July 2010 to harmonise and simplify DGSs, ensure a faster payout and upgrade the funding of schemes.

Box 1.3. **Basel III and new European initiatives** *(cont.)*

- A new European framework for financial supervision has been designed. A European Systemic Risk Board (ESRB) will be in charge of macro-prudential supervision and issuing system-wide risk warnings and recommendations. Three new European Supervisory Authorities (ESAs) for Banking (EBA), insurance and pensions (EIOPA) and securities and markets (ESMA) will oversee regulation of individual entities.
- A framework for crisis management was set out in October 2010 paving the way for legislation due by spring 2011. It consists of preparatory and preventative measures (recovery plans and living wills), supervisors' powers to take early action to remedy problems before they become severe *(e.g.* powers to require the replacement of management, trigger a recovery plan or divest excessively risky activities) and resolution tools *(e.g.* powers to prompt the takeover of a failing bank by a sound institution or a bridge bank). The EC is also proposing the creation of national resolution funds financed by contributions from the banking sector, which should be harmonised as much as possible across countries to avoid competitive distortions.
- Other important measures include enhanced regulation of credit rating agencies and derivatives markets, strengthening of consumer protection and recommendations on remuneration principles.

* For more details, see OECD (2010d).

Implementation issues and further reforms

Implementation of the new standards is essential

Reforms will be phased in over several years and their successful implementation will be challenging for regulators. It is important that the momentum for financial reform be maintained as memories of the crisis will fade and lobbying from the financial sector will try to loosen regulations. Market participants often argue that strict regulation will harm the competitive position of London as an international financial centre. However, the stability of the financial system and the reliability of counterparties are also essential to the competitiveness of a financial centre (FSA, 2009). The authorities will also need to monitor the behaviour of market players to ensure that they are not circumventing regulations through financial innovations or shifting activity to unregulated areas, as happened on a wide scale before the crisis. Finally, effective co-ordination between new institutional structures, both at the national level and with European institutions will be needed.

Macro-prudential regulation is now recognised as essential to counter systemic risks. However, macro-prudential policy instruments remain to be defined. There is a difficult trade-off between rules and discretion in this area. Rules bring credibility and transparency and limit the scope for lobbying, but discretion allows more flexibility in a sector characterised by rapid innovation. Systemic risk mainly results from over-optimism of economic agents during expansions and the underestimation by banks of spill-over effects (BoE, 2009). The pro-cyclicality of the financial system could be mitigated by dynamic provisioning, where estimated future losses depend on past losses evaluated over a whole business cycle, as in Spain since 2000, and indeed, Basel III introduces a counter-cyclical capital buffer to dampen the credit cycle, although the trigger remains at the discretion of national authorities. A number of potential indicators for capital surcharge have been identified by the BoE, including credit flows and stocks, spreads, asset prices and credit

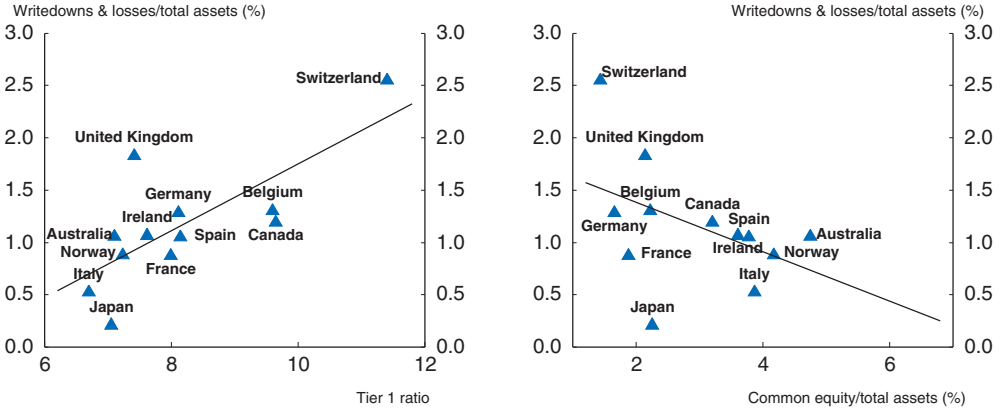
conditions (BoE, 2009).[6] Another issue is whether capital surcharges should apply to banks' headline capital requirements or be targeted at the most risky categories of lending, as a constraint on overall capital might lead banks to reduce less lucrative low-risk lending, rather than high-return high-risk loans.

Product regulation could also play a role in curbing risky lending and unaffordable borrowing. Before the crisis, the FSA relied on disclosure of information and market discipline to avoid unsustainable credit developments. However, loan-to-value ratios are now being considered, along with other macro-prudential tools, for use by the Government's proposed Financial Policy Committee.

Capital standards are not enough

The increase in capital requirements in Basel III is an important step towards strengthening the financial system, but additional measures will be needed to prevent future crises (King, 2010). Risk-based weights are assessed according to past experience, although risks are likely to change over time. For example, in Basel II mortgages attracted low capital requirements, as they had been historically fairly safe loans. But the loosening of underwriting standards, especially in the United States, changed the picture dramatically. Furthermore, capital adequacy ratios based on risk-weighted assets have promoted capital arbitrage, allowing banks to reduce risk-weighted assets using off-balance sheet vehicles and derivatives, increasing leverage and risk-taking (Blundell-Wignall *et al.*, 2009). Indeed, in recent years, bank write-downs and losses have been positively correlated with tier 1 capital adequacy ratios (Figure 1.12).

Figure 1.12. **Capital adequacy and leverage vs. losses**[1]



1. Calculations based on the sample of banks reporting write-downs and credit losses as reported by Bloomberg, excluding US banks. Write-downs and losses are accumulated from January 2007 until mid-2009; Tier 1 ratios, total assets and common equity are averages of 2006-2008 end-of-year data (2007-2008 for Japan Tier 1 ratio).

Source: OECD calculations (See Blundell-Wignall *et al.*, 2009).

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Limiting leverage should be a priority. Leverage ratios (ratio of common equity to total un-weighted assets), contrary to risk-weighted capital adequacy ratios, are negatively correlated with write-downs and losses. Basel III introduces a leverage ratio as a backstop to the risk-based capital requirements. However, given the banks' ability to arbitrage capital weights to reduce capital requirements, the leverage ratio should be a primary

capital control tool (Blundell-Wignall and Atkinson, 2010). Regulators should also make sure that it covers all relevant assets, including off-balance sheet exposures.

Financial authorities need to minimise regulatory arbitrage. "Shadow banking" has played a prominent role in the global financial system in recent years. Investment banks, structured investment vehicles (SIV) and money market mutual funds carried out activities typically associated with banking – liquidity services, maturity transformation and leverage (Tucker, 2010). They were not subject to the same regulations as banks, in particular in terms of capital requirements and could take greater risks. The shadow banking system is also deeply interconnected with traditional banks, which often used shadow banking to circumvent prudential regulations. Reinforced regulation of shadow banking institutions may be warranted in some cases – *e.g.* consolidating bank sponsored SIVs on balance sheets. Regulators should in any case require maximum disclosure of traditional banks' exposures to non-bank financial institutions/products. This is essential to monitor systemic risks, especially as financial innovation can be used to find ways around regulations. The Turner review makes useful recommendations in that respect: the regulatory and supervisory coverage should follow the principle of economic substance and not legal form; the authorities should be able to gather information on all significant unregulated institutions to assess system-wide risks; offshore financial centres should be covered by international agreements on regulatory standards.

The "too-big-to-fail" problem needs to be addressed

One critical problem in today's financial system is the existence of institutions whose failure would have such catastrophic financial and economic consequences that they cannot be allowed to fail and therefore benefit from an implicit state guarantee. Many of these institutions engage in investment banking as well as commercial banking.[7] This creates moral hazard and affects the competitive structure in the sector, leading to further concentration and thus larger moral hazard problems. Several instruments can be used to encourage commercial banks to take less risk. One example is the levy applied to banks' balance sheets since 1 January 2011. Another possibility is to raise capital requirements substantially for systemically important banks, as proposed by the Basel committee and the Financial Stability Board, and already decided by Switzerland.[8] More radical reforms could be envisaged. Separating commercial from investment banking in the spirit of the US Glass-Steagall Act of 1933 or the Volcker proposal to restrict banking entities from engaging in proprietary trading and private fund sponsorship, management and investment is an attractive option. Commercial banking would continue to benefit from deposit insurance, and access to the discount window, but these benefits would no longer be available to investment banking.

There are diverging views on whether it is feasible to break up banks. The Governor of the Bank of England has noted the attractions of separating commercial from investment banking. In contrast the Turner review, while recognising the need to constrain commercial banks' proprietary trading activities, stated that "a more formal and complete legal distinction of "narrow banking" from market making activities is not feasible". This is largely because in a globalised financial system it would be difficult to enforce a separation of activities in the absence of an unlikely international agreement on an appropriate division. The government has appointed the Independent Commission on Banking, chaired by Sir John Vickers, to examine the structure of the UK banking system. The commission will present its final recommendations on measures to reform the banking

system and promote stability and competition, including the issue of separating retail and investment banking functions, in September 2011.

An alternative to breaking up banks is to build a "firewall" between higher risk investment banking and commercial banking by promoting non-operating holding company structures (NOHC). These create a separation of commercial and investment banking, requiring legal separation of capital pools for group subsidiaries with very different risk characteristic, while safeguarding synergies and economies of scale and scope within banking groups. Such transparent structures would allow market participants and regulators to better assess banks' vulnerabilities, thereby reducing contagion and counterparty risk. Higher risks associated with investment banking would be reflected in the cost of capital for investment entities, which would limit risk taking. Finally, an investment structure could be allowed to fail, without affecting the commercial part of the bank in a critical way (Blundell-Wignall *et al.*, 2009).

Box 1.4. **Recommendations on macroeconomic and financial policy**

Monetary policy

- If the recovery proceeds as projected, first steps towards more normal settings of monetary policy should be taken during the second part of 2011 and withdrawal of stimulus should proceed in 2012 as the recovery gathers pace. Quantitative easing should be withdrawn in an orderly fashion once policy rates have risen from current low levels. The Bank of England will, however, need to react sooner if inflation expectations begin to rise considerably or feed through to significant wage increases.

Fiscal policy

- The announcement and initial implementation of the fiscal consolidation programme strikes the right balance between addressing fiscal sustainability and thereby reducing tail-risks on the one hand, and preserving short-term growth on the other. The fiscal mandate of reaching a cyclically-adjusted balance by the end of a rolling five-year horizon sets an ambitious target and is useful to steer public finances back to sustainability.
- In due time, the fiscal mandate should be modified into a permanent fiscal framework to guide fiscal policy beyond 2015/16. A forward-looking framework with a five-year rolling horizon, a larger share of total spending than currently under an expenditure ceiling (leaving out only the most cyclical components) and a deficit target should be considered. The target should be set to ensure long-term fiscal sustainability, for example through a debt level target. The OBR should be charged with monitoring budgetary compliance with the framework.
- By setting up the independent OBR, the government has addressed important concerns relating to fiscal projections and assessing performance against set targets. Given the limited resources available to the OBR, it will be highly dependent on Treasury's and other departments' analytical capacity. If the remit is widened or the OBR takes a more active role in policy costing, more resources will be needed.
- The composition of fiscal consolidation could be adjusted to better promote growth and efficiency:
  - Increasing preferential and abolishing zero VAT rates would enhance efficiency of taxation. This would also promote consistency in climate change policies, as the VAT rate for domestic energy use is only 5%. Relevant distributional concerns could be more efficiently addressed through targeted support.

Box 1.4. **Recommendations on macroeconomic and financial policy** *(cont.)*

- Ring-fencing health care puts other expenditures under undue pressure and risks perpetuating inefficiencies in health provision. Efficiency enhancing structural reforms, addressing excessive remunerations and increasing competition in health care provision, should be pursued instead.
- The government has tried to focus public investment on projects with high economic returns, but large cuts in public investment are a risk to long term growth. Channeling more resources to public investment would be warranted, as long as projects offer a viable rate of return.
- The decision to bring forward increases in the state pension age is an important measure to improve fiscal sustainability. Further steps in this direction should be taken, perhaps by implementing an automatic longevity adjustment.

Financial regulation

- The too-big-to-fail problem should be addressed. One approach is to break up major banks. Another is to impose additional capital requirements or use tax instruments to address the implicit "too-big-to-fail" subsidy. Firewalled non-operating holding company structures could deal with contagion and counterparty risk that are integral to the "too-big-to-fail" issue.
- Capital adequacy standards should be strengthened in line with the Basel III agreement to ensure that banks have a sufficient capital cushion for the risks they take on. Group leverage ratios, covering all relevant assets, including off-balance sheet exposures, should also contribute to setting binding capital constraints. Banks should be required to hold adequate capital for off-balance sheet risks to counter regulatory arbitrage and reputational risks. Consistent with this, the accounting treatment of off-balance sheet assets should be aligned with the underlying risks. Without prejudicing the choice of other macroprudential instruments, dynamic provisioning should be used to reduce the pro-cyclicality of the financial system.
- The announced macro-prudential framework is important for financial stability. Policy instruments need to be defined and implemented quickly.
- Lending standards and alignment of incentives with long-term value creation should receive greater regulatory and supervisory attention.

Notes

1. During the recession that started in early 1990, general government employment fell by almost 12% over 5 years, while the OECD estimates that the corresponding number for the latest recession is almost 2% up until end-2012, although these numbers are affected by the increase in government employment due to reclassification of some employees in the financial sector. From the peak reached in end-2009, government employment is expected to fall by around 4% to end-2012, whereas the corresponding fall in the early 1990s was roughly 8%.
2. Different estimates for 2010 are: OECD –4.4%; IMF –2.7%; OBR –3.25%; NIESR –4.0%; EC –3.9%.
3. See the appendix for further information on progress on structural reforms.
4. Northern Rock and Bradford and Bingley were taken into full state ownership. HBOS and Lloyds TSB are now part of Lloyds Banking Group, which is under partial state ownership.
5. Under the tripartite system, the FSA was responsible for financial and banking regulation, the BoE for monetary policy, last resort lending and macro-prudential surveillance and the Treasury for the overall architecture of the system and aspects affecting the public finances (for more details, see OECD, 2009).
6. Other authors have proposed early warning indicators of costly asset price booms (IMF, 2009; Alessi and Detken, 2009; Agnello and Schuknecht, 2009).

7. Commercial banking can also experience large losses. However, the flows of incoming and outgoing cash associated with bank credit are reasonably predictable, mitigating problems of contagion and counterparty risk (Blundell-Wignall *et al*., 2009).
8. UBS and Credit Suisse will be required to hold an amount of capital of 19% of risk-weighted assets by 2019, with at least 10% in common equity and the rest in contingent capital.

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ANNEX 1.A1

Progress in structural reform

This annex reviews actions taken on recommendations from previous *Surveys*. Recommendations that are new in this *Survey* are listed in the relevant chapter.

Recommendations	Action taken since the previous *Survey* (June 2009)
Education	
Continue to promote a focus on the acquisition of core skills for pupils at all age levels and ensure that this focus is not compromised by the goal of expanding the average number of years of schooling.	The government has announced its intention to undertake a systematic and comprehensive review of the National Curriculum in England for 5-16-year olds. The new curriculum will set out only the essential knowledge and understanding that all children should acquire.
Design all education targets in a way that limits the potential for gaming, by ensuring an interactive performance management system that captures the complexity of the education process.	School performance tables are being reformed so that they are more focussed on the essentials that ensure a sound basis for pupils' progression. Gaming will be reduced through a greater emphasis on pupil progress and lowering incentives to offer qualifications which benefit league table positions rather than pupils' needs. The Department for Education will publish all the information it holds on schools to increase transparency.
Encourage the highest quality teachers to move to the most disadvantaged schools.	The pupil premium, which will direct funding to schools with disadvantaged pupils, will mean that these schools have greater scope to use recruitment and retention incentives to attract the best teachers, including those with advanced level skills. The "Golden Handcuff" scheme has been closed to new entrants. Training programmes for teachers and school leaders; "Teach First", "Teaching Leaders" and "Future Leaders" focus on schools in disadvantaged areas.
Evaluate the pros and cons of introducing a differentiated voucher system of funding (as in Chile) where pupils from poorer families receive vouchers that are valued more highly than those for the general population.	The government has introduced a new pupil premium for deprived children, which will mean that money will go with eligible children to the schools they attend.
Health	
Remedy any lack of capacity within Primary Care Trusts (PCTs) and general practices that limit their ability to fulfil their commissioning responsibilities.	Primary Care Trusts (PCTs) will be abolished and consortia of GP practices will be taking on the commissioning of the majority of NHS services.
Review progress on the involvement of patients and the public in decision making by PCTs. Improve flows of information to allow PCTs and patients to make informed decisions.	In September 2010 PCTs first reported on consultation evidence of the impact of the public and patient voice on their decision-making. The Department of Health's document *Liberating the NHS: An Information Revolution,* published on 18 October 2010, set out its plans for better information, more openness, transparency and comparability. The government will use the responses to the consultation document to develop a more detailed information strategy.
Clarify policies on the entry, merger and exit of provider organisations. Improve the consistency and transparency of local service reconfigurations.	On entry, patients will have the ability to choose between any willing provider that meets NHS standards and prices. On mergers, the Secretary of State would continue, as at present, to decide whether to permit NHS trusts to complete mergers until all remaining NHS trusts have become foundation trusts (FTs). Exit will be provided through allowing commissioners to replace existing services without risk of interruption in access to services for patients. On local service reconfiguration, the revised Operating Framework for 2010-11 to the NHS identified key tests for service change, which are designed to build confidence within the service, with patients and communities.

Recommendations	Action taken since the previous *Survey* (June 2009)
Design Payment by Results to reflect priority activities and reward higher quality. Align the remuneration of personnel more closely with activity.	The introduction in 2010-11 of a number of "Best Practice Tariffs" signals the start of a change of approach through which the tariff will increasingly reward recognised best practice models of care rather than simply reflect average reported cost. There will be a significant increase in the number of Best Practice Tariffs in 2011-12, with the expectation that this expansion will gather pace in future years The scope of Payment by Results is also being expanded to mental health and some community activities, which should help improve outcomes and efficiency in these areas. NHS Foundation Trusts already have freedoms to determine pay for their own staff. The government has stated in the White Paper *Equity and excellence: Liberating the NHS* that it intends to extend these freedoms to all NHS employers.
Improve methods and data to evaluate health care reforms.	The Policy Research Programme does contain research to evaluate the reforms that are the focus of this document. The shadow NHS Commissioning Board will produce and publish an analysis of the findings of the GP consortia pathfinder programme and set out the lessons learned that will be applied as consortia become formally established during 2012/13.
Labour market	
Consider modifications to the tax and benefit system that would reduce the marginal effective tax rate faced by lone parents and one-earner couples when extending their hours or when progressing in work.	In October 2010, the government announced the new Universal Credit, to be introduced over the next two Parliaments, which will replace the current system of means-tested working-age benefits with a simple streamlined payment. The universal credit will improve financial work incentives by ensuring support is reduced at a consistent and managed rate.
Improve incentives for labour force participation by second earners by reducing the high implicit taxes on returning to work caused by high child-care cost.	The Universal Credit will provide a simpler, integrated system of support in and out of work, and improve work incentives. Ongoing work is analysing whether childcare support should be delivered as part of, or alongside, the Universal Credit.
Extend the Pathways to Work scheme on a mandatory basis to the stock of existing claimants.	The government has made clear its intention to replace Pathways to Work and a number of other employment programmes with a new integrated Work Programme, encompassing disabled people. It will sit alongside a more flexible offer of support from Jobcentre Plus. All claimants currently on Incapacity Benefit where return to the labour market is seen as realistic will be required to access the Work Programme or Jobcentre Plus support.
Improve the monitoring of the health status of people reaching the end of their entitlement to sickness pay and benefits and make the medical assessment of benefit claims earlier.	Under the Work Capability Assessment (WCA) that was introduced in October 2008 entitlements to Employment and Support Allowance will be assessed. Over the next three years, the government will be reassessing around 1.5 million people who are currently receiving incapacity benefits. An Independent Review of the WCA was published in November 2010, which will be a starting point for the government's work on further reforms.
Pay more attention to the early sickness stage of the large number of people claiming incapacity benefit from a non-employment status.	By focusing on the functional effects of an individual's condition rather than the condition itself, the Work Capability Assessment provides an assessment of an individual's ability to work, no matter whether or not they have been in employment prior to their claim, taking into account the requirements of the modern workplace. A new and more flexible Work Programme is planned to be in place nationally from the summer of 2011.
Improve statistical monitoring of the stock of migrant labour by "cross-checking" registered workers on the Worker Registration Scheme against other databases (*e.g.* taxpayers).	The Office for National Statistics is currently engaged in a substantial programme to significantly improve the quality and timeliness of data on migration and the population more generally. Phase 1 of the programme ended in May 2010 and has resulted in significant improvements to statistics, including revised population estimates at local authority level for 2002-2008 using new more timely and accurate data.
Productivity	
Facilitate the entry of new businesses by reforming planning regulations, especially in the area of retail trade, and abolish the "needs test" for market demand. Put more weight on economic issues in the planning process.	The government has set out a series of commitments to give local authorities the tools and incentives to support their local economy. This includes a commitment to provide a level playing field between small and large retailers by enabling councils to take competition issues into account when drawing up their local plans.
Free-up land for development by reconsidering the boundaries of the "green belts" in fast-growing areas.	Planning authorities review green belt boundaries when implementing planning policy.

Recommendations	Action taken since the previous *Survey* (June 2009)
Consider further incentives for land development particularly those with the potential to contribute to the funding of local infrastructure.	The government is consulting on the introduction of a New Homes Bonus which will see local authorities rewarded for adding to the housing stock within their area. In addition to this, the Local Government Resource Review, launched in January 2011, will consider options for allowing local retention of business rates as a means of incentivising local authorities and communities to support economic development and growth within their area. In September 2010, the government announced that it will introduce Tax Increment Financing (TIF) powers so as to allow local authorities to borrow against anticipated future uplift in their business rates base for the purpose of investing in local infrastructure. The Local Government Resource Review will consider how TIF powers would operate alongside business rates retention.
Ensure that infrastructure investment does not fall short of that envisaged in the government's Ten Year Plan for Transport. Consider ways to improve the predictability of transport funding. Follow through with targeted spending in key strategic growth areas.	The Spending Review prioritised capital spending on transport projects which offered high economic returns. For example over £10 billion will be invested over the Spending Review period on maintenance and investment in new high value road, regional and local transport schemes, subject to the completion of the appropriate statutory processes. Also over £14 billion will be provided for Network Rail, supporting maintenance and investment to continue to enhance the capacity and speed of services across the country.
Continue to examine the options for addressing road congestion and environmental impacts including the implementation of a road-pricing system on a national scale.	The Spending Review prioritised capital spending on transport projects that offered high economic returns – many of which are designed to address road congestion. The Spending Review also supported the government's climate change commitment, for example through an incentive scheme offering up to £5 000 towards the cost of new ultra-low emission vehicles and supporting the roll out of the charging infrastructure for such vehicles. National road pricing for cars on existing roads will not be implemented during this Parliament.
Raise the skill level of the workforce by focusing adult training on the most disadvantaged groups. When evaluating progress, focus more on broader measures. This encompasses improving the quality and volume of qualifications, as well as the employment outcomes from acquiring skills and qualifications, and international measures of adult cognitive skills.	The government has prioritised investment in the Spending Review period (up to 2014-15) to support learners with low levels of skills – through fully-funding literacy and numeracy courses for all adults and supporting young people aged 19-24 to complete a first full qualification at Level 2 and 3. The government will be evaluating progress through monitoring.
Assess the efficiency of fiscal support to R&D, such as the R&D tax credit, over the longer term.	The government has undertaken and published an evaluation of the UK's R&D tax credit schemes.
Tax competition	
Continue to cut the statutory corporate tax rate and broaden the base.	The June 2010 Budget announced a phased reduction in the main rate of corporation tax from 28% to 24% over the next four years. This cut will be in part-funded by reductions in capital allowances; however once fully implemented the package reduces the corporation tax burden by more than £2 billion.
Reduce the complexity of the tax code.	The government has established the Office of Tax Simplification (OTS) to provide expert advice on simplifying the tax system. The OTS is currently undertaking two reviews on tax reliefs and small business tax.
Miscellaneous	
Monitor closely the speed and efficiency of the planning system and progress towards the government's regional housing targets.	The government plans to abolish regional housing targets and replace them by a framework of incentives for councils to support economic and housing growth. The government is also committed to speeding up the planning system, including through consolidating disparate planning policy statements and introducing a presumption in favour of sustainable development.
Consider imposition of some form of mandatory pension savings in the medium term.	The government recently confirmed its commitment to the introduction of a statutory duty on employers to automatically enrol qualifying employees into a minimum quality workplace pension scheme from October 2012. The government is also proceeding with the creation of a trust-based defined contribution pension scheme aimed at employers and employees who are not currently served by the market, which is due to launch in Spring 2011.

Chapter 2

Improving the functioning of the housing market

A well functioning housing market is essential for economic prosperity and well-being. A combination of favourable economic and financial conditions and tight housing supply led to sharp increases in real house prices between the mid-1990s and end-2007, which spurred household consumption. While this boosted output growth, economic imbalances and financial weaknesses mounted, leaving the economy vulnerable to the global financial crisis. Current land use planning policy is excessively restrictive, making supply unresponsive to demand and contributing to creating housing shortages and reducing affordability. While additional supply in the private rental market provides an alternative to homeownership for a significant number of households, social housing waiting list numbers have increased rapidly over the past decade. A reform to replace top-down building targets with incentives for local communities to allow development is underway, but the outcomes are somewhat uncertain. Housing taxation is regressive and encourages excessive demand for housing. More effective taxation could help contain demand and stabilise the housing market.

A combination of favourable economic and financial conditions and a tight housing supply led to sharp increases in real house prices in the United Kingdom between the mid-1990s and end-2007. Demand for housing was pushed up by strong income growth and a rise in mortgage lending as real interest rates declined and lending standards were loosened. Investment in housing is also encouraged by the tax system, which favours homeownership over other tenures. The excessively restrictive land use planning policy left supply unresponsive to demand, contributing to housing shortages and reduced affordability. Deteriorating affordability had halted the increase in homeownership by 2003. While additional supply in the private rental market provided an alternative to homeownership for a significant number of households, social housing waiting list numbers have increased rapidly. Rising house prices were partly a symptom of growing economic imbalances and made the economy vulnerable to the global financial crisis. As the crisis unfolded, weaknesses in financial institutions were revealed, residential investment collapsed and lower house prices weighed on private consumption. A well functioning housing market is essential for economic prosperity and well-being. Developments in the housing market can affect macro-economic volatility, financial stability, competitiveness and growth, distribution of wealth, social conditions and the quality of the environment. To respond to housing needs and enhance the stability of the housing market, both supply and demand side policies should be considered. This chapter provides an overview of recent developments in the UK housing market and discusses policy options to improve the effectiveness and stability of the housing system, including planning, taxation and social and subsidised housing policies.

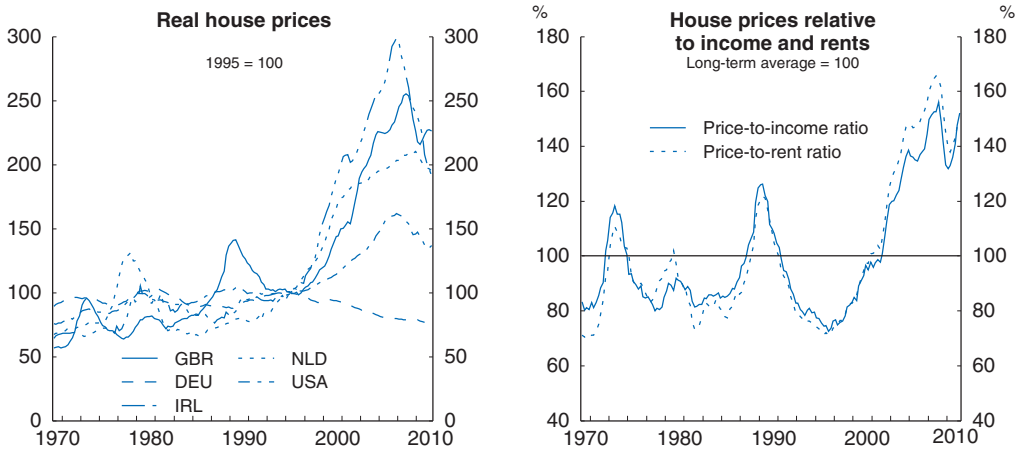
Recent developments in the housing market

House prices remain high despite recent drops

Between the mid-1990s and the end of 2007 real house prices in the United Kingdom were multiplied by more than two and a half, which was among the sharpest rises in the OECD (Figure 2.1, first panel). The price-to-income and price-to-rent ratios are currently around 40% above their long-term averages (Figure 2.1, second panel), suggesting overvaluation. These ratios have generally tended to revert to their long-term average, even though they can be shifted by changes in economic or demographic variables and have often deviated from historical norms for protracted periods.

The 2008 financial crisis accelerated adjustments in an already weakening housing market. Prices and demand for housing fell substantially when credit dried up in the wake of the collapse of the US subprime mortgage market. However, compared to the preceding increases, price falls have generally been fairly modest – except in Northern Ireland, where the market is affected by developments in the neighbouring Republic of Ireland. In mid-2009, UK real house prices had fallen by about 15% from their peak in the last quarter of 2007. Since then, they have moved up again and are now on average only about 11% below their peak level, albeit showing renewed signs of weakness.

Figure 2.1. **Housing prices**



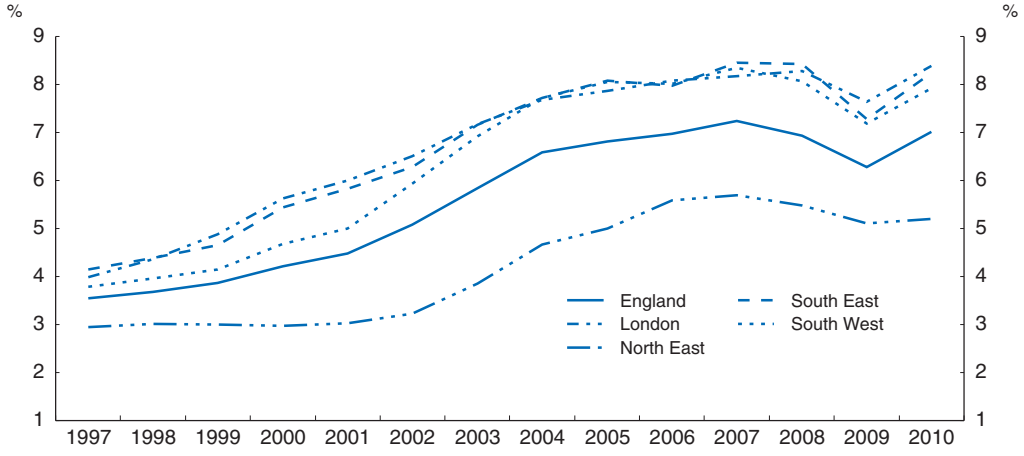
Source: National sources and OECD calculations.

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Worsening affordability has boosted demand for rentals and social housing

The increase in the homeownership rate stalled after 2003 mainly as a consequence of reduced affordability. Around two-thirds of UK households are owner-occupiers, which has long been encouraged by housing and tax policies. House prices are currently high relative to household income, especially in London and the South of England. The ratio of median house prices to median annual employee earnings in England rose from 3.5 in 1997 to 7.2 at the peak of the market in 2007 and, after falling back to 6.3 in 2009, rebounded to 7.0 in 2010. This is still well above the long-term average of around four. In London and the South, median prices represent more than eight times income in 2010 (Figure 2.2). The decline in social housing provision since the 1980s contributed to an increase in homeownership until affordability deteriorated in the 2000s, pushing up demand for private rentals.

Figure 2.2. **Ratio of median house price to median earnings**

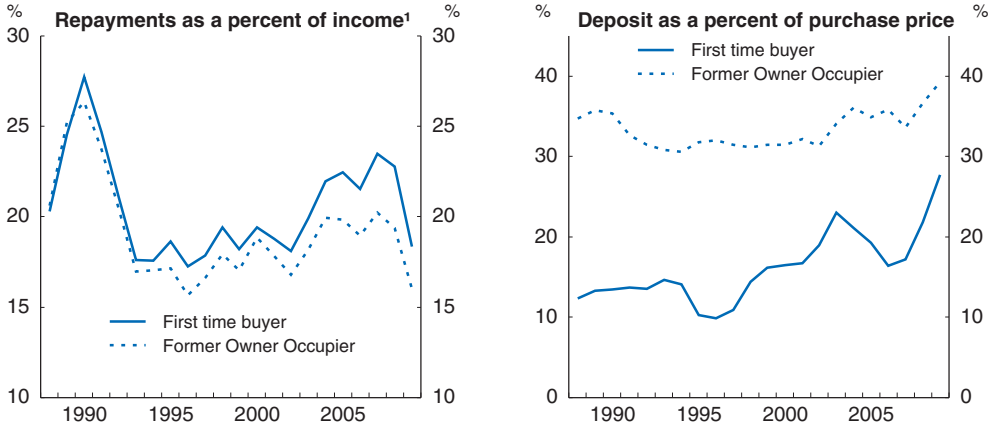


Source: DCLG Table 577.

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Housing affordability has been affected by financial and social factors. The impact of high house prices on affordability has been partially offset by the low level of interest rates. Total mortgage repayments as a percentage of income rose during the boom, but have fallen back since to a level that is close to that seen in the mid-1990s (Figure 2.3, first panel). The easing of lending standards during the boom including a rising share of subprime loans also improved access to housing finance during that period. Nevertheless, the deposit put down by buyers has increased substantially, even before the onset of the financial crisis. While existing homeowners could use their accumulated housing wealth to move up the housing ladder, providing the required deposit has proved increasingly difficult for first-time buyers, with their deposit increasing from about 10% of the purchase price in 1995 to close to 20% before the crisis and more than 25% in 2009 (Figure 2.3, second panel). As a result, the share of first-time buyers as a percentage of total loans for house purchase has declined since the mid-1990s (Figure 2.4). Even though factors such as late

Figure 2.3. **Financial burden on households**

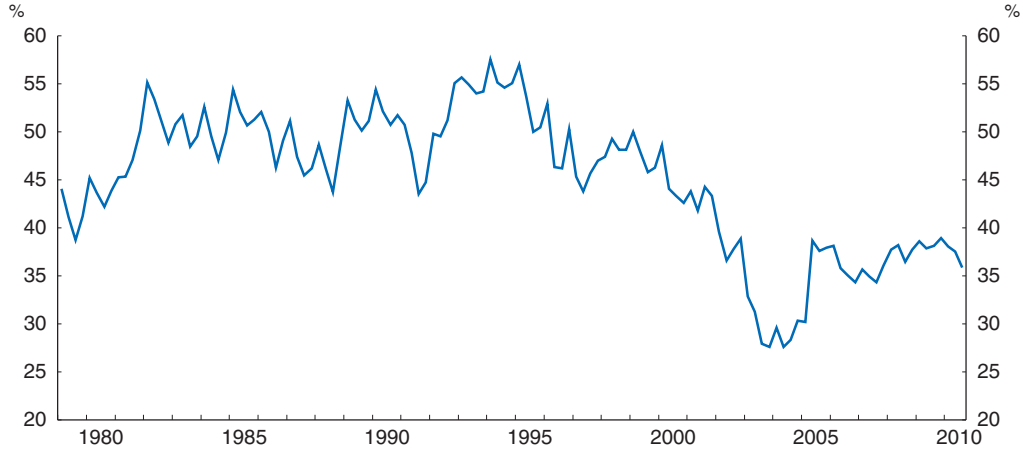


1. Repayments data up to and including 2000 takes into account mortgage tax relief.

Source: DCLG Table 539.

StatLink http://dx.doi.org/10.1787/888932376497

Figure 2.4. **First-time buyers share of total loans**



Source: Council of Mortgage Lenders.

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entry into the labour market because of longer education and later family formation have contributed to this trend, there is no doubt that reduced affordability has played a significant role. Hence, young households who do not benefit from intergenerational transfers are increasingly excluded from homeownership. Tighter lending conditions in the wake of the financial crisis imply that recent declines in house prices are unlikely to translate into easier access to homeownership.

The private rental market has expanded significantly since the turn of the century to cover nearly 14% of households. Rent increases have been roughly proportional to that in household income, leaving the rent-to-earnings ratio fairly stable since the early 2000s, at around 20% for the England average and 25% for London. These developments can partly be attributed to the growth of the buy-to-let market, which helped the private renting sector to expand from just under 2.5 million units in 2000 to almost 3 million in 2006 (Wilcox, 2008). As a consequence, in many places renting has become cheaper than buying. The National Housing and Planning Advice Unit (NHPAU) estimates that "on average across England the cost of renting a 2 bedroom house was 72% of the cost of buying in 2008 although there was significant regional variation". Nevertheless, nearly a quarter of private renters are spending more than half of their income on rent (Reynolds *et al*., 2008). Furthermore, the quality of rented accommodation is often a concern, with 47% of private rented properties falling below the decent homes standard, mainly at the lower end of the market (Wilcox and Bramley, 2010).

Deteriorating affordability has also led to an increase in demand for social housing. In 2009, there were about 1.8 million households on social housing waiting lists in England, a 70% increase over ten years. It is uncertain whether this number is an accurate reflection of housing needs, as there are no qualifying criteria to register. People may register on more than one list, registers might be out of date and the large discounts relative to market rents – on average about 50% – might raise demand. In 2008, only 43% of households on the social housing waiting list were from a "reasonable preference category" (Local Authorities are required by statute to give reasonable preference to people who: are homeless; live in overcrowded/unsanitary conditions; need to move on medical/welfare grounds or to avoid hardship). In any case, low affordability is putting pressure on social housing. Since 1997, the policy focus has been on improving the quality of social housing and the number of households living in non-decent social homes has been reduced by more than a million, about half of total (DCLG, 2007). Meanwhile, new additions to the social housing stock have failed to keep pace with needs. The Housing Green Paper (DCLG, 2007) estimated the need for new social rented homes at 50 000 per year, nearly 50% above the 1997-2009 average addition. The new government has committed to delivering up to 150 000 new affordable homes by 2014/15 (HM Treasury, 2010). Despite housing shortages and low affordability, policies have been successful in containing homelessness, in contrast to much of the OECD (Fitzpatrick and Stephens, 2007).

The deterioration of affordability has adverse economic and social consequences

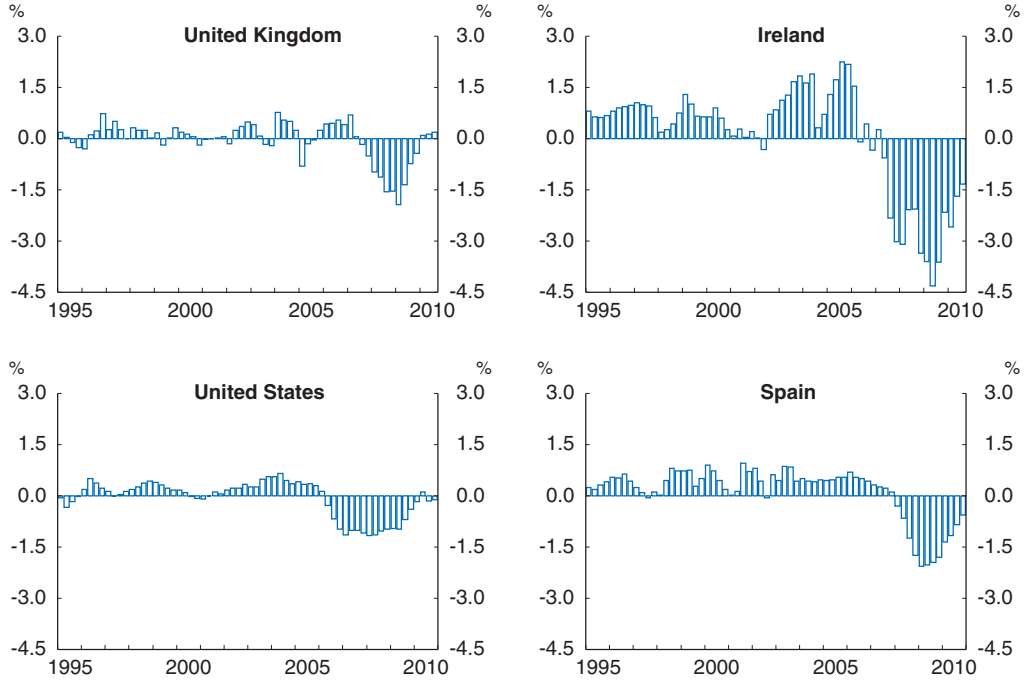
Household formation might decrease, as young people now find it increasingly difficult to buy or rent suitable dwellings. In recent years, household formation has been lower than projected on the basis of demographic trends (Meen and Andrew, 2008; Holmans, 2008). Though other socio-economic factors have played a role, low affordability is likely to have been an important factor. As many as 1.2 million households cannot be formed in England alone because high housing costs force young adults to live with their parents or share dwellings (NHPAU, 2009).

Higher affordability can have positive growth and competitiveness effects. Household mobility would be increased, improving the allocation of labour and employment creation. In regions where house prices are high, especially London and South England, hiring and retaining workers can be difficult. This is particularly true for the public sector, where the inability to attract or retain experienced key workers (*e.g.* teachers, nurses) may impair the quality of public services. High housing costs raise the cost of living and labour costs, resulting in a loss of competitiveness for the British economy (Barker, 2004; Solutions, 2009). Improving affordability might also reduce social inequalities. Increases in house prices generate a transfer of wealth from renters to homeowners and from younger to older households.

House price developments have contributed to volatility in the wider economy

Housing-related activity is a large and volatile part of the economy. The construction sector is an important and labour-intensive sector of the economy, and real-estate services and housing finance contribute further to economic activity and employment. Housing investment accounts for a relatively modest but highly volatile share of GDP. During the expansion, as supply constraints were tight, residential investment contributed modestly to GDP growth, adding on average 0.15% per year between 1995 and 2006. This is considerably lower than in countries experiencing comparable house price increases, such as Spain or Ireland (Figure 2.5). During the downturn, the collapse of residential investment contributed significantly to the contraction in GDP. The drop in residential investment was more spectacular – 50% from peak to trough – and more prolonged than that of prices, with the

Figure 2.5. **Real residential investment**
Contribution to year-on-year GDP growth



Source: OECD, *OECD Economic Outlook database.*

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current level still about 40% below the peak. As a result of economic uncertainties and financing constraints, the number of permanent dwellings completed in England fell by nearly a third between 2007 and 2009 to less than 120 000. This is half the target set in the Housing Green Paper issued by the Department for Communities and Local Government in 2007 (DCLG, 2007). Construction also contributes heavily to swings in employment. Between the 1997 and 2008, more than half a million construction jobs were created, nearly one in five jobs created over that period. Between the third quarter of 2008 and the first quarter of 2010, about 300 000 construction jobs were lost or about half of job losses during the downturn.[1]

Net housing wealth appears to be a significant driver of household consumption (Box 2.1). A one-pound rise in net housing wealth is associated with an increase in British

Box 2.1. **How does private consumption relate to housing wealth?**

From the mid-1990s to the recent recession, private consumption has outpaced household income. This Box evaluates the role of increases in housing and financial wealth in this evolution. A consumption function based on Catte *et al.*, (2004) is estimated over the period 1987Q4-2009Q4. The equation relates real private consumption to real labour income, real housing and financial wealth, the unemployment rate and the real short-term interest rate. An error-correction equation is estimated in two steps using the Stock-Watson procedure (Stock and Watson, 1993). The results are as follows:

$$\Delta \ln C = \underset{(8.5)}{0.005} + \underset{(4.3)}{0.094}\,\Delta \ln NHW - \underset{(-4.3)}{0.010}\,\Delta UNR - \underset{(-3.7)}{0.182}\,(\ln C_{-1} - \underset{(-6.1)}{5.740} - \underset{(-8.8)}{0.496}\ln Y_{-1} - \underset{(-12.1)}{0.134}\ln NHW_{-1}$$
$$- \underset{(-8.0)}{0.157}\ln NFW_{-1} + \underset{(3.9)}{0.009}\,UNR_{-1} + \underset{(2.7)}{0.006}\,IRS_{-1})$$

$R^2 = 0.49$; s = 0.005; DW = 2.09

(t values are reported in parentheses)

Where:

C = Real private consumption

Y = Household real labour income

NHW = Net real housing wealth (housing wealth net of mortgages)

NFW = Net real financial wealth (financial assets net of non-mortgage financial liabilities)

UNR = Unemployment rate

IRS = Real short-term interest rate

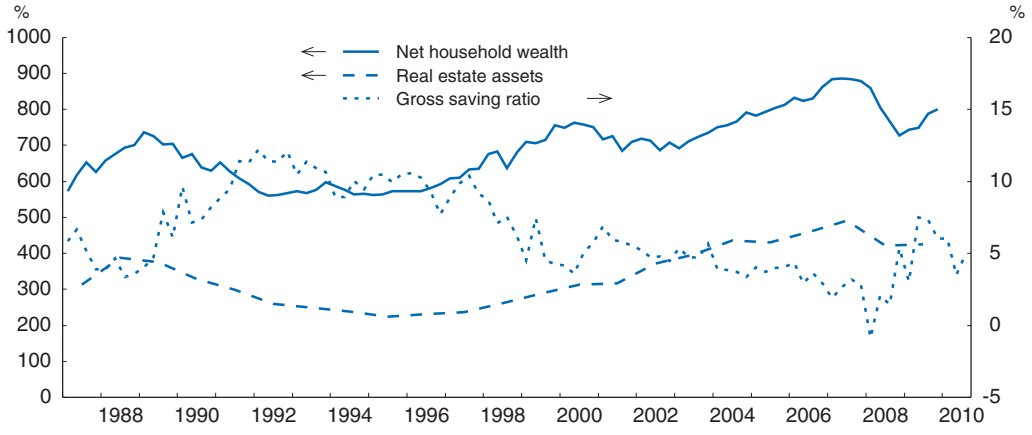
The estimation results are in line with those reported in Catte *et al*. (2004). The specification of the equation with constant elasticities of consumption to wealth implies that marginal propensities to consume (MPC) vary over time. MPCs can be evaluated by multiplying coefficients (elasticities) by the average ratio of real consumption to real housing or financial wealth over the sample period.* The long-term MPC of housing and financial wealth estimates are respectively 0.07 and 0.04. The short-term MPC of housing wealth is 0.05. The short-term MPC of financial wealth has not been found to be statistically significant.

* Replacing the ratio of consumption to housing wealth over the sample period by the same ratio at the end of the period would yield slightly lower MPCs of housing wealth, of 0.05 in the long term and 0.03 in the short term.

households spending of 7 pence, compared to 4 pence from net financial wealth. Catte, *et al.* (2004) provide evidence that the link between housing wealth and consumption is stronger in the United Kingdom and other English-speaking countries with more developed mortgage markets than in most other OECD countries. From the mid-1990s to 2007, increases in household wealth coincided with a steadily declining trend in the household saving rate (Figure 2.6). Housing equity withdrawal contributed to translating increased housing wealth into higher levels of private consumption. It represented up to 8.5% of after-tax household income in late 2003 (Figure 2.7).[2] Higher housing wealth provided collateral to secure additional borrowing, which helped finance increases in consumption, though it also substituted for more expensive categories of debt (*e.g.* personal loans or credit card debt). Housing wealth was also used as collateral to borrow to buy more housing or financial assets, which amplified the cyclical upswing.

Figure 2.6. **Household wealth and savings**

Per cent of household disposable income

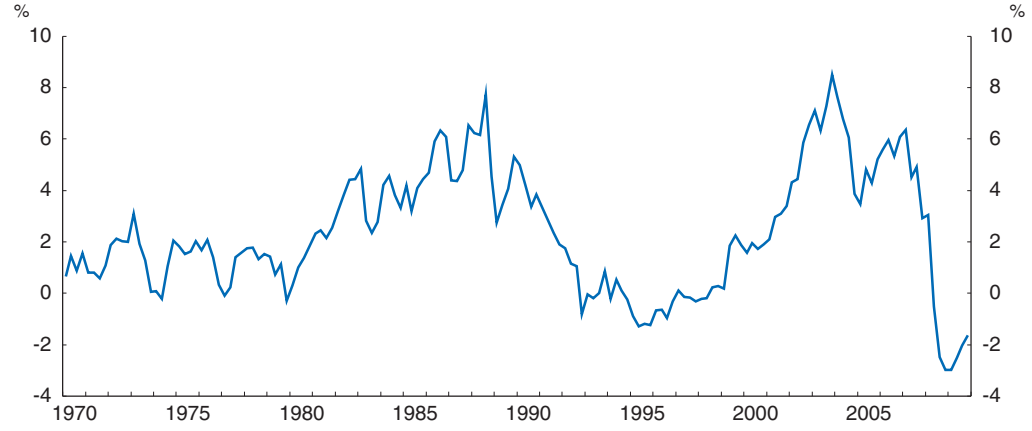


Source: OECD, *OECD Economic Outlook database* and Office for National Statistics.

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Figure 2.7. **Housing equity withdrawal**

Per cent of after-tax income



Source: Bank of England.

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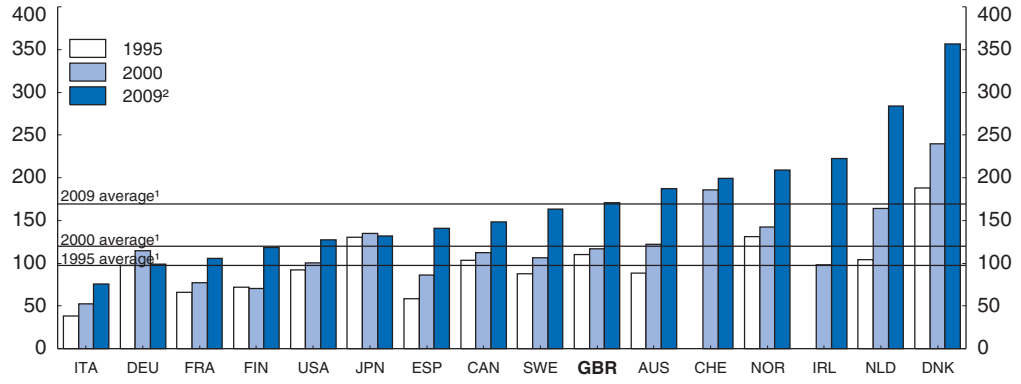
Rising asset prices generated wealth, which was used as collateral to increase borrowing, leading to an expansion in demand for assets and thus higher asset prices, and so on, until the credit crunch triggered a sharp reversal.

Some households and financial institutions are vulnerable

Even though recent house price adjustments have eroded housing equity, homeowners on average still have a substantial equity buffer. Household debt in the United Kingdom increased from 110 % of disposable income in 1995 to 170% in 2009, close to the OECD average (Figure 2.8). Mortgage liabilities are by far the largest components of household liabilities, at 133% of disposable income in 2009. At the same time, residential assets amounted to 426% of disposable income, leaving the household sector with a large aggregate net equity position. According to the Council of Mortgage Lenders estimates for 2007, 42% of housing wealth was owned outright with the rest by mortgage borrowers. But the latter held on average a 48% free equity share in their gross housing wealth (CML, 2008).

Figure 2.8. **Gross household debt**

Per cent of disposable income



1. Averages are unweighted.
2. 2008 for Switzerland.

Source: OECD, National accounts database.

StatLink http://dx.doi.org/10.1787/888932376592

The decline in house prices has led to a rise in the proportion of households with negative housing equity, although on a much more limited scale than has occurred in the United States. The proportion of households with mortgages in negative equity rose from around 4% in September 2008 to 7-11% in the first quarter of 2009 (Hellebrandt *et al.*, 2009). Although this is a substantial increase, the proportion of households underwater on their loans is nowhere near that of one in four reached in the United States in the first quarter of 2010 (Harvard, 2010). Furthermore, for most UK households in negative equity, the amounts involved were relatively small, with 78% having less than £15 000. In the first quarter of 2009, even as house prices were near recent lows, 75% of UK households had a loan-to-value ratio of less than 75% (Hellebrandt *et al.*, 2009).

Although some households are vulnerable to the housing downturn and deteriorating economic conditions, arrears and possessions during the latest recession have been lower than most observers had feared. The recession has pushed arrears and possessions up

from the very low levels observed in the mid-2000s. The rate of mortgages more than 3 months in arrears rose from around 1% to a peak of 2.5% in the second quarter of 2009, before slowly starting to recede. The number of possessions rose from a low point of fewer than 10 000 per year in 2003 and 2004 to 46 000 in 2009 (about 0.4% of mortgages), but is receding slowly with the Council of Mortgage Lenders forecasting 39 000 possessions in 2010 (August 2010). This is much lower than in the early 1990s, when the rate of mortgages more than three months in arrear and possessions reached, respectively, around 6% of mortgages and 75 500 (nearly 0.8% of mortgages). It is worth noting, even though this segment of the market is relatively small, that arrears are particularly high for specialist (non-bank) loans, which expanded steadily during the boom, following a business model based on "equity lending", *i.e.* putting more weight on the value of collateral than on the repayment capacity of borrowers (FSA, 2009). From an international perspective, mortgage arrears in the United Kingdom appear to be much higher than in Australia and Canada, somewhat lower than in Spain, but much lower than in Ireland and the United States (RBA, 2010; Irish Mortgage Arrears and Personal Debt Expert Group, 2010). An important factor behind the resilience of households has been the fall in interest rates. As variable rate mortgages are predominant in the United Kingdom, sharp drops in short-term interest rates have significantly reduced the burden of mortgages. Government schemes - Support for Mortgage Interest, Mortgage Rescue Scheme and Homeowners Mortgage Support – also provided support, though the number of households involved remained small.

Increases in interest rates, a further deterioration in the labour market or renewed falls in house prices could lead to financial difficulties for many households. In 2006-07, around 40% of the lowest income households (with less than £1 000 disposable income per month) were spending more than half of their disposable income on their mortgage (FSA, 2009). Should their income situation deteriorate further and/or interest rates rise, they would face great financial difficulties. Low income households are also the most vulnerable to unemployment. Low interest rates and fairly rapid stabilisation in house prices have improved the repayment prospects for troubled mortgages. This has led lenders, in part encouraged by government initiatives, to adopt generous forbearance policies in the current downturn (Styles, 2010).

Mortgage providers were hit hard by the global crisis, especially those that were heavily reliant on short-term wholesale funding. Three of the top five lenders needed some government support during the crisis, one of them being fully nationalised (EMF, 2009). HBOS and Lloyds TSB are now part of Lloyds Banking Group, which is under partial state ownership. Northern Rock is in full state ownership. Lending standards had been relaxed in the years preceding the financial crisis, with an increasing share of non-documented, interest-only and high loan-to-income or loan-to-value ratio mortgages (FSA, 2009). However, as shown earlier, even in adverse economic conditions, arrears on mortgages have not increased dramatically. But mortgage lenders had become increasingly reliant on wholesale funding, in particular via the securitisation of mortgages (André, 2011). In 2001, lending by domestic UK banks to non-bank borrowers was comparable to domestic deposits. By 2008, the funding gap between retail deposits and lending was £738 billion (OECD, 2009a). Wholesale funding allowed very rapid growth in mortgage lending – for example, the average annual growth rate of loans by Northern Rock between 2001 and 2006 was over 30% (Onado, 2010). When the US subprime market collapsed, investors' appetite for mortgage-backed securities all but vanished, leaving banks unable to fund

their portfolios. The financial sector is now recovering, thanks to the considerable support received from the government and the Bank of England, but needs to be better regulated and to rely on more stable and diverse sources of funding going forward (See Chapter 1).

Improving the efficiency and resilience of the housing market

The overview of the UK housing market has highlighted a number of weaknesses calling for action to improve the efficiency of the housing market and its resilience to economic and financial shocks. A key issue for policy is to determine the extent to which the rise in prices reflects fundamentals or is a bubble related to speculation. In designing housing policies, it is also important to recognise that different parts of the system are interdependent. For example, an efficient mortgage market might improve access to homeownership and lead to better housing conditions for many households. However, if housing supply is not responsive to demand, a great part of the enhanced ability to borrow will translate into higher house prices and access to better housing will not be improved. In addition, the social impact of housing policies needs to be taken into account.

Price increases tend to reflect fundamentals in the United Kingdom

Econometric estimates show that fundamentals can largely explain house price developments in the United Kingdom (Box 2.2). A large part of the increase in real house prices over the upswing between 1995 and 2007 can be attributed to higher income and an increase in the number of households. Lower mortgage rates have also contributed to push house prices up. However, their contribution seems to have been relatively modest compared to other countries which have experienced housing booms, as the reduction in mortgage rates in the United Kingdom during the period has not been as large as, for example, in Spain or Ireland. But the offsetting effect of higher housing supply has also been much weaker in the United Kingdom, where the response of housing investment to higher house prices has been much more muted than in most other OECD countries (Miles and Pillonca, 2008; André, 2010). Short-term dynamics account for an overshooting of house prices relative to their long run equilibrium level by around 10% at the peak of the market. Such overshooting is to be expected, since house price expectations are, at least to some extent, backward looking.

The robust link identified by econometric models between real house prices and their main determinants does not rule out sharp adjustments in house prices. Indeed, real house prices are particularly sensitive to changes in real household income and interest rates. Furthermore, some determinants of house prices might themselves deviate substantially from their equilibrium values, giving rise to house price levels, which, despite being justified at the moment, might not be sustainable. This would be the case, for example, if easy financing conditions were unsustainable.

Other econometric studies are mixed on whether the UK house price increases reflect changes in fundamentals, or a "house price bubble", *i.e.* a situation where price increases are driven by expectations of further price increases. Barrell *et al.* (2004) estimated that house prices were around 30% above their equilibrium level already in 2004. The International Monetary Fund pointed to an overvaluation of house prices of about 30% at the peak of the cycle (IMF, 2008). Miles and Pillonca (2008) developed a model which is able to explain house price increases between 1996 and 2006, but find that about a third of the increase can be attributed to expected capital gains. By contrast, Cameron *et al.* (2006), estimating a dynamic panel data model of British regional house prices

Box 2.2. **How do house prices relate to fundamentals?**

In order to assess the extent to which fundamental factors can explain the evolution of real house prices, an error correction model was estimated. The model is fairly standard in the literature and versions of this equation have given very consistent results over the years (Meen, 2008). In particular, the equation has proved to perform well out of sample. The following house price equation has been estimated over the period 1969Q2-2010Q1:

$$\Delta \ln RHP = \underset{(-4.7)}{-1.19} + \underset{(2.7)}{0.24}\,\Delta \ln RY - \underset{(-6.9)}{0.005}\,\Delta UC - \underset{(-6.7)}{0.11}\,(\ln RHP_{-1} - \underset{(-5.1)}{2.94}\,\ln RY_{-1} - \underset{(-1.4)}{0.12}\,\ln RFW_{-1} + \underset{(4.4)}{2.089}\,\ln HS_{-1} + \underset{(12.4)}{0.04}\,UC_{-1} - \underset{(-2.5)}{2.22}\,WSH_{-1})$$

$R^2 = 0.75$; s = 0.016; DW = 1.81

(t values are reported in parentheses).

Where:

RHP = Real house prices*

RY = Household real disposable income*

UC = User cost of housing

RFW = Household real financial wealth*

HS = Housing stock

WSH = Share of wages and salaries in household income

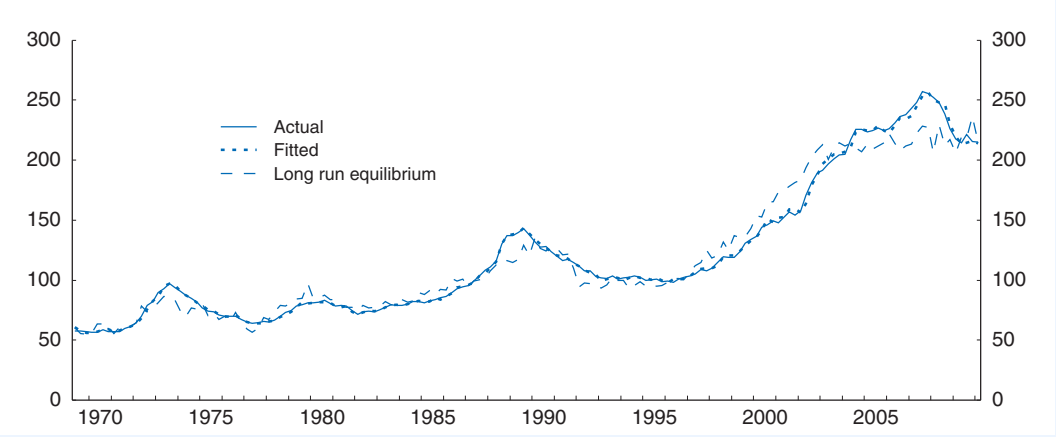
A number of features of the model are worth highlighting. First, demographic variables do not appear directly in the equation. But household real disposable income is the product of real income per household and the number of households. When these two variables are entered separately into the regression, their coefficients are not significantly different from each other. Thus, it is possible to enter only aggregate real disposable income. Second, the user cost of housing – which depends on the mortgage rate, the housing depreciation rate, housing-related taxes and expected capital gains on houses – includes a measure of mortgage rationing (see Meen, 2008, for more details). As expected capital gains are influenced by past house prices, there is a potential endogeneity bias. Omitting expected capital gains reduces the ability of the equation to explain short run dynamics, but does not alter the estimated long run equilibrium significantly. This is consistent with the view that extrapolative expectations tend to cause overshooting during booms. Third, the elasticity of real house prices to both real income and the user cost of housing are high. Hence, small variations in these variables can lead to significant shifts in real house prices. Fourth, as expected, the housing stock has a negative impact on real house prices, but it is fairly small. A one per cent increase in the housing stock would reduce real house prices by around 2%. To put this number into perspective, the annual increase in the housing stock has been less than one per cent over the last decade. This implies that construction would have to increase by large amounts to put significant downward pressure on prices if demand is strong. Fifth, the share of wages and salaries in household income accounts for the fact that wage and investment income may have different impacts on housing demand (Meen and Andrew, 1998).

The model tracks the data very well, with absolute residuals only exceptionally exceeding 3% (Figure 2.9). Nevertheless, real house prices adjustments are slow – the speed of adjustment of 0.11 implies that, on average, reverting to the equilibrium level takes more than two years. Furthermore, short-term dynamics tend to drive the market to overshoot during upswings, as can be observed both in the late 1990s and between 2004 and 2007.

Box 2.2. **How do house prices relate to fundamentals?** *(cont.)*

Figure 2.9. **Real house prices**

1995 = 100



Source: OECD calculations.

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Overall, traditional determinants explain real house price developments fairly well. Table 2.1 displays the contributions of the explanatory variables to the increase in real house prices over the cyclical upswing from the mid-1990s to 2007. Strong growth in income per household, the increase in the number of households due to population growth and the reduction in the size of households and to a lesser extent a lower user cost of housing have played a prominent role in pushing prices up. The increase in the housing stock – about 14% from 1995 to 2007 – has been insufficient to offset the influence of demand factors. Short run dynamics account an overshooting of prices by around ten per cent relative to their long term equilibrium level at the peak of the market.

Table 2.1. **Contributions to change in real house prices**

1995-2007

Real income	123
Of which:	
Real income per household	95
Number of households	28
Real financial wealth	9
Housing stock	–38
User cost of housing	23
Wage share	16
Total long run factors	134
Short run factors[1]	17
Actual	151

1. Short run factors include the terms in differences and a small residual.

Source: OECD calculations.

* Real variables are deflated by the private consumption deflator.

between 1972 and 2003, find no evidence of a recent bubble. Muellbauer and Murphy (2008) find "no house-price bubble in recent house prices, at least up to 2005, with immigration, income growth, and strong stock-market rises explaining further appreciation and the outperformance of London and the South-east." However, they reckon that by mid-2007, "prices looked a little overvalued". Meen (2008) finds limited evidence for house price bubbles in the United Kingdom between 1997 and 2007. Waldron and Zampolli (2010), using a calibrated overlapping generations model, conclude that "the increase in house prices between 1987 and 2006 was broadly consistent with other changes to the UK macroeconomy over that period".

In the United Kingdom, as high house values reflected more tight supply than excessive demand, house price falls were relatively mild and prices rebounded relatively quickly. This contrasts with several other OECD countries, where large price increases from the mid-1990s to 2006 have been accompanied by buoyant construction activity, sometimes largely driven by speculation. As the increase in demand proved unsustainable, there is now a large excess stock of houses weighing on prices in some places, notably Ireland, Spain and some regions of the United States. These examples highlight the fact that when excessive demand for housing is allowed to develop, higher responsiveness of supply might lead to a greater misallocation of resources. While a high elasticity of supply to prices is desirable, the necessity to prevent unsustainable developments in demand becomes even more important in that case.

Supply should be made more responsive to demand

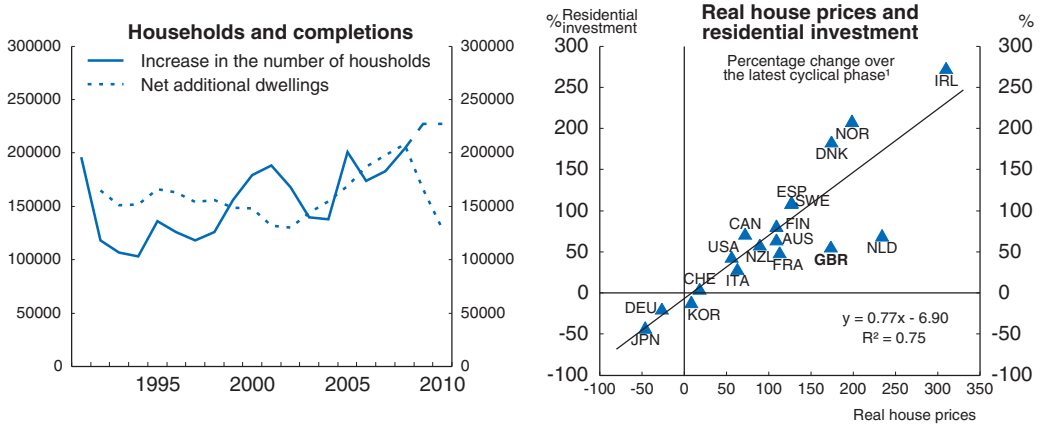
The UK housing stock is on average older and consists of smaller units than in most of OECD. More than 35% of dwellings were built before 1945 and new dwellings are much smaller in size than in continental Europe.[3] The government wants to bring empty homes back into use. But these account for only around 3% of the total housing stock, which seems quite low by international standards (Evans and Hartwich, 2005). A dynamic housing market necessarily implies a certain level of vacancies. Moreover, the empty homes may not be where they would be needed (Solutions, 2009). Hence, while bringing empty homes back to the market is useful at the margin, the potential of such action may be limited.

Despite rapidly rising prices, net additions to the dwelling stock in England since the late 1990s have not kept up with the increase in the number of households, even though household formation itself is likely to have been constrained by housing shortages (Figure 2.10, first panel). Estimates of housing requirements are very uncertain, but there is widespread agreement that more housing is needed. While the United Kingdom is densely populated, especially in the South, there is a common perception that the land use planning system is the main obstacle to housing development (Barker, 2006b). Hence, making the land use planning system more flexible, more predictable and more responsive to market signals, without compromising its social and environmental objectives, is essential. Easier access to land could also increase competition and allow more innovation in the construction sector, enhancing its ability to adapt to social, demographic and environmental evolutions. Over the medium term, a successful planning reform would help restore housing affordability in the owner-occupied market. But as such reforms take time to bear fruit, access to housing is likely to remain severely constrained for low and medium income and young households in the short to medium term. In this context, it is important that housing policies provide a supportive framework for a sustainable

development of the private rental market and the social sector, which provides an essential safety net in a difficult housing and economic environment.

The United Kingdom stands out within the OECD, together with the Netherlands, as having had large real house price increases but only fairly modest growth in housing investment (Figure 2.10, second panel). While housing supply is always rigid in the short-term, as getting permits for building, developing land and constructing dwellings takes time, it is generally more elastic in the longer term. In a wide sample of OECD countries, housing investment has been highly correlated with house price variations over the last cycle, suggesting that supply is on average fairly responsive to price signals in the medium term. Econometric studies confirm that the price-elasticity of housing supply is low in the United Kingdom. Recent OECD estimates imply that a one per cent increase in real house prices raises residential investment by only 0.4% in the long run (Caldera Sánchez and Johansson, 2011). Although many continental European countries also have a low price-elasticity of supply, the United Kingdom is among those where the supply response has been most muted over the last 20 years. Swank *et al.* (2002) report a price elasticity of supply of 0.3 for the United Kingdom, compared to 0.45 for the Netherlands, 1.1 for France, 1.4 for the United States and 2.0 for Germany. Meen (2005) finds a price elasticity of supply close to zero since the 1990s. Recent research confirms that housing supply is less responsive to market conditions in Britain than in the United States or Australia (Ball *et al.*, 2010). The need to increase housing supply is widely recognised. The DCLG Green Paper (DCLG, 2007) set the ambitious target of delivering three million homes by 2020. The new government finds these targets inappropriate, but recognises the need for more houses (HM Government, 2010).

Figure 2.10. **Housing supply is unresponsive to demand pressures**



1. The latest cyclical phase corresponds to the expansion that ended in 2006-2007 for most countries (see Table 1 in André, 2010). For Japan and Germany, it corresponds to the ongoing downturn.

Source: DCLG Tables 244 and 401, OECD, *OECD Economic Outlook database* and national sources.

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Physical constraints on the availability of land are limited, notwithstanding England's high population density, especially in the South. The percentage of developed land that was in England and Wales was at most 13.5% in 2000 (Barker, 2008). Around 36% of land is protected from development (nearly 60% in the South-East) either through environmental designations (*e.g.* Areas of Outstanding Natural Beauty, National Parks and Sites of Special Scientific Interest) or through Green Belts. It is worth noting that Green Belts, which cover

around 13% of English land, do not correspond to an environmental designation, but to a planning policy designation aimed at preventing urban sprawl (Barker, 2004). GO-Science (2010) estimates that the land take corresponding to the 2007 DCLG objective of 240 000 new buildings per year would be 0.06% of total land in England. Even building 120 000 houses per year in the South-East over ten years – an extreme assumption – would only take 0.75% of the total regional land area (Barker, 2004).[4]

Reforming planning is key

The planning system has been a major obstacle to the expansion of housing (Box 2.3). Loosening planning constraints in a way that would be consistent with the protection of the environment and social objectives could have a significant impact on house prices. Hilber and Vermeulen (2010) estimate that regulatory constraints have a substantive positive long-run impact on house prices, whereas the effect of constraints due to scarcity of developable land is confined to highly urbanised areas. If the planning regulations were completely relaxed, house prices would be 21 to 38% lower (in 2008) and the standard deviation of prices some 30 to 52% lower (over the period 1974 to 2008). Obviously, it is neither feasible nor desirable to completely relax the planning regulations, but the estimates clearly show a large impact of planning constraints on the level and volatility of house prices.

In granting planning permissions, the authorities should weigh the costs and benefits of development more carefully. The planning system plays an essential role in promoting environmental - including climate change mitigation and adaptation – and social objectives such as urban regeneration, protection of town centres, shaping of cities. However, the Barker review of land use planning pointed out that the economic benefits of development might not receive enough consideration in planning decisions and that the planning system should be more responsive to price signals (Barker, 2006b). However, both the benefits and costs of more development are difficult to evaluate. Benefits are often diffuse, indirect - *e.g.* impacts on jobs, growth and income distribution – and long-term. Costs include possible loss of amenity, ecosystem resilience or environmental quality, which are difficult to value. Nevertheless, recent studies suggest that, based on a full cost-benefit analysis, the planning system is excessively restrictive. In particular, the Government Office for Science report on Land Use Futures states that:

> "*There is a strong economic case that planning controls on land in some areas, especially in the South East of England, are tighter than can be justified by current valuations of the net costs of development. Releasing land for development in areas of high demand can confer large social welfare gains and would require some relaxation of planning policy. The long-term social, economic and environmental costs and benefits will need to be carefully weighed*." *(GO-Science, 2010)*.

The new government has decided on a major overhaul of the planning system. The central idea, in accordance with the *Localism agenda,* is to "create a planning system where there is a basic national framework of planning priorities and policies, within which local people and their accountable local governments can produce their own distinctive local policies to create communities which are sustainable, attractive and good to live in" (Conservative Party, 2010). Accordingly, the top-down building targets and the regional level of planning have been abolished and the NHPAU closed. Local planning authorities will be responsible for assessing local housing needs and identifying suitable areas where land can be released to meet these needs. The New Homes Bonus (NHB) will provide an incentive for communities to allow development by offering a central government transfer

Box 2.3. **The top-down planning system did not allow enough homes to be built**

The top-down planning system originated in the Town and Country Planning Act 1947. The new government has set out to reform the system, which has failed to deliver enough building spots, at least over the past two decades.[1] This box describes the top-down planning system as it operated until mid-2010.

National targets for the number of new homes were derived from demographic projections, which were translated into regional spatial strategies (RSS) and local development frameworks (LDF). The RSS provided a broad development strategy for the region over the next 15 to 20 years, identified areas for new housing and regeneration and priorities for infrastructure and the environment. The LDF determined the spatial planning – *e.g.* location, size and type of new homes and proportion of affordable homes – for the local planning authority's (LPA) area. In addition, LPAs could negotiate developer contributions, in particular to infrastructure and affordable housing, as part of a planning obligation (Section 106 of the Town and Country Planning Act 1990). The Community infrastructure levy (CIL) was introduced in April 2010 to allow LPAs to tax planning gains to finance infrastructure in a way that is more straightforward and predictable than through section 106 agreements.

Household number projections, which played a key role in RSSs, are very uncertain, especially at the regional level (Barker, 2008). Moreover, trend-based household projections do not take into account market signals, in particular the impact of house prices on housing demand and household formation (Meen and Andrews, 2008). Hence, building the right amount of homes in the right places has proved challenging. To overcome these difficulties and in response to a recommendation of the Barker Review of Housing Supply (Barker, 2004), the then government adopted affordability targets and set up the National Housing and Planning Advice Unit (NHPAU) in 2006 to monitor affordability and housing supply and to advise the government and the regions.

The planning system also set brownfield and density targets, which have been criticised for having led to the provision of too many flats, when households prefer houses, and to the disappearance of gardens in urban areas - so-called "garden grabbing" (Nickell, 2009).[2]

1. The planning system has also raised obstacles to business expansion – as pointed out by the Barker review of land use planning (Barker, 2006b) and successive editions of OECD Going for growth – and renewable energy projects.
2. Gardens used to be classified as Brownfield. This is no longer the case since June 2010.

to local authorities that matches the amount raised on new homes through the council tax for six years.

Replacing the top-down planning system with a decentralised framework where local authorities are empowered to set their development priorities and have incentives to allow building is attractive in principle. A fundamental weakness of the top-down planning system was that it provided few incentives for local authorities to allow development. As noted earlier, the benefits of development are often diffuse, indirect and long-term, while the associated costs are local, visible and short-term (Barker, 2006b). Local residents are often not supportive of house building in their local area, an attitude often referred to as NIMBYism (Not In My Back Yard). A recent survey carried out by YouGov for the NHPAU shows that on average only about one in two English adults supports house building in their local area, although there is more support among younger people, in the North East, and in London (NHPAU, 2010). Increased resistance to targets set by national and regional

authorities at the local level is an important reason why the top-down system has failed to deliver enough homes to prevent a sharp reduction of affordability in recent years (Burgess *et al.*, 2010). Fostering the willingness of communities to support development will be a key challenge for the "open source" planning system (Box 2.4).

Box 2.4. **Encouraging local communities to promote development**

Providing the right level of incentives to local authorities for allowing development is important. Growing communities require costly public investment in infrastructure and services. The expansion of towns and cities may also result in loss of amenity and increased congestion. House prices may be negatively affected. Against these costs, benefits to residents, such as increased vitality or enhanced job potential, are less apparent. In fact, a large share of the benefits is likely to accrue to newcomers. Hence, residents often tend to resist development. Overcoming this resistance requires appropriate incentives.

If residents are confident that expansion will bring with it the funding required to maintain infrastructure and public services, or even allow improvement in services and lower local taxes, they will be more willing to accept new developments. The YouGov survey mentioned above shows that more than three quarters of people would support house building if they were sure local services (*e.g.* GP surgeries, hospitals and schools) would not suffer. People would also be more favourable to development if adequate infrastructure (*e.g.* roads, utilities) was provided and if the homes were "well designed and in keeping with the local area" and went to local people. Only 13% of homeowners mentioned a negative impact on house prices as a reason for opposing development (NHPAU, 2010).

The new government has committed to providing "strong incentives" for development, but with public finances under severe pressure, funding local infrastructure investments is likely to prove challenging. The level of incentives required to generate sufficient housing supply remains uncertain. The New Homes Bonus could prove insufficient to motivate some communities to allow development. The new community infrastructure levy could contribute significantly to adequate provision of infrastructure. However, providing the right incentives for local communities to adopt a more positive attitude towards development might require a move towards a more decentralised tax system. For example, in Austria, Germany, Switzerland and the United States, local authorities receive a larger share of taxes paid by their residents, which encourages them to allow construction. Supply in these countries has been much more responsive to demand than in the United Kingdom. Some communities, especially among the wealthiest, might resist development altogether and even more the building of affordable housing, arguing that additional housing is not needed in their area. The evolution of housing completions should be monitored very closely and the level of incentives revised if needed.

Decentralisation also offers an opportunity to streamline the planning system. Once local plans are endorsed by communities, the presumption of sustainable development – the right to build provided that development conforms to national standards and the local plan – should speed up the process of granting planning permission and make it more predictable (HM Government, 2010). This could bring the system closer to the zoning system operating in the United States and New Zealand or the Master Plans in place in Austria, Germany and the Netherlands. In these systems, a plan defines what type of

building is appropriate in a particular area and no development permission is required beyond the requirements of the plan. Such systems tend to enhance housing supply responsiveness relative to systems where individual permissions are required. However, it is "important to distinguish how systems operate in theory from how they are delivered in practice" (Barker, 2006a). For example, the Dutch system has become increasingly restrictive since the early 1990s.

The recent removal of the regional level of planning raises important concerns about strategic planning of infrastructure and public services. In a number of areas, including health, education, transport, waste management and flood prevention, consistency and co-ordination between local plans is essential. The Localism bill will set a "new statutory duty to co-operate on local authorities, public bodies and private bodies that are critical to plan-making, such as infrastructure providers" (HM Government, 2010). But defining a precise framework for such co-operation is warranted. It is also important to ensure that the strategic planning expertise that existed at the regional level is not lost (Burgess *et al*., 2010). Furthermore local planning authorities should be provided with technical assistance when needed.

As noted earlier, limitations on the use of land for housing result more from planning constraints than from the scarcity of suitable land. In particular, construction of dwellings is severely constrained by Green Belts. The fundamental aim of Green Belts is to prevent urban sprawl. They also play a role in achieving other objectives, such as protecting the environment or preserving the character of historic towns. But these objectives would be better achieved through land protection closely tied to environmental or social interest rather than location around urban areas. Green Belts include previously developed land and farmland with limited environmental value. Locating homes beyond the Green Belt increases commuting distances and carbon emissions. These considerations point to reconsidering Green Belt boundaries (Barker, 2006b). Changes in boundaries should be justified by a transparent assessment of the full benefits and costs – including environmental and social – of allowing development. Such an assessment could help overcome resistance to change, as there is widespread public support for Green Belts, perhaps because "it is not clear that people understand the function of Green Belts, and it is also unlikely that many appreciate its extent or indirect costs" (Barker, 2006b).

A fundamental question is the location and type of new building sites to be delivered by the bottom-up planning system. This will depend on local circumstances. Nevertheless, general questions may be raised. Increasing home supply implies either higher housing density or new land development (Box 2.5). In the early days of the system created by the Town and Country Planning Act 1947, urban containment was accompanied by the creation of new towns to accommodate growing demand for housing. Later, the focus moved to increasing density within cities and allocating land for development in growth areas along transport corridors (Solutions, 2009). The previous government also tried to revive the Garden city idea in the form of Eco-towns, but with limited success, due to design problems and local opposition. The new government has announced the end of growth area funding and the Thames Gateway programme, which aimed at maximising the potential of the Thames Gateway to provide London with the space to grow (HM Treasury, 2010). Overall, whether current planning policies can deliver the land for enough housing where it is needed is uncertain and their development will need to be closely monitored.

Box 2.5. **Building the right type of housing in the right places**

Over the past decade, the government encouraged development of brownfield sites and "densification", with some success. A target of 60% of all new developments to be built on brownfield land was set in 1998, which was consistently met in the 2000s, with the proportion of homes built on brownfield land reaching 80% in 2008. The average density of new housing has increased from less than 25 dwellings per hectare before 2002 to over 40 in 2007 (GO-Science, 2010). Notwithstanding this success, it should be noted that in a long term perspective the availability of brownfield land is limited and that not all brownfield spots are in areas of high demand.*

Brownfield development spares land for other uses, helps city regeneration and tends to reduce infrastructure costs, even though building infrastructure in high density areas can be expensive. High density is often assumed to be friendlier to the environment as it would induce less use of transports and high-density buildings would tend to be more energy efficient. However, this view is increasingly challenged (GO-Science, 2010, Solutions, 2009). Even if high density building were to lower carbon emissions, instruments such as congestion charges or a carbon tax would presumably be more effective than the planning system in promoting efficient energy use. Besides, low density housing would be better for biodiversity than mono-cultural farmland (Evans and Hartwich, 2005).

UK households have a high propensity to live in houses rather than in flats. The proportion of the population living in flats is the second lowest in the European Union (27 countries) after Ireland (Eurostat, Housing statistics, 2010). Surveys confirm that British households have a strong preference towards living in houses and housing policies have often been accused of leading to the construction of too many flats and too few houses. Subscribing to this view, the new government has abolished density targets. This implies that more land will need to be released for building, especially greenfield land.

* GO-Science (2010) notes that "it would require all urban brownfield sites to be used to meet the 60% target for the planned three million extra homes by 2020, not including the backlog of suppressed demand".

Strong competition in the construction sector can contribute to lower costs and increased supply

The house-building sector has been hit hard by the recession and its production capacity and supply chains have been affected. The sector is heterogeneous, comprising many small businesses – around 6 000 – and a few large developers, the top six of which account for 40% of output (Pretty and Hackett, 2009). Most companies are concerned with high debt levels and cash-flow management. Tight credit conditions weigh particularly on small and medium enterprises. Low interest rates have mitigated the problem for the firms that have retained access to credit.

A strong and competitive construction industry is vital to the provision of quality housing. House-building is an inherently risky business because of the length of the production cycle and the difficulty to predict costs, especially in an uncertain market and regulatory environment (Ball, 2010). Real construction costs increased by 48.9% in the UK over the period 2000-2007 compared to an average of 17.7% in a sample of 18 OECD countries (André, 2010). To some extent, this might be linked to the increase in brownfield development, which tends to be more expensive than building on greenfield. The volatility of land and property markets has probably also contributed to increasing costs.

Reforms in the planning system and housing taxation would lead to a more stable and predictable environment, which would have positive effects on home-builders' performance. Planning policies have led to a situation in which the house-building industry derives most of its profits from gains on land values. The scarcity of land exacerbates competition between home-builders to secure building plots and reduces competition on the design and quality of construction. Restricted access to land in an area acts as a barrier to the entry of competitors for developers that have secured land. Facing little competition, these home-builders have less incentive to innovate and improve quality. Indeed, customer satisfaction with house-builders tends to be low. The volatility of house prices and the uncertainty in gaining planning permission increase the risks for developers, resulting in reduced investment in technology, innovation, workforce training, brownfield development and responsiveness of supply (Barker, 2004).

The framework improvements outlined above would improve the operational environment of the construction industry and make house-builders more efficient. Structural sources of difficulties for house-builders stem from regulations that increase costs and uncertainties. Negotiations of development conditions (Section 106; see Box 2.3) have become increasingly complicated and delay planning agreements. Building regulations also tend to be cumbersome and their evolution uncertain, especially on sustainability standards. Regulations should focus on outcomes rather than means, allowing the industry to find the most effective means to meet specified standards.

Policies should also make sure that the construction industry remains competitive. As noted above, a small number of firms account for a large share of output. Large developers are also better able to secure access to land and planning permissions than smaller ones (Adams *et al.*, 2008). But, except for obstacles to access to land, the UK construction industry generally looks competitive. A comprehensive Office of Fair Trading (OFT) market study of homebuilding "found little evidence of competition problems with the delivery of new homes in the UK" (OFT, 2008). Mark-ups in the sector seem to be quite low by international standards, also suggesting fairly strong competitive pressures in the industry (Andrews *et al.*, 2011). Nevertheless, the OFT has recently uncovered cases of bid rigging in the construction industry in England (OECD, 2008). This calls for a close monitoring of the degree of competition in the industry. The UK construction sector suffered from a lack of skilled workers in recent years prior to the crisis, albeit mitigated by immigration. A sufficient amount of high quality apprenticeships in construction-related trades should be made available to avoid bottlenecks when demand picks up.

The rental market is important and may benefit from greater professionalisation

A dynamic private rental market forms an important part of the housing market and can play a role in dampening overheating in the owner-occupied housing market and may facilitate labour mobility (Priemus and Maclennan, 1998; Caldera Sanchez and Andrews, 2011). The rise in the private rental market has contributed to limiting increases in rents and has provided an alternative to home ownership for young, relatively high-income households, which require a high degree of mobility (Meen and Andrew, 2008). However, the increase in demand for housing to let has also arguably added to pressures on house prices during the expansion. Growth in the buy-to-let market was mainly driven by expectations of capital gains. A study by the Building Societies Association shows that nearly half of investors were motivated both by the rental income and the prospect of capital gains, but 37% valued the latter only, while just one fifth was interested only in

rental proceeds. A widely cited motive for investing in buy-to-let is accumulating capital for retirement (BSA, 2007).

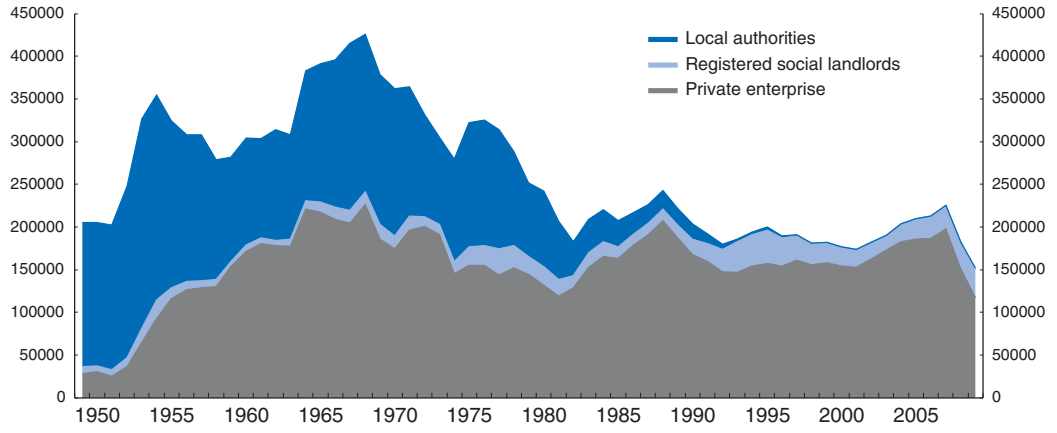
In an environment of stagnating or declining house prices and reduced mortgage availability, the prospects for the buy-to-let market are uncertain. Higher taxes on capital gains for rented dwellings also make the investment less attractive and cuts in the Housing Benefit are likely to discourage investment at the lower end of the market. The development of professional investment in the rental market, in particular by institutional investors such as pension funds, would be beneficial. Such investors can propose long term leases and expertise in management and maintenance. Regulating professional investors is also easier than for individual landlords. By managing large portfolios, institutional investors can spread risks and, by adopting a long-term view, they can have a stabilising influence on the demand for dwellings. From the point of view of investors, a portfolio of houses for rent should have an attractive risk-return profile in the long term. However, institutional investors view the sector as "cash intensive, cyclical and relatively high risk" (Pretty and Hackett, 2009). Other reasons why they have been reluctant to invest in housing include costly regulation, low rental yields, reputational risk, high management costs and lack of scale. Measures favouring the stability of the housing market, as those outlined above, could make it more attractive to institutional investors.

Social and subsidised housing

To provide decent housing for low income households, the policy framework in the United Kingdom incorporates both supply-side measures, such as social housing, and demand-side supporting benefits, notably the Local Housing Allowance (LHA), a means-tested benefit claimed by people in work, retired, unemployed or on disability benefits. Over the last thirty years, there has been a shift from supporting supply to demand-side subsidies, the latter now accounting for more than two thirds of the total, as personal subsidies in this form have been considered more effective than social housing financed through bricks-and-mortar subsidies. The private supply of rented housing has failed to make up for the reduction in social provision, however (Figure 2.11). In fact, there seems to be a general pattern across countries that demand-side subsidies have not prompted the supply response policy-makers expected (Maclennan, 2005; Lawson and Milligan, 2007). The cost of the LHA has almost doubled in nominal terms over the past decade, as a result of median private rents increasing by almost 70% and an increase in the number of claimants since the beginning of the economic downturn. In addition, the LHA, being means-tested, generates disincentives to work and save (Hills, 2007). The marginal deduction of benefits upon return to work can reach more than 95%. Some cases of inequity, where households on benefits are able to live in houses many working people cannot afford, have been well publicised. But the new government's reform, while generating significant savings for the budget, is likely to result in a sharp decline in income and deterioration in housing conditions for many low-income households (SSAC, 2010).

The Local Housing Allowance (LHA) reform, which is part of a broader welfare reform, includes: *i)* setting the LHA rates at the 30th percentile of local rents, instead of the median; *ii)* introducing an absolute cap on amounts payable by size of property; and *iii)* increasing LHA rates over time in line with the consumer price index (CPI) rather than actual market rents. Housing benefits will be cut for virtually all LHA claimants, including many low-income employees. Because of the significant numbers of LHA claimants in the UK private rental sector, the government expects these changes to have a dynamic effect on private

Figure 2.11. **Permanent dwellings completed, by tenure**



Source: DCLG Table 241.

StatLink http://dx.doi.org/10.1787/888932376649

sector rents. Some households might be able to negotiate a rent reduction and others will be able to cut other spending. However, estimates by external commentators that do not allow for dynamic impacts suggest that between 68 000 and 134 000 households could face an involuntary move or eviction (Fenton, 2010). This implies that if anticipated dynamic effects do not occur, social segregation may increase, with the social consequences observed in England and in many other countries. Homelessness assistance expenditure and other costs related to the impact of poor housing on individuals might also increase (Diacon *et al.*, 2010). The indexation of the LHA on the CPI from April 2013 would further reduce housing possibilities for LHA claimants, unless there is a marked slowdown in rent increases, which is only likely if housing supply increases significantly or income growth proves particularly sluggish. To mitigate these risks, the Government recently announced that it would extend powers for local authorities to pay LHA directly to landlords where they agree to reduce rents to affordable levels.

Housing services to those most in need could be delivered by social housing at sub-market rents. Nearly a fifth of English households live in social housing provided almost equally by local councils and Housing Associations. This is one of the highest shares of social housing in the OECD, lower than in the Netherlands (around a third) and Austria (about a quarter), but similar to France, Denmark and Sweden (Scanlon and Whitehead, 2007). Nevertheless, since the 1980s the proportion of households in social housing has been declining despite rising demand, as the right to buy allowed many social tenants to become home-owners while construction declined.

To avoid poverty traps, housing policies should also aim at better integrating social housing into the wider housing system, promoting tenure flexibility, facilitating labour mobility and creating mixed communities. While social housing provides an essential safety net for vulnerable populations with limited access to quality private housing, it appears to create unemployment (Dwelly, 2006). In 2006, more than half of the working-age population living in social housing was out of paid employment. Controlling for personal characteristics to account for the fact that the social sector disproportionately houses disadvantaged people, the probability of being employed is still significantly lower in social housing than in other tenures (Hills, 2007). Low employment rates among social tenants

can be linked to a number of factors, including segregation, neighbourhood effects, welfare benefits providing little incentives for work and the difficulty of moving. Clearly all these problems cannot be tackled by housing policies alone and co-ordinated social policy interventions are warranted.

The new government has committed to delivering up to 150 000 new affordable homes by 2014/15 (HM Treasury, 2010). Some charities have argued that it is less than a third of what is needed (Shelter, 2010). New affordable homes would be financed by allowing social landlords to charge higher rents for new tenants – up to 80% of market rents, compared to a median of below 60% today – and by capital investment, though this will be sharply reduced from past levels. It is unclear whether such arrangements will provide sufficient funding and incentives to meet the target. Since the late 1980s, local councils have been discouraged from investing in housing, in particular by ring-fencing the Housing Revenue Account (HRA), which pools and redistributes nationally proceeds from rents and dwelling sales under the Right to Buy (DCLG, 2007). The announced dismantling of the HRA could provide new opportunities for the development of council housing. However, house building by local authorities is now almost negligible – less than 2% of social dwelling completions.

Therefore, Housing Associations are likely to continue to provide the bulk of new affordable housing. These non-profit institutions have been the main providers of new homes in the social sector since policies encouraged local councils to transfer to them a large share of the social stock in the late 1980s (Whitehead, 2007). Importantly, around half of affordable social housing is currently built by private house-builders for Housing Associations under Section 106 agreements (Pretty and Hackett, 2009). As noted earlier, Section 106 agreements allowing for a variety of contributions from developers have made the planning process increasingly complicated and slow. However, Section 106 agreements have been successful in providing affordable homes and creating mixed communities (Burgess and Monk, 2010). Hence there is a case for focussing Section 106 agreements on the provision of affordable housing in areas where this type of housing is needed.

Bringing in more private financing for affordable housing would allow government grants to be better targeted on areas where social returns are likely to be high, such as urban regeneration. The reductions in public grants, which financed about a third of new affordable housing, will make funding new construction challenging. Housing Associations will need to leverage public funds with more private finance than in the past to finance their development, through the issuance of bonds or equities (Pretty and Hackett, 2009). Bond financing has been quite successful since the Housing Act 1988 set the formal framework for introducing private finance in social housing funding (Whitehead and Williams, 2009). The Housing Benefit has provided a guarantee for private investors in affordable housing, and scaling it back will make investment in this area less attractive. Attracting private equity into Housing Associations could increase financing possibilities. The Housing and Regeneration Act 2008 allows the registration of for-profit enterprises as Housing Associations from April 2010 (Elphicke, 2010). The legislation ensures the same level of protection to tenants of for-profit and non-profit Housing Associations. A strong equity base facilitates investment in long-term and risky projects, such as urban regeneration. Non-profit organisation active in both the market and social sectors can use cross-subsidisation to finance social housing. However, it is crucial that Housing Associations are carefully regulated so that excessive risk-taking in market activity does not put the provision of affordable housing at risk.

Affordable housing also needs to be more flexible and more responsive to tenants' needs. Social housing has become more and more polarised over the past two decades, with particular concentrations of deprivation in some specific neighbourhoods and estates. Residents and neighbourhoods have been increasingly stigmatised and social housing has tended to become the tenure of last resort. To remove the stigma associated with living in social housing it is essential to create mixed communities. Section 106 agreements provide a useful contribution to this objective. In addition, policies should promote more flexible tenures. One example is the HomeBuy scheme, which enables social tenants, key workers and first-time buyers to buy a share of a home and get onto the housing ladder. By allowing social tenants to become homeowners within their neighbourhood, shared-ownership schemes promote tenure and social mix. They allow households who cannot buy outright to participate in capital gains in rising markets. Shared-ownership also allows flexibility during recessions, when people facing difficulties repaying their loans can reduce their equity or stay in their homes as tenants. Older people could also withdraw equity from their homes to finance consumption.

Property taxation could have a stabilising effect

The current set of housing-related taxes in the United Kingdom is quite regressive and encourages excessive demand for housing, which is particularly harmful in a situation where supply is heavily constrained (Andrews, 2010).[5] More effective taxation could help contain demand and stabilise the housing market. Mortgage interests are no longer tax deductible since 2001 and recurrent taxes on immovable property are comparatively high (OECD, 2009b).[6] On the other hand, imputed rents and capital gains on owner-occupied houses are not taxed and there is no VAT on new construction. Finally, there is a stamp duty land tax on housing transactions, but it is on average not very high by European standards (EMF, 2006). UK housing taxation appears to favour wealthier and older households relative to poorer and younger ones (Evans, 2009). As an investment good, owner-occupied housing does not seem to be excessively advantaged, as other investments – such as Individual Savings Accounts (ISA) and pension funds – also benefit from exemptions from taxes on dividends and capital gains. As a consumption good, the absence of VAT on new homes advantages housing over other goods, even if this advantage is partly offset by the existence of the Stamp duty land tax and the Council tax (IFS, 2004).

The introduction of a property tax related to market values has been widely recommended (*e.g.* Barker, 2004; IFS, 2004; IMF, 2005; Muellbauer, 2005; OECD, 2005). The Mirrlees review also concludes that "Council tax should be reformed to relate it more closely to actual property values" (Mirrlees, 2010). The Council tax is a local tax on property. Its level is set by local authorities, although relative tax rates between properties in different valuation bands are determined by central government. Property valuations used for this purpose are still based on 1991 valuations – except in Wales, where a revaluation was carried out in 2005 (based on 2003 property values) and Northern Ireland (which has domestic rates rather than council tax), favouring households whose house values have increased most. Furthermore, the Council tax is highly regressive. In England, the tax liability for properties over £320 000 is only twice the liability for properties of £70 000 and three times the liability for houses under £40 000. Low income households are entitled to a council tax benefit. However, the take up is only around 65%. An additional undesirable feature of this tax in a context of housing shortages is a discount on second and empty homes. Hence, the Council tax should be reformed or replaced by a property tax based on

current market values or a land tax (Crawshaw, 2009). One positive aspect of the Council tax is that as a local tax it provides local authorities with a steady flow of income independent of central government. Any reform proposal needs to take this into account.

Scrapping the Stamp duty land tax and replacing it with a recurrent tax on property would also increase efficiency. As with any transaction tax, the Stamp duty land tax penalises mobility, with negative consequences on the labour market and economic growth. In addition, the Stamp duty land tax increases the amount of cash needed up-front by house-buyers, penalising young households with little savings in high prices areas. The government tried to use Stamp duty land tax holidays to buttress the market during the early 1990s downturn and again very recently. The results of such initiatives in boosting transactions are mixed (Nationwide, 2010). While using the Stamp duty land tax to dampen cyclical fluctuations can make sense in theory, getting the right timing for changes in rates is challenging and other instruments might be more appropriate.

Tax neutrality considerations would support charging VAT on new homes, especially as VAT is charged on repair, maintenance and improvements of existing homes (Evans, 2009). Housing seems to benefit from a more favourable tax treatment as a consumption good, than as an investment vehicle. However, charging VAT on new homes would reduce housing supply incentives, which is clearly not desirable in the current environment.

A property tax would mitigate adverse distributional effects of supply restrictions. Planning constraints, which to some extent reflect external costs, translate into high house prices, which should reduce demand for land and houses. However, houses are investments as well as consumption goods. As planning constraints lead to rising house prices and thereby expected capital gains, they lower the user cost of housing. In other words, housing is expensive but the prospects of capital gains are high. This leads those who can afford it to over-consume (Barker, 2008). As a result, others, especially young households, are increasingly excluded from homeownership. In some sense, the implicit tax falls on those who can the least afford it, exacerbating wealth inequalities.

A tax on actual property values would likely slow growth in household debt and housing demand, by moderating the financial accelerator, as increases in mortgage debt over recent years mainly came from existing homeowners taking advantage of rising housing wealth to increase investments in dwellings or withdraw equity. It would also make it less attractive to buy houses for an investment motive and provide a disincentive to leave homes empty. A property tax would increase the user cost of housing, contain housing demand through income and collateral effects, and limit expectations of house price increases. These effects are difficult to quantify, but rough estimates suggest that a property tax linked to the value of houses would have lowered prices by around 20% at the peak of the market in 2007. This result is broadly in line with estimates indicating that the introduction of a tax equivalent to a sixth of imputed rents could lead to a 20 to 25% fall in prices reported by Muellbauer (2005). More stable house prices would foster more balanced and sustainable economic growth, while wealth could be more equally distributed.

The implementation of a property value tax requires consideration of four additional factors. First, a property tax based on market values would bring volatile proceeds, which is undesirable for local finances. Therefore, its introduction would require a reorganisation of public finances between central and local government. Second, a regular updating of property values entails administrative costs, but these seem manageable. The Lyons

inquiry (Lyons, 2007) states that "the technology now exists to go ahead with a revaluation relatively cost effectively". Nine OECD countries reassess cadastral values at least every five years (Johansson, 2011). Third, as the introduction of a property value tax can have a significant effect on house prices, it might be judicious to phase it in progressively. Policymakers should consider the timing of measures carefully in order not to destabilise a vulnerable market. Safeguard mechanisms for housing rich but income poor households, mainly retired, would also need to be devised. Options would be to defer the payment till the sale of the house or the death of the owner or to develop an efficient market for equity withdrawal to pay for taxes. Fourth, should replacing the stamp duty and the council tax by a property value tax prove politically infeasible, a first step could be to base the council tax on regularly updated property valuations.

Box 2.6. **Recommendations on housing**

- **Housing supply.** Make supply of housing more responsive to demand by loosening planning restrictions, including replacing Green Belts by land-use restrictions that better reflect environmental designations. Monitor the impact of the planning reform on housing supply closely to assess whether development incentives for local communities are sufficiently strong and review incentives if necessary. Provide an adequate framework for strategic planning.
- **Housing taxation.** The current council tax and stamp duty should be replaced by a property tax based on market values. As a minimum first step, the council tax could be based on regularly updated property valuations. Safeguard mechanisms for housing rich but income poor households, mainly retired, might also need to be devised. Options would be to defer the payment until the sale of the house or the death of the owner or to develop an efficient market for equity withdrawal to pay for taxes.
- **Housing affordability.** Housing policies should ensure access to decent affordable housing or financial support for households unable to access it through the market. This can be achieved through a mix of means-tested housing benefits and subsidies for affordable housing construction, paying attention to the diversity of local needs. It is crucial that housing policies are designed in a way that encourages mixed communities and avoids creating obstacles to mobility and poverty traps.
- **Construction competition.** Enhance competition between developers by facilitating even access to land.
- **Construction workforce.** Provide high quality apprenticeship in construction related trades to ensure no shortage of skilled workforce hinders construction growth when demand picks up.

Notes

1. The numbers refer to the total construction sector, which also includes non-housing related activities. However, non-dwelling construction is strongly correlated with the housing cycle.
2. Housing equity withdrawal is new borrowing secured on dwellings that is not invested in the housing market (*e.g.* not used for house purchase or home improvements), so it represents additional funds available for reinvestment or to finance consumption spending (Bank of England).
3. The average floor space in new dwellings is 76 m^2 in the UK, the smallest in the European Union (15 countries), compared to an un-weighted EU average of about 100 m^2 (Evans and Hartwich, 2005a).

4. The latter estimate assumes that 60% of homes would be built on Brownfield, corresponding to the government target at the time the estimation was made, which has been consistently exceeded over recent years.
5. The owner-occupier tax advantage is estimated at £23.7 billion in 2007-08. This is higher than the £15.7 billion Housing Benefit bill in the same year. The tax advantages included in this estimation are the absence of tax on imputed rents and of capital gains tax on principal residences (Diacon, *et al.*, 2010).
6. Recurrent taxes on immovable property amounted to 3.2% of GDP in 2007. However, this item includes taxes on business – *e.g.* shops, factories and offices. Taxes on households (essentially the council tax) represented 1.7% of GDP, which is the highest among countries reporting this item.

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Chapter 3

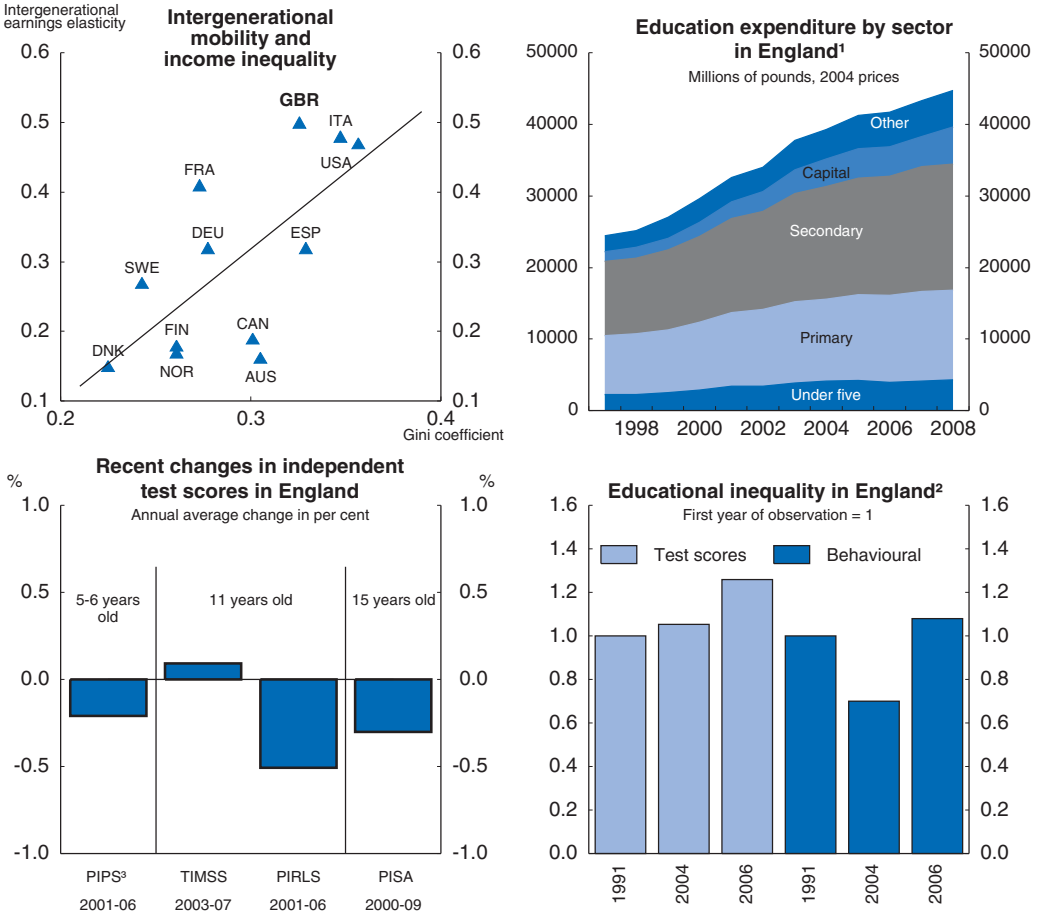
Reforming education in England

Despite significant increases in spending on child care and education during the last decade, PISA scores suggest that educational performance remains static, uneven and strongly related to parents' income and background. Better educational performance could improve labour market outcomes, raise growth, lower the consequences of a disadvantaged background and increase social mobility. Given the austere fiscal outlook, improvements have to come from higher efficiency rather than further spending. More focused pre-school spending on disadvantaged children could improve skill formation. Better-targeted funding for disadvantaged children combined with strengthened incentives for schools to attract and support these students would help raising educational outcomes. The government is increasing user choice by expanding the academies programme and introducing Free Schools, but needs to closely follow effects on fair access for disadvantaged children. The impact of increasing user choice on educational outcomes is uncertain, but the government should experiment with proscribing the use of residence criteria in admission to local government maintained schools in some local authorities. Reforms to increase supply flexibility should be pursued. All government funded schools should enjoy the same freedom in hiring and wage setting to level the playing field across different school types. To better gauge progress and inform policy makers, schools and parents on educational outcomes, additional performance measures should be developed and steps taken to lessen the reliance on grades in performance management. Insufficient supply of high-quality vocational programmes and tertiary education study places hamper human capital formation and growth. Stabilising and simplifying vocational education by more focus on high quality apprenticeships would support participation. The government needs to find efficient measures to raise participation especially among children from low income families to replace the abolished educational maintenance allowance. Further reforms to funding of higher education could lower taxpayers' costs and help finance a needed expansion in the sector.

International test scores suggest that educational outcomes have not improved

Educational outcomes and human capital formation are among the most important drivers of economic growth and contribute to human well-being (See Box 3.1). Furthermore, large differences in educational outcomes increase income inequality. Differences in educational outcomes also lower intergenerational social mobility, as

Figure 3.1. **Educational and social outcomes in the United Kingdom and England**



1. Education expenditure by Central and Local Government in England. Excludes DfE administration costs and expenditure on other areas than education, for instance on children and families and on skills.
2. Measured as impact of parent income on children's cognitive skills at 6 years age.
3. PIPs is used by a relatively small number of schools and there have been concerns about the robustness of the test results (Statistics Commission Report, 2005).

Source: Panel 1: Data on intergenerational earnings elasticity are based on the meta-analysis carried out by Corak (2006) for most countries. Those for Spain, Australia and Italy are from D'Addio (2006). Data on income inequality are from the OECD. Panel 2: Department Annual Report 2009. Panel 3: PISA database, Mullis *et al.* (2007 and 2008) and Merrel, Tymms and Jones (2007). Panel 4: Blanden and Machin (2007).

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children of high-income parents tend to achieve better in the education system than their peers (Blanden *et al.*, 2007). Incomes and educational outcomes are unevenly distributed in the United Kingdom compared to many other OECD countries, and intergenerational social mobility is low (Figure 3.1, first panel).

Evaluating educational reforms and identifying efficient policies is often difficult however. Firstly, conclusive evaluations in terms of labour market and social outcomes can often not be performed until groups affected by policies have reached adult age, which may take place 20 years after policies have been introduced. Developing and analysing intermediate indicators of outcomes therefore needs to be an important part of the evaluation of policies. Secondly, policy evaluation is difficult as education systems are complex by their nature and different countries seem to be able to perform well under different institutional settings (Braconier and Brézillon, 2011). This means that reforms has to be seen in a country-specific institutional context.

During the last ten years, ambitious reforms aiming at improving educational outcomes, addressing inequality and increasing social mobility have been pursued in England. Spending on pre-school education (henceforth pre-schooling) and schooling has risen substantially (Figure 3.1, second panel). Major reforms have aimed at supporting disadvantaged children and families by addressing child poverty and work incentives for parents. These policies have been successful in reducing poverty, in particular among children and pensioners the last decade (Joyce *et al.*, 2010). Progress on improving educational outcomes and lowering educational inequality has been limited however (Figure 3.1, panel 3 and 4).

Box 3.1. **Wellbeing in the United Kingdom**

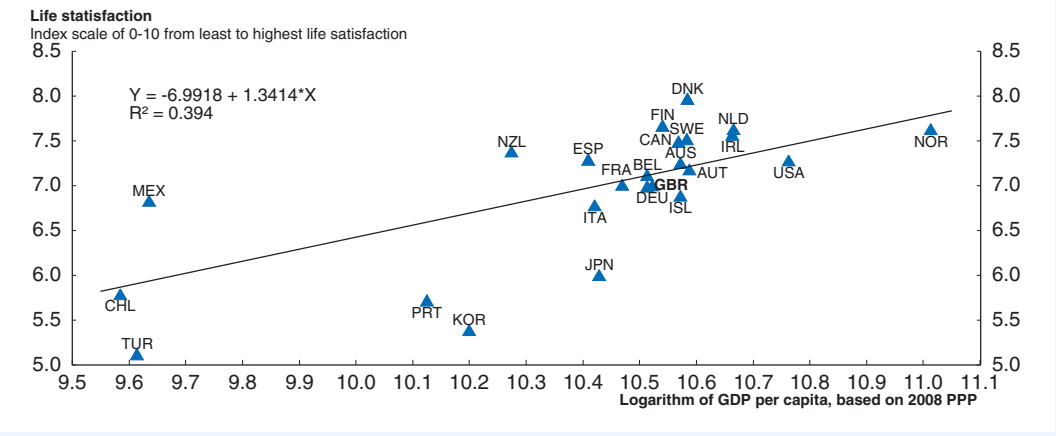
GDP as a measure of wellbeing has well known drawbacks, recently highlighted by Stiglitz *et al.* (2009). GDP mainly reflects market production, excluding *e.g.* household production. Furthermore, Stiglitz *et al.* (2009) emphasise that wellbeing is a multi-dimensional concept, and identify, in addition to material living standards, a variety of other important determinants of wellbeing. Examples are health, education, personal activities, political voice and governance, social connections and relationships, environment and economic and physical insecurity. Other studies also show that wellbeing is not just a function of income at a point in time, but adapts to changes in income. If GDP growth slows, life satisfaction can decrease (Di Tella *et al.*, 2003).

Policy makers are increasingly interested in these additional indicators and their determinants as complements to GDP. An index of wellbeing has, for example, been developed in Canada, and the Australian government has articulated the goal of improving the wellbeing of current and future generations (Australian Government, 2010). The Australian Bureau of Statistics has published a dashboard of wellbeing indicators since 2002, along the lines spelled out more comprehensively in Stiglitz *et al.* (2009). In the United Kingdom, the development of a wellbeing index as a reference for policy was proposed recently by Prime Minister Cameron, building on work by the Office for National Statistics (2010). The government's explicit goal is to improve the wellbeing of current and future generations. It has recognised that wellbeing is a multi-dimensional concept beyond GDP per capita and economic performance and policy should take into account the stock of environmental, human and social resources. (Waldron, 2010). Efforts to improve the measurement of wellbeing are being co-ordinated in an ongoing OECD project on "Measuring Progress in Societies" as a follow-up to Stiglitz *et al* (2009).

Box 3.1. **Wellbeing in the United Kingdom** *(cont.)*

Comparing wellbeing across countries and over time remains a challenge and there are many ways to measure it. In recent years, a large body of theoretical and empirical research has examined the inherently complex conceptual and measurement problems related to a broader concept of wellbeing. Research has been facilitated by the development of internationally comparable wellbeing indicators (World Value Survey, Gallup World Poll). However, these polls remain unofficial and are at times criticised for covering limited samples and changing excessively between waves. Furthermore, these surveys have no variables on housing, although it can be an important determinant of wellbeing. The types of wellbeing measures developed include expanded GDP, weighted averages of life satisfaction indexes, and self-reported subjective assessments of wellbeing based on survey data (Boarini *et al.*, 2006). Self-reported subjective wellbeing can be further divided into life satisfaction surveys (ranks of 0 to 10 of a person's satisfaction with life) and emotional wellbeing indicators (a person's emotional feelings at a point in time) (Kahneman and Deaton, 2010; Di Tella *et al.*, 2001). Index-based measures face problems with subjective weights, while expanded GDP excludes potentially important factors of wellbeing. Studies based on self-reported life satisfaction avoid these problems, but are subject to challenging data interpretation issues. These studies, which are getting increasing attention in the literature (Helliwell *et al.*, 2008 and 2009), tend to show that self-reported subjective wellbeing has a strong correlation with income (Figure 3.2), but also that other factors, such as health, unemployment and divorce, or quality of life indicators based on objective outcomes, are important.

Figure 3.2. **Life satisfaction and GDP per capita across OECD countries, 2008**[1]



1. Life satisfaction is measured on an index scale from 0 to 10 of a person's satisfaction with life, from least to highest life satisfaction.

Source: Gallup World Poll, 2008 and OECD, *OECD Economic Outlook 88 database.*

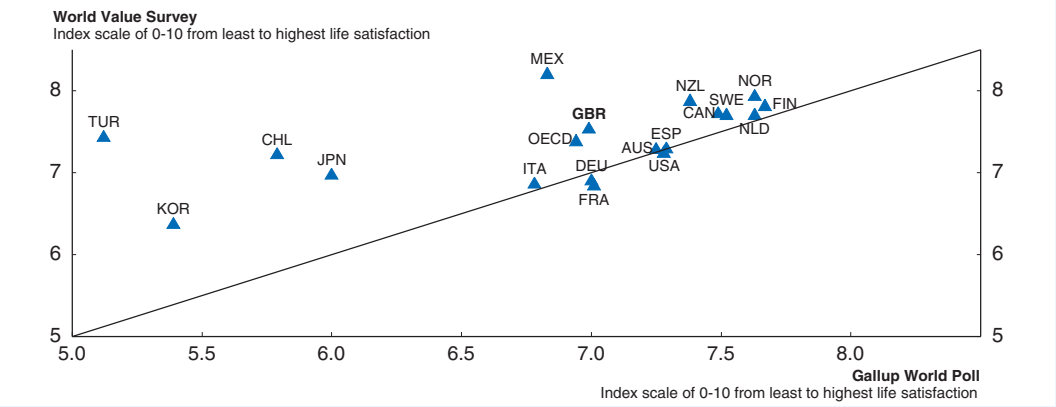
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Wellbeing measured by self-reported life satisfaction in the United Kingdom is around the OECD average. The ranking is slightly higher in the World Value Survey than in the World Gallup Poll in the 2008 (Figure 3.3). The Scandinavian countries together with Canada, New Zealand and the Netherlands tend to perform strongly, while Korea, Japan and Italy perform less impressively. Life satisfaction in the United Kingdom stagnated between 1981 and 2008, despite strong GDP growth, while it improved in the OECD as a whole. During the same period, UK self-assessed health and perceptions of the environment worsened, while perceptions of educational attainments and being employed improved strongly. Perceptions of freedom of choice and control rose also according to the World Values Survey (Figure 3.4).

Box 3.1. **Wellbeing in the United Kingdom** *(cont.)*

Figure 3.3. **Life satisfaction in OECD countries**[1]

Comparison of life satisfaction results of two surveys



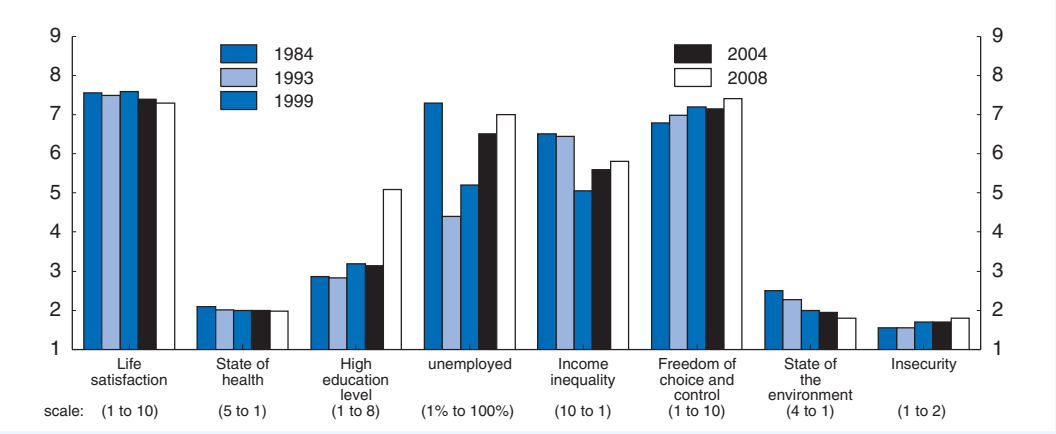
1. Life satisfaction is measured on an index scale of a person's satisfaction with life, from the worst possible to the best possible life. The Gallup World Poll index scale goes from 0 to 10 and the World Value Survey index scale from 1 to 10.

Source: Gallup World Poll, 2008 and World Values Survey, 2005-2008.

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Figure 3.4. **Life satisfaction and other indicators in United Kingdom**

Index scale from worst to best



Source: World Values Survey, 1981-2008.

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To better understand what drives self reported wellbeing in the United Kingdom relative to other OECD countries, some tentative and explanatory empirical analysis was carried out (Annex 3.A2). The most important factors for self-reported subjective wellbeing in the United Kingdom, apart from income, are self evaluated health, employment status, perceived freedom of choice and perceptions of the environment (Figure 3.4). These factors are also important for other OECD countries on average.* An increase in perceived health by one unit (for instance, moving from good health to very good health), would increase overall life satisfaction by 0.53 on average in the United Kingdom, compared to 0.65 in the average OECD country. Being unemployed strongly decreases life satisfaction which is in line with other similar studies (Winkelmann and Winkelmann, 1998). As in other Anglo-Saxon countries, perceptions of freedom of choice play a relatively large role for wellbeing in the United Kingdom. Approximately, a one point increase in this

Box 3.1. **Wellbeing in the United Kingdom** *(cont.)*

variable improves wellbeing by 0.45. The perception of the current and future environment has a high coefficient compared to the OECD average, suggesting that perceptions about environmental problems related to climate change and air pollution affect wellbeing more in the United Kingdom than in most other OECD countries. Other significant factors relate to perceptions of (self-evaluated) insecurity, income inequality and social relations. Perceptions of income inequality decrease life satisfaction in line with other studies (Alesina, Di Tella and MacCulloch 2004; Di Tella and MacCulloch, 2006), but less so in the United Kingdom than in most other OECD countries. Finally, having a higher educational level does not have a major direct impact on life satisfaction, but indirect effects through employment, income and social relations are likely to be substantial. The above results show that apart from increasing incomes and addressing inequalities, wellbeing could be enhanced by improving health and labour market outcomes and achieving stronger freedom in life and addressing environmental concerns.

* To compare the results for the United Kingdom to those of the OECD on average, a statistical test was run to determine the significance of the difference between the coefficients. While this is not significantly different from zero at 5% level of significance, it, however, suggests that the size of the determinants of wellbeing estimated in the regressions is similar to a OECD average.

Better targeted pre-schooling can support social mobility and increase educational efficiency

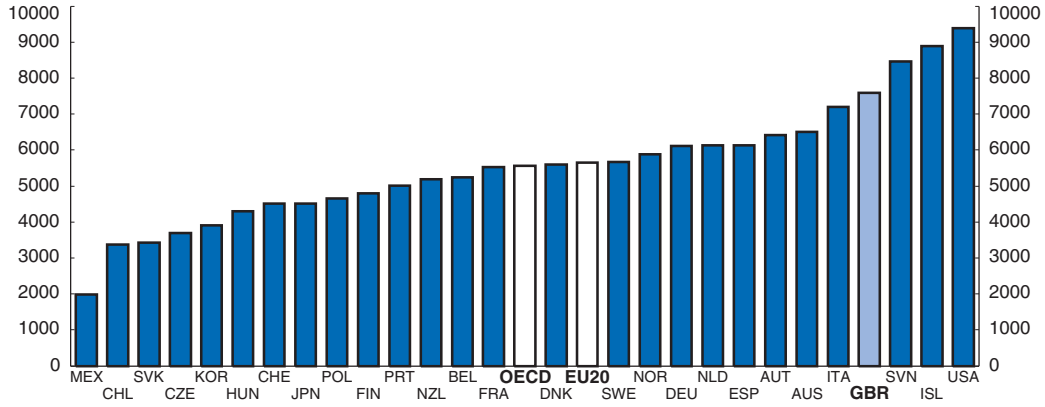
Providing high-quality preschooling to children from disadvantaged backgrounds can yield high social and private economic returns and support social mobility (Goodman and Sianesi, 2005; Heckman and Masterov, 2007). The high returns reflect that disadvantaged families may lack access to credit and may thus invest too little in their children's education. More importantly, parents' lack of skills in creating an efficient home learning environment or knowledge of the return that education can yield, also contribute to underinvestment. Programmes to address underinvestment are therefore warranted, especially as the accumulation of both cognitive (intellectual) and non-cognitive (behavioural and social) skills during early childhood have high knock-on effects, and complement later skill-formation (Cunha and Heckman, 2010). Inequalities in skill formation and attainment up until secondary schooling are the most important explanations for lower tertiary participation among groups with lower socio-economic status in England (Chowdry *et al.*, 2010a).

Pre-schooling expanded rapidly in the United Kingdom during the early 2000s, fuelled by new programmes. The enrolment rate reached almost 95% in 2008, which is significantly higher than the OECD average of 72% (OECD, 2010).[1] Pre-schooling costs per full time equivalent are among the highest in the OECD area (Figure 3.5), although overall spending as a share of GDP is moderate, reflecting low average hours per child. The expansion in England was driven by early Sure Start local programmes (integrated early years provision, health and family support), the subsequent establishment of Sure Start Children's Centres and the Early Years entitlement (free nursery education per week for 3- and 4-year-olds). While the initial Sure Start programme focused on disadvantaged geographic areas, it has later expanded into non-disadvantaged areas.

Impact evaluations of the Sure Start programme have not provided clear results, in part because of a large degree of local freedom in tailoring programmes and successive waves of roll-outs (NESS, 2008), but also due to the practicalities of establishing relevant

Figure 3.5. **Annual spending per capita on pre-primary education for children aged 3 and older**

Full time equivalents, in equivalent USD using GDP PPPs, 2007[1]



1. 2008 for Chile.

Source: OECD (2010b).

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control groups.[2] Some evidence suggests that the roll-out of relatively inefficient free Sure Start day care has squeezed out more efficient private nurseries (Sylva *et al.*, 2006). The earliest phase of the National Evaluation of Sure Start (NESS) impact evaluation found little evidence of positive effects. However, more recent phases of the study have found some positive impacts. These included self-assessed quality of the home environment, child behaviour and child health, possibly reflecting improvements in quality over time (OECD, 2008; NESS, 2008; NESS, 2010). According to teacher assessments in the Early Years Foundation Stage Profile, school starters' level of development has improved significantly and the gap between the 20% lowest-achieving children and the rest narrowed from 36% in 2008 to 33% in 2010. PIPS, which is an independent assessment tool provided by Durham University aimed at school starters, show little improvement in average cognitive abilities however (Merrell *et al.*, 2007). Furthermore, disadvantaged children seemed to perform worse in 2006 than in 2001, while the impact of parents' income on 6-year-olds cognitive and non-cognitive skills has if anything increased recently (Figure 3.1, panel 4). The apparent slippage in cognitive skill levels among disadvantaged children at pre-school age is especially worrisome, as these skills seem to be less malleable at higher ages than non-cognitive skills (Cuhna and Heckman, 2010; Carneiro *et al.*, 2007). To date, there has been no cost-benefit analysis of Sure Start.

The low impact on disadvantaged children so far is likely to partly reflect that interventions often do not reach the neediest children. While overall pre-schooling participation is high, participation of children from ethnic minorities and socially disadvantaged backgrounds remains relatively low (Hopkins *et al.*, 2010). To some extent this reflects too little focus on outreach activities in Sure Start, *i.e.* establishing contacts with the relevant target groups (NAO, 2006; NAO, 2009). In the earliest Sure Start programmes, outreach activities accounted for only 12% of wage costs (excluding overhead) and special needs spending for 2%; while child care, health services and family support accounted for the majority of the rest in 2008/09. As has been pointed out by the National Audit Office (NAO, 2006) outreach activities to the neediest parents should be stepped up to raise awareness among target groups. The government is providing funding

Box 3.2. **Different measures of disadvantage**

In this chapter, the term disadvantaged children (students) is used to loosely describe children (students) that have lower abilities to achieve in pre-schooling and the school environment and thus may be in need of extra support. There is no uniform measure of disadvantage and variation in abilities is best seen as a continuum, where any specific indicator will yield an (arbitrary) cut-off. A number of observable background statistics do correlate with low abilities and achievements including child characteristics as development disorders and parents' characteristics like income, socio-economic status, ethnicity and level of education. The most important indicators used in the United Kingdom are:

- Special educational needs (SEN) refer to children who have been assessed by the local authority (LA) to have learning difficulties or disabilities and therefore need extra support. LAs provide additional funding to schools for children with stated SEN. In 2010, 2.7% of all pupils in English schools had a SEN statement.
- Special educational needs without statement (or additional educational needs, AEN), refer to children who are deemed by schools to have learning difficulties but who don't have a SEN statement from the LA. Learning difficulties are in practice less pronounced than for stated SENs and schools are typically expected to cover the extra costs within their allocated budget. In 2010, 18.2% of all pupils in English schools belonged to this category.
- Free School Meal (FSM) recipient. Parents can apply for FSM at their local authority (LA) if they depend on income support and similar schemes or if their income is low. FSM is used as a marker of (relatively small) extra needs and enters school funding formula and is the criteria for the new pupil premium. In 2010, 17.4% of all students in maintained primary schools had an FSM statement.

for 4 200 extra health visitors to work alongside outreach and family support workers, which will enable stronger links with local health services for families. This is useful and should be accompanied by further focus on outreach activities to engage disadvantaged families in pre-schooling and also gauge the need for regular support to develop the home learning environment for the most disadvantaged children.

Pre-schooling has a disproportionately large effect on cognitive abilities and labour market outcomes of children from disadvantaged families (Hopkins *et al.*, 2010; Goodman and Sianesi, 2005). To improve pre-schooling outcomes among disadvantaged children more resources should therefore be geared towards disadvantaged families while containing costs in other areas of pre-schooling. In this context, the government has said that it wants a stronger focus on supporting the most vulnerable and disadvantaged families and increased use of evidence-based interventions within Sure Start Children's Centres. It has also set aside funding to extend the entitlement to fifteen hours per week of free early education to the 20% most disadvantaged two-year-olds in England by 2013. For the most disadvantaged children, further measures may be warranted. Early interventions with extensive use of home-visits by teachers on a regular basis, to support parents in providing more efficient educational activities at home seem to have been especially effective in supporting disadvantaged children in the United States (Heckman and Masterov, 2007). The applicability of such programmes in England should be evaluated. Home support programmes are resource-intensive however, and therefore need to be

targeted at the most disadvantaged families and would require recruiting appropriate staff (See Box 3.2 for different definitions of disadvantage). One option to implement stepped up home support could be through a voucher system to spend on teachers coming for regular visits. To incentivise parents to participate in these activities, financial incentives could also be considered.

The effect of pre-school participation on skill formation among non-disadvantaged children is weaker in recent evaluation and cohort studies. Studies based on children born before 2000 found significant impact on test scores among school starters in England (Goodman and Sianesi, 2005; Sylva *et al* 2004). The effects waned over time however, and Goodman and Sianesi (2005) found that average returns to pre-schooling were lower than for later education. More recent research focusing on children that attended pre-schooling during the mid-2000s (born 2000-02) show small and often insignificant effects on test scores at school starting age (Hansen and Jones, 2009; Hopkins *et al.*, 2010). Hopkins *et al.* (2010) also questioned previous evidence that variations in quality of child care have a significant effect on the average child outcomes in England. In a tight fiscal environment, the evidence therefore suggests spending should be focused on disadvantaged children.

The government also needs to contemplate methods to thoroughly evaluate, and potentially reform the Sure Start programme and pre-schooling programmes in general to improve overall efficiency. Hopkins *et al.* (2010) report that almost 40% of Childcare and Early Years providers do not know their outfits' total costs while unit costs differ significantly across authorities and providers (NAO, 2009). It may be useful to impose stronger restrictions across programmes to ensure more comparability. Any reforms should be carried out to facilitate explicit evaluation, by ensuring local variation and availability of control groups.

Primary and secondary education in England, the United Kingdom and the OECD

In England, children enter compulsory primary schooling at the age of five. After six years children undergo the National Curriculum Tests (also termed Key Stage 2) before progressing to secondary schooling. Students typically take General Certificate of Secondary Education (GCSE, also termed Key Stage 4) exams when they are 15, which are a prerequisite for entering the voluntary upper part of secondary schooling, the A-level. For those students that do not want to pursue an academic track, various vocational paths exist. Enrolment at the A-level is for two years and A-level exams form the basis for assessing entry into tertiary education. In the primary and secondary school system in the United Kingdom roughly 93% of students are enrolled in publicly funded schools with the remaining 7% enrolled in independent (*i.e.* private) schools which are independently funded and administered and set their own curricula (Table 3.1).

The primary and secondary school systems in Northern Ireland, Scotland and Wales share many features with the English system, but differ in some respects. The education systems in Wales and Northern Ireland used to be very similar to the English one, but differences have increased since 1998 as England has diversified from the comprehensive secondary school system that still prevails in Wales and Northern Ireland. The differences should not be overstated, as most English secondary schools remain comprehensive (Reynolds, 2008). The Scottish school system is more dissimilar, with slightly different admission criteria and a broader set of subjects being studied in secondary school.

Since 2000, the number of academies (autonomous public funded schools) has grown fast in England, although they still constitute a small part of the total number of schools (Table 3.1). Academies enjoy independence from Local Authorities (LA) in terms of daily operations, recruiting staff and admitting students, and are funded by the central government according to a different formula. In the Academies Act of 2010, the coalition government specified that any primary, secondary or special school that has been rated outstanding by the Office for Standards in Education (Ofsted) should be allowed to become an academy. This is in contrast to the previous focus on poorly-performing secondary schools.[3] The number of academies is set to grow rapidly over the next few years. The government is also introducing a free-school reform whereby parents, teachers or non-profit organisations can set up Free Schools that enjoy the same independence as academies.

The Department for Education oversees education in English schools, defines the National Curriculum, and distributes funding to the roughly 150 LAs through a complex set of "earmarked" and general grants. LAs then in turn distribute funding to local authority-maintained schools according to local formula. Schools then decide how to spend, apart from some earmarked funding. The current government has proposed to simplify the funding schedule, reducing the number of funding channels and instituting a pupil premium specifically aimed at deprivation funding. Apart from influencing school funding through the local funding formula, the LAs are also responsible for ensuring availability of suitable school places (Table 3.1). The quality of education is monitored by Ofsted. Schools deemed by Ofsted to provide an inadequate quality may be put under special administration, possibly replacing senior management and the governing board, while better performing schools are put under a lighter inspection regime.

Table 3.1. **Institutional setup of primary and secondary schools in England**

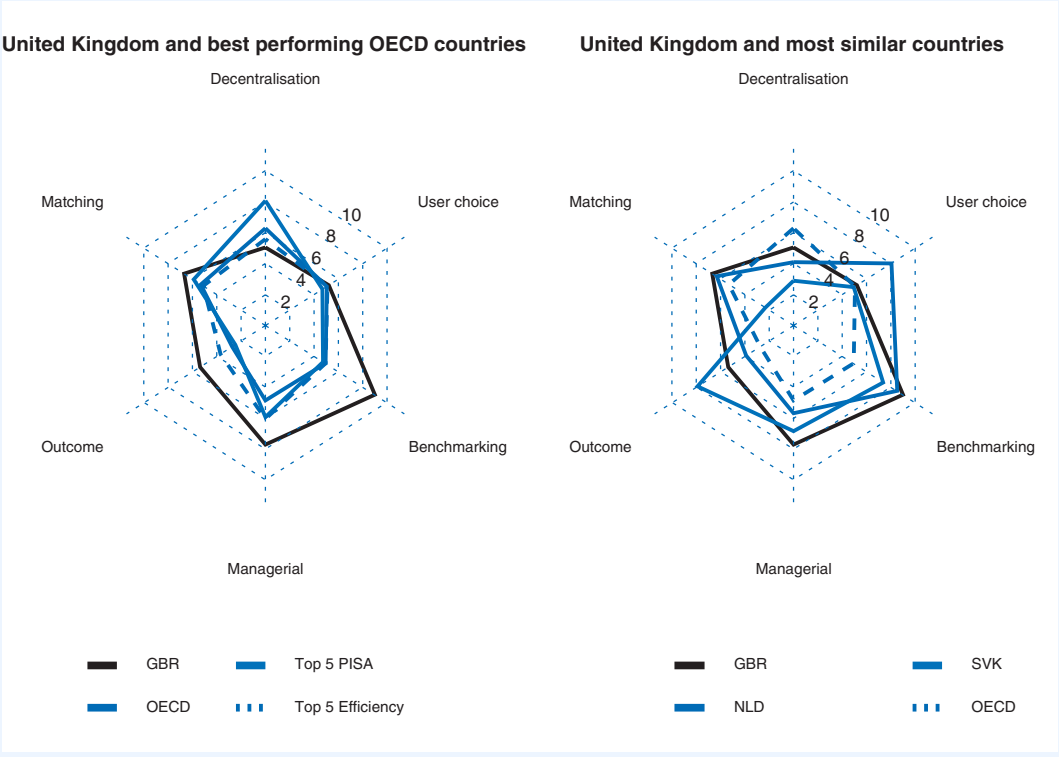
School type	Main source of funding	Selection of governing body	National curriculum applies	Admission and selection	Hiring of teachers	For profit	Share (%) 2006-07
Community	LA	LA	Yes	LA decides. Often priority to residents in catchment area	LA	No	62.1
Voluntary controlled	LA	Foundation and LA	Yes	LA decides. Often faith based priority	LA	No	3.3
Foundation	LA	Foundation and LA	Yes	Governing body decides	Governing body	No	16.6
Voluntary aided	LA and foundation	Foundation and LA	Yes	Governing body decides. Often faith based priority	Governing body	No	16.3
Academy	Central government	Limited company and sponsor	Partly	Up to 10% academic priority	Governing body	No	1.4
Free school	Central government	Charity or similar	No	Up to 10% academic priority	Governing body	No	–
Independent school	Tuition fees	Charity or similar	No	Often academic	Governing body	No	–

1. Further types of schools are City technology colleges and Special schools not maintained by LAs. Shares refer to share of maintained mainstream schools.

Box 3.3. **The English and UK primary and secondary school system in an OECD context**[1]

Recent data compiled by the OECD describes the quality of educational institutions across member countries (Gonand, 2007). 21 indicators are aggregated into 6 composite indicators: decentralisation, matching resources to specific needs, outcome-focused policies, managerial autonomy at the school level, benchmarking, and user choice. As shown in Figure 3.6, the indicators suggest that institutional settings in the United Kingdom are significantly better than the OECD average in four areas, with decentralisation being the only area where institutional performance is below the OECD average. The same conclusions can be drawn when comparing the United Kingdom to the five countries that achieved the highest average scores in the PISA survey (OECD, 2007a) or the five countries that were deemed to have the most efficient primary and secondary school systems by Sutherland *et al.* (2009).[2]

Figure 3.6. **Institutional settings in primary and secondary education**



Source: Braconier and Brézillon, 2011.

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Sutherland *et al.* (2009) report that the above-mentioned institutional factors cannot explain cross-country variations in efficiency in primary and secondary education. They do, however, find some evidence that devolution of decision power to schools on instruction and planning (which are parts of the managerial autonomy at the school level) increases efficiency. The evidence also suggests that the variation in efficiency across schools within countries falls when countries perform strongly in terms of decentralisation and matching resources to specific needs, although the latter may simply reflect that countries with early selection mechanically tend to have larger between-school variation in outcomes.

Box 3.3. **The English and UK primary and secondary school system in an OECD context**[1] *(cont.)*

One likely reason for not finding strong relationships between "good" institutions and educational performance may be that there exist different institutional frameworks that produce strong educational outcomes. Braconier and Brézillon (2011) use principal component analysis (PCA) and cluster analysis to identify groups of OECD countries that share institutional features. Primary and secondary school systems in OECD countries can be divided into 5 groups (clusters), and high-performing countries in terms of high average PISA scores or high efficiency are spread across these groups, suggesting that very different institutional setups can yield strong outcomes (Table 3.2).

Table 3.2. **Grouping of OECD countries according to setup of primary and secondary educational institutions**

	Cluster 1: USA, SWE, NZL*#, JPN*#, CZE, FRA, ITA, PRT	Cluster 2: CAN*, HUN, AUS*, NOR, DNK, ISL	Cluster 3: GBR, NLD#, SVK#	Cluster 4: DEU#, AUT, GRC, TUR	Cluster 5: BEL(FL), BEL(FR), ESP, FIN*, MEX
Mean PISA score (standard deviation)	502 (93.6)	516 (89.0)	507 (90.5)	482 (91.7)	446 (88.5)

* Indicates that country is among top five performers in average PISA score across subjects in PISA 2009.
# indicates that country is among top five performers in terms of efficiency (Sutherland *et al.*, 2007).

The cluster analysis suggests that the institutional setup in the United Kingdom is most similar to those in the Netherlands and the Slovak Republic (Figure 3.6, second panel), with strong institutional settings in benchmarking, managerial autonomy at the school level and outcome-focused policies but weak in terms of decentralisation. The top-performer within the group, the Netherlands, also has strong settings in terms of user choice. This indicates that for countries with the United Kingdom's institutional setup, increasing user choice may improve educational outcomes and efficiency. Indeed, it might be argued that significant user choice, in combination with high-quality information (benchmarking), managerial freedom (managerial autonomy at the school level) and supply-side flexibility, is a necessary condition for offering genuine choice and competition in the education system. As discussed in Box 3.5, the Dutch education system seems to provide the preconditions for an efficient "quasi"-market in primary and secondary schooling (Patrinos, 2010).

The institutional similarities identified by the clusters analysis and PCA makes it possible to analyse the impact of policy variables on educational outcomes within each cluster with the help of regression analysis (Braconier and Brézillon, 2011). Estimates for the UK cluster are then compared to estimates for the whole OECD area and the United Kingdom, which can be used to gain further insights into how policy changes may impact outcomes. For example, if one wants to analyse the effects of increasing user choice by weakening the impact of residency in a catchment area on admittance, using only data for the United Kingdom will be inefficient, as admittance criteria are highly correlated with other institutional settings. By including data for similar countries (the Netherlands and the Slovak Republic), more efficient predictions of the impact of institutions can be made. Estimates for the three countries and the whole group (cluster) are shown in Annex 3.A1.

1. Largely based on Braconier and Brézillon (2011).
2. Efficiency estimated based on a range of inputs and outputs. See Sutherland *et al.* (2007) for further details.

Benchmarking with tests and grades is an important part of the English school system. National Curriculum test scores for primary schools and GCSE scores for (lower) secondary schools are published. Traditional league tables for secondary schools typically focus on the share of GCSE candidates that achieve a certain grade level, such as the *Grades* A*-C which is the basis for selection into the academically focused (A-level) track into upper secondary schooling. Concerns relating to the usefulness of published league tables, which reflect levels of achievement rather than the value added of the particular school, has led to the publication of Contextual Value Added (CVA) scores by the Department for Education since 2006. The CVA indicator tries to reflect students' progress by relating output measures to inputs.[4] Kramarz *et al.* (2009), however shows that even this more advanced approach does not give good estimates of school efficiency as it to a large extent reflects pupil specific factors.

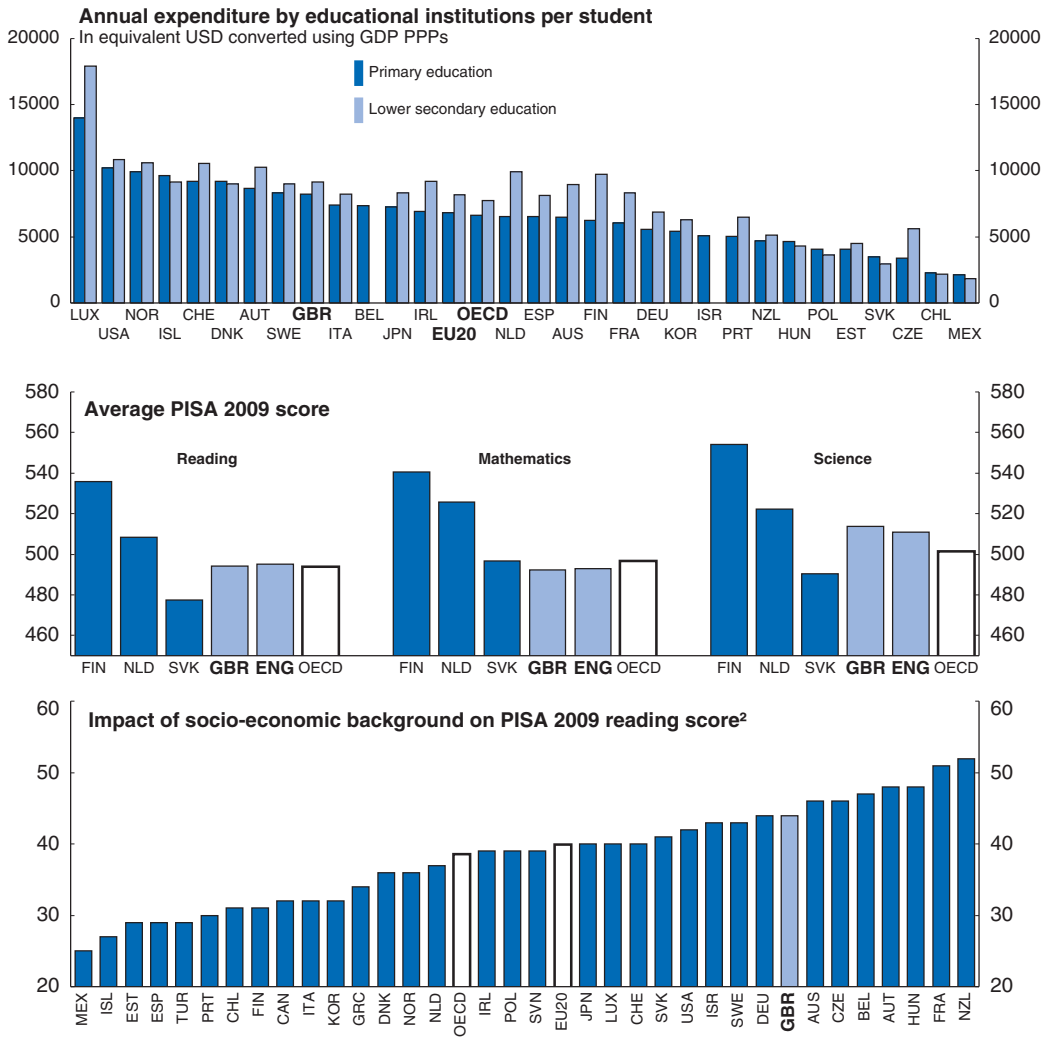
Efficiency in primary and secondary education is low and has fallen

International evidence shows only a weak relationship between educational outcomes and spending on education (Sutherland *et al.*, 2009). Achieving significant improvements in educational outcomes have also proven difficult in many OECD countries despite increases in spending on primary and secondary education (OECD, 2007b). Studies focusing on single countries more often find positive effects of spending. Holmlund *et al.* (2009) finds evidence that higher expenditure per student has a positive and significant impact on test scores in English primary schools. One may speculate that the inability to find similar positive results in time series and cross-country data evidence may be due to that lower quality inputs or less effective institutional arrangements counteract effects from increased spending.

Despite sharply rising school spending per pupil during the last ten years, improvements in schooling outcomes have been limited in the United Kingdom (Figure 3.1; Box 3.4). Real spending per pupil in primary and secondary schooling has increased by 4.8% per annum between 1997/98 and 2009/10, leaving spending per pupil significantly above the OECD average (Figure 3.7, first panel). While national indicators of average educational outcomes show significant improvements, these developments are not supported by international data, which suggest sharply falling productivity in the education sector (Box 3.4). Although average PISA tests scores, measuring cognitive skills of 15-year-olds, for the United Kingdom are close to the OECD average, they trail strong performers such as Finland and the Netherlands in achievements (Figure 3.7, second panel). Average performance among 10-year-olds, as measured by PIRLS and TIMSS scores (Mullis *et al.*, 2007 and 2008) is however relatively strong in an OECD perspective.

OECD research also suggest that considerable efficiency gains could be achieved in primary and secondary school system, as the median school in the United Kingdom performs at roughly 70-80% of the OECD best-practice (Sutherland *et al.*, 2007). A move to best-practice would therefore mean that current levels of output could be provided using roughly 20% fewer resources. With growth in real central government spending on primary and secondary schooling predicted to fall to 0.1% per annum between 2010/11 and 2014/15 (HM Treasury, 2010), significant efficiency improvements will be needed to achieve better and more equitable educational outcomes.

Figure 3.7. **Educational indicators**[1]



1. Aggregates are unweighted average of available countries.
2. Score point difference associated with one unit increase in the PISA index of social and cultural status.

Source: OECD (2010a), *Education at a glance*; OECD (2010b), PISA 2009.

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The impact of socio-economic background on PISA scores in the United Kingdom are at the higher end in the OECD (Figure 3.7, third panel and Annex 3.A1) and a low share of students from weak socio-economic backgrounds perform well (OECD, 2010a). The average PISA score of the weakest 10% of students is below the average for the same group in the OECD. This means that a sizeable share of the population leaves compulsory schooling with low levels of skills, which has an adverse impact on rates of dropout in non-compulsory schooling, labour market performance, productivity growth, and income inequality.

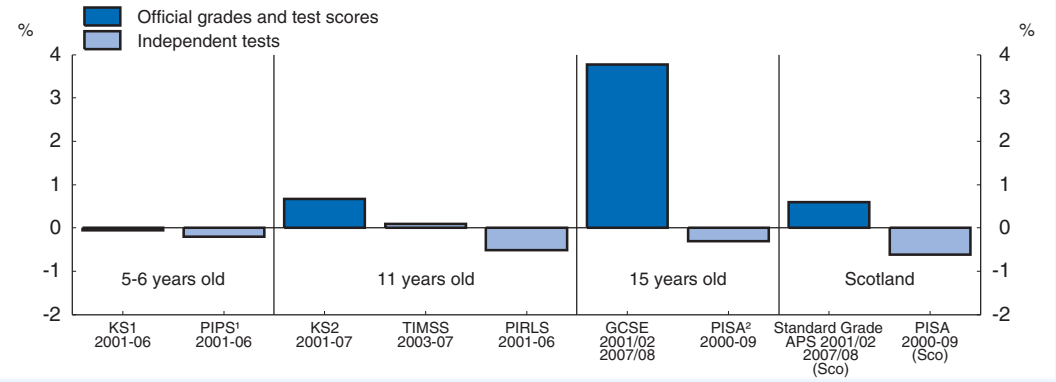
Box 3.4. **Grades, test scores and productivity in the education sector**

Measuring output accurately in the education sector is crucial for evaluating the effectiveness of education policy. While quantitative measures (number of students etc) are easy to come by, quality is more difficult. During the last few years, several OECD countries have started to incorporate quality adjustment factors in order to improve estimates of public service output.* In the United Kingdom, this has mainly been implemented by augmenting quantity measures of schooling output by the annual change in average scores of GCSEs and equivalent qualifications. To the extent that improvements in GCSEs overstate actual improvements in educational outcomes, value added in the education sector will be overvalued. As discussed in the main text, there is a risk that the use of "high-stake" grades influence estimates of educational quality in England.

Official test scores and grades in England show systematically and significantly better performance than international and independent tests (Figure 3.8). These differences in performance increase with the age of the students tested and are more pronounced for England than for Scotland. The measures used by the Office for National Statistics (ONS) based on English (GCSE Average Point Score) and Scottish (APS) grades show significant increases in quality over time, while the measures based on cognitive tests not used for grading show declines or minimal improvements. The annual difference between the improvement in the average GCSE score and the decline in the PISA score is 4.1%.

Figure 3.8. **Test scores in England and Scotland**

Annual average change in per cent



1. PIPS is used by a relatively small number of schools and there have been concerns about the robustness of the test results (Statistics Commission Report, 2005).
2. While data from PISA for the United Kingdom for 2000 should be used with some caution, due to sampling problems, PISA reading scores fell by an average of 0.1% per annum between 2006 and 2009.

Source: PISA database, Mullis *et al.* (2007 and 2008) and Merrel, Tymms and Jones (2007) and ONS (*www.statistics.gov.uk/articles/nojournal/education-extended-analysis.pdf*).

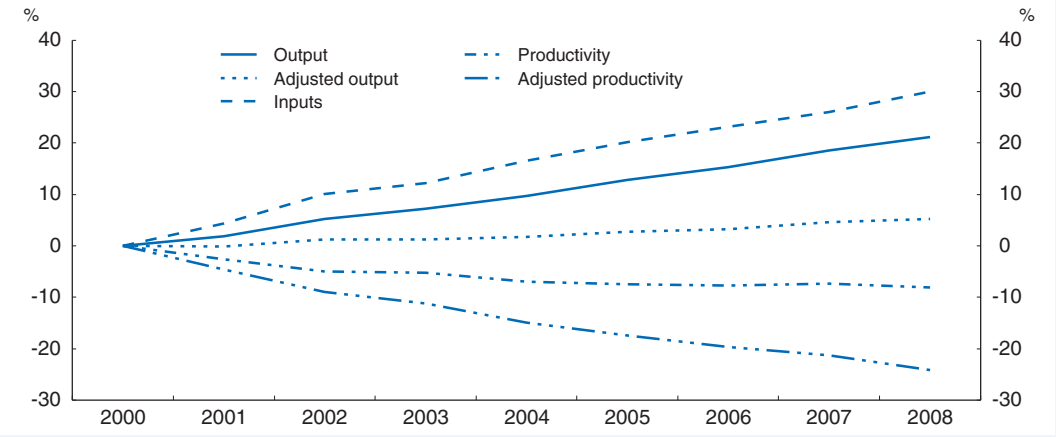
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To illustrate the impact of different assumptions on quality adjustments in educational output, the ONS's approach of using GCSEs and APS scores is contrasted to an assumed unchanged quality in output over the period 2000-2008. Educational productivity falls by 1% per year in the first approach but by roughly 3% a year if quality is unchanged (Figure 3.9). Assuming that value added in public primary and secondary education amounts to roughly 4% of GDP, there is almost a 0.1% annual effect on GDP growth from the ONS assumed quality improvement. Although quality-adjustment of output in the public sector is clearly useful in principle, the quality of the data is of utmost importance. Developing better and more reliable indicators of quality should therefore be a priority.

Box 3.4. **Grades, test scores and productivity in the education sector** *(cont.)*

Figure 3.9. **Educational output, inputs and productivity**

Per cent change from 2000



Source: www.statistics.gov.uk/articles/nojournal/education-productivity.pdf, www.statistics.gov.uk/articles/nojournal/education-extended-analysis.pdf and *www.statistics.gov.uk/pdfdir/pps0609.pdf* and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376820

* See *www.statistics.gov.uk/articles/nojournal/education-extended-analysis.pdf* for a discussion.

The extensive focus on grades in the school system is a cause of concern

National Curriculum Tests and GCSEs are used in many ways, such as selection for higher education, informing parents and students on school choice, need of Ofsted inspection, measuring variation and improvements in educational outcomes, quality adjustment factor in national accounts data, and for research purposes. They are used to gauge students, schools and national achievements. The use of benchmarking is more widespread than in virtually any other OECD country (Gonand *et al.*, 2007).

While benchmarking is an important feature of a successful school system, high-stake tests can have negative consequences for educational outcomes (Looney, 2009; Rosenkvist, 2010). The current use of tests and grades in England therefore raises several concerns. Firstly, high-stake tests are conducive to grade inflation, which raises issues of comparability over time. Whilst is it difficult to draw clear conclusions on the extent of grade inflation, the share of A-level entries awarded grade A has risen continuously for 18 years and has roughly trebled since 1980. While comparable data over long time periods is not available, independent surveys of cognitive skills do not support this development (Box 3.4). This divergence might reflect a range of factors, where *e.g.* grades reflect changing subject choices, more frequent resitting of exams and also changes to teaching and to the curriculum. This contrasts with international tests like TIMSS, PIRLS and PISA which are designed to facilitate comparability over time. High-stakes benchmarking can influence behaviour in other ways too. For students, grades are obviously crucial, and this pressure is further leveraged by limited access to tertiary education. Schools and teachers stand to benefit from increased autonomy through a lighter inspection regime from the Ofsted and a higher ranking in the league tables if performance is strong. The government

could obviously stand to gain from being seen to improve educational performance. And the five examination boards that certify examinations have little incentive to uphold higher standards than their competitors – although an independent regulator, Ofqual is in place to guard against lowering of standards. Nevertheless, there remain strong incentives for "gaming" and "teaching to tests" (OECD, 2007b). Providers of higher education have also raised concerns about the impact of gaming on university admission and the university admission service (UCAS) launched a review of the admission system in summer 2010.

Secondly, test scores compiled during a short period measure only a small part of the relevant skills of the student. In particular, non-cognitive skills are not measured by tests but have a significant impact on students' future educational career and life outcomes in terms of employment, income and wider social success (Carneiro *et al.*, 2007). It is not only that these skills, which seem to be much more malleable during school age than cognitive skills, are neglected in testing but that extensive testing and grading of cognitive skills could actually "crowd out" non-cognitive skill accumulation in classrooms. This deficit may affect disadvantaged students disproportionately as their social networks may be less able to compensate this lack of support in the school environment. There is evidence that spillovers from parental to children's "non-educational" income is especially important in the United Kingdom, which may suggest that the school system is not effective in fostering social skills that are important for labour market outcomes and social mobility (Braconier, 2011).

The reliance on GCSE scores should be lessened and primarily used as selection indicators into higher education and employment. Universities and employers are main stakeholders in the grade system and should have a greater say in the qualification procedures. Universities may anyway see the need to develop more individualised selection instruments, such as interviews, to better gauge overall and especially non-cognitive skills, although a larger reliance on non-cognitive skills could make entry more difficult for students from disadvantaged backgrounds. The government should consider whether the possible negative side-effects of having five competing examination boards, are sufficiently held in check by Ofqual.

More sophisticated indicators of schools value-added should be developed. GCSE grades and National Curriculum scores are important indicators of school quality for parents, students and Ofsted. While the move to publish Contextual Value Added (CVA) scores was a step in the right direction, school efficiency is imperfectly measured by this indicator (Kramarz *et al.*, 2009). The use of more sophisticated measures could dispel some of the overestimation of peer effects among parents that seems to be reflected in an excessive focus on sending children to schools where students have "good" social backgrounds, perhaps neglecting other factors of school quality and children's well-being.[5] Ofsted's inspection regime would also benefit from more accurate indicators. Furthermore, it is important that more focus is being put on proper inspections of "non-failing" schools to further relieve the pressure for schools to produce strong scores in order to avoid inspections.[6] More emphasis on lesson observation and the learning environment would provide evidence which can be used alongside attainment data in assessing schools and could make performance management more dynamic (OECD, 2007b).

To measure changes in overall schooling outcomes (output) over time more accurately, additional information should be collected. Outcomes for statistical comparisons should be separated from school grades to make output measures independent of grade inflation

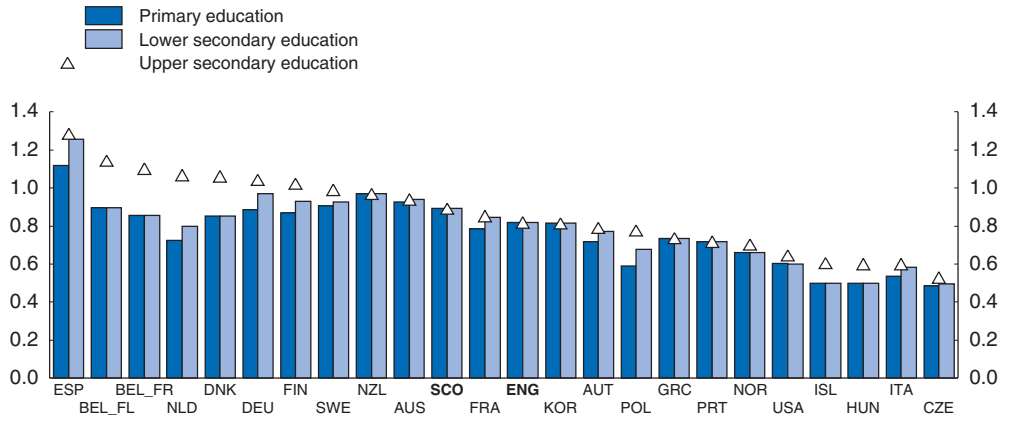
and changes to the curriculum. As measurement and testing is costly, sampling methods should be used to track changes in outcomes over time and across regions and school organisations. The sampling approach would hinder ranking of schools and would therefore remove teachers' and schools' incentives to "teach to tests". These cognitive tests could also be combined with a (smaller) set of in-depth interviews to analyse development of non-cognitive skills. This set of testing should be designed and administered by an independent body, without connection to Ofsted or qualification boards, with a specific remit to measure quality of schooling over time, region, school form and social background. Possibly, such an outfit could be set up as a part of the Office for National Statistics (ONS).

More attention to composition and quality of inputs could improve outcomes

Raising teacher quality is important for better outcomes. Teachers are the most important resource in schools, with spending on teachers amounting to roughly 60% of total spending in English primary schools (Holmlund *et al.*, 2009). Student teacher ratios seem to have a bigger impact on educational outcomes than general funding (Chowdry *et al.*, 2010b). As the share of educational spending that goes to core activities (excluding transport, meals and housing) is lower in the United Kingdom than in any other OECD country (OECD, 2010b), reallocating resources towards teaching seems warranted. Teacher quality is even more important. Hanushek and Wossman (2007) and Slater *et al.* (2009) find that higher quality of teachers raise student test scores. Recruiting and maintaining the most efficient teachers should therefore be prioritised. Measures to improve the quality of teachers include improving remuneration and work conditions. Continuing professional development is also an important factor in raising quality (Day *et al.*, 2006). Teacher wages in high performing countries in terms of PISA scores and efficiency tend to be relatively competitive compared to other academic professions (Figure 3.10). While starting salaries in general are high in England, low top wages may discourage the more experienced teachers from remaining in the profession, which may be exacerbated by an increasing number of retirements over the coming years. Working hours in teaching are also fairly long compared to many other OECD countries.

To address the significant inequalities in the English education system, there is a need to provide better teaching for the most disadvantaged students. As shown in Box 3.3, the Netherlands statistically has the most similar institutional setup to the United Kingdom. In comparison to Dutch students, UK students from better socio-economic backgrounds tend to be taught in smaller classes and have access to better quality teaching resources (Figure 3.11). The previous government tried to improve teacher quality for students from disadvantaged backgrounds by offering golden handcuffs for young teachers with high grades if they took up positions in disadvantaged areas. This policy has been abolished by the current government. Attracting and maintaining well-performing teachers should be the focus. It should be noted however that although better remuneration and work conditions could improve quality of the pool of teachers, easily observable teacher characteristics seem to have little correlation with effectiveness (Slater *et al.*, 2009). This point to the importance of giving individual schools, which can identify teacher quality, the tools and incentives to hire and reward high performing teachers, but also to remove low performing ones. Localising hiring and making pay conditions more flexible also for LA maintained schools would therefore be warranted and would also level the playing field relative to independent schools, academies, Free Schools and faith schools.[7] There is a risk

Figure 3.10. **Salary after 15 years of experience (minimum training) in relation to earnings for worker with tertiary education**[1]



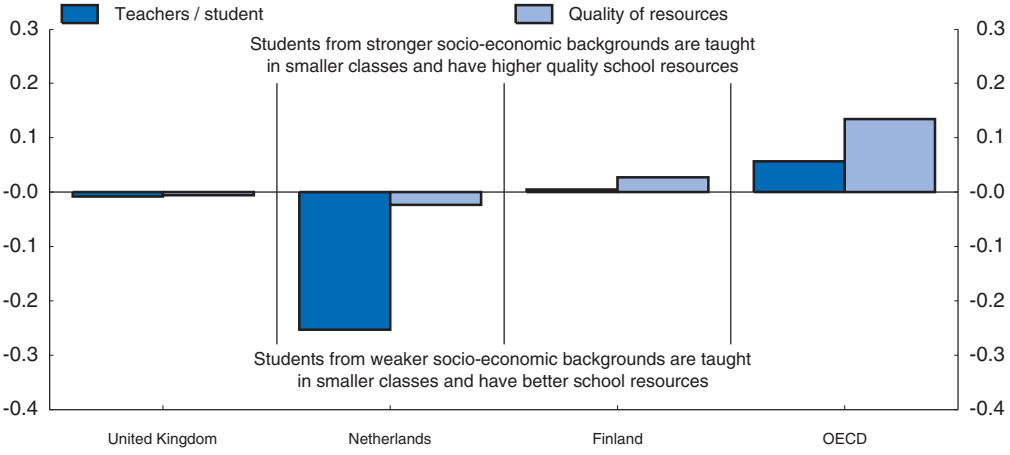
1. Full-time worker aged 25 to 64.

Source: OECD (2010b).

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that current proposals for academies and Free Schools may actually increase the correlation between socio-economic background and the quality of school resources. The government has proposed that LA maintained schools judged to be good by Ofsted should be eligible for academy status, thus providing already well-performing schools with relatively few disadvantaged students with more independence in hiring and wage setting (Machin and Vernoit, 2010). Free Schools which will receive similar freedoms are likely to cater to better off parents' needs, given the expected role to be played by parents in their creation. The impact of these reforms therefore needs to be closely monitored.

Figure 3.11. **Correlation between students' socio-economic background and school inputs**

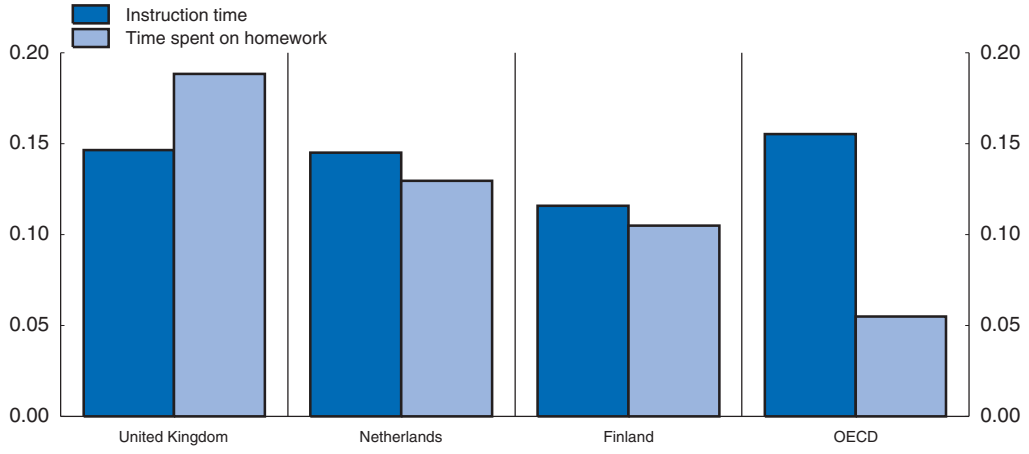


Source: PISA 2009 database and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376858

As shown in Annex 3.A1, longer instruction time and time spent on homework tends to be associated with higher PISA scores in the United Kingdom. Studies typically find a positive relationship between instruction time and test scores, although point estimates often are quite small.[8] However, most studies are based on national data, where variation in instruction time is typically fairly low, whereas more recent evidence based on international data find modest to large effects of instruction time on PISA scores (Lavy, 2010). Although increasing instruction time could be a relatively straightforward and cost effective way of improving educational outcomes in England and the United Kingdom, it should be noted that English students already receive more instruction time especially in science, maths and national language than their OECD peers. Research on the effects of homework on outcomes is mixed, but homework and homework support have been shown to improve results for non-native speakers (Cosden *et al.*, 2004). This seems less to be the case for better-off children who already benefit from a more intellectually stimulating home environment and high-quality extracurricular activities. PISA data show that the correlation between socio-economic status and instruction time is positive in the United Kingdom and of a similar magnitude as for other OECD countries (Figure 3.12). Time spent on homework is much more highly correlated with socio-economic status in the United Kingdom than in other OECD countries (Figure 3.12). Homework support for disadvantaged students should therefore be contemplated. In designing such programmes special attention should be given to support to parents, as programmes otherwise could have negative long-term consequences by separating parents from their childrens' homework.

Figure 3.12. **Correlation between students' socio-economic background and learning time**



Source: PISA 2006 database.

StatLink http://dx.doi.org/10.1787/888932376877

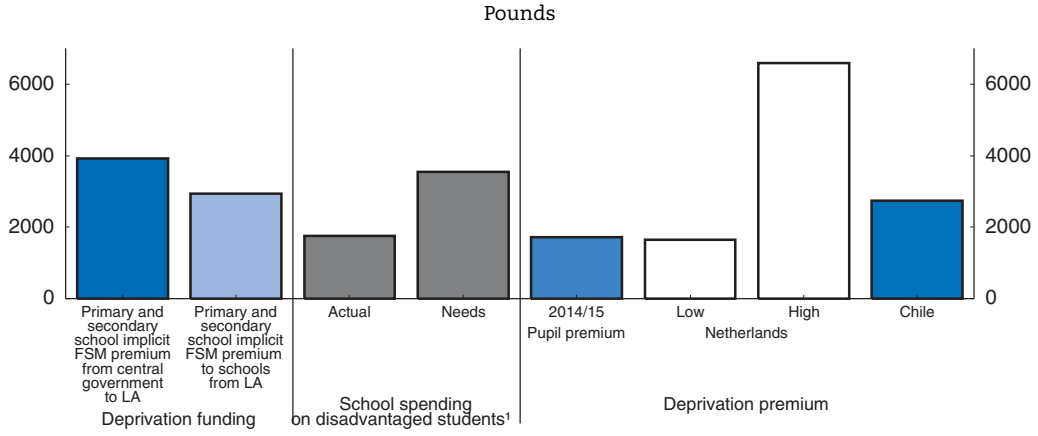
Pursuing a strategy where sufficient resources, high-quality staffing and efficient institutional arrangements are in place, especially for the most disadvantaged students, should be a priority. Achieving such outcomes is not easy however and takes time. Stop-gap measures, such as numeracy and literacy hours, to support less experienced teachers have been efficient in raising educational outcomes at a relatively low cost and should be pursued further (Machin and Vignoles, 2006).

Inefficient deprivation funding leads to underachievement among disadvantaged students

The unequal educational outcomes and the high impact of socio-economic background in the United Kingdom and England partly reflect a poorly functioning deprivation funding system in England. The central government currently provides (implicit) additional funding per deprived student in a LA equivalent to roughly £4 000 per year (Figure 3.13). On average, LAs (implicitly) pass through roughly £3 000 per deprived student to schools, with the difference spread across all schools within the LA. Several mechanisms can contribute to this low level of pass through. The complex transfer system may contribute by making it difficult for LAs to understand the share of deprivation funding in their total grants. The partial pass through may also reflect that LAs do not agree with the governments priorities. For schools (and parents with children in those schools) that have fewer disadvantaged children, strong deprivation funding to other schools may seem unfair and these schools may try to influence the LAs funding schedule. This may be one reason why LAs sometimes do not express support for extensive deprivation funding (OECD, 2007b).

Schools also face incentives to underspend on disadvantaged students. Firstly, the complex funding system may lead schools to underestimate the implicit deprivation funding that they receive. Secondly, if perceived deprivation funding is lower than schools' perceived costs, they may engage in "cream skimming", trying to dissuade disadvantaged students and recruit more able students. The lag in receiving deprivation funding provides an incentive for some schools not to recruit or retain disadvantaged students (Sibieta *et al.*, 2008). Schools also seem to spend significantly less on disadvantaged students than what they say is appropriate (Figure 3.13).

Figure 3.13. **Deprivation funding and spending in primary and secondary schools**



1. Refers to schools' estimates per pupil with additional educational needs (excluding high-cost needs).

Source: Chowdry *et al.* (2010), PwC (2009), Ministry of Education, Culture and science (2009) and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376896

The government is introducing a pupil premium (DfE, 2010). In 2011/12 schools will receive a premium amounting to £430 per child entitled to free school meals on top of base funding. The OECD estimates that after full roll-out in 2014/15 schools will receive additional funding equivalent to somewhat less than £1 700 per annum for each

disadvantaged student. The premium will go some way towards addressing underspending on deprived students. It clearly establishes the central government's preferences in terms of minimum deprivation spending. It is not clear whether the proposed level of deprivation funding is sufficient, and therefore the impact should be montitored carefully. Deprivation premia in the Netherlands and Chile are also more generous in relation to base funding (Figure 3.13). The impact of the premium on overall resources available for disadvantaged students is furthermore unclear as some underlying incentive problems leading to underfunding in today's system remains. LAs could circumvent the government's intentions of the premium by spending less on disadvantaged schools from the general grant system, while schools may continue to face similar incentives for "cream skimming". The decision to include in the performance tables an indicator of attainment over time of pupils eligible for the pupil premium should go some way towards increasing transparency and may also incentivise schools to use the funding to improve the attainment of the target group. To be fully efficient however, the government needs to ensure that the pupil premium in combination with implicit deprivation funding is transparent, sufficiently large and more directly responsive to the actual number of enrolled disadvantaged students. This would incentivise schools to attract and retain disadvantaged students. Transparancy would also make it more difficult for LAs to divert funding for other purposes. To increase transperency, the government should therefore consider incorporating implicit deprivation funding into the pupil premium, making it the only source of deprivation funding. Providing school funding through a voucher style system with an integrated and large deprivation premium along the lines of the Netherlands and Chile could also be considered.

Strong reliance on admission based on residency hampers user choice

Admission authorities vary across school providers in England (Table 3.1). Compared to other OECD countries, admission based on residency is very common and academic criteria are seldom used (See Box 3.5 and Musset, 2010). Most LA maintained schools admit students by residence criteria, hampering competition between schools in different catchment areas and driving up house prices around "good" schools (Gibbons *et al.*, 2006; Black and Machin, 2010). Faith-based schools often use a combination of denomination and academic criteria, while academies often use some aptitude criteria for particular subjects, such as sports and music. Independent schools admit on a combination of tuition fees and academic criteria. Effective user choice is thus highly influenced by whether families can afford independent schools or have access to faith-based schooling, have children with specific aptitudes, or are able to move close to attractive LA maintained schools.

The introduction of Free Schools could decrease the reliance on admission based on residency and contribute to more user choice and competition between schools. There is however mixed evidence within the OECD area whether school systems with more user choice provide better outcomes. User choice may also increase segregation of high-ability and low-ability students, which is likely to create peer-spillovers. Several high performing school systems in the OECD area offer very limited user choice, such as Finland, Canada and New Zealand. Country-specific evidence is also mixed. Studies show no measurable long term effects of increasing user choice on pupils in Sweden and the United Kingdom (Bohlmark and Lindahl, 2008; Gibbons *et al.*, 2006). However, Gibbons *et al.* (2006) find evidence that competition between faith-based schools (which typically do not use

residency admittance criteria) seems to improve efficiency in English schools. Patrinos (2010) also finds that more school choice, proxied by private school attendance, increases PISA scores in the Netherlands.

It is thus uncertain whether the increased user choice that will be provided through school reforms will improve overall educational performance. Compared to many other countries however, preconditions for establishing a well-functioning educational quasi-market are relatively good in England. Outcome indicators for schools are widely available, helping parents to make informed choice, and schools have significant management autonomy, making them able to adjust to local needs. Funding largely follows the student, although responsiveness could be improved, as discussed above. Increasing user choice would hence induce stronger competition between schools which could provide better educational outcomes.

Although the number of academies and Free Schools are set to rise fast, most English schools will continue to manage oversubscription using criteria where proximity to the school plays an important role. Arguably, admission based on residency in maintained schools is a bigger obstacle to user choice than "market shares" of academies and Free Schools. Disadvantaged families living in areas where maintained schools are low-performing currently have limited user choice, especially as supply is inflexible (see below) and popular schools are oversubscribed, and may not be affected by reforms. More equality in user choice could thus be warranted, which also would provide disadvantaged families with a better bargaining position *vis-à–vis* schools. User choice could be increased by proscribing the use of residential criteria in all LA maintained schools. Admission based on residency is limited in the Netherlands, providing significant user choice for parents and students, and the Dutch education system is performing well in an OECD perspective (Box 3.5; Patrinos, 2010). Reforms to lessen residency criteria could have significant impact. Based on the analysis in the Annex 3.A1, the move to a similar level of admission based on residency as in the Netherlands could increase average PISA scores in the United Kingdom by almost 8 points (2%), although uncertainties surround these estimates.[9] Such reforms may have to be radical however, as piecemeal reforms are likely to lead to a limited resorting of students within catchment areas, as seems to have been the consequence of admission reforms in Brighton and Hove (Allen *et al.*, 2010). As there is significant uncertainty to the effectiveness of admission reforms, the government should initially experiment with proscribing the use of residential criteria in a few LAs.

Supply must be more flexible if substantial user choice is to be exercised

In order to improve competition among schools and increase user choice, the above-mentioned demand-side reforms need to be complemented by more flexible supply, allowing low-performing schools to exit, new schools to enter and popular schools to expand. Without flexible supply, schools would face captive markets and user choice would simply result in reshuffling of students. Empirical evidence suggests that supply flexibility is low in England, with combined exit and entry rates equal to 1.2% of the total primary and secondary school population in 2005/06, less than half the rate in Sweden during the same time. Furthermore, even schools that are among the bottom 10% in terms of performance manage to fill 93% (primary schools) and 89% (secondary schools) of available places, indicating low competitive pressure (Sibieta *et al.*, 2008). To reap the dynamic gains of competition, temporary excess capacity may have to be accepted to ensure that parents and students are able to choose schools rather than the other way

Box 3.5. **School choice, competition and educational outcomes in the Netherlands**

The Netherlands is a useful point of comparison when evaluating the English and the UK education systems for several reasons. Firstly, institutional similarities are significant, as illustrated by the cluster analysis in Box 3.3. These similarities entail a strong emphasis on government benchmarking through a national curriculum and exams (that are published), significant managerial freedom for schools and a relatively weak influence of local authorities. Differences between the two systems are significant too with early tracking, a national school funding scheme directly linked to enrolment, direct "deprivation compensation" to schools and extensive user choice and supply flexibility being hallmarks of the Dutch system. Admission is typically based on academic rather than residential criteria (Table 3.3).

Secondly, similarities in terms of inputs are also significant, both in terms of social background and school resources, with students in both countries having better than average socio-economic backgrounds than the OECD average, while immigrants and non-national language students make up large shares of the student population. In 2007, the Netherlands spent 3.7% of GDP on primary, secondary and post-secondary non-tertiary education compared to 4.2% in the United Kingdom (OECD, 2010b).

Table 3.3. **Educational outcomes**

	United Kingdom	United Kingdom (maintained schools)	United Kingdom (independent schools)	Netherlands	OECD
Average PISA score (index)	500	497	516	519	492
Socio-economic background (index)	0.20	0.16	0.46	0.27	–0.15
Native	0.93	0.94	0.91	0.95	0.95
Speak national language at home	0.98	0.98	0.97	0.96	0.97
Students per teacher	14.5	14.9	9.5	15.6	16.1
Quality of resources (index)	0.45	0.44	0.61	0.32	0.07
Residency not considered in admittance	0.19	0.17	0.35	0.62	0.35
Academic performance not considered in admittance	0.72	0.84	0.00	0.03	0.41

Source: PISA database.

Thirdly, the Netherlands is interesting as the education system scores among the top countries in terms of average PISA results and educational efficiency (Sutherland *et al.*, 2007). Furthermore, the school system seems to be efficient in mitigating the impact of differences in socio-economic background, as shown by the low impact this variable has on PISA scores (See Table 3.A1.1 and the annex). Thus, the Dutch school system is able to produce average outcomes comparable to independent schools in the United Kingdom with resources comparable to the UK public funded school system, while at the same time compensating efficiently for differences in socio-economic background.

Within the Dutch government-financed primary and secondary education sector, roughly 70% of students attend independent (non-government) schools and 30% attend public schools provided by municipalities. These shares have been remarkably stable since financial equality was introduced in 1917 (Karsten, 1999). Independent schools often have a confessional alignment and may therefore impose religious criteria for admission, but selectivity is in most cases limited. Students attending independent schools tend on average to perform better on national exams, even after controlling for the socio-economic background of their students (See Table 3.A1.3 in Annex 3.A1). Overall, the Dutch primary and secondary school system seems to provide genuine school choice and good outcomes for disadvantaged children (Patrinos, 2010).

around. The recent White Paper *The Importance of Teaching* sets out an intention for movement in this direction.

One factor hampering supply is that decisions to open a new school rest with the LA, except in the case of Free Schools, which may have weak incentives to encourage competition at the cost of already struggling LA maintained schools. Surplus places also lead to higher short term costs and decreased value for money and LAs have therefore been under pressure from the Audit Commission and the Department for Children, Schools and Families (now replaced by DfE) to keep vacancies low (Sibieta *et al.*, 2008). Presumptive school providers should instead be allowed to start new schools if they fulfill quality evaluations that should not be provided by the LA.

Another factor that constrains supply is access to appropriate facilities for would-be entrants. Already under the current system, shrinking funding for investment will cause strains as the number of pupils is growing. Encouraging more flexible supply would probably need a system where providers may receive a reasonable per pupil grant in order to find existing facilities to rent or to cover costs of actually constructing a new school. The latter setup may be facilitated by allowing for-profit providers to enter the market, as these could provide upfront capital for investment in facilities.

Participation in upper secondary education is low

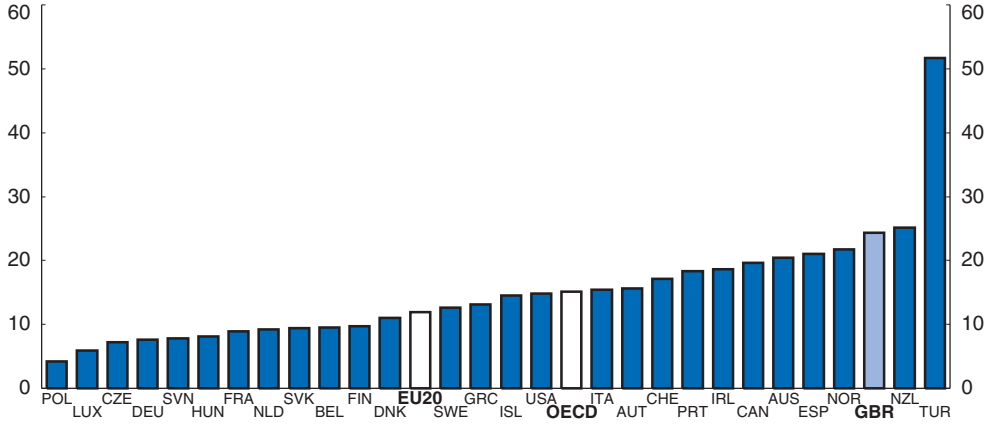
Participation rates in education in the United Kingdom among 15 to 19-year-olds have been increasing but remain low in comparison to other OECD countries (Figure 3.14). In 2009 85.1% of 17 year-olds participated in education or work-based learning compared to 79.7% in 2008. The share of the age group that is neither in education nor in employment (so-called NEETs) is high and increased during the recession (OECD, 2010d), but has started to fall. To address relatively low participation in non-compulsory upper secondary education the compulsory participation age will be increased in England. According to the 2008 Educations and Skills Act, participation in education or training will be compulsory until 17 years age in 2013 and 18 years from 2015, instead of the current 16 years. Full-time education, work-based apprenticeships and part-time education combined with employment all qualify.

Compulsion can raise participation and may improve later educational and labour market outcomes (OECD, 2008b). Evidence however suggests that those that do not stay on beyond compulsory schooling may face low expected returns from further education (Dearden *et al.*, 2004). As discussed in OECD (2007a), policies should focus on ensuring that students are equipped with the right skills to benefit from further education, incentivising them to participate and ensuring that the training provided eventually gives high returns in the labour market.

The main problem in the vocational education system seems to be that many qualifications have low or even negative impact on future wages, although high quality apprenticeships and some higher level vocational qualifications are major exceptions (Machin and Vignoles, 2006). There is a perception that there is too much fragmentation and too many programmes (UKCES, 2010). The sheer amount of programmes and the fact they have changed significantly over time contributes to employers' lack of understanding of the programmes, and their low impact (Machin and Vignoles, 2006). Providing a less complex and higher quality set of further education paths would make participation more attractive and could contribute to overall productivity. Therefore, the supply of education

Figure 3.14. **Share of the 15 to 19-years-olds population not in education**

Per cent, 2008



Source: OECD (2010b).

StatLink http://dx.doi.org/10.1787/888932376915

paths should be streamlined, quality increased and the number of apprenticeship positions further increased. The government has recently commissioned an independent review on vocational training.

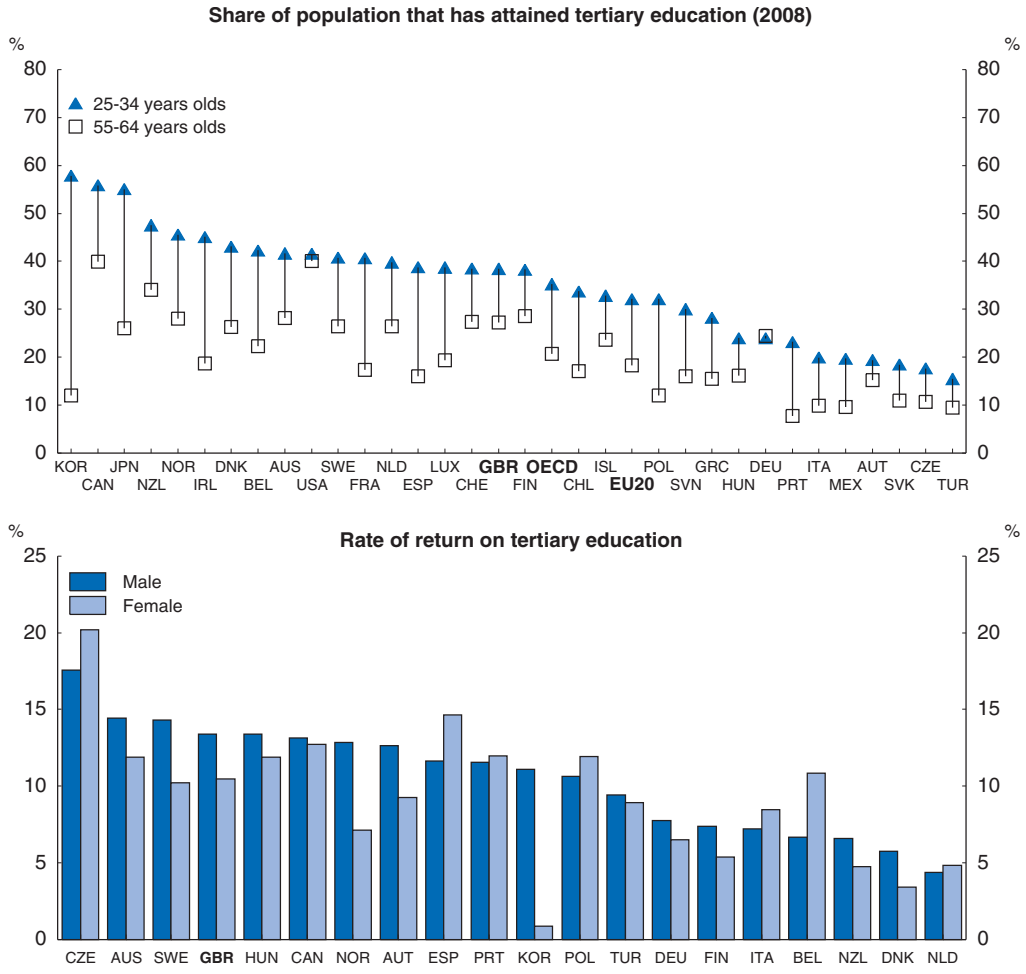
Economic incentives for risk groups that may stand to gain most in the long run from education but who are severely credit constrained are also warranted. The abolished Education Maintenance Allowance (EMA) raised the participation of recipients by roughly 8%, indicating deadweight costs around 92%, but economic benefits seemed to exceed the costs of the system (Chowdry *et al*, 2007; Dearden *et al.*, 2005). Given that the government has abolished the EMA, it needs to find alternative measures to efficiently raise incentives for participation for children from low income families.

Higher caps on tuition fees should provide room for increasing the number of study places

United Kingdom attainment levels in tertiary education are just above the OECD average (Figure 3.15, first panel), and overall quality of universities is impressive.[10] Private returns to tertiary education are high compared to most OECD countries (Figure 3.15, second panel). Bratti *et al.* (2008) find that a male (female) university graduate will typically gain a 16% (19%) wage premium relative to similar individuals without higher education. The averages reflect significant variations across subjects and institutions, however. Returns on the margin seem lower, but still relatively high (Dearden *et al.*, 2004). Even though university attendance has increased recently, there is little evidence that returns have fallen (Walker and Zhu, 2008), reflecting buoyant demand for highly educated labour relative to supply (The Browne Review, 2010). Increasing the supply of study places in higher education without diluting quality would increase human capital, raise economic growth, further equality and mobility by increasing access to higher education and potentially contribute to lowering wage differentials. Finding ways to finance such an expansion of higher education is therefore key.

As individuals reap a large share of the gains from higher education, there is a strong case for students meeting a large share of the costs. However, market imperfections mean

Figure 3.15. **Tertiary education in the United Kingdom**



Source: OECD (2010b).

StatLink http://dx.doi.org/10.1787/888932376934

that students, especially from disadvantaged backgrounds, may find it difficult to invest sufficiently upfront in higher education. Thus there is a case for a publicly supported financing system that eventually recovers most costs for tuition and maintenance for graduates. The current funding system of higher education in the United Kingdom provides such mechanisms to a greater degree than most OECD countries, with good access to upfront support in terms of maintenance loans and grants to students, significant tuition fees and eventual repayment of significant parts of the costs. Still, public subsidies per student remain very high; the public covers almost 60% of total direct costs of a degree, *i.e.* university spending and student loans and grants (Figure 3.16).[11] In the current system, repayments do not even cover the costs of support that students' receive when studying. There is thus further room for increasing the graduate's share of the costs of education, in order to lower the reliance on government funds and finance an expansion of the number of study places.

Student support arrangements vary across the United Kingdom as higher education policy is a devolved matter. Currently, tuition fees in England are capped at £3 290 per year for EU citizens with most universities charging the top rate.[12] In response to the Browne

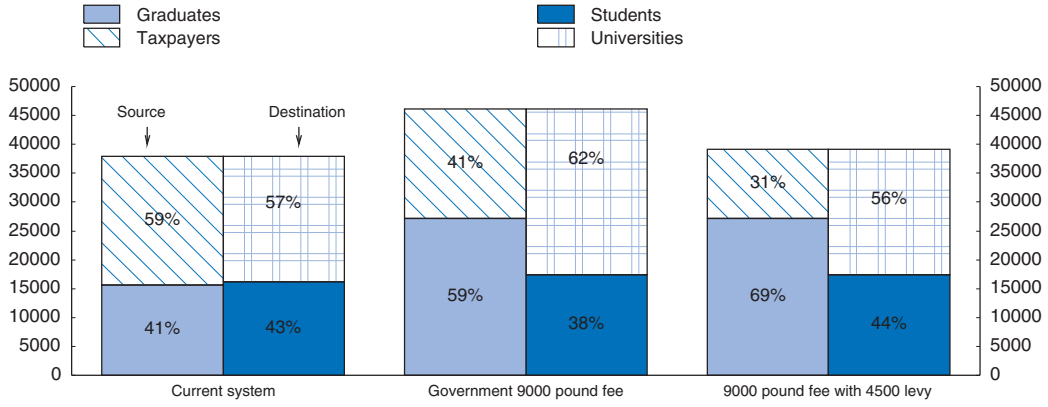
Review the government is changing higher education funding policy in England, increasing the cap to £9 000 per year, accompanied by changes to loans and grants to pay for tuition.[13] Government grants to universities will be cut measurably, but public subsidies will remain significant; even if tuition fees were to increase to the maximum £9 000, tax payers would cover over 40% of total costs of a degree (Figure 3.16).

The level of tuition that English universities will choose will depend on a complex set of demand and supply factors. The reform will mean that universities will need to increase tuition fees to £7 000 to compensate for lower government grants (Chowdry *et al.*, 2010c). Given the high returns to higher education and buoyant demand, tuition fees are likely to increase more, leaving universities with higher funding per graduate. Some universities have already signalled that they will raise fees to £9 000, subject to the agreement of the director for fair access. Any increase in tuition fees above £7 000 will imply a net gain in funds for universities and an annual tuition of £9 000 would in itself more than cover the current cost for universities for producing a degree (Figure 3.16), questioning the proposed levels of government grants to universities. If the tuition were to rise above £7 000, steps should therefore be taken to lower taxpayers' subsidies per graduate.

There are several ways to deal with universities' net gain. Taxpayer costs per student can be reduced, for example by lower grants to universities or a levy, as suggested in the Browne review. As an illustration, amending the government's proposed system with an average levy on universities equivalent to £4 500 per graduate would leave per student funding in line with the current system (Figure 3.16). With tuition fees at £9 000 this would further increase the share of costs that graduates eventually pay to almost 70% and lower public costs further, while maintaining current levels of funding for universities. Local conditions and the composition of subjects need to be considered in designing a levy. Given the high return to higher education, parts of a tax on tuition income could finance an expansion of available study places, as suggested in the Browne Review. The expansion in study places should be focused on lines of education with high social and private returns.

Figure 3.16. **UK higher education source and destination of funding**

Pounds per graduate



Source: Dearden, L, Chowdry, H and G Wyness (2010), "Higher Education Reforms: progressive but complicated with an unwelcome incentive", IFS Briefing Note 113. OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376953

High tuition fees may discourage students from disadvantaged families from accessing tertiary education, reflecting both financial constraints and less knowledge about the returns to higher education. Substantial progress has been made on widening participation and young people from the most disadvantaged areas are 50% more likely to enter higher education than their peers in the mid-1990s. Students from disadvantaged backgrounds are still significantly underrepresented in higher education however and especially in the "elite" institutions in the United Kingdom. The underperformance to a large extent reflects their weaker performance in secondary schooling. However, when controlling for this earlier performance, students from disadvantaged backgrounds do not seem to be underrepresented in higher education (Chowdry *et al.*, 2010b). This puts the onus on improving earlier schooling experience for students from disadvantaged backgrounds. Still, given the size of the proposed changes, the government should keep a close eye on the social composition of entry into higher education, especially as there are concerns that the reformed system provides incentives for high-fee universities to turn away students from poor backgrounds (Chowdry *et al.*, 2010c).

Box 3.6. **Recommendations on education in England**

- The Sure Start programme and rising participation in pre-schooling does not seem so far to have delivered significant improvements in educational outcomes. Pre-schooling resources should be more strongly focused on disadvantaged children, and intensified outreach through home support for the most disadvantaged children should be considered.
- The extensive use of grades and scores in primary and secondary schools to measure pupils, schools and the school systems performance should be lessened as it creates strong incentives for gaming and grade inflation and may distort educational content and measured outcomes. Specifically the government should:
  - Further develop value-added indicators of schools' educational output to provide more relevant information to parents, students and regulators on school quality.
  - Increase the emphasis within inspection on teaching and learning, including through more lesson observation and assessment of pupils' work, so that inspectors can consider this evidence alongside attainment data in reaching their judgements on the effectiveness of schools.
  - Measure and monitor the quality of educational standards through data independently collected through sampling techniques rather than using grades and test scores for all pupils.
  - Give key stakeholders, including universities and employers, a greater say in school leaving qualifications (A-levels and GCSEs) and review the merits of having competing examination boards.
- Insufficient focus on disadvantaged students in educational spending, teacher support and quality of educational resources contributes to large disparities in educational outcomes in England. The introduction of the pupil premium is a step in the right direction, but further reforms to make funding more responsive to the actual number of enrolled disadvantaged students should be pursued. The government should also further increase transparancy of funding for disadvantaged students, possibly through incorporating implicit funding into the pupil premium.

Box 3.6. **Recommendations on education in England** *(cont.)*

- The introduction of Free Schools and the rapid increase in the number of academies will decrease the reliance on admission based on residency and contribute to more user choice. The government should review the effects of schooling reforms on equity and fair access for disadvantaged students. User choice is likely to remain limited for students from disadvantaged homes however, as admission based on residency will continue to limit geographic user choice. The government should experiment with proscribing the use of residence criteria in admission to local government maintained schools in some local authorities.
- User choice is also limited by low supply flexibility through entry and exit and high capacity utilisation, leaving locally maintained schools with a captive market. Entry of new schools should be encouraged even if it, temporarily, creates some excess capacity. Decisions on whether a new school should be openend should rely on the quality of the business plan and should not be left to local authorities but to another appropriate body.
- Locally maintained schools should have the same opportunities for hiring staff and negotiating wages as academies and Free Schools to level the playing field.
- Post-16 participation remains low, partly reflecting a confusing and rapidly changing array of often low quality vocational programmes. The system of vocational education should be simplified. A further focus on high-quality apprenticeships is warranted. Given that the government has abolished the education maintenance allowance, it needs to find alternative measures to efficiently raise incentives for participation for children from low income families.
- The government's proposal to allow universities to increase tuition fees switches a significant share of the costs of funding higher education from taxpayers to graduates. The government could pursue reforms to further lower the public share of funding, *e.g.* through lower university grants. Some of the proceeds should be used to expand the number of study places to support investment in human capital and growth. While the proposed changes in the grant and loan system should ensure that universities remain open for students from disadvantaged backgrounds, the government should keep a close eye on this issue.

Notes

1. Measured as a share of the population aged 3 and 4.
2. The National Evaluation of Sure Start (2008) does, for example, evaluate the effect of Sure Start Local Programmes (SSLP) by comparing children within the programmes to a sample from the Millennium Cohort Study (MCS). The data collection was conducted by different organisations and the children in the MCS were studied, on average, two years before the SSLP children (NESS, 2008).
3. See *www.education.gov.uk/popularquestions/schools/typesofschools/a005582/what-are-academies*.
4. See "A Technical Guide to Contextual Value Added (including English and maths) Key Stage 2 to 4: 2009 Model" (*www.dcsf.gov.uk/performancetables/schools_09/s3.shtml*) for further details.
5. More recent evidence tends to show that peer effects on test scores are significant but relatively small (See *e.g.* Gibbons *et al.*, 2006 and Kramarz *et al.*, 2009). It should be noted however, that peer effects on non-cognitive skills and social networking are much less explored in the literature. Gibbons and Silva (2009) find that parents' perceptions of school quality is indeed dominated by test score performance, which however isn't strongly associated with student enjoyment of school.
6. Schools deemed to be good or outstanding are inspected with five-year intervals unless annual performance indicators suggest otherwise (Ofsted, 2010).
7. It should be noted however, that LA-maintained schools often do not use existing room for wage differentiation.
8. Estimates of the effects of instruction time range from insignificant (*e.g.* Eide and Showalter, 1998), significant but small (Wossmann, 2003) to significant and important (Lavy, 2010).

9. This number is based on the estimated impact of the variable *Residency not considered in admission* for the joint cluster United Kingdom, the Netherlands and the Slovak Republic which is 17.96 according to Table 3.A1.3 multiplied by the difference in applying this criteria in the Netherlands and in the United Kingdom (0.62-0.19) which gives 17.96* (0.62-0.19) = 7.72 points.
10. See *e.g.* QS World University ranking (2010), where 4 UK universities are among the top ten (*www.topuniversities.com/university-rankings/world-university-rankings/2010/results*).
11. In relation to other OECD countries, the private share of tertiary education funding is slightly above the median (Santiago *et al.*, 2008).
12. Tuition fees for non-EU citizens are typically higher than for EU citizens.
13. According to the government's proposal, universities that want to charge tuition fees above £6 000 must take additional action to ensure that disadvantaged students do not have fair access.

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ANNEX 3.A1

Determinants of PISA scores

Data

The econometric analysis is based on the PISA 2006 and 2009 surveys. Descriptive statistics are presented for the United Kingdom (all schools, publicly funded schools, independently funded schools and United Kingdom excluding Scotland), the Netherlands, the Slovak Republic, the joint estimate for these three countries (*Cluster*) and finally the whole OECD area. The Netherlands and the Slovak Republic are included as being the countries with most similar institutions to the United Kingdom (See Box 3.3). Estimates for other country groups, as well as an analysis and description of estimation procedures are presented in Braconier and Brézillon (2011).

- *Educational outcomes* are measured as the average score of the PISA scales for science, maths and reading for each student.

Data on inputs can be broadly divided into student and school level data:

- *Student level data:*
  - *Personal background:* PISA index of economic, social and cultural status; gender; language spoken at home; immigration status.
  - *Input related factors:* learning time in school (in above three subjects); learning time self/ homework. Only available for 2006.
- *School level data:*
  - *Input related factors:* location in rural area; size; student/teacher ratios; index of quality of school educational resources.
  - *Institutional factors:* lack of school choice in area; public school; residency not considered in admission; academic record not considered in admittance.

Results

Table 3.A1.1. **Descriptive statistics based on PISA 2009 database**

	United Kingdom		United Kingdom – Public School		United Kingdom – Independent		United Kingdom (England, Wales and Northern Ireland)	
Variable	mean	sd	mean	sd	mean	sd	mean	sd
Average PISA score over 3 subjects	500.10	90.00	497.39	89.66	516.26	90.39	499.72	89.96
Family socio-economic background	0.20	0.79	0.16	0.77	0.46	0.82	0.21	0.79
Female[D]	0.51	0.50	0.50	0.50	0.55	0.50	0.51	0.50
Native[D]	0.93	0.25	0.94	0.24	0.91	0.29	0.93	0.26
Speak national languages at home[D]	0.98	0.15	0.98	0.15	0.97	0.16	0.98	0.15
School located in rural area[D, 1]	0.27	0.44	0.31	0.46	0.07	0.25	0.26	0.44
School size	1 070.56	401.86	1 101.11	386.84	641.78	362.04	1 085.18	403.43
Student-teacher ratio	14.51	2.76	14.88	2.45	9.50	1.71	14.77	2.65
Index of quality of school educational resources	0.45	0.96	0.44	0.97	0.61	0.77	0.44	0.95
Lack of school choice in area	1.33	0.67	1.35	0.68	1.06	0.32	1.29	0.63
Public school	0.86	0.35	1.00	0.00	0.00	0.00	0.85	0.36
Residency not considered in admission[D]	0.19	0.39	0.17	0.37	0.35	0.48	0.19	0.39
Academic record not considered in admittance[D]	0.72	0.45	0.84	0.37	0.00	0.07	0.70	0.46

	Netherlands		Slovak Republic		Cluster[2]		OECD	
Variable	mean	sd	mean	sd	mean	sd	mean	sd
Average PISA score over 3 subjects	518.82	87.85	488.13	88.73	506.86	90.49	492.11	94.08
Family socio-economic background	0.27	0.86	–0.09	0.84	0.31	0.81	–0.15	1.08
Female[D]	0.50	0.50	0.50	0.50	0.52	0.50	0.49	0.50
Native[D]	0.95	0.21	0.99	0.09	0.92	0.27	0.95	0.22
Speak national languages at home[D]	0.96	0.20	0.98	0.14	0.97	0.16	0.97	0.18
School located in rural area[D, 1]	0.18	0.38	0.29	0.45	0.19	0.39	0.24	0.42
School size	999.15	580.96	512.48	260.01	962.73	435.97	972.26	777.07
Student-teacher ratio	15.63	4.90	14.12	3.15	13.27	3.37	16.12	11.34
Index of quality of school educational resources	0.32	0.85	–0.46	0.75	0.48	0.92	0.07	1.12
Lack of school choice in area	1.27	0.50	1.28	0.57	1.27	0.61	1.50	0.80
Public school	0.33	0.47	0.91	0.29	0.50	0.50	0.79	0.41
Residency not considered in admission[D]	0.62	0.48	0.73	0.44	0.26	0.44	0.35	0.48
Academic record not considered in admittance[D]	0.03	0.18	0.27	0.44	0.42	0.49	0.41	0.49

Note: D dummy variables.

1. Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).
2. Cluster is defined as an aggregate of unweigthed students of United Kingdom, the Netherlands and the Slovak Republic.

Table 3.A1.2. **Regressions based on PISA 2009 database**

Variable		United Kingdom				United Kingdom (England, Wales and Northern Ireland)				Netherlands			
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2	Test 3	Test 4	Test 1	Test 2	Test 3	Test 4
Family socio-economic background	Coefficient	45.09	44.46	42.07	44.91	45.07	44.38	41.87	44.91	38.84	27.23	27.30	27.29
	S.E	*1.66*	*1.56*	*1.81*	*1.73*	*1.86*	*1.75*	*2.15*	*1.94*	*1.91*	*2.91*	*2.94*	*2.98*
Female[D]	Coefficient	–2.38	–2.12	–4.07	–2.11	–2.80	–2.57	–4.83	–2.57	3.83	0.80	0.89	0.87
	S.E	*3.25*	*3.58*	*3.69*	*3.61*	*3.56*	*3.94*	*4.05*	*3.96*	*2.40*	*2.48*	*2.51*	*2.54*
Native[D]	Coefficient	11.65	11.37	11.63	9.43	12.11	12.02	11.84	10.01	23.01	20.67	20.75	20.74
	S.E	*5.83*	*6.53*	*6.65*	*6.55*	*6.16*	*7.00*	*7.21*	*7.03*	*6.35*	*5.51*	*5.43*	*5.43*
Speak national languages at home[D]	Coefficient	58.84	61.83	60.00	61.69	59.22	63.35	61.72	63.09	51.92	42.24	42.04	42.09
	S.E	*8.59*	*9.34*	*9.41*	*9.46*	*10.10*	*11.23*	*11.31*	*11.33*	*6.98*	*7.80*	*7.71*	*7.75*
School located in rural area[D, 1]	Coefficient	..	7.15	8.23	5.09	..	6.84	7.50	4.77	..	–10.97	–10.28	–10.38
	S.E	..	*4.22*	*4.16*	*5.02*	..	*4.66*	*4.59*	*5.43*	..	*9.84*	*10.27*	*9.82*
School size	Coefficient	..	0.01	0.01	0.01	..	0.01	0.01	0.01	..	0.05	0.05	0.05
	S.E	..	*0.01*	*0.01*	*0.01*	..	*0.01*	*0.01*	*0.01*	..	*0.01*	*0.01*	*0.01*
Student-teacher ratio	Coefficient	..	–0.70	0.66	–0.80	..	–0.50	1.23	–0.69	..	3.72	3.68	3.65
	S.E	..	*0.86*	*1.22*	*0.82*	..	*1.06*	*1.73*	*0.94*	..	*1.99*	*1.99*	*2.01*
Index of quality of school educational resources	Coefficient	..	0.44	0.72	1.00	..	0.51	0.83	1.12	..	–8.07	–8.06	–8.01
	S.E	..	*2.40*	*2.42*	*2.35*	..	*2.67*	*2.69*	*2.59*	..	*4.87*	*4.98*	*4.99*
Lack of school choice in area	Coefficient	..	..	..	2.93	..	..	..	3.01	..	..	..	–1.24
	S.E	..	..	..	*3.33*	..	..	..	*4.14*	..	..	..	*9.40*
Public school	Coefficient	..	..	–38.88	..	..	..	–42.07	..	..	..	–0.01	..
	S.E	..	..	*9.46*	..	..	..	*13.43*	..	..	..	*9.58*	..
Residency not considered in admission[D]	Coefficient	..	10.11	..	..	..	11.29	..	..	..	–3.78	..	..
	S.E	..	*7.01*	..	..	..	*8.08*	..	..	..	*9.99*	..	..

Note: D dummy variables.

1. Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).
2. Cluster is defined as an aggregate of unweigthed students of United Kingdom, the Netherlands and the Slovak Republic.

Table 3.A1.2. **Regressions based on PISA 2009 database** *(cont.)*

		Slovak Republic				Cluster[4]				OECD			
Variable		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2	Test 3	Test 4	Test 1	Test 2	Test 3	Test 4
Family socio-economic background	Coefficient	43.86	41.77	41.79	41.82	46.75	43.51	39.63	44.98	39.32	35.61	34.78	35.06
	S.E	*2.36*	*2.26*	*2.30*	*2.29*	*5.58*	*3.67*	*2.74*	*5.57*	*0.54*	*0.69*	*0.64*	*0.70*
Female[D]	Coefficient	15.61	13.74	14.21	14.25	2.90	3.22	–0.32	2.87	4.83	5.33	5.16	5.05
	S.E	*3.40*	*3.36*	*3.32*	*3.39*	*6.12*	*5.89*	*2.71*	*5.35*	*0.86*	*0.92*	*0.92*	*0.94*
Native[D]	Coefficient	–3.97	–5.15	–5.11	–5.04	3.13	8.40	8.43	4.91	16.19	19.16	19.68	20.31
	S.E	*15.97*	*14.56*	*14.92*	*15.21*	*21.94*	*10.96*	*9.35*	*15.26*	*2.16*	*2.38*	*2.36*	*2.38*
Speak national languages at home[D]	Coefficient	57.70	56.11	56.52	56.53	55.66	62.33	59.47	62.41	50.75	49.16	48.87	49.15
	S.E	*8.12*	*7.93*	*8.17*	*8.17*	*8.76*	*18.89*	*10.52*	*20.65*	*1.86*	*2.07*	*2.09*	*2.07*
School located in rural area[D, 1]	Coefficient	..	–14.03	–16.00	–16.42	..	6.96	9.59	5.40	..	–9.88	–9.62	–9.03
	S.E	..	*8.71*	*8.88*	*9.62*	..	*9.01*	*14.84*	*11.47*	..	*2.47*	*2.46*	*2.80*
School size	Coefficient	..	0.04	0.04	0.04	..	0.01	0.01	0.01	..	0.01	0.01	0.00
	S.E	..	*0.02*	*0.02*	*0.02*	..	*0.02*	*0.02*	*0.02*	..	*0.00*	*0.00*	*0.00*
Student-teacher ratio	Coefficient	..	–1.64	–1.76	–1.78	..	–1.56	0.61	–2.45	..	–0.47	–0.45	–0.47
	S.E	..	*1.30*	*1.30*	*1.29*	..	*5.10*	*1.33*	*7.09*	..	*0.09*	*0.08*	*0.09*
Index of quality of school educational resources	Coefficient	..	1.47	1.00	1.02	..	2.98	3.84	3.95	..	5.72	5.10	5.39
	S.E	..	*4.14*	*4.25*	*4.08*	..	*8.03*	*10.53*	*9.72*	..	*1.06*	*1.09*	*1.10*
Lack of school choice in area	Coefficient	..	..	..	0.61	..	..	..	0.99	..	..	..	–4.57
	S.E	..	..	..	*6.87*	..	..	..	*3.13*	..	..	..	*1.40*
Public school	Coefficient	..	..	–1.23	..	..	..	–39.20	..	..	..	–12.25	..
	S.E	..	..	*13.25*	..	..	..	*38.83*	..	..	..	*2.86*	..
Residency not considered in admission[D]	Coefficient	..	11.24	..	..	..	17.96	..	..	..	9.56	..	..
	S.E	..	*6.18*	..	..	..	*9.86*	..	..	..	*1.76*	..	..

Note: (D) dummy variables. Dependent variables average PISA score across 3 subjects.

1. Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).
2. Schools where students' past academic records and recommendation of feeder schools are not taken into account for admission.
3. Schools where students' past academic records and recommendation of feeder schools are a prerequisite for administration.
4. Cluster is defined as an aggregate of unweigthed students of United Kingdom, the Netherlands and the Slovak Republic.

Table 3.A1.3. **Descriptive statistics based on PISA 2006 database**

	United Kingdom		United Kingdom – Public School		United Kingdom – Independent		United Kingdom (England, Wales and Northern Ireland)	
Variable	mean	sd	mean	sd	mean	sd	mean	sd
Average PISA score over 3 subjects	501.77	94.50	497.80	93.06	524.58	99.35	501.37	94.97
Family socio-economic background	0.19	0.81	0.15	0.81	0.41	0.83	0.19	0.82
Female[D]	0.50	0.50	0.51	0.50	0.50	0.50	0.51	0.50
Native[D]	0.94	0.23	0.95	0.22	0.91	0.28	0.94	0.23
Speak national languages at home[D]	0.93	0.25	0.94	0.24	0.92	0.28	0.93	0.25
School located in rural area[D, 1]	0.26	0.44	0.28	0.45	0.15	0.36	0.25	0.43
School size	1 070.54	394.12	1 099.19	379.27	703.05	396.69	1 078.44	398.56
Student-teacher ratio	15.27	2.69	15.70	2.19	9.52	2.09	15.51	2.61
Index of quality of school educational resources	0.27	1.06	0.24	1.01	0.67	1.43	0.25	1.06
Learning time in school	3.48	0.66	3.47	0.66	3.55	0.65	3.48	0.66
Learning time self/homework	2.19	0.59	2.17	0.59	2.30	0.60	2.20	0.58
Lack of school choice in area	1.24	0.58	1.25	0.59	1.10	0.35	1.18	0.51
Public school	0.85	0.36	1.00	0.00	0.00	0.00	0.85	0.35
Residency not considered in admission[D]	0.15	0.36	0.12	0.32	0.37	0.48	0.15	0.36
Academic record not considered in admittance[D]	0.75	0.43	0.87	0.34	0.07	0.25	0.75	0.43
	Netherlands		Slovak Republic		Cluster[4]		OECD	
Variable	mean	sd	mean	sd	mean	sd	mean	sd
Average PISA score over 3 subjects	520.75	89.70	482.30	91.93	503.89	93.90	485.80	98.30
Family socio-economic background	0.25	0.89	–0.15	0.91	0.18	0.84	–0.11	1.04
Female[D]	0.49	0.50	0.49	0.50	0.50	0.50	0.49	0.50
Native[D]	0.94	0.23	0.99	0.10	0.95	0.22	0.95	0.22
Speak national languages at home[D]	0.92	0.26	0.98	0.13	0.94	0.25	0.91	0.28
School located in rural area[D, 1]	0.19	0.39	0.35	0.48	0.25	0.43	0.26	0.44
School size	1 023.32	542.36	532.18	252.37	1 016.47	444.07	965.59	762.02
Student-teacher ratio	15.96	4.36	15.04	3.74	15.39	3.20	15.67	6.96
Index of quality of school educational resources	0.26	0.91	–0.54	0.75	0.20	1.03	0.01	1.07
Learning time in school	2.77	0.63	2.96	0.68	3.31	0.72	3.29	0.85
Learning time self/homework	2.06	0.58	2.19	0.72	2.17	0.60	2.30	0.75
Lack of school choice in area	1.36	0.66	1.24	0.59	1.26	0.60	1.55	0.82
Public school	0.32	0.47	0.92	0.27	0.76	0.43	0.77	0.42
Residency not considered in admission[D]	0.73	0.45	0.73	0.44	0.31	0.46	0.32	0.47
Academic record not considered in admittance[D]	0.09	0.29	0.25	0.43	0.59	0.49	0.47	0.50

Note: (D) dummy variables.

1. Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).
2. Schools where students' past academic records and recommendation of feeder schools are not taken into account for admission.
3. Schools where students' past academic records and recommendation of feeder schools are a prerequisite for administration.
4. Cluster is defined as an aggregate of unweigthed students of United Kingdom, the Netherlands and the Slovak Republic.

Table 3.A1.4. **Regressions based on PISA 2006 database**

		United Kingdom					United Kingdom (England, Wales and Northern Ireland)					Netherlands				
Variable		Test 1	Test 2	Test 3	Test 4	Test 5	Test 1	Test 2	Test 3	Test 4	Test 5	Test 1	Test 2	Test 3	Test 4	Test 5
Family socio-economic background	Coefficient	43.48	42.01	39.21	43.18	37.41	43.40	41.83	39.00	42.99	37.63	38.12	28.14	28.50	28.15	25.25
	S.E	*1.74*	*1.76*	*1.93*	*1.78*	*1.81*	*1.83*	*1.87*	*2.08*	*1.90*	*1.90*	*1.89*	*2.45*	*2.41*	*2.53*	*2.20*
Female[D]	Coefficient	0.60	0.44	0.34	0.39	–3.59	0.56	0.56	0.39	0.63	–3.48	3.61	–0.01	–0.02	–0.05	0.92
	S.E	*2.26*	*2.44*	*2.43*	*2.46*	*2.35*	*2.46*	*2.69*	*2.66*	*2.69*	*2.61*	*2.95*	*3.03*	*3.06*	*3.09*	*3.13*
Native[D]	Coefficient	6.21	7.54	8.29	5.88	10.16	7.33	9.26	9.38	7.74	11.76	16.57	13.78	13.70	13.11	14.42
	S.E	*6.03*	*6.93*	*6.56*	*6.67*	*6.43*	*6.32*	*7.27*	*6.78*	*7.06*	*6.84*	*7.00*	*5.89*	*6.00*	*5.87*	*5.97*
Speak national languages at home[D]	Coefficient	30.03	31.03	27.83	31.70	30.58	29.76	31.22	26.99	32.16	30.83	35.23	29.57	29.70	31.30	29.58
	S.E	*7.81*	*8.39*	*7.78*	*8.37*	*6.18*	*8.04*	*8.65*	*7.88*	*8.69*	*6.39*	*7.13*	*5.43*	*5.52*	*5.55*	*6.20*
School located in rural area [D, 1]	Coefficient	..	9.12	9.15	7.33	7.63	..	9.13	8.18	7.47	7.59	..	–3.37	–2.83	–2.41	–8.90
	S.E	..	*4.91*	*5.03*	*5.43*	*4.79*	..	*5.42*	*5.46*	*5.70*	*5.22*	..	*13.03*	*12.95*	*13.16*	*11.77*
School size	Coefficient	..	0.01	0.01	0.01	0.01	..	0.02	0.01	0.01	0.01	..	0.03	0.03	0.03	0.02
	S.E	..	*0.01*	*0.01*	*0.01*	*0.00*	..	*0.01*	*0.01*	*0.01*	*0.00*	..	*0.01*	*0.01*	*0.01*	*0.01*
Student-teacher ratio	Coefficient	..	–0.93	1.53	–1.85	–1.54	..	–1.21	1.94	–2.48	–1.84	..	5.75	5.83	5.60	4.33
	S.E	..	*0.80*	*0.84*	*0.70*	*0.59*	..	*0.96*	*1.23*	*0.80*	*0.69*	..	*1.81*	*1.83*	*1.78*	*1.53*
Index of quality of school educational resources	Coefficient	..	6.00	4.67	5.58	5.58	..	6.01	4.63	5.48	5.61	..	7.98	7.90	8.07	5.21
	S.E	..	*2.08*	*2.13*	*2.18*	*1.84*	..	*2.24*	*2.29*	*2.30*	*1.97*	..	*3.96*	*4.10*	*4.08*	*3.95*
Learning time in school	Coefficient	..	..	..	..	30.10	..	..	..	..	29.87	..	..	..	..	34.25
	S.E	..	..	..	..	*2.34*	..	..	..	..	*2.47*	..	..	..	..	*2.64*
Learning time self/homework	Coefficient	..	..	..	..	17.50	..	..	..	..	18.12	..	..	..	..	–3.90
	S.E	..	..	..	..	*2.35*	..	..	..	..	*2.61*	..	..	..	..	*2.94*
Lack of school choice in area	Coefficient	..	..	..	4.45	..	..	..	..	8.00	..	..	..	..	–5.02	..
	S.E	..	..	..	*3.59*	..	..	..	..	*4.12*	..	..	..	..	*7.62*	..
Public school	Coefficient	..	..	–64.97	..	..	..	..	–69.55	..	..	..	..	–1.60	..	..
	S.E	..	..	*7.43*	..	..	..	..	*10.50*	..	..	..	..	*8.46*	..	..
Residency not considered in admission[D]	Coefficient	..	26.12	..	..	..	..	27.53	..	..	..	..	9.10	..	..	..
	S.E	..	*9.48*	..	..	..	..	*10.41*	..	..	..	..	*7.52*	..	..	..

Table 3.A1.4. **Regressions based on PISA 2006 database** *(cont.)*

Variable		Slovak Republic					Cluster[4]					OECD				
		Test 1	Test 2	Test 3	Test 4	Test 5	Test 1	Test 2	Test 3	Test 4	Test 5	Test 1	Test 2	Test 3	Test 4	Test 5
Family socio-economic background	Coefficient	44.54	41.39	41.97	41.24	34.14	46.88	43.37	38.07	45.08	38.22	42.95	37.21	37.06	36.96	33.54
	S.E	*2.62*	*2.31*	*2.53*	*2.36*	*2.35*	*7.49*	*4.64*	*5.12*	*5.17*	*1.31*	*0.48*	*0.55*	*0.58*	*0.54*	*0.51*
Female[D]	Coefficient	9.27	7.10	7.54	8.29	0.42	1.18	–1.01	–0.77	–1.37	–6.24	6.76	6.76	6.70	6.51	2.83
	S.E	*3.86*	*3.68*	*3.63*	*3.52*	*3.31*	*2.36*	*5.50*	*4.84*	*5.96*	*8.51*	*0.96*	*1.07*	*1.09*	*1.08*	*1.06*
Native[D]	Coefficient	–10.60	–11.05	–10.51	–10.44	–9.35	2.70	5.31	8.04	4.91	7.42	18.74	19.28	19.24	18.61	14.82
	S.E	*12.33*	*12.85*	*12.33*	*12.39*	*11.43*	*10.71*	*6.36*	*5.47*	*5.92*	*6.80*	*2.03*	*2.03*	*2.01*	*2.06*	*1.88*
Speak national languages at home[D]	Coefficient	43.12	39.75	42.15	41.59	39.39	26.30	24.72	19.43	26.48	26.67	32.17	37.34	36.85	37.13	29.46
	S.E	*8.75*	*8.78*	*8.65*	*8.66*	*8.89*	*8.23*	*9.67*	*19.51*	*7.69*	*4.90*	*2.09*	*2.14*	*2.17*	*2.16*	*1.91*
School located in rural area[D, 1]	Coefficient	..	–3.13	–2.97	1.11	–6.30	..	1.37	5.87	1.44	2.05	..	–6.65	–5.82	–5.02	–5.52
	S.E	..	*7.66*	*7.78*	*7.94*	*7.16*	..	*8.75*	*4.04*	*5.88*	*5.86*	..	*2.19*	*2.19*	*2.30*	*1.92*
School size	Coefficient	..	0.04	0.04	0.04	0.04	..	0.02	0.02	0.01	0.01	..	0.02	0.02	0.02	0.01
	S.E	..	*0.02*	*0.02*	*0.02*	*0.02*	..	*0.02*	*0.01*	*0.01*	*0.01*	..	*0.00*	*0.00*	*0.00*	*0.00*
Student-teacher ratio	Coefficient	..	–3.16	–3.57	–3.54	–4.89	..	–2.66	1.56	–4.16	–3.58	..	–1.17	–1.17	–1.16	–1.28
	S.E	..	*1.14*	*1.04*	*1.04*	*0.94*	..	*7.49*	*0.48*	*10.12*	*8.20*	..	*0.14*	*0.14*	*0.14*	*0.13*
Index of quality of school educational resources	Coefficient	..	–4.99	–4.73	–4.03	–3.20	..	8.53	5.13	8.66	7.35	..	8.55	8.33	8.65	7.95
	S.E	..	*4.23*	*4.30*	*3.98*	*4.10*	..	*4.34*	*1.79*	*5.21*	*4.50*	..	*0.83*	*0.83*	*0.82*	*0.74*
Learning time in school	Coefficient	..	..	..	..	34.90	..	..	..	..	27.81	..	..	..	..	29.99
	S.E	..	..	..	..	*3.21*	..	..	..	..	*12.99*	..	..	..	..	*0.66*
Learning time self/homework	Coefficient	..	..	..	..	2.47	..	..	..	..	18.78	..	..	..	..	–3.07
	S.E	..	..	..	..	*2.54*	..	..	..	..	*11.81*	..	..	..	..	*0.70*
Lack of school choice in area	Coefficient	..	..	..	–10.40	..	..	..	..	0.36	..	..	..	..	–3.42	..
	S.E	..	..	..	*8.18*	..	..	..	..	*4.21*	..	..	..	..	*1.33*	..
Public school	Coefficient	..	..	–3.39	..	..	..	..	–66.33	..	..	..	..	–5.11	..	..
	S.E	..	..	*13.11*	..	..	..	..	*71.05*	..	..	..	..	*2.13*	..	..
Residency not considered in admission[D]	Coefficient	..	17.80	..	..	..	..	26.03	..	..	..	..	–2.15	..	..	..
	S.E	..	*8.92*	..	..	..	..	*4.95*	..	..	..	..	*2.28*	..	..	..

Note: (D) dummy variables. Dependent variables average PISA score across 3 subjects.

1. Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).
2. Schools where students' past academic records and recommendation of feeder schools are not taken into account for admission.
3. Schools where students' past academic records and recommendation of feeder schools are a prerequisite for administration.
4. Cluster is defined as an aggregate of unweigthed students of United Kingdom, the Netherlands and the Slovak Republic.

ANNEX 3.A2

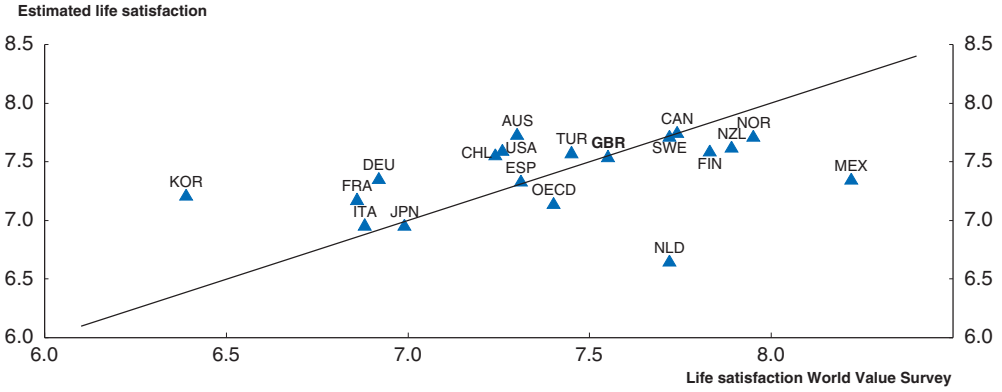
Estimation of wellbeing determinants

The effects of various explanatory variables on overall wellbeing were estimated using data from the World Values Survey (1981-2008) with ordered probit and Weighted Least Squares (WLS) (see Annex Table 3.A2.1). The explanatory power of each covariate/ determinant of life satisfaction can be compared with (the log of) income through "compensating differentials", to shed light on the relative importance of various wellbeing dimensions to life satisfaction. However, this method cannot explain wellbeing developments over time nor demonstrate causality. This approach, which is in line with recent practice in the literature (Stevenson and Wolfers, 2008), avoids the problems associated with arbitrary weights with index-based comparisons. The ordered probit is justified by the qualitative categories scores defining the variable "life satisfaction" from 0 to 10, and is the common theoretical approach in the literature. However, as both Ferrer-i-Carbonell and Frijters (2004) and Stevenson and Wolfers (2008) point out, in practice the choice of ordered probit or, WLS makes little difference for life satisfaction data. The WLS coefficients are used as the basis for our analysis since they are relatively easy to interpret intuitively. The individual fixed effects (age, squared age, sex, marital status, number of children) included in the calculation reduce the chance that unobserved heterogeneity, like ability, exaggeration or family background, is driving the observed correlation, making happiness data more comparable across individuals. Robust standard errors should avoid problems with heteroskedasticity.

To compare estimated life satisfaction determinants to their actual values and assess composition effects, the "marginal effects (coefficient) x average available stocks (value of the indicator in the survey)" were calculated for each country using the United Kingdom's regression coefficients. This allows us to estimate overall life satisfaction for an individual by applying the estimated UK coefficients to actual values of life satisfaction in the Survey for each country. If the United Kingdom's relative position improved compared to using country specific weights, this would mean that country-specific differences in coefficients explain some of the UKs relatively weak performance with life satisfaction. If, on the other hand, the UK's position remains unchanged, most of the underperformance can be attributed to weaker outcomes in terms of actual values of life satisfaction determinants. The two methods show that the United Kingdom's ranking does not change, hence the results seem fairly stable for differences in estimated coefficients (see Figure 3.A2.1). The use of the UK coefficients also maintains the relative position of some Asian countries (low), which can imply that the relative low ranks of these countries in the Survey is not due to cultural differences in answering the questions, as has been suggested.

Figure 3.A2.1. **Life satisfaction between 2005-2008 in OECD countries based on United Kingdom coefficients**[1]

Index scale of 1-10 from least to highest life satisfaction



1. We have computed an alternative indicator (computed as the marginal effects average available stocks for each country) using the United Kingdom's coefficients. It allows us to estimate overall life satisfaction for an individual with coefficients similar to the United Kingdom based on subjective subindexes for other OECD countries. If the United Kingdom's relative position improved compared to using country specific weights, this would mean that country-specific differences in coefficients explain some of the UKs relatively weak performance. If, on the other hand, the UKs position remains unchanged, most of the underperformance can be attributed to weaker outcomes in terms of subindicators.

Source: World Values Survey, 2005-2008 and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932376972

Table 3.A2.1. **Determinants of life satisfaction in the UK and OECD**

	Ordered probit regressions, United Kingdom, 1981-2008	WLS regressions, United Kingdom, 1981-2008	Ordered probit regressions, OECD, 1981-2008	WLS regressions, OECD, 1981-2008	Compensating differentials wrt log income, United Kingdom
Micro data					
Log income	0.0570 (0.061)	0.1606 * (0.107)	0.0873 ** (0.012)	0.1921 ** (0.022)	–
Wealth accumulation	0.0277** (0.013)	0.0435* (0.002)	0.0385** (0.002)	0.0654** (0.004)	0,25*
State of health (subjective)	0.3113** (0.038)	0.5386** (0.066)	0.3527 ** (0.008)	0.6519** (0.015)	3,31**
To be unemployed	–0.3657** (0.020)	–0.4570** (0.358)	–0.2988** (0.040)	–0.5860** (0.078)	2,81**
High educational level	0.0538** (0.025)	0.0919** (0.045)	0.0193** (0.004)	0.0338** (0.007)	0,57**
Belong to a cultural, sportive, political group	0.0840* (0.067)	0.1818* (0.119)	0.0665** (0.013)	0.1475** (0.025)	1,12*
National data					
Income inequality (subjective)	–0.1213** (0.059)	–0.1113* (0.094)	–0.1285** (0.011)	–0.2390** (0.021)	0,68*
Freedom of choice and control (subjective)	0.1665* (0.148)	0.4512* (0.228)	0.2152** (0.145)	0.3572** (0.026)	2,81*
State of the environment (subjective)	0.3017** (0.146)	0.2768* (0.223)	0.1414** (0.028)	0.2360** (0.051)	1,68*
Insecurity (perceived)	–0.1741* (0.250)	–0.2248 (0.399)	–0.3813** (0.069)	–0.4624** (0.125)	1,37

Table 3.A2.1. **Determinants of life satisfaction in the UK and OECD** *(cont.)*

	Ordered probit regressions, United Kingdom, 1981-2008	WLS regressions, United Kingdom, 1981-2008	Ordered probit regressions, OECD, 1981-2008	WLS regressions, OECD, 1981-2008	Compensating differentials wrt log income, United Kingdom
Individual fixed effects					
Age	–0.0026**	–0.049**	–0.0179**	–0.0325**	–
	(0.012)	(0.021)	(0.002)	(0.004)	
Squared age	0.0339**	0.0604**	0.0249**	0.0440**	–
	(0.012)	(0.021)	(0.002)	(0.005)	
Female	–0.0638	–0.1135	0.0270**	0.0368*	–
	(0.068)	(0.121)	(0.013)	(0.023)	
Divorce	–0.0537**	–0.0930**	–0.0374**	–0.0685**	–
	(0.018)	(0.033)	(0.003)	(0.007)	
Number of children	–0.0013	–0.0026	0.0024	–0.0035	–
	(0.026)	(0.046)	(0.005)	(0.009)	

Chapter 4

Climate-change policy in the United Kingdom

The United Kingdom started to pursue policies to reduce greenhouse gas emissions at a relatively early date and now has a comprehensive set of measures in place. It has set clear targets for emission reductions consistent with international goals of limiting global warming and has pioneered statutory underpinning of target-setting. On the international stage, it has been an active protagonist of a global deal to limit human-induced climate change. The new government has endorsed the direction of previous policies in this area and is introducing further measures, despite heavy fiscal pressures. The United Kingdom is likely to reduce emissions by more than its near-term domestic targets and its target under the Kyoto Protocol, outperforming many OECD countries in the latter respect. But some of the success has been due to "one-off" factors such as the "dash for gas", reductions in non-CO_2 greenhouse gases in the 1990s and the recent recession, rather than explicit climate-change policies. The pace of decarbonisation of the power sector has been slow and the spread of renewable energy technologies limited. Implicit carbon prices vary across sectors, and should be harmonised and thus more efficient. The unevenness partly reflects the way in which policies have proliferated and overlap and a simplified structure would be desirable. A step-change in the pace of emission reductions is required to put the UK on the path towards its ambitious 2050 target. Given the central role of the EU emissions trading scheme, a key element of the UK strategy should be to seek tighter quotas within the EU scheme. Preparations to adapt to climate impacts also need to be stepped up, focusing on the provision of more information, better risk-assessment frameworks and more advanced metrics for monitoring and evaluation of adaptation planning.

Rising to the climate challenge

This chapter analyses the UK climate-change policy framework. It first examines the United Kingdom's performance according to various outcomes relevant to climate change, such as greenhouse gas emissions (GHG) reductions and the market penetration of renewable energy. It then discusses UK policies and how well they are designed to reduce greenhouse gas emissions in a cost-effective way. Particular attention is paid to carbon pricing and in the light of the market failures that afflict innovation the promotion of renewable energy. Examining policies piecemeal can lead to neglect of significant interactions among them when, for example, quantity-based instruments co-exist with price-based instruments or policies are applied at different stages in the supply chain. Hence the chapter also addresses the issue of overlapping policy instruments. The variety of policies across different sectors of the economy is also noted. The chapter then moves from climate-change mitigation to discuss adaptation policies. Finally, the chapter concludes with some suggestions for how policies could be improved.

Recent progress on emissions has been significant but a step change is needed to achieve ambitious targets

Emissions have fallen rapidly

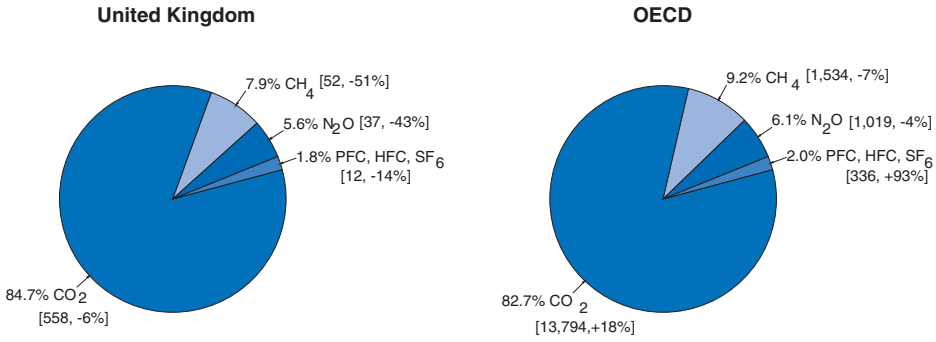
The United Kingdom did better than OECD countries on average in achieving emission reductions (Figure 4.1). Performance was most striking in the non-carbon dioxide (non-CO_2) gases. Much of the decrease in methane (CH_4) was due to improved landfill and waste management, encouraged by UK policies such as the 1996 landfill tax and the Landfill Allowance Trading Scheme. A small number of industrial installations accounted for nearly all industrial non-CO_2 emissions and reduced them sharply, responding to policy and new technological opportunities. The OECD as a whole has been much less successful in this area. Progress in reducing carbon dioxide (CO_2) emissions has also been better than in the OECD as a whole (Figure 4.1), although since 2007, there has been a major decline in both OECD and UK CO_2 emissions, primarily due to the recession (Figure 4.2).

Considering the full range of targets covered by the Kyoto Protocol, the United Kingdom, in 1990, had higher emissions per head than the EU15 as a whole. Emissions were lower than the OECD average though (Table 4.1).[1] By 2005, the United Kingdom had reached the EU15 average, which itself had dropped, while emissions per capita increased slightly in the OECD as a whole. Similarly, UK emissions per unit of GDP dropped faster than the OECD average, falling to around the EU15 average.

UK energy CO_2 emissions[2] are the main focus of climate change mitigation policies as they account for around four-fifths of total emissions (the same proportion as in the OECD as a whole).[3] The Kaya decomposition (Table 4.1) decomposes energy CO_2 emissions into its components using the "Kaya identity", which expresses energy CO_2 emissions per head (column A) as equivalent to the product of GDP per head (B), the carbon intensity of energy (C), and the energy intensity of output (D). The relatively low energy CO_2 emissions in the

Figure 4.1. **Total GHG emissions by gas in 2005**[1]

Total GHG's and percentage change from 1990



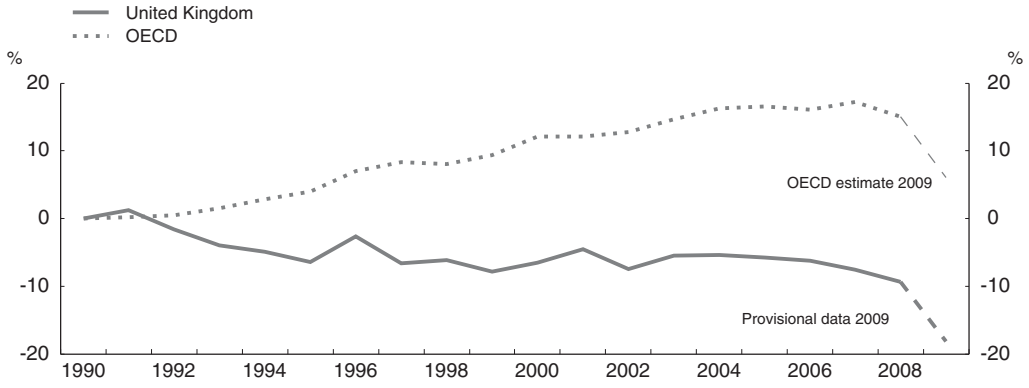
1. Share based on million tonnes CO_2 equivalent. Excludes land use change. Carbon dioxide (CO_2); Methane (CH_4); Nitrous oxide (N_2O); Perfluorocarbons (PFCs), Hydrofluorocarbons (HFCs); Sulphur hexafluoride (SF_6). In brackets: emissions in million tonnes CO_2 equivalent and percentage change from 1990.

Source: Climate Analysis Indicators Tool (CAIT) World Resources Institute (2010) and UK UNFCCC submission (2008).

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Figure 4.2. **Change in total CO_2 emissions in the United Kingdom and the OECD**[1]

Percentage change from 1990



1. Excludes land use change.

Source: IEA database, CO_2 Emissions from Fuel Combustion (OECD estimate in 2009 extrapolated from Friedlingstein, *et al.*, [2010]); UK Department for Energy and Climate Change (DECC) (2010), *UK Emissions Statistics*, with 2009 Provisional data.

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United Kingdom and European countries, compared with Canada and the USA, are driven by lower energy intensity (column D) and to a lesser extent by lower GDP (column B). Energy emissions decreased on average by 0.7% per year per head between 1990 and 2005, which is more than the OECD, EU15 and world averages. The reductions in carbon and energy intensities outweighed the impact of strong economic growth between 1990 and 2005. These reductions, strongest in the period 1990-2000 (Table 4.2), were influenced by the privatisation of the electricity industry in the early 1990s. Privatisation was accompanied by reduced gas prices and improvements in electricity generation technology, which led to greater use of cleaner energy sources, especially gas (the so-called "dash for gas"), which replaced coal and oil. At the end of the 1990s, the "dash for gas" and

Table 4.1. **Decomposition of energy CO_2 emissions**

Panel 1: Emissions 1990

Country/region (%)	GHG emissions/head (tCO_{2e})	A Energy CO_2 emissions/head (tCO_2)	B GDP per head ('000 Intl$ppp 2005)	C Energy CO_2 emissions/energy use (tCO_2/toe)	D Energy use/GDP (toe/Intl$ppp 2005) x 10^3
USA	24.5	19.6	31.9	2.5	0.24
Canada	21.1	15.7	27.0	2.1	0.28
Germany	15.3	12.0	25.7	2.7	0.17
UK	**12.8**	**10.0**	**23.6**	**2.7**	**0.16**
Japan	9.9	8.7	26.0	2.4	0.14
France	9.8	6.2	24.9	1.5	0.16
Italy	9.1	7.0	23.8	2.7	0.11
OECD	14.0	10.7	22.9	2.5	0.19
EU15	11.7	8.5	23.7	2.3	0.15
World	5.8	3.9	6.7	2.4	0.25

Panel 2: Emissions 2005

Country/region (%)	GHG emissions/head (tCO_{2e})	Energy CO_2 emissions/head (tCO_2)	GDP per head ('000 Intl$ppp 2005)	Energy CO_2 emissions/energy use (tCO_2/toe)	Energy use/GDP (toe/Intl$ppp 2005) x 10^3
USA	23.9	19.7	41.9	2.5	0.19
Canada	23.0	17.3	35.1	2.0	0.24
Germany	12.2	9.8	31.4	2.3	0.13
UK	**11.4**	**9.0**	**32.2**	**2.3**	**0.12**
Japan	10.9	9.6	30.3	2.3	0.14
France	9.4	6.4	30.7	1.4	0.15
Italy	9.9	7.7	28.1	2.4	0.11
OECD	14.3	11.1	29.6	2.3	0.16
EU15	11.4	8.5	30.4	2.1	0.13
World	6.0	4.1	8.8	2.3	0.20

Panel 3: Average annual growth in emissions 1990-2005

Country/region (%)	GHG emissions/head (tCO_{2e})	Energy CO_2 emissions/head (tCO_2)	GDP per head ('000 Intl$ppp 2005)	Energy CO_2 emissions/energy use (tCO_2/toe)	Energy use/GDP (toe/Intl$ppp 2005) x 10^3
USA	–0.2	0.0	1.8	–0.1	–1.6
Canada	0.6	0.7	1.8	–0.1	–1.0
Germany	–1.5	–1.3	1.3	–0.9	–1.8
UK	**–0.8**	**–0.7**	**2.1**	**–1.0**	**–1.7**
Japan	0.6	0.7	1.0	–0.3	–0.1
France	–0.3	0.2	1.4	–0.7	–0.6
Italy	0.6	0.7	1.1	–0.6	0.2
OECD	0.1	0.3	1.7	–0.3	–1.1
EU15	–0.2	0.0	1.7	–0.7	–1.0
World	0.2	0.3	1.8	–0.1	–1.4

Source: Climate Analysis Indicators Tool (CAIT): World Resources Institute, 2010; and *UN World Population Prospects database*: 2008 Revision.

the impact of privatisation lessened, and the United Kingdom began to implement a new set of climate-change policies directly targeted at energy efficiency and emission reductions. This coincided with a continued but slower decline in energy CO_2 emissions per head post-2000. The carbon intensity of energy stopped falling despite the new

policies, although this was partly offset by a faster rate of reduction of the energy intensity of GDP. The United Kingdom's rank within the OECD improved on the latter measure, in contrast to its ranking with respect to growth in GDP per head and reductions in carbon intensity.

The economic downturn brought some temporary respite. The latest data suggest a faster annual average rate of decline in energy emissions per head between 2005 and 2009, driven by a fall in the annual rate of change in GDP per head (the early impact of the recession), a fall in carbon intensity, and a further fall in the energy intensity of output. Once allowance is made for the downturn, which has had a disproportionally large impact on several energy-intensive sectors, policies to reduce carbon emissions appear to have contributed less to reductions than did the "dash for gas". Stronger measures are therefore required to accelerate the transition from fossil-fuel-based electricity generation towards cleaner energy supplies to sustain the trend.

Table 4.2. **Average annual growth in energy CO_2 emissions, 1990-2000 and 2000-2005**

%	Period	Energy CO_2 emissions/head	GDP per head	Carbon Intensity	Energy Intensity
UK	**1990-2000**	**–0.9**	**2.1**	**–1.6**	**–1.4**
	2000-2005	**–0.3**	**2.0**	**0.1**	**–2.3**
	2005-2009[1]	**–3.4**	**–0.3**	**–0.5**	**–2.6**
	1990-2009[1]	**–1.4**	**1.6**	**–0.7**	**–2.4**
OECD	1990-2000	0.5	1.9	–0.4	–1.0
	2000-2005	0.0	1.4	–0.2	–1.3
World	1990-2000	–0.4	1.6	–0.3	–1.7
	2000-2005	1.6	2.3	0.2	–0.9
UK rank /all OECD countries	1990-2000	7	11	4	13
	2000-2005	7	14	23	4

1. These estimates for the United Kingdom are sourced from World Bank Development indicators, the UK Office of National Statistics (ONS), DECC (2010) *UK Emissions Statistics*, with 2009 Provisional UK figures, UK UNFCCC submission (2008), and IEA Energy, *Balances of OECD countries*, 2010. Provisional estimates for 2009 from various sources.

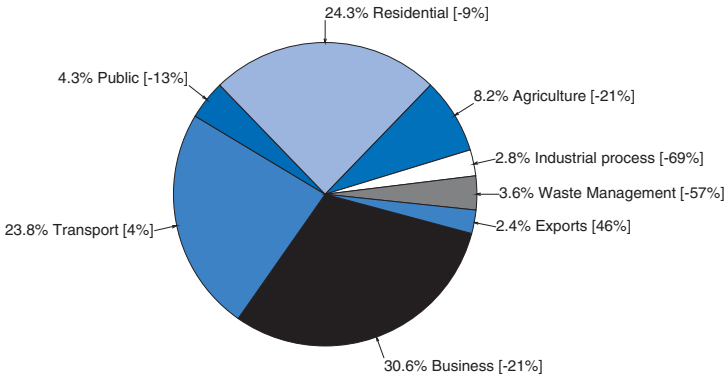
Source: Climate Analysis Indicators Tool (CAIT): World Resources Institute, 2010; *World Bank World Development Indicators; UN World Population Prospects database:* 2008 Revision; UK emissions data are from the UK UNFCCC National Inventory Submission, 2008.

The sectoral distribution of emissions reductions has been uneven. Emissions in UK waste management decreased 57% over 1990-2008 and those from industrial processes fell 69% (Figure 4.3). The United Kingdom has not, however, achieved significant reductions in the transport and residential sectors, which account for around 48% of total emissions, despite some relatively inexpensive mitigation options in these sectors. A range of market failures and behavioural barriers are preventing greater progress.

Emission reduction targets are ambitious

The United Kingdom, along with the EU15 as a whole, is on track to outperform its Kyoto target significantly by means of domestic emission reductions (Figure 4.4), unlike some individual EU members such as Spain, Austria and Luxemburg, and some other Kyoto signatories such as Canada and Japan. At the inception of the Kyoto Protocol, the EU15 committed to reducing emissions by 8%, on average, over the 2008-12 commitment period, compared with base-year emissions.[4] Under the EU's burden-sharing agreement the

Figure 4.3. **UK GHG emissions by end-user in 2008**[1]



1. Share based on million tonnes CO_2 equivalent. Percentage change since 1990 in brackets.

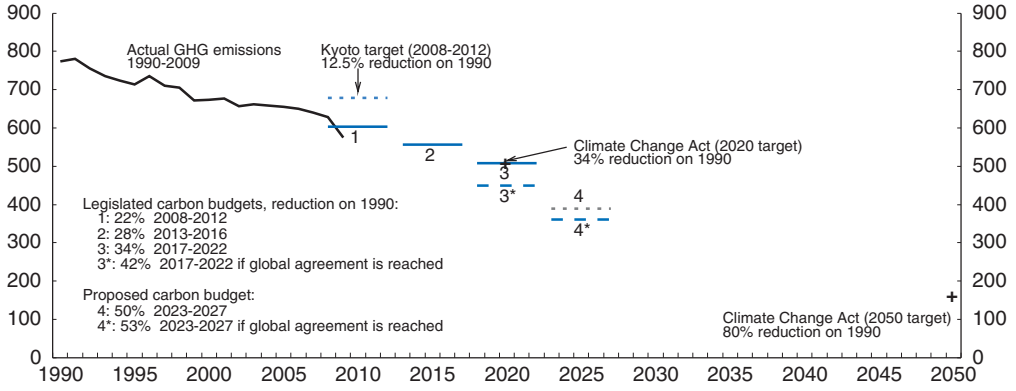
Source: DECC (2010). UK Climate Change Sustainable Development Indicator: 2009 Greenhouse Gas Emissions, Provisional Figures and 2008 Greenhouse Gas Emissions, Final Figures by Fuel Type and End-User. *www.decc.gov.uk/en/content/cms/statistics/climate_change/gg_emissions/uk_emissions/2009_prov/2009_prov.aspx.*

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United Kingdom accepted a national target of a 12.5% reduction. In 2009, total UK emissions were around a fourth below 1990 levels (Figure 4.4). The EU15 as a group should also exceed its collective target; the European Environment Agency estimates that EU emissions were 13% below 1990 levels in 2009. In addition to the Kyoto commitment, in 1997 the incoming UK government set a 20% target for CO_2 reductions between 1990 and 2010. Prior to the recent downturn, the United Kingdom was not widely expected to meet this target, but success now appears likely. More recently the UK has introduced a system of carbon budgets setting legally binding emissions limits over five year periods. The first three carbon budgets, covering the periods 2008-12, 2013-17 and 2018-22 respectively, require a 34% reduction in emissions with respect to 1990 levels by 2020.

Figure 4.4. **United Kingdom GHG emissions 1990-2009 and targets to 2050**

Million tonnes CO_2 equivalent



Source: DECC (2010), *UK Emissions Statistics*, with 2009 provisional data; Committee on Climate Change.

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However, further improvements in the rate of emission reductions are required over the coming decades if the UK (and the world) is to achieve reductions on the scale required to have a 50/50 chance of limiting the temperature increase from pre-industrial times to 2 °C. According to Stern (2009a, 2009b), that objective will require that countries will need to be, on average, at two tonnes CO_2 equivalent (CO_2e) per head by 2050. That is consistent with the UK national commitment of at least 80% cuts in total emissions from 1990 to 2050 (Figure 4.4). As energy is the largest contributor, energy CO_2 emissions will also need to be around two tonnes per head by 2050 if targets are to be achieved. This requires raising the annual average rate of emission reductions in energy CO_2 per head from 0.9% over the past decades (Table 4.2) to around 3.2% per year between 2008 and 2050. Over a shorter time horizon, the UK Committee on Climate Change (CCC) in its second progress report argued that the rate of emission reductions needs roughly to double from its mid-2000 level to meet near-term UK carbon budgets, even after taking into account the effect of the recession (CCC, 2010a).[5] Early and effective policy action is required to discourage new high-carbon investments, to redirect innovation towards low-carbon growth and to avoid the need for sharper changes in carbon prices and investment flows closer to the target dates. The current government is taking forward action in a number of areas to accelerate rates of decarbonisation, including through the Electricity Market Reform project, support for the carbon price and the introduction of a "Green Deal" to drive improvements in domestic energy efficiency.

Renewable and nuclear energy plays a less prominent role in the United Kingdom

Government policy in the United Kingdom over the past decade has promoted renewable energy to reduce the carbon intensity of energy and diversify supply. The contribution from renewable energy to Total Primary Energy Supply (TPES) and electricity generation has risen since the introduction of renewable energy policy in the early 2000s, by around 2 and 4 percentage points respectively (Table 4.3, Panels 1 and 2). The share of nuclear energy has declined since 2000, reversing an upward trend during the 1990s (Table 4.3, panel 3). The contribution of renewables to energy supply and electricity generation remains low, both in absolute terms and relative to other OECD countries. Fossil fuels continue to account for the major share of supply (Figure 4.5).

Table 4.3. **Non-fossil energy contributions**

Panel 1: Contribution of renewable energy sources to TPES[1]

%	1990	2000	2009	Absolute % change 1990-2009	Average annual % change 1990-2000	Average annual % change 2000-2009
USA	5	4.5	5.4	8.0	–1.0	2.0
Canada	16.2	16.9	16.9	4.3	0.4	0.0
Germany	1.5	2.7	9.1	506.7	6.1	14.5
UK	**0.5**	**1**	**3.1**	**520.0**	**7.2**	**13.4**
Japan	3.5	3.2	3.2	–8.6	–0.9	0.0
France	6.8	6.3	7.6	11.8	–0.8	2.1
Italy	4.4	5.9	9.3	111.4	3.0	5.2
OECD Total	5.8	5.9	7.3	25.9	0.2	2.4
OECD Europe	5.7	6.8	9.9	73.7	1.8	4.3
World	12.7	12.9	–	–	–	–

Panel 2: Share of electricity generation from renewable sources[1]

%	1990	2000	2009	Absolute % change 1990-2009	Average annual % change 1990-2000	Average annual % change 2000-2009
USA	11.5	8.2	10.2	–11.3	–3.3	2.5
Canada	62.4	60.6	60.8	–2.6	–0.3	0.04
Germany	3.5	6.2	16.1	360.0	5.9	11.2
UK	**1.8**	**2.7**	**6.7**	**272.2**	**4.1**	**10.6**
Japan	12	9.9	9.5	–20.8	–1.9	–0.5
France	13.4	13.1	12.9	–3.7	–0.2	–0.2
Italy	16.4	18.8	23.1	40.9	1.4	2.3
OECD Total	17.3	15.6	17.2	–0.6	–1.0	1.1
OECD Europe	17.6	18.9	22.5	27.8	0.7	2.0
World	19.5	18.4	–	–	–	–

Panel 3: Share of electricity generation from nuclear energy

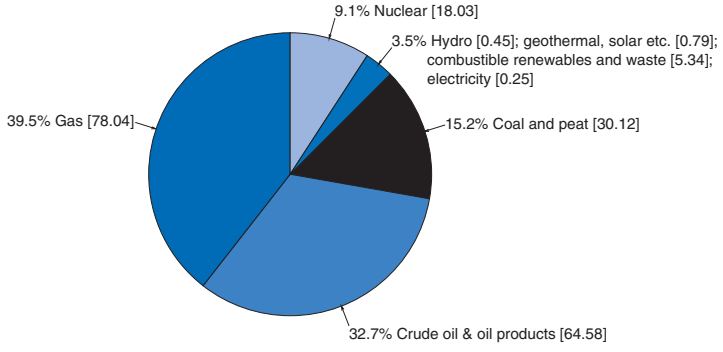
%	1990	2000	2009	Absolute % change 1990-2009	Average annual % change 1990-2000	Average annual % change 2000-2009
USA	19.1	19.8	20.0	4.7	0.4	0.1
Canada	15.1	15.1	14.5	–4.0	0.0	–0.4
Germany	27.8	29.6	22.8	–18.0	0.6	–2.9
UK	**20.7**	**22.7**	**18.8**	**–9.2**	**0.9**	**–2.1**
Japan	24.2	30.7	26.9	11.2	2.4	–1.5
France	75.3	77.5	76.5	1.6	0.3	–0.1
Italy	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
OECD Total	22.8	23.3	21.8	–4.4	0.2	–0.7
OECD Europe	29.7	29.2	25.6	–13.8	–0.2	–1.5

1. Renewable energy sources include hydroelectricity, geothermal, solar thermal, solar PV, tide, wind, renewable municipal waste, solid biomass, liquid biomass and biogas.

Source: Panels A and B: IEA Renewable Information 2010; Panel C: IEA Energy Balances of OECD countries, 2010.

Figure 4.5. **Estimated energy supply balance for the United Kingdom in 2009**[1]

Total primary energy supply



1. Share based on million tonnes of oil equivalent. Million tonnes of oil equivalent in brackets. Includes imports and deducts exports, including international aviation and marine bunkers.

Source: IEA (2010), *Energy Balances of OECD countries*.

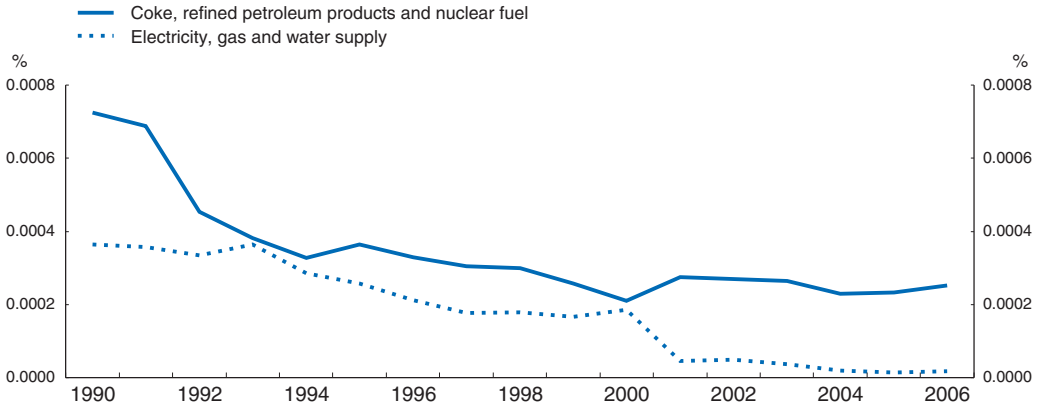
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Research, development and technological innovation

Technological innovation over the long term is essential to ensure that the step-change in emission reductions required is delivered at a reasonable cost. While it may be technically possible to achieve the required emission reductions using current technologies, this is likely to be increasingly costly as cheaper options are exhausted and more fundamental structural changes, such as the replacement of fossil-fuel-powered transport, are required. Hence it is worrying that R&D spending in energy-related industries has declined substantially over the past 20 years in relation to GDP (Figure 4.6). The United Kingdom has lagged other major OECD countries in government energy R&D spending (Figure 4.7). A sharp decline in both public and private nuclear R&D post-1990 can be attributed to countries' experiences with cost over-runs, construction delays, and public concerns over reactor safety and waste disposal. The more recent resurgence of UK government R&D is largely due to spending on renewable

Figure 4.6. **Industry R&D expenditure**

Per cent of GDP – nominal current prices

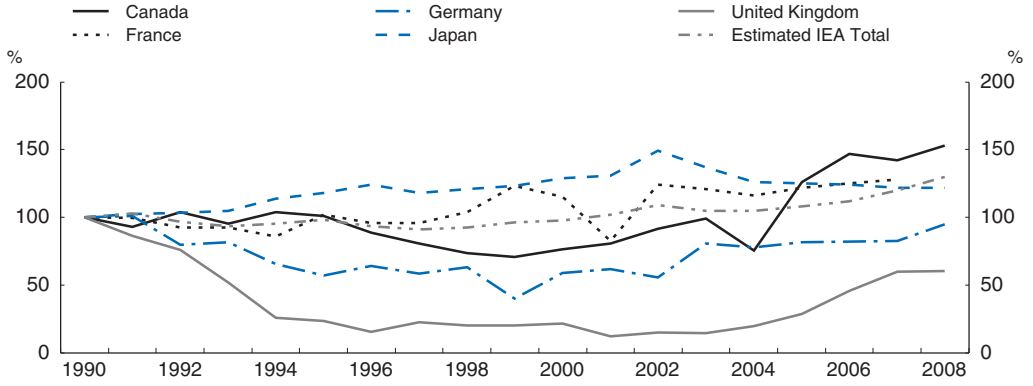


Source: IEA database, Energy Technology R&D Statistics.

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Figure 4.7. **Index of government "green" energy R&D budgets**[1]

Index: 1990 = 100 – 2008 prices USD and PPP



1. "Green" energy R&D budgets include: energy efficiency, renewables, nuclear, hydrogen and fuel cells, other power and storage technologies, and other technology or research. Excludes fossil fuels.

Source: IEA database, Energy Technology R&D Statistics.

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energy R&D, reflecting climate-change and energy-security objectives. However, the recent review of innovation policy by the Committee on Climate Change suggests that current government funding for clean energy R&D is at its minimum acceptable level and increases are warranted in certain areas (CCC, 2010b).

Although the United Kingdom ranked highly on global patent submission in "clean" innovation over the period 1980-2007 and 2002-2007, its position slipped slightly in the latter period (Table 4.4). While the United Kingdom remains a leader in marine energy innovations, its ranking declined in batteries, electric and hybrid vehicles, nuclear, methane, heating, solar, fuel injection and waste. However, the falls appear to be due to higher growth in patenting activity in emerging economies such as Korea, rather than a major decline in the UK.

Table 4.4. **Top 15 nations by share of the world's climate-related inventions**

Country Rank	1980-2007		2002-2007	
	Average % of world's inventions	Rank	Average % of world's inventions	Rank
Japan	20.2	1	20.8	1
Germany	19.8	2	17.8	2
USA	15.4	3	14.1	3
France	5.1	4	4.4	5
UK	**4.5**	**5**	**4.3**	**6**
Australia	3.8	6	2.9	9
Sweden	3.3	7	1.7	14
South Korea	3.1	8	5.6	4
Canada	2.2	9	3.0	8
Netherlands	2.1	10	1.8	13
Austria	2.0	11	2.1	11
Italy	1.9	12	2.3	10
Switzerland	1.9	13	1.3	16
China	1.9	14	3.9	7
Denmark	1.4	15	1.4	15
Total	**88.6**		**87.4**	

Source: Dechezleprêtre and Martin (2010).

Major policy instruments

The overall policy framework is complex, encompassing several different instruments and objectives

The UK has developed a complex set of measures to reduce emissions since the late 1980s. The aim has been to price emissions, stimulate the development and deployment of clean energy and improve energy efficiency. Policies to promote efficient adaptation to the uncertain impacts of climate change are underdeveloped. The United Kingdom has recognised the importance of international collaboration on mitigation and adaptation, given the global nature of the climate-change problem (Box 4.1).

Most domestic UK policies are designed to be "market friendly", using price signals to encourage firms and households most able to adjust their behaviour cost effectively (Box 4.2). Policies rely heavily on tradable quota markets, a form of quantity-based

Box 4.1. **Contributions to international climate-change policies**

The United Kingdom has a proven track record in international action on climate change, which, together with a cross-party commitment to a strong domestic policy framework, is setting a useful international example. The United Kingdom has consistently been in the vanguard of developed nations in promoting international action on climate change. It has strongly supported international climate-change negotiations through the United Nations Framework Convention on Climate Change (UNFCCC) and EU channels, along with considerable unilateral efforts to support adaptation and mitigation in developing countries. At the G8 Summit at Gleneagles in July 2005, the United Kingdom proposed a focus on poverty reduction and climate change. Soon after, the then Labour government commissioned the Stern Review on the economics of climate change, which helped to push climate change to the centre of the policy debate in the United Kingdom and many other OECD countries. The United Kingdom offered strong support for a global climate change agreement at the UNFCCC Conference of Parties in Copenhagen in 2009 (COP15) and Cancun in 2010 (COP16).

Although COP15 fell short of expectations and COP16 made only modest progress on outstanding issues, the United Kingdom continues to push for strong and co-ordinated action on climate change. In July 2010, the environment ministers of the United Kingdom, Germany and France published joint articles in three leading newspapers emphasising the economic benefits of unilaterally increasing the EU emission-reduction target for 1990 to 2020 from 20% to 30%, a proposal that is now official UK policy. Despite the environment of fiscal austerity, the new government is also committed to providing finance to assist developing countries manage climate change, including £1.5 billion as its share of fast-start financing of USD 30 billion in 2010-2012 promised in the Copenhagen Accord. The United Kingdom's total commitment to international climate-change finance over the spending review period is £2.9 billion.

The United Kingdom is active in the international arena in other ways, too. The Foreign and Commonwealth Office's three strategic priorities include promoting sustainable growth. The Department for International Development (DFID) supports adaptation in developing countries and, through the International Forestry Group, participates in international forestry negotiations.*

* A list of recent and ongoing programmes and initiatives is available at *www.dfid.gov.uk/About–DFID/Finance-and-performance/Structural-reform-plan/Climate-change/About–DFID/Finance-and-performance/Structural-reform-plan/Climate-change*.

instrument (such as the Renewables Obligation [RO]), although there are also primarily price-based instruments (such as the Climate-Change Levy [CCL]). In practice, several schemes are hybrids. There are also regulations mandating specific actions, such as labelling requirements for energy efficiency. One unusual aspect of the UK policy framework is that, since 2008, it has been underpinned by a Climate Change Act, which gave statutory force to domestic carbon-reduction budgets. The Act also set up an independent body, the Committee on Climate Change, with statutory responsibilities to propose appropriate carbon budgets, assess progress towards the government's long-term emission reduction targets and give advice to the government on climate-change policies in general, covering both mitigation of and adaptation to climate change.

Box 4.2. **A timeline of UK climate-change policies**

1989: The Non Fossil Fuel Obligation (NFFO) and the Scottish Renewables Obligation (SRO) were established under the Electricity Act 1989. Originally intended to support nuclear electricity generation, the NFFO and SRO were expanded in 1990 to include renewables. The NFFO and SRO were funded by a **Fossil Fuel Levy** paid by suppliers of electricity from fossil fuels.

2000: Climate Change Programme. This report set out policies and priorities for action both in the United Kingdom and internationally. Updated in 2006, the policies are supposed to reduce CO_2 emissions by 15-18% below 1990 levels by 2010 and overall GHG emissions by 23-25%.

2001: The Climate Change Levy (CCL) was introduced on 1 April 2001, effectively replacing the Fossil Fuel Levy. It is a downstream tax on non-domestic energy use by industry and the public sector, designed to incentivise energy efficiency and emission reductions, with part of the revenue being used to reduce National Insurance contributions. Energy-intensive firms can receive up to an 80% discount if they join a ***Climate Change Agreement (CCA)***, which requires meeting energy efficiency or carbon-saving targets. Renewable electricity suppliers are exempt from the CCL.

2002: The Renewables Obligation (RO) replaced the NFFO and SRO as the primary renewable energy policy instrument. The RO requires electricity end-suppliers to purchase a certain fraction of their annual electricity supply from producers using specific renewable technologies, and they receive tradable Renewables Obligation Certificates (ROCs) for doing so. The supplier can also "buy out" the obligation by paying a set price per MWh. The buy-out revenue is recycled to participating suppliers in proportion to their ROCs.

2002: The Energy Efficiency Commitment (EEC) was introduced, requiring energy suppliers to achieve 62TWh of savings over the period to 2005 through assisting the implementation of home energy efficiency improvements, equivalent to a reduction in domestic emissions of approximately 1%. The second phase of EEC (2005-2008) raised the total savings required to 130TWh.

2005: European Union Emissions Trading System (EU ETS). The UK Emissions Trading Scheme closed in 2006 and was replaced by the EU's that aims at ensuring compliance with the Kyoto obligations. Under the EU system, member states proposed National Allocation Plans (NAPs) to the European Commission, allocating a set proportion of a country's total 2008-2012 emission budget to sectors covered by the scheme; tradable quotas were then divided among firms (*www.eea.europa.eu/pressroom/newsreleases/questions-and-answers-on-key*).

2008: Climate Change Act. This Act set a legally binding target of 80% reductions in emissions from 1990 to 2050. A medium-term target of a 34% reduction by 2020 was also adopted, with the promise of a further tightening in the event of a global deal on climate change. To achieve these targets, the Act established the principle of five-year carbon budgets. The first three budgets were set in 2009 and cover 2008-12, 2013-17 and 2018-22. The fourth budget, 2023-2027, was recently proposed by the UK Committee on Climate Change. The government must submit its policies to meet these budgets to Parliament, as it did in the **Low-Carbon Transition Plan** of July 2009, which set out policies to cut emissions across the power and heavy industry sector; the transport sector; in homes and communities, workplaces and jobs; in agriculture; and in land use and waste management. The Act also requires the government to include aviation and shipping emissions, or provide an explanation why not, by the end of 2012.

Box 4.2. **A timeline of UK climate-change policies** *(cont.)*

2008: Carbon Emission Reduction Target (CERT). This scheme follows on from the Energy Efficiency Commitment, with a greater focus on more substantial and robust household energy saving measures such as insulation, and a component targeted at those most vulnerable to fuel poverty. The total lifetime savings required from energy suppliers over the duration of the scheme until 2012 is 293 million tonnes CO_2.

2008: Renewable Transport Fuel Obligation (RTFO). This is administered by the Renewable Fuels Agency and requires suppliers of fossil fuels to ensure that a specified percentage of UK road fuel supply is from renewable fuels. The target for 2009-2010 is 3.25% of fuels by volume. Suppliers may buy out their obligation for 30 pence/litre. The obligation also requires companies to submit reports on the carbon content and sustainability of the biofuels used.

2009 Community Energy Saving Programme (CESP) established to complement CERT. The scheme achieves aims of both carbon reduction and addressing fuel poverty by requiring energy suppliers to achieve 19.25 million tonnes CO_2 lifetime savings in the most deprived areas of England, Scotland and Wales, promoting area-based and whole-house approaches to energy efficiency improvements.

2010: Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES). Established under the Climate Change Act 2008, the scheme covers emissions by firms and public bodies not already subject to the EU system or substantially covered by other agreements. It comprises reporting requirements and a carbon levy. There are also several policies to promote energy efficiency in residential buildings.

2010: Feed-In Tariffs (FITs). From April 2010, the government has offered FITs for small-scale low-carbon electricity generated by households, businesses and communities. Additional payment is provided for electricity fed into the grid. FIT rates vary according to technology, will last from 10 to 25 years, and are adjusted for inflation. A pilot scheme for micro Combined Heat and Power plants has also been launched.

Proposed: Green Investment Bank (GIB). The new government plans to introduce a GIB to unlock finance for the transition to low-carbon growth. The autumn 2010 Spending Review committed £1 billion funding and promised additional future proceeds from asset sales to capitalise the Bank.

Proposed: Renewable Heat Incentive (RHI). Details of this policy, to provide incentives for the use of renewables for heating, will be announced during 2011.

Proposed: The Energy Bill. Currently before the House of Lords, this bill includes provisions for a "Green Deal" on energy efficiency, greater security of energy supplies and more low-carbon electricity. More detailed secondary legislation will be prepared during 2011 and there will be a formal consultation process (*www.decc.gov.uk/en/content/cms/what_we_do/consumers/green_deal/green_deal.aspx*). The business Plan 2011-2015 outlines plans for future policies (*www.decc.gov.uk/assets/decc/About%20us/decc-business-plan-2011-2015.pdf-2015.pdf*).

Related: Taxes on hydrocarbon oils (*e.g.* petrol, diesel, biodiesel) were first introduced in 1909. In 1993, the government introduced an annual Fuel Price Escalator (FPE), initially at 3% above the rate of inflation, then at 6% after the election of the Labour government in 1997. The escalator was abolished in 2000, although rates have been adjusted since. Other transport taxes include the vehicle excise duty on road vehicles, now differentiated by emissions. Other environmental taxes include the Landfill Tax and the Aggregates Levy, a tax designed to price externalities from quarrying, while taxes such as Air Passenger Duty have potential environmental impacts. The VAT rate charged on domestic energy consumption is 5% in contrast to the standard rate of 20% (IFS 2010).

Carbon pricing is complex, with numerous overlapping instruments

The central pillar of any set of policies to combat climate change must be a method of pricing the externalities caused by emissions. Each tonne of CO_2 or CO_2-equivalent can be expected to do the same amount of damage wherever it is emitted, because emissions mix in the atmosphere quickly. Its price should therefore be the same regardless of location or sector, reflecting the social cost of carbon and giving an incentive to equalise the marginal cost of abatement across technologies, countries and firms.[6] The United Kingdom's main pricing instrument is the EU trading scheme, which covered about 48% of UK CO_2 emissions in 2009 (but not other GHGs) with aviation to be covered from 2012 onwards. From 2013, CO_2 emissions from a wider range of industrial processes will be included, as will some industrial nitrous oxide (N_2O) and perfluorocarbon emissions.

The EU system is a cap-and-trade scheme that sets quantitative limits for emissions by firms within its scope. The carbon price is set by trading emissions quotas, in contrast to a carbon tax that directly sets a carbon price. A quantitative limit delivers a greater degree of confidence about the amount of emissions reduction in the face of economic shocks, and hence can ensure that a long-run emissions reduction target and milestones along the way can be met. However, it may do so at the cost of deviations of the carbon price from the social cost of carbon and large variations in the price signal over time, distorting investment incentives and increasing uncertainty at the firm level.

In practice, the price of European Emission Allowances (EUAs) has been volatile, and has been highly correlated with the wholesale prices of natural gas (one of the most volatile commodity prices), oil and coal, reflecting variations in energy demand and the scope for switching commercial energy supplies among sources (Mansanet-Bataller, Pardo and Valor, 2007; Geman, 2005). The price dropped some 70% between July 2008 and February 2009 with the onset of the global recession. As the downturn could not have had such a large impact on the social costs, or marginal damage costs, of CO_2, which the price should reflect, the fall was excessive.[7] Volatility is not unusual in cap-and-trade schemes, because shifts in demand translate into price changes due to inelastic supply of quotas (Metcalf, 2009). The high volatility may in turn discourage investment, especially in risky and long-term abatement options.

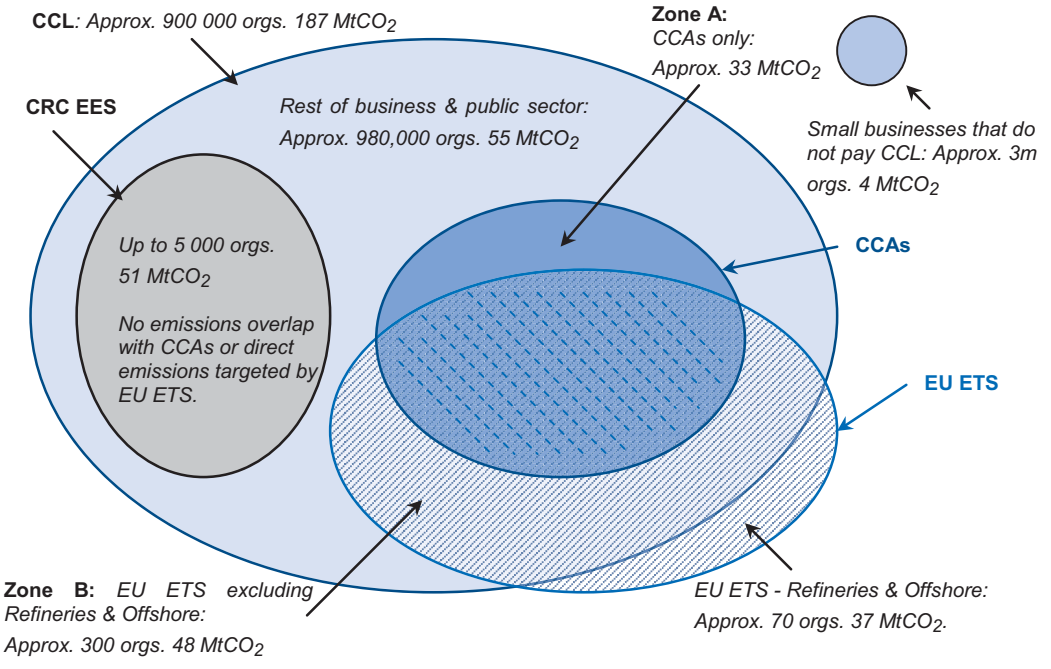
The price of EUAs may also be too low to achieve the UK 2050 target. In 2009, the UK Climate Committee revised its projection for the carbon price in 2020 from € 55/tCO_2 to € 20/tCO_2, and commented that such a price might not be sufficient to support the required investments in low-carbon power generation. This fear is corroborated by model-based projections of the carbon price trajectory needed to keep the global temperature increase from pre-industrial times below 2°C.[8] The uncertainty about the long-run emissions reduction goal of the EU, and the low and volatile price at which allowances have recently been trading, have served to reduce the incentive for covered firms to cut emissions. The most transparent route to ensure carbon prices that are consistent with the 2050 target would be to work for firmer and earlier commitments about the stringency of quota allocations under the EU scheme in the future. An early decision about whether the EU will adopt unilaterally the currently conditional target for more aggressive emissions reductions by 2020 would be helpful in this respect.

Domestic policy instruments should also be used to accomplish the higher, more consistent and less volatile carbon prices that are needed to achieve the transformation of the capital stock needed to meet the UK's 2050 emissions target.[9] The UK Climate

Committee has argued that there is a case for government underpinning of the carbon price. The government already does this to some extent, as described below. A further step could be taken by shifting part of the burden of uncertainty about the carbon price from firms to the government, on the grounds that carbon price volatility is partly due to policy uncertainty. Policy uncertainty relates to potential time inconsistency problems, whereby governments will be tempted not to deliver the high carbon prices that are needed to reach future targets. This discourages investment in low-carbon technologies predicated upon future carbon price increases. This time inconsistency problem reflects uncertainty about future policy, a risk that may be appropriate for policy makers to mitigate, unlike the normal commercial risks arising from fossil-fuel price volatility and uncertainties about the success of new technologies. An example of such a policy would be for the government to offer, for a fee, contracts to pay firms if the carbon price at a future date was below some reference level (thereby threatening to make investments in low-carbon capital unprofitable), while firms would pay the government if the carbon price was above that level. The UK is considering options for market reform to encourage more investment in low-carbon power, including support for the carbon price through the imposition of Climate Change Levy (CCL, henceforth the Levy) and oils carbon price support rates on the fossil-fuel inputs to electricity production (see *www.hm-treasury.gov.uk/consult_carbon_price_support.htm*).

In practice, effective carbon prices in the UK economy have been higher and more pervasive than the EU Allowance price would suggest. For example, the Levy (an energy tax) and the Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES) in effect apply additional carbon prices and these policies overlap each other (Figure 4.8). Firms not covered by a Climate Change Agreement (CCA) (see Box 4.2) could be paying a form of

Figure 4.8. **Climate policy overlap**[1]



1. Million tonnes of Carbon Dioxide ($MtCO_2$)

Source: Based on a figure from Defra presented in CBI evidence to the House of Commons Environmental Audit Committee report, *The role of carbon markets in preventing dangerous climate change, Fourth Report of Session 2009-10.*

carbon tax three times over: first, through higher payments for electricity produced by generators subject to the EU scheme and sold by suppliers subject to the Renewables Obligation; second, through the Levy; and, third, through the Energy Efficiency Scheme. That could result in an effective carbon price more than triple the EU price. In contrast, energy-intensive firms outside the EU scheme but covered by a Climate Change Agreement would have to pay only 20% of the Levy (35% from April 2011)[10] and would not be affected by the implicit carbon tax in the electricity price if they used fossil fuels directly (although they would then be paying fuel duties).

Outside the sectors subject to the EU scheme, other measures such as Vehicle Excise Duty and graduated company car taxation are based on emissions and hence provide an incentive to promote more environmentally efficient behaviour, although that is not their prime objective. Air Passenger Duty also provides environmental signals. Hydrocarbon fuel duties can be thought of as a form of carbon tax, too, although there is no rebate for biofuels (the Renewable Obligation, a quantity-based instrument, is the main tool to achieve greater market penetration of biofuels). If the entire fuel duty were treated as a carbon tax, the implicit rate on unleaded petrol would be in the region of € 250/tCO_2. But such a treatment would be inappropriate, because the tax can also be regarded as a road user charge, congestion charge, tax on local pollution and means of raising revenue from a commodity for which demand is relatively inelastic. A more explicit assignment of taxes to specific purposes, or the introduction of instruments targeted at specific externalities such as road pricing schemes, would help to clarify whether the implicit tax rates are set at appropriate levels. At the retail level, energy for domestic use is only subject to a VAT rate of 5%, much lower than the standard rate of 20%, thus reducing the incentive for households to increase energy efficiency and cut energy use. As a result the effective carbon price can vary widely across the economy because of the interaction of these different ways of pricing carbon, leading to inefficient (and therefore unnecessarily costly) allocation of abatement activity across sectors and distorting relative prices of final goods and services. The extra cost burden and perceptions of unfairness risk undermining the popular acceptability of climate-change policies.

The Climate Change Levy provides an example. It is a tax levied "downstream" on energy use in the business sector (rather than "upstream" on primary energy providers), which now adds around 3-6% to business energy bills. The implicit rates of taxation on energy from different sources differ; the rate charged for electricity use does not depend on the primary energy mix used by the electricity suppliers (Table 4.5). Given its carbon content, coal is relatively lightly taxed, which some commentators have ascribed to the desire of the previous government to put less of a burden on the coal industry than other energy providers (Pearce, 2005; Helm, 2010). The carbon input to electricity production is taxed relatively heavily (and will be more so as lower carbon generation technologies are deployed, unless the tax rate per kWh is reduced *pari passu*). Hence implicit carbon prices vary across firms and sources in a way that makes abatement less effective and more costly.

The Climate Change Agreements have been controversial. One review claimed that there had been a substantial announcement effect from the introduction of the Climate Change Levy (Cambridge Econometrics, 2005) and that the Agreements strengthened the effectiveness of the Levy (Ekins and Etheridge, 2006). Firms themselves have claimed that the Agreements were effective in winning managerial attention to energy efficiency (EAC, 2008). However, others have argued that they have not been very demanding, given the way in which targets were negotiated and the underlying trend in energy efficiency

Table 4.5. **Implicit rates of carbon taxation, 2001**

Fuel type	Tax rate	Fuel price	Implicit carbon tax
	[Pence/kWh]		[£/tCO_2]
Electricity	0.43	4.25	8.45
Coal	0.15	2.46	4.36
Gas	0.15	0.91	8.17
LPG	0.07	0.85	5.99

Source: Martin, de Preux and Wagner, 2009.

improvements. Martin and Wagner (2009a, 2009b), utilising more detailed micro-level data allowing better identification of the impact of the Agreements, have cast serious doubt on their efficacy; participation in an agreement had a strong *positive* impact on both energy intensity and energy expenditures relative to firms having to pay the full Levy. The case for the Agreements on competitiveness grounds, protecting energy-intensive industries particularly vulnerable to foreign competition, is weak, as there was no sign of an impact of the full Levy on output, jobs or productivity. The studies also showed that the full Levy, but not the Agreement, was successful in promoting energy efficiency and innovation. Negotiating and monitoring the Agreements was also a resource-intensive process. Their research provides persuasive evidence of the effectiveness of the full Levy, its lack of adverse side effects and the inadequacy of the Agreements, suggesting that there is a case for the abolition of the latter. Along with a rise in the VAT rate on domestic energy use, this would also raise revenue at a time of fiscal retrenchment. However, any rise in VAT would impose significant new cost burdens on households at a time of slow real income growth, and may need to be accompanied by targeted support for the most exposed groups (See Chapter 1). The timing of any rise in VAT on energy use would need to be carefully considered to avoid undermining public support for climate policies.

The new Energy Efficiency Scheme also applies a carbon price downstream, to businesses that are not subject directly to the EU trading scheme and for which less than a quarter of emissions are covered by an Agreement. It covers emissions from energy use (electricity and heat) in large but not particularly energy-intensive public and private organisations. In the introductory phase, tradable allowances will be sold at a price of £12 per tonne of CO_2. The government has stressed the scheme's role in promoting energy efficiency. The registration and monitoring requirements placed on organisations, and the publication of league tables, should help to tackle the lack of managerial focus on energy efficiency, bringing down the very high implicit discount rates reported for investments in this area. The Climate Change Committee (2010c) offered recommendations to simplify the scheme. A further simplification, reducing compliance costs and risks from policy overlap, would be to develop a single downstream carbon tax to supplement the inadequate signal given by the EU price, merging the Levy and the levy component of the Efficiency Scheme. The downstream layer could be justified on two grounds. First, it would push up the overall carbon price while the EU scheme was giving an insufficiently strong signal. Second, it would help to focus the attention of energy users on the need to improve energy efficiency, as would the new reporting requirements on energy use brought in by the Efficiency Scheme, which could be maintained. For the household sector, the carbon subsidy implicit in the reduced rate of VAT on domestic energy should be removed, as there are more narrowly focused tools with which to tackle energy poverty. Upstream carbon pricing could also be simplified, by relating hydrocarbon fuel duties outside the EU scheme more closely

to their carbon content. The guiding principle would be to simplify the structure of carbon pricing to one upstream and one downstream layer. Remaining anomalies in the overall incidence of the carbon price could be reduced extending the coverage of both layers.

In the event of such changes, two issues would remain about the interaction of the downstream layer of taxation with the quantity constraint imposed by the EU scheme. First, the layering would be designed to reduce UK emissions further than would the EU scheme alone. However, in so far as it succeeded in reducing demand for the output of plants and establishments subject to the EU scheme, their demand for the allowances would be reduced and they would sell more of them to the rest of the EU, reducing their price. Hence greater stringency of UK policies would tend to weaken abatement incentives elsewhere in the EU, unless the overall cap was tightened or the UK government bought up the allowances. And if other countries were to pursue a similar approach to the United Kingdom, the allowance price could fall significantly. This is why economists have stressed the need to co-ordinate multiple interventions by administrations at different levels carefully (Boemare *et al*, 2003). Second, the layering would result in a higher implicit carbon price for energy downstream than for other carbon-intensive products such as steel. For that reason, layering is very much a second-best option as a means of raising the carbon price. Strengthening and extending the EU scheme (and applying upstream carbon taxes in sectors not subject to the cap-and-trade scheme) would be a more attractive approach.

However, some downstream policy intervention is warranted to focus attention on opportunities to improve energy efficiency where information is currently scarce or energy accounts for only a small proportion of total costs. One option is to create a UK carbon reduction certification agency that could help to address the latter concern (Martin and Wagner, 2009b). It could take on the monitoring, verification and reporting requirements in the Efficiency Scheme, Levy and possibly EU schemes, and promote public and shareholder interest in firms' success in cutting emissions and energy use. Standards-setting and obligations to provide information, for example by labelling, may also have a role to play, although care needs to be taken to avoid imposing less cost-effective energy efficiency improvements than market incentives would encourage.

As long as the EU allowance price remains an inadequate price signal to achieve UK emission-reduction objectives in a cost-effective way, domestic measures to move towards higher and more uniform carbon pricing across the economy are desirable. They should preferably be introduced in the context of the more wide-ranging reforms of environmental and energy taxes that have been proposed (Newbery, 2005; IFS, 2010):

- adjusting Climate Change Levy rates and hydrocarbon fuel duties to reflect carbon content (and the content of other pollutants) more closely;
- merging the Levy and Efficiency Scheme to a single levy related to carbon content (while keeping new reporting requirements);
- stopping making Climate Change Agreements that effectively reduce the implied carbon tax rate;
- raising the VAT rate on domestic energy use from 5% to the standard rate of 20%, while using more focused payments to help those deemed to be in "energy poverty"; and
- considering ways of giving firms greater certainty about the trajectory of the carbon price.

Promoting clean energy

Efforts to promote clean low-carbon energy have focused on the promotion of renewable energy, although nuclear power and "carbon capture and storage" equipped fossil fuel plants are also low-emissions energy sources. The EU has adopted a target of deriving 20% of final energy demand from renewables by 2020 and has agreed on country targets to achieve this; the United Kingdom's target is 15%.[11] Carbon pricing via the EU scheme provides an incentive to switch to renewables (and nuclear). However, further incentives might be justified. Market failures afflict technology development as a result of the public good nature of much knowledge, including some of that acquired by learning-by-doing. Support now for a range of the most promising renewables technologies is one means of building credibility of climate policies over the long term, as long as that support is seen to be designed to correct market failures rather than supplement an inadequate carbon price.[12] There may be other social objectives apart from mitigating climate change served by promoting renewables, such as greater energy security and lower local pollution.

Unlike the EU's emissions reduction target, the EU-wide renewables target is not accompanied by an EU-wide policy instrument. As a result, the extent, strength and form of support differ considerably across Europe, with no assurance of a cost-effective distribution of resources across countries or technologies. In the United Kingdom, the main additional instrument has been the Renewables Obligation (Obligation), a quantitative requirement on electricity end-suppliers to increase the proportion of wholesale electricity purchased from producers using renewable energy, with the costs reflected in higher retail electricity prices. There is also a Road Transport Fuel Obligation designed to increase the proportion of transport fuel comprising biofuels. Both these measures are primarily quantity-based instruments mandating that a certain proportion of energy consumption is provided by renewable energy. Certificates are issued for verified renewables use and can be traded. Such quantity-based instruments differ from those that guarantee a price for renewable energy (such as feed-in tariffs) or a premium over the price charged for energy from non-renewable sources, although there are certain similarities with the latter in practice given the fixed buy-out price in the UK Renewables Obligation scheme (see Box 4.3 for a discussion of different forms of renewables support).[13] However, the revenue from the penalty or "buy-out" price that has to be paid by users who do not meet their Renewables Obligation is recycled to suppliers that over-achieve their targets, providing an additional incentive to hold or acquire certificates, driving up their price. In 2010-2011, the target for renewables penetration of the power generation market is 11%, compared with the achievement of 6.7% in 2009 (Table 4.3, panel B).

The Renewables Obligation has evolved since it was launched in 2002, in response to some of the criticisms to which it has been subjected (Box 4.3). The most significant change was in April 2009, with the introduction of varying rates of certificate allocation across technologies to provide a greater incentive to technologies further from the market but with potential to deploy on a large scale. For example, landfill gas now earns only 0.25 certificates for every MWh produced, onshore wind 1.0, offshore wind 1.5 (although it is temporarily receiving an uplift to two for projects accredited by March 2014), geothermal and solar photovoltaic (PV) 2.0. In April 2010, there were further changes, including the extension of the Obligation's end date from 2027 to 2037 for new projects, to provide greater long-term certainty for investors and an increase in support for offshore wind projects. The market penetration target is now set in such a way that there is less risk of the success of the policy leading to a collapse in the Obligation certificate price. In 2010, a feed-in tariff system for household and other micro-

power-generation (under 5 MW) was launched to complement the Obligation system, with the rate paid per kWh varying by technology and size of installation.

Notwithstanding the welcome evolution of the Obligation system, the Committee has warned that "meeting the 2020 renewable energy target requires a step change in the rate of progress and entails significant delivery risk" (CCC, 2010d). It pointed out, for example, that the capacity of electricity generation from wind power needed to increase at an annual average rate of 3 GW from 2010 to 2020, yet only 1 GW was added in 2008. Also, the subsidiary targets for biofuels and heat generation from renewables appeared to be difficult to achieve sustainably (in the former case) or cost-effectively (in the latter). The recent Energy Market Assessment (DECC, 2010) also acknowledged that current electricity market arrangements were unlikely to result in the required electricity-sector decarbonisation by 2030 and that long-term incentives to invest in low-carbon energy needed to be improved. Pollitt (2010) has suggested that the element of the Obligation system by which the payments from suppliers "buying out" their obligations are recycled to suppliers in proportion to their certificates should be dropped, because it contributes to the high cost per kWh of power from renewables in the UK scheme (Box 4.3). In December 2010, the UK government announced a programme of market reforms to support additional low-carbon power investment and ensure continued energy security. The proposals are focused on introducing a floor for the carbon price in the UK electricity generation sector, a system of feed-in tariffs for low-carbon generation, an emissions performance standard to prevent the construction and operation of new unabated coal-fired power stations, and measures to ensure sufficient generating capacity is available to maintain security of supply.

While the emphasis on rewarding output of renewable energy helps to compensate for lower than-desirable and uncertain carbon prices and rewards learning-by-doing, it is unlikely to correct fully for underinvestment in R&D arising from difficulties in appropriating returns to new ideas. Capacity support mechanisms encourage picking winners by government, deliver subsidies to incumbents, weaken the focus on providing a stronger, less volatile, carbon price signal and benefit large foreign utilities and offshore equipment manufacturers disproportionately (Jamasb *et al.*, 2008). Privatisation and increased competition in the early 1990s saw a decline in private energy R&D (Figure 4.6) and utilities reduced their spending in this area after privatisation, consistent with the "public good" nature of much R&D. In the energy sector, the scope for capturing returns to R&D through product differentiation, charging more for the most innovative products (as many consumer goods manufacturers do), is limited.

One option for achieving carbon emissions reductions is the expansion of nuclear power, the generation of which does not produce emissions. However, challenges remain in managing nuclear waste and ensuring operational safety. Policy makers also face the problem of assessing and managing the small risk of catastrophic outcomes over a very long time horizon. Anti-nuclear sentiment has contributed to a widespread desire to phase out aging capital stock in the nuclear industry. UK nuclear operator British Energy (bought by EDF Energy in 2009) has extended the operating lives of many of its plants in recent years but all plants but one are due to shut by 2023 (BERR, 2008), which will place additional pressure on energy and emission reduction policies. However, official UK policy has been changing. Nuclear energy is increasingly seen as a relatively clean technology likely to make an important contribution to long-term decarbonisation of the power sector. The new government has voiced support for nuclear power as long as it does not need subsidies

beyond those for low-carbon generation generally. New nuclear plants are planned, but the private sector developer of the first does not expect it to be operational until at least 2018.

The UK policy framework could be more effective if there were more support for energy R&D, where the existence of externalities is well-known. More deployment options would be maintained as technologies developed and information about climate change improved. A greater emphasis on R&D relative to the output of renewable energy would also promote the creation of skills enabling firms to respond more readily to shifts in the direction of innovation. Investment in human capital would have a substantial advantage over technology-specific support mechanisms because skills are more transferable (Jamasb *et al.*, 2008). It may be possible to identify areas in which the United Kingdom has a comparative advantage at the margin in innovation (*e.g.* using marine technologies) and to co-ordinate the distribution of international research across technologies to avoid excessive duplication of effort. Recent increases in government-financed R&D have been helpful, including the announcement in the October 2010 Spending Review of a commitment to spend up to £1 billion on a commercial-scale carbon capture and storage demonstration project (one of the first in the world on power generation). However, since 1990 UK public spending has fallen relative to other major countries (Figure 4.7).

The potential interaction of policy instruments aimed at market failures associated with the development of clean energy and those directed at the emissions externality needs to be considered (Braathen, 2007; Fischer and Preonas, 2010). An appropriate combination of instruments can achieve the emissions reduction objective more cost effectively by tackling the two sets of market failures simultaneously (Fischer, 2008; Fischer and Newell, 2008).

However, instrument interaction can also be inefficient. Renewables policies may affect the carbon objective through their indirect impact on the carbon price. By gradually switching electricity generation away from fossil fuels (if successful), renewables policies reduce the power generation sector's overall CO_2 emissions. If a cap on emissions is already in place, this reduces the sectoral demand for allowances and thus the carbon price, so electricity producers' costs are offset to some extent, the marginal cost curve shifts, and wholesale electricity prices are lower than they would be if the carbon price were constant (Rathmann, 2007; De Jonghe *et al*, 2009; Stankeviciute and Criqui, 2008). That contributes to a "rebound" effect, tending to increase energy demand relative to what it would have been with a constant carbon price. If renewables policies are introduced without revising down the emissions cap, their impact on emissions is very likely to be entirely offset by this and other induced increases in demand. Carbon markets can then appear more and more inadequate on their own, apparently justifying more and more direct, technology-specific, support (Blyth *et al.*, 2009). The weakened carbon price signal can then point path-dependent technological development and investment away from low-carbon technologies, especially outside the sectors covered by the renewables policies. The weakness of the EU allowance price suggests that the EU has not adequately taken into consideration the impact of renewable energy policies on carbon reduction objectives.[14]

Other market failures may warrant government intervention. At the current conjuncture, the malfunctioning of financial intermediation is a major issue in the developed world. The 2010 Spending Review announced the setting up of a Green Investment Bank (GIB), funded initially by a £1 billion commitment, to encourage investment in green infrastructure. The

consultants Ernst and Young have estimated that the United Kingdom needs capital investment of £450 billion from now to 2025 if it is to meet its green energy goals, but that there will only be some £50-80 billion of capital available from current project finance and infrastructure funds. Hence the Bank alone will not be sufficiently large even if it is allowed to function as a true bank, borrowing to apply leverage to the capital provided by the government. However, it could play an important role together with more robust carbon pricing and stronger incentives for renewable energy in reassuring potential private-sector investors that the United Kingdom is committed to a low-carbon growth path. The main arguments for a public-sector institution focused on green objectives are:

- Investments with intergenerational implications, including many low-carbon investments, should be appraised using a discount rate lower than the market interest rate, for reasons of equity across generations that are not internalised by markets. If they are to be undertaken at an adequate scale, they may require an interest rate subsidy.
- Many low-carbon projects entail large-scale investments that pay off over very long time horizons. Such investments have often required syndicated project finance, which has become more difficult because of heightened risk aversion among financial intermediaries in the wake of the financial crisis.
- Financial markets may not be prepared to take on all the risks associated with new low-carbon technologies, given their novelty and the dependence of their success on future policies and provision of infrastructure, so that in the absence of further government intervention insufficient finance would be available at the scale and pace needed to meet decarbonisation goals. Private investment in this area is contingent on the credibility of the government's long-term commitment to carbon pricing and other climate-change policies; subscription of government capital helps build that credibility. This will help to redirect saving flows to low-carbon investments more generally.

The consequences of the Bank for the balance sheet of the government also need to be considered. Government interest rate subsidies and public guarantees to those lending to the Bank would increase public sector liabilities, particularly if the Bank were to focus its lending on riskier products.

In summary, the government needs to speed up the development and deployment of low-carbon technologies, focusing on correcting inadequate private market incentives for innovation. Its proposal to reform the regulation of the electricity market provides an opportunity to reduce the risks faced by renewable-energy power generators, for example, by encouraging long-term contracts for the supply of renewable energy and making grid connection easier (without removing all the commercial risks, many of which firms are better placed than government to manage). Given the "public good" nature of basic research, it is also desirable to increase public spending on R&D for low-carbon technologies, preferably focusing on areas in which the United Kingdom has a comparative advantage at the margin and (to avoid free-riding) in the context of international co-ordination of research efforts across technologies. Such spending would need to be consistent with overall fiscal consolidation plans.

Box 4.3. **Price *versus* quantity instruments to promote renewable energy**

Several empirical studies have investigated the relative merits of price- and quantity-based instruments (such as feed-in tariffs (FITs) and the UK Renewables Obligation respectively) as means of promoting renewable energy for electricity generation. On the whole, they have found that price-based instruments have been the more effective. For example, the European Commission (2005, 2008) compared the costs of renewable energy support schemes with the proportion of the potential renewable energy supply share achieved, concluding in both years that "well-adapted feed-in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity." Despite the United Kingdom being below the EU27 average on the Commission measures of both the effectiveness of its support for onshore wind power over 1998-2006 and the trend in effectiveness in 2006, the expected profit per kWh for UK generators using renewable energy was one of the highest.* Ragwitz *et al.,* (2007) also found that in 2004 and 2006, the Spanish and German FITs were the most effective and the UK quota system was much less so. Lipp (2007) compared UK experience unfavourably with that of Denmark and Germany, writing that "not only has the United Kingdom avoided picking winners, but it would also seem it has not chosen a policy winner either." Ofgem (2007) argued that the price of electricity including the cost of the Renewable Obligation was above that necessary to make renewable energy technologies viable. Similarly, Jacobsson *et al*. (2009) concluded that UK renewables support had generated excess profits for the wind power sector (primarily owned by the established utilities).

The evidence is not, however, entirely in favour of price-based over tradable-certificate systems. For example, Jamasb *et al*. (2008) noted that German FITs had encouraged inefficient wind generation in low-wind areas. Newbery (2010) observed that FITs had originally been set too high for solar PV power in Spain and Germany, raising prices excessively high; the solar PV industry was then undermined when the pricing regime was amended. The two key issues are the incidence of risk and the generation of intramarginal rents on more mature renewables technologies, rather than the debate over price-based *versus* tradable-certificate systems.

Potential renewable-energy suppliers face several types of risk. Mitchell *et al*., (2006) compared the Renewable Obligation in England and Wales with the FIT system in Germany, showing how in the former renewables generators have faced considerably more risks. But many of those risks reflected the absence of long-term contracts and the way in which the electricity grid has been regulated, and are not intrinsic to tradable-certificate schemes. Tradable certificate systems have tended to be more effective in promoting renewable energy where long-term contracts have been used (Agnolucci, 2007). That has reduced the risks associated with the short-run volatility of certificate prices, which have been easier for large incumbent firms than new market entrants to manage. In the United Kingdom, long-term contracting has been uncommon. Introducing compulsory long-term certificates would help encourage new entrants (Mitchell, 2006). It would be unwise in any case to try to remove all sources of risk facing renewables suppliers. Klessman *et al*. (2008) drew attention to how risks facing renewables suppliers have often been reduced at the cost of reducing incentives for them to respond to long-run relative cost developments and shorter-run fluctuations in market demand and grid balancing requirements.

Box 4.3. **Price *versus* quantity instruments to promote renewable energy** *(cont.)*

Among the reasons suggested for the superiority of some price-based systems has been that they have allowed the differentiation of price according to the renewables technology used. However, it is possible to differentiate among technologies under certificate trading schemes where this is deemed appropriate to reduce rents, as recent revisions to the UK Renewables Obligation system illustrate. The point of differentiation has been to prevent excessive profits being made by the users of more mature technologies, while ensuring that an appropriately broad portfolio of technologies are initially encouraged (Kramer and Haigh, 2009; Foxon and Pearson, 2007). There is, however, a danger of setting prices so that even technologies with very poor prospects are profitable at the margin. That can be avoided if the premium for any particular technology starts at broadly the same level and declines after initial commercial deployment at the same rate.

* However, it is not clear that all the costs of the FIT schemes (*e.g.* those falling on national grids) were taken into consideration.

Adaptation to climate change

Climate-change policy in the United Kingdom should increasingly consider adaptation in addition to mitigation. The world is already committed to some climate change due to past emissions, and emissions over the coming decades, which will lead to further increases of concentrations of greenhouse gases in the atmosphere, will contribute to further changes in climate. Failure to reach agreement to restrain emissions across nations may also lead to high emissions in the future. Therefore the United Kingdom must prepare to adapt.

Adaptation requires a very different set of policy responses from mitigation. The UK Climate Change Act 2008 encouraged a step change in adaptation activities required, proposing:

- the introduction of Climate Change Risk Assessments (CCRAs), at five-yearly intervals from 2012, to provide assessments about the risks faced by the UK from climate change;
- a National Adaptation Programme, to be produced following the first risk assessment in 2012 and reviewed every five years, which will address the most important opportunities and risks;
- an Adaptation Sub-Committee (ASC) to provide advice to government on the risk assessments, to assess progress towards the implementation of the government's National Adaptation Programme, and to provide advice when requested on adaptation; and
- the Adaptation Reporting Power, which enables the Secretary of State to direct authorities with public or statutory functions to prepare reports on their proposed adaptation actions.

Other measures outside the Act include the requirement for government departments to prepare Departmental Adaptation Plans and local authorities to report their progress on adaptation.

A review by the Environmental Audit Committee (EAC, 2010) concludes that "The UK's adaptation policy framework compares well with arrangements put in place in other countries. The Climate Change Act 2008 has, however, introduced a complicated

assessment and reporting regime. Its complexity has been increased by the introduction of Departmental Adaptation Plans." Furthermore, while action on adaptation has increased in recent years, especially since the 2008 Act, the UK Committee on Climate Change has reported that the United Kingdom remains inadequately prepared for the changes in climate that may occur over the coming decades. Current action involves building adaptation capacity through the provision of advice. But there is little evidence that climate impacts are being incorporated into local decision-making and actions that reduce risks (CCC 2010e).

The Environmental Audit Committee review (EAC, 2010) recommended that the new government should review the regime if it fails to deliver the necessary step-change in adaptation planning and action. The government has responded, arguing that the framework is robust and that it is committed to reducing any unnecessary complexity and bureaucracy should it arise.

The United Kingdom has made strong progress in overcoming barriers to adaptation in recent years.[15] Insufficient climate risk information, undeveloped risk-assessment frameworks, little incorporation of adaptation across government policy, and poorly developed metrics for monitoring and evaluation have hampered progress; Pidgeon and Butler (2009) provide a detailed review of the benefits and limitations of risk-based approaches to climate-change adaptation. The forthcoming risk assessments should provide high-quality risk information, and the quality of risk-assessment frameworks, such as the guidance offered by the Supplementary Green Book, has also increased. While there is more work to be done on measuring and monitoring adaptation, progress is being made on many fronts.[16] It will be important to resolve tensions between the use of process-based tools and outcome-based metrics for monitoring and evaluation. The United Kingdom has also started incorporating adaptation into policy, for example, in the building regulations and in heat-wave plans that will assist preparations for more frequent heat-waves.[17]

Going forward, the government should establish a process for defining what level of risk is acceptable, assist in the delivery of adaptation outcomes, and consider adaptation measures in policy reform (CCC, 2010e). The sub-Committee also recommends that the United Kingdom should focus early adaptation efforts where further adaptation to present-day climate variability is desirable and where decisions have long-lasting consequences. The latter include investment in long-lived assets (for example, buildings and infrastructure), decisions that may cause irreversible changes (for example loss of biodiversity), and decisions that may have systemic and far-reaching effects (for example development in one part of the floodplain with knock-on effects downstream). Five adaptation priorities are proposed, including a strategic approach to land-use planning, provision of national infrastructure, design and renovation of buildings, management of natural resource sustainability, and effective emergency planning. Focus on these areas will provide "low-regrets" investment options that provide immediate benefits and reduce risks.

The UK government is already active in these five areas. For example, the United Kingdom committed more than £2 billion over the 2010 Spending Review period to flood and coastal erosion adaptation. This funding should remain a priority as recent events suggest that the United Kingdom is not adequately equipped to cope with extreme local flooding, despite better information about risks in this area. In addition, various

government departments are undertaking work to build capacity and move adaptation planning and action forward.[18] The authorities should take incremental actions to protect against near-term climate threats that are better understood, allowing flexibility and retaining options as risks and the knowledge base evolve over coming decades. They should continue to focus on the appropriate provision of public goods, including information, better risk-assessment frameworks, and more advanced metrics for monitoring and evaluation.

The challenge of decision-making under uncertainty at the local level remains, as does the need to maintain flexibility and options as new information becomes available. Much of the adaptation decision-making will be carried out at the local and regional levels and this will increasingly be the case as responsibility for many central government policies is decentralised. The implications of the recent government decision to abolish the Regional Development Agencies and Government Offices for the Regions need to be carefully considered to avoid the loss of critical regional information. However, the Environment Agency, the body responsible for much adaptation planning and oversight, operates on a regional basis, with implementation largely falling on local government. It should be possible, therefore, to maintain progress on adaptation despite the administrative changes. Flexibility implies focusing on mitigation before large-scale spending on adaptation, long-lived infrastructure investments excepted. Defra, the relevant government department, recommends this approach for government appraisals, emphasising the need to maintain flexibility as risks evolve.[19]

Box 4.4. **Recommendations on climate change and adaptation policies**

- Given the government's ambitious emission-reduction targets, it should seek a higher carbon price at the international level through tighter quotas within the EU emission trading system (EU ETS) and the adoption of a 30% EU emissions reduction target by 2020. The EU ETS should also aim at strengthening the long-term carbon price signal and extending its scope to reduce distortions in carbon pricing across the economy.
- EU emission allowances may not provide sufficient price signals to achieve the UK's major emission-reduction objectives. Higher and more uniform domestic carbon prices across the economy should therefore be sought in a cost-effective way. The government should also assess more thoroughly how policy instruments overlap and interact so that the effective carbon price becomes more uniform across industry sectors and different stages of production. Specifically:
  - Adjust the Climate Change Levy (CCL) and hydrocarbon fuel duties to reflect more closely carbon content and the content of other pollutants.
  - Merge the CCL and the Carbon Reduction Commitment Energy Efficiency Scheme and stop making Climate Change Agreements which reduce the implied carbon tax rate.
  - Raise the VAT rate on domestic energy use over time from 5% to the standard rate of 20% to promote consistency in climate change policies and enhance efficiency of taxation. Relevant distributional concerns could be more efficiently addressed through targeted support.
  - Consider ways of giving firms greater certainty about the trajectory of the carbon price they face (*e.g.* by means of long-term contracts that transfer some risk around EU ETS carbon prices from firms to the government), including by implementing proposals in the current carbon price support and energy market reform consultations.

Box 4.4. **Recommendations on climate change and adaptation policies** *(cont.)*

- Speed up the development and deployment of low-carbon technologies, focusing on correcting the inadequate private market incentives for innovation. Increased public spending on R&D for new low-carbon technologies could be warranted taking account of fiscal constraints.
- The government plans to reform the regulation of the electricity market, which should be used to review support for renewable-energy power generators. The review should focus on ways to facilitate longer-term renewable-energy contracts; reducing the burdens placed on renewable-energy power generators by grid connection rules; and simplifying and accelerating planning procedures.
- The proposed Green Investment Bank should be used to subsidise projects where a low social discount rate is appropriate. To increase leverage, it should also be allowed to borrow in debt markets taking into account fiscal constraints.
- The government should continue to build adaptive capacity across the UK economy, with a focus on reducing market failures such as the appropriate provision of public goods, including information, better risk-assessment frameworks and more advanced metrics for monitoring and evaluation. Immediate action should focus on near-term climate threats that are better understood.

Notes

1. Based on CAIT data, which exclude emissions from changes in land use. The Kyoto gases comprise CO_2, N_2O, CH_4, HFCs, PFCs, and SF6. The EU15 comprise Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.
2. Energy CO_2 emissions are produced from fuel combustion in electricity and heat generation, transport, manufacturing and construction and include "fugitive" emissions, as defined by the United Nations Framework Convention on Climate Change (UNFCCC) Reporting Framework. Electricity production, heat generation and transport account for over 80% of energy CO_2 emissions in the United Kingdom.
3. The Kaya decomposition (Table 4.1) decomposes energy CO_2 emissions into its components using the "Kaya identity", Kaya (1990), which expresses energy CO_2 emissions per head (column A) as equivalent to the product of GDP per head (B), the carbon intensity of energy (C), and the energy intensity of output (D). The relatively low energy CO_2 emissions in the United Kingdom and European countries, compared with Canada and the USA, are driven by lower energy intensity (column D) and to a lesser extent by lower GDP (column B).
4. Base year emissions are generally 1990. However, most EU15 countries, including the United Kingdom, have chosen 1995 as the base year for fluorinated gases (HFCs, PFCs and sulphur hexafluoride).
5. Analysis in this chapter focuses on the United Kingdom's prospects of meeting 2050 targets, under certain simplifying assumptions. CCC (2010a) examines the prospect of meeting the 2018-2022 UK carbon budget.
6. Strictly speaking, this is a requirement for efficiency; whether it is desirable depends also on whether the distributional impacts of carbon pricing are acceptable and, if not, whether appropriate redistributive transfers are made.
7. The marginal damage costs depend on the marginal climate change brought about over a long time period in the future, which is unlikely to be much affected by a transient recession.
8. See, for example, the reports of the RECIPE and ADAM projects (Edenhofer *et al.*, 2009; Knopf *et al.*, 2009).
9. This problem illustrates one reason why many economists prefer a carbon tax to a cap-and-trade system, as long as the tax rate is regularly reviewed in the light of its impact on cumulative

emissions. See Weitzman (1974), Pizer (1998) and Hepburn (2006). It could also be argued that a global recession warrants revising quantitative emission targets downwards to reflect the reduced costs of meeting any given target.

10. Firms in certain energy-intensive industry sectors are offered an 80% discount if they join a negotiated CCA, adopting a specific target for energy consumption or carbon emissions. The discount will decrease to 65% in April 2011.

11. The adoption of these targets implies a judgement about the desirable contributions of renewables, gas and nuclear energy to lower-carbon energy supply by 2020, a judgement that could have been left to the interaction of markets and broader energy-sector regulation. The UK emissions target for 2020 might be hit more cheaply if gas were substituted for coal more rapidly and renewable energy were adopted more gradually (Grubb *et al.*, 2008).

12. It would not be sensible for all governments to support the entire range of potential technologies indefinitely. International agreements on some burden-sharing and collaboration would be desirable, together with public guidelines about what would trigger the winding down of support of individual technologies.

13. Lipp (2007) counted 38 countries and five sub-national entities with FIT systems, compared with eight countries and 30 sub-national entities with tradable renewables certificate systems.

14. It can be argued that the EU ETS quotas are consistent with the current EU target for GHG emissions in 2020, so that renewables policies are not undermining the main climate-change policy. But the concern is about the incentives for the R&D and investment in low-carbon plant, equipment and buildings that will determine the capacity to decarbonise beyond 2020.

15. See *www.ukclimateprojections.defra.gov.uk/content/view/12/689/*.

16. See, for example, *www.defra.gov.uk/environment/climate/documents/adaptation-guidance.pdf*.

17. See *www.environment-agency.gov.uk/research/library/consultations/106100.aspx*.

18. For a summary of government adaptation action, see *www.2.defra.gov.uk/environment/climate/government/*.

19. See *www.environment-agency.gov.uk/research/library/consultations/106100.aspx*.

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Glossary

ASC	Adaptation Sub-Committee of the CCC
CCA	Climate Change Agreement
CCC	UK Committee on Climate Change
CCL	Climate-Change Levy
CCRA	Climate Change Risk Assessment
CERT	Carbon Emissions Reduction Target
CESP	Community Energy Saving Programme
CO_2e	CO_2 equivalent
COP15	Conference of Parties 15
CRC EES	Carbon Reduction Commitment Energy Efficiency Scheme
DECC	Department for Energy and Climate Change
DFID	Department for International Development
ECO	Energy Company Obligation
EEA	European Environment Agency
EPC	Energy Performance Certificate
EU ETS	European Union Emissions Trading System
EUA	European Emission Allowances
FIT	Feed-In Tariff
FPE	Fuel Price Escalator
GHG	Greenhouse Gas
GIB	Green Investment Bank
LULUCF	Land Use, Land Use Change and Forestry
N_2O	Nitrous Oxide
NAP	National Allocation Plan
NFFO	Non Fossil Fuel Obligation
PV	(Solar) Photovoltaic
R&D	Research and Development
RHI	Renewable Heat Incentive
RO	Renewables Obligation
ROC	Renewables Obligation Certificate
RTFO	Renewable Transport Fuel Obligation
SRO	Scottish Renewables Obligation
TPES	Total Primary Energy Supply
UNFCCC	United Nations Framework Convention on Climate Change

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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