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**REPORT**

# The Role of Commercial Property in the UK Economy

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**MARCH 2013**

# The Role of Commercial Property in the UK Economy

This research was funded and commissioned through the IPF Research Programme 2011–2015.

This Programme supports the IPF's wider goals of enhancing the understanding and efficiency of property as an investment. The initiative provides the UK property investment market with the ability to deliver substantial, objective and high-quality analysis on a structured basis. It encourages the whole industry to engage with other financial markets, the wider business community and government on a range of complementary issues.

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# The Role of Commercial Property in the UK Economy

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## Report

**IPF Research Programme 2011–2015**

March 2013

# The Role of Commercial Property in the UK Economy

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# The Role of Commercial Property in the UK Economy

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# The Role of Commercial Property in the UK Economy

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## 1. EXECUTIVE SUMMARY

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- The commercial property sector plays an important role in the UK economy, both as a direct (and indirect) employer and generator of output, and in providing other sectors, such as retailers and financial and business services, with a critical factor of production – the physical location from which to do business.
- Totalling the three sub-sectors of commercial property for which output and employment can be estimated (construction, repair and maintenance and real estate services), it is estimated that total output in the sector in 2011 was around £41bn (equivalent to 3.2% of UK gross value added (GVA) at 2008 prices) and total employment was just under 800,000 (2.5% of total UK employment, excluding ancillary occupations such as architects).
- The commercial property sector has a substantial multiplier effect on the rest of the economy, with each £1 of GVA generated in the construction and repair and maintenance sub-sectors being associated with an additional £1.09 GVA in other sectors, and each £1 of GVA in the commercial property real estate services sub-sector associated with an additional 42p in other sectors.
- The sector makes a substantial contribution to the Exchequer. The estimated contribution through VAT and PAYE income tax is approximately £6.5bn for 2009–2010 (4% of the total yield via these two taxes). Stamp Duty Land Tax (SDLT) paid on commercial property transactions is estimated at around £1.5bn for 2010–2011. Total business rates income in 2011–2012 is estimated at around £25bn, although it is difficult to estimate the types of properties paying which proportion of this total due to the complexity of the current taxation system.
- Output in the commercial property sector has fallen more sharply during the downturn than at the whole economy level, commensurate with its role as an investment good. Output fell by around £8 billion from 2007 to 2011, a 15% fall in real terms. Had output in the sector remained at a level consistent with its long-run trend relative to whole economy GVA, it is estimated that total output in the UK economy would have been around 0.3% higher in 2011.
- As a consequence of the fall in demand, in particular in commercial property construction, employment in the wider sector by 2012 was about 250,000 lower than in 2007. Had the sector suffered a more moderate correction, back to its long-run trend relative to the wider economy, it is estimated that employment in the sector would be approximately 80,000 higher than it is currently.
- High void rates, falling rents (the IPD all-property rents index fell by 20% in real terms between 2007 and 2011) and much lower levels of new work have combined to create a climate in which many think there is a large and structural excess supply of commercial property that will not disappear for some time (even if some sub-markets display a better balance of supply and demand). The implications are for further rental adjustment and an ongoing weakness of new development work. The associated problems with property finance, in particular the banks' problems with potentially non-performing commercial property loans (not discussed in this report), adds to the malaise.
- High void rates are partly due to the large amount of commercial floorspace, which has not fallen in the recession, and the fall in demand as a result of the recession. The total amount of floorspace, however, is a poor measure of the 'economic' input made by commercial property to the UK economy. This is because it does not distinguish between new stock and old, modern and obsolete, nor stock in prime areas and property in fringe markets.

## 1. EXECUTIVE SUMMARY

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- As a consequence of legacy stock, estimates show only muted growth in the total as a result of new additions. An alternative approach, based on the perpetual inventory method, produces an estimate of the net capital stock in commercial property that has increased at a rate much closer to GVA growth over the 1986–2010 period.
- Commercial property is a key factor of production, which helps to underpin the economy as a whole. Valued using the perpetual inventory method, commercial property stock accounts for half of the total non-residential capital stock of the UK economy.
- Although there now appears to be a surplus of commercial property, consensus views of future economic growth, combined with analysis based on the perpetual inventory model, suggests that there will need to be an increase in the construction of commercial and industrial property in the 2014–2016 period in order to prevent constraints to growth emerging.
- This conclusion opens up a number of further questions, which may merit future research. For example, which types of commercial property need to be developed to support the UK's growing sectors, and in which parts of the country? How do the strains in the UK's banking sector (including those generated by losses on commercial property loans) affect the likelihood of the necessary recovery in commercial property being realised? Furthermore, what might be the costs to users of commercial property of alternative scenarios in which the necessary rebound in construction does not materialise?



## 2. INTRODUCTION

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A 2006 Oxford Economics report<sup>1</sup> emphasised the role of commercial property in contributing to the productive potential of the UK economy. 2006 was a time when the UK economy was growing rapidly and there was much talk of capacity constraints and inflationary pressures. In today's post-credit-crunch world, capacity constraints are not an immediate concern for most parts of the UK economy, not least commercial property. Consequently, a fresh approach is needed and the purpose of this research is to place commercial property in the context of the wider economy and to explore the nature of the links between the two.

This report considers two aspects of commercial property and its relationship with the economy as a whole:

- **The direct role the sector plays in employment, output generation and tax take.** The research also considers how declines in activity in commercial property (particularly commercial property development) have impacted on the UK economy as a whole.
- **The role of property as a factor of production.** In particular, the research considers the long-run relationship between the net stock of commercial property, the level of economic output and the rate at which new construction needs to take place to ensure that the sector can continue to play its role in facilitating economic activity in the rest of the economy.

Three appendices comprise:

- more detail on recent developments in the commercial property stock in England and Wales and the demand for different types of space, drawing on detailed floorspace data from the Valuation Office Agency (VOA); and
- technical detail underpinning the analysis of the long-run relationship between the net stock of commercial property and economic output.

<sup>1</sup> Oxford Economic Forecasting (2006), "The contribution of Commercial Property to the UK Economy".

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

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The first part of the research considers the economic impact of commercial property on the economy and, in particular, the impact of the contraction of the sector since 2007. Three types of impact are considered:

- the **direct** impacts of the sector, in terms of the generation of output and employment, through the provision of commercial property and associated services;
- the **tax impacts** of the sector, including, for example, the VAT and income tax paid by firms providing commercial property, as well as the contribution of taxes levied upon those who buy, sell, rent or let commercial property; and
- the wider economic impact on the rest of the economy, sometimes known as the **indirect impact**, which measures the increase in demand for firms in other sectors arising from commercial property activity.

Additionally, the impact of the downturn on the commercial property sector is considered in terms of the depth of the downturn in the sector relative to its long-run trend within the wider economy.

Due to data constraints, the definition of the commercial property sector used comprises construction of commercial property (sometimes referred to as 'new build'), repair and maintenance (R&M) of existing commercial property and real estate activity related to commercial property.

Previous studies (such as Scott, 2004) have added further sub-sectors relating to commercial property to this analysis, including investment management and security and cleaning services. However, the availability of data has deteriorated since these studies were published, necessitating a focus solely on the three sub-sectors mentioned. In addition, it is important to note that whereas floorspace data are only available for England and Wales, the data used in this analysis are available at the UK level, and therefore include Scotland and Northern Ireland.

In contrast to previous work, this analysis separates out the economic impact of commercial property sector activity from the role of commercial property as a factor of production. As such, imputed rents are not included in the estimates of economic impact, given that these reflect the utility gained by users of commercial property, rather than the GVA,<sup>2</sup> jobs and tax impact of the activity in the commercial property sector itself. A corollary with another industry would be to estimate the impact of the automotive sector purely through the jobs and output it generates through its own activity and those firms that supply it. This would not add the GVA generated through the activities of hire car companies or the payments made by consumers on car financing packages, since these represent activity of car users, not car makers.

#### 3.1 Direct economic impacts

The estimates, set out in Figure 3.1,<sup>3</sup> indicate that total gross value added (GVA) across construction (new build and R&M) and other real estate activities totalled around £41bn in constant 2008 prices in 2011 (3.2% of 2008 prices UK GVA<sup>4</sup>), down from just under £49bn in 2007 (3.8%). This fall of 16% in real commercial property output is a much greater contraction than output across the economy as a whole, which was around 3% lower in 2011 than in 2007. This illustrates the role that the sector plays in facilitating investment by firms, which typically falls much faster during a recession than overall output. The fall in commercial property GVA from 2007–2011 is broadly in line with that of wider business investment, which in 2011 was 14% lower in constant prices than in 2007.

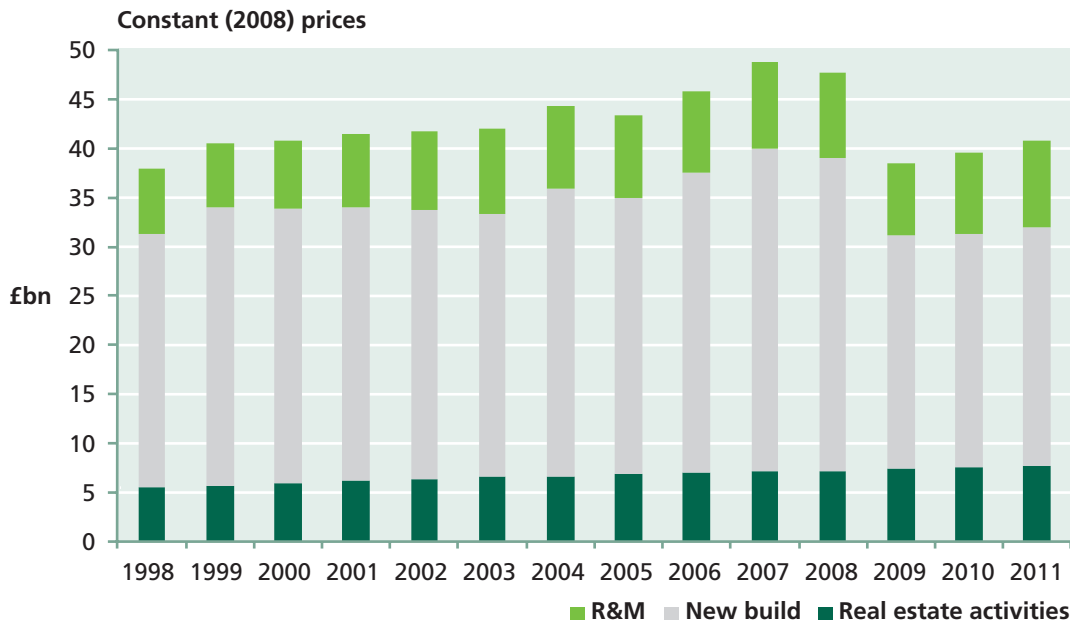
<sup>2</sup> Gross value added is defined as the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector.

<sup>3</sup> The estimates of the direct economic contribution of the commercial property industry set out in this chart do not consider the imputed rent on owner-occupied commercial property, as in other studies (for example Scott 2004, Oxford Economic Forecasting 2006).

<sup>4</sup> By convention, constant price, or 'inflation adjusted' data, are used to measure changes in economic activity or contribution to changes.

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

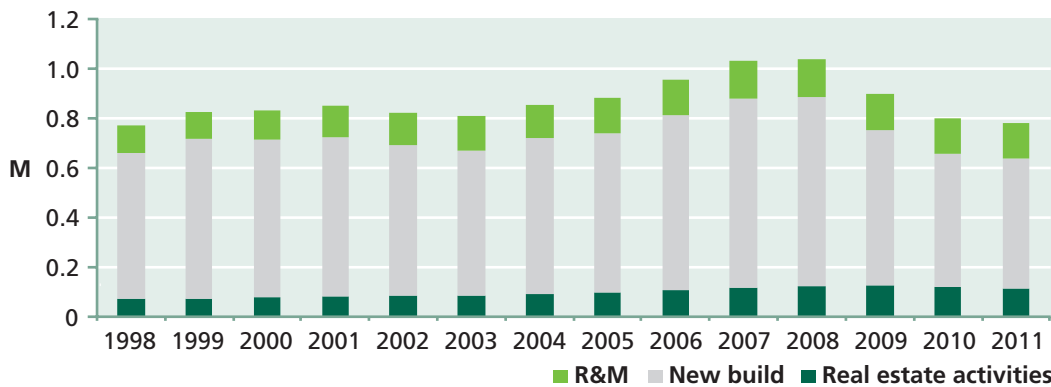
Figure 3.1: Components of GVA in commercial property



Source: Oxford Economics/Haver Analytics

Within the overall figure for commercial property GVA, the figure for real estate activities related to commercial property<sup>5</sup> has been the most stable, reflecting tenancy agreements that are multi-year, providing relatively stable income streams. GVA in the new build of commercial property has been impacted much more heavily by the downturn – the constant price value of commercial property construction has fallen by around a quarter since 2008 (reaching £24bn in 2011). R&M activity fell by around 15% in 2009, but has since recovered, and is estimated to have been worth around £9bn in 2011 (again, in 2008 prices).

Figure 3.2: Employment in commercial property



Source: Oxford Economics/Haver Analytics

<sup>5</sup> It is possible to estimate the new build and R&M portions of construction GVA with a reasonable degree of certainty, given the availability of detailed output data from ONS. However, estimates for the real estate portion of GVA are based on an assumption that the share of total real estate output accounted for by commercial property real estate agencies is roughly proportionate to the share of commercial property in residential and commercial property.

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

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The estimates of employment in different parts of the commercial property sector (Figure 3.2) are based on the respective shares of commercial property new build and R&M in total construction output, and the total level of construction employment in the UK. Employment in the real estate sector is apportioned to commercial property based on the authors' estimates of the share of GVA in the sector.

These estimates show total employment in these three parts of the commercial property sector (including both employees and self-employment) to have been 797,000 in 2010, or 2.5% of total workforce jobs. To this may be added approximately 15,000 jobs in fund investment and asset management identified in the PIA Property Data Report 2011,<sup>6</sup> which gives a total of 812,000, a figure that is close to the aggregate Property Data Report estimate of 833,000. The remaining small difference is likely to be due to small revisions to official statistics since the Property Data Report was compiled. Employment in the sector has since edged down a little further, to 781,000.

Based on these estimates, the commercial property sector has shed 259,000 jobs since the start of the recession in 2008, when the total employed was 1.04m. The vast majority of these, 230,000<sup>7</sup>, have been in new build construction, with 10,000 jobs or so lost in each of the R&M and real estate services sub-sectors. This loss of employment has had a significant impact on the state of the overall UK labour market. The loss is equivalent to just under half of the total decline in employment at the UK level over the same period (total workforce jobs in the UK were 31.8m in 2007 and 31.2m in 2011). Other sectors, however, have also lost significant numbers of jobs over the same period – employment in the manufacturing sector is 300,000 lower, for example.

#### 3.2 Tax impacts

It is also possible to estimate the tax contribution of the commercial property sector. Data for the sectoral breakdown of tax contributions are most readily available for VAT and PAYE. There are also good data on the rateable value of property by types of premises.

Ideally this analysis would also be repeated for the sector's contribution through corporation tax. However, at the time of writing, a sectoral breakdown for corporation tax is only available on the old industrial classification,<sup>8</sup> which groups together Real Estate, Renting and Business Service activities (the PAYE and VAT breakdowns are available under the updated classification, which has a separate Real Estate category). Accordingly, the analysis excludes this.

Figure 3.3 sets out the estimated net VAT contribution of the commercial property sector (again defining the sector as consisting of the new build, R&M and real estate services sub-sectors). Using the share of commercial property new build and R&M in total construction GVA and latest data for the value of VAT payments made by the construction sector as a whole, an estimate for net VAT payments by the construction parts of the commercial property sector yields just under £2.1bn in net VAT payments in 2009–2010. Using a similar methodology for the real estate portion produces a figure of £1.87bn in 2009–2010.

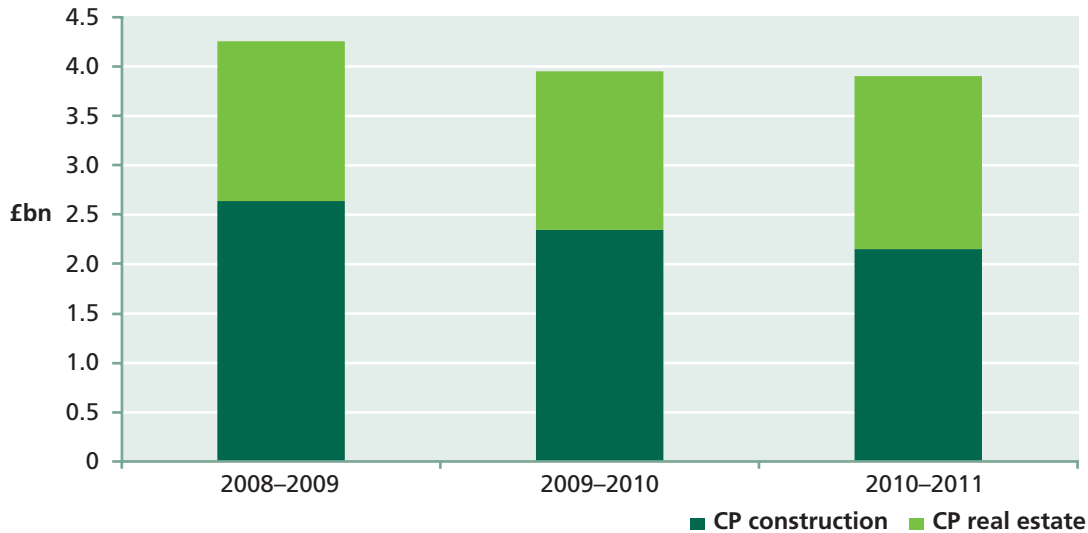
<sup>6</sup> Property Industry Alliance Property Data Report, 2011. Earlier estimates (Scott, 2004) gave the contribution of UK commercial property to jobs as 1.2m. The difference is partly due to timing and partly because of the inclusion of employment in ancillary industries such as architecture in the earlier estimates, which have been excluded from this analysis due to data constraints.

<sup>7</sup> Other authors have estimated the loss of construction jobs to be somewhat higher than this, at around 300,000.

<sup>8</sup> Standard Industrial Classification (SIC) 2003 to be precise, as opposed to the more up-to-date SIC 2007.

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

**Figure 3.3: VAT generated by commercial property by financial year**



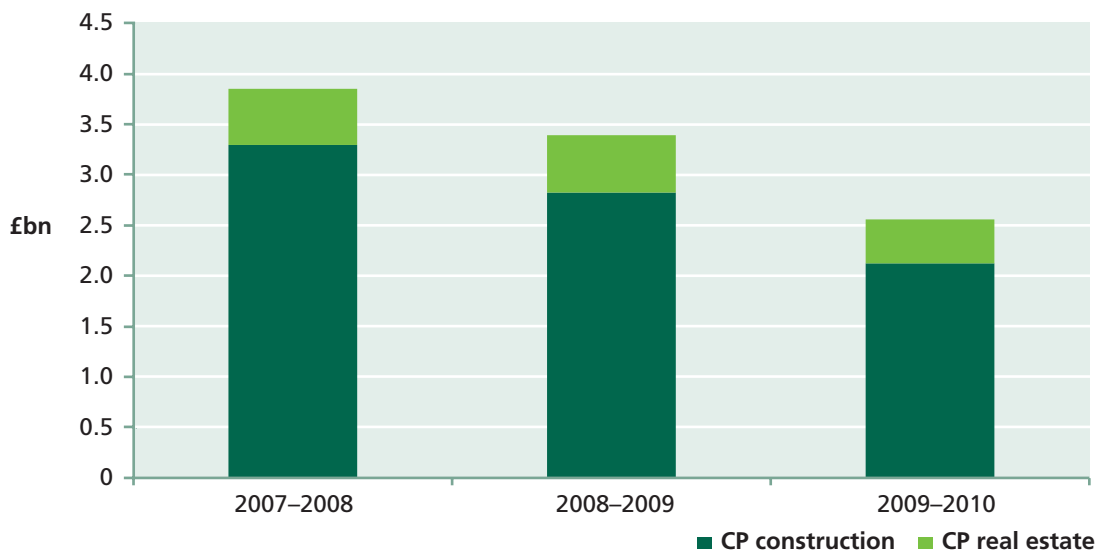
Source: Oxford Economics/Haver Analytics

Overall, these estimates indicate that the net VAT generated by commercial property construction and real estate activity was £3.9bn in 2009-2010. This is equivalent to 4.1% of the total VAT paid in the UK economy, noticeably higher than commercial property’s share of current price GVA in 2010 (around 3%).

Figure 3.4 illustrates the equivalent estimates of the value of PAYE generated by commercial property, derived from estimates of the share the sector has in employment in the construction and real estate sectors and the PAYE paid by these broad industrial groups.

These estimates assume that output per worker in the commercial property construction and real estate sector is the same as in the wider construction and real estate sector.

**Figure 3.4: PAYE generated by commercial property by financial year**



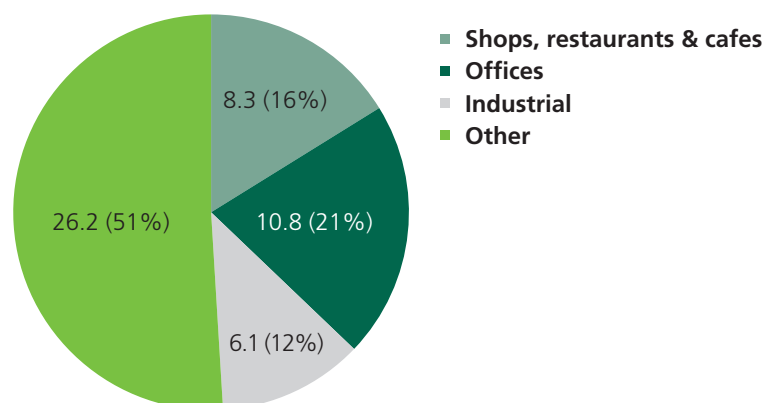
Source: Oxford Economics/Haver Analytics

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

Based upon these assumptions, it is possible to conclude that the commercial property sector, taking into account the two construction sub-sectors and commercial property real estate services, generated just over £2.5bn in PAYE revenue in 2009–2010. In contrast to the VAT contribution of commercial property, which has held up relatively well during the downturn, PAYE generated by the sector has declined substantially, from just short of £4bn in 2007–2008 to £2.5bn in 2009–2010. In proportionate terms, the commercial property sector contributed 2.1% of total PAYE in 2009–2010 according to the authors' estimates, down from 3.1% in 2007–2008.

It is also possible to provide some measure of the relative contribution made by commercial property users to property taxes. An estimate of the contribution of commercial property to the total rateable value of property liable for business rates in England and Wales is set out in Figure 3.5. Commercial property, on a narrowly defined basis (including retail, industrial and office space), contributes just under 50% of the total rateable value of all real estate in England and Wales. Incorporating other types of property that could be considered part of the commercial estate, including licensed premises and entertainment venues, increases this proportion to nearly two-thirds of all rateable values (around £31bn out of a total £51.3bn rateable value).

**Figure 3.5: Total rateable value of commercial property in England and Wales (£bn, 2009)**



Source: Oxford Economics/Haver Analytics

Total business rates income in 2011–2012 is estimated at around £25bn.<sup>9</sup> There are difficulties in estimating which types of properties paid which proportion of this total due to the complexity of the regime, but it is nevertheless clear that users of commercial property made a substantial contribution to the Exchequer through their business rates.

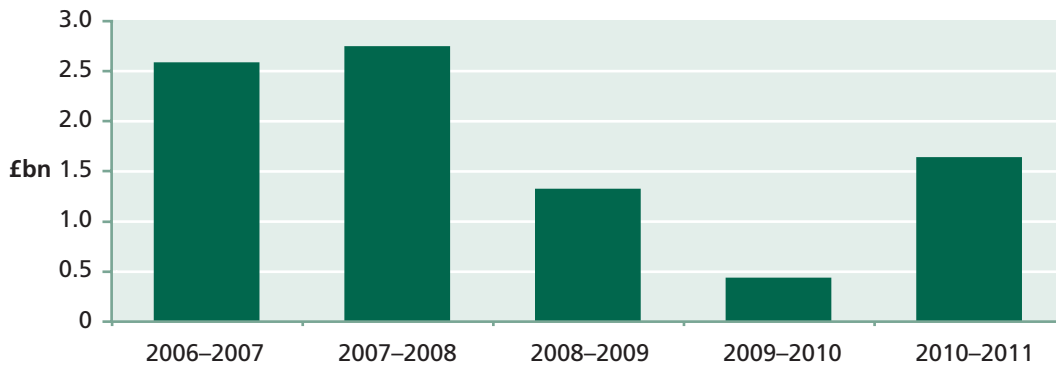
It is also possible to make a broad estimate of the Stamp Duty Land Tax (SDLT) payments generated by commercial property activity. Again, there are data constraints but, assuming that commercial property generates SDLT in line with its share of total real estate activity,<sup>10</sup> an estimate of the revenues raised via this tax by activity in the commercial property real estate sector is set out in Figure 3.6. In the years leading up to the global financial crisis, commercial property contributed around £2.5bn per annum in SDLT, but this fell markedly in 2008–2009 and 2009–2010, as investment market activity reduced significantly. Receipts from SDLT in commercial property have rebounded subsequently, but remain around 30–40% lower than prior to the economic crisis.

<sup>9</sup> IFS, 2011.

<sup>10</sup> An assumption that may understate the contribution of the sector, given that far more residential property transactions are likely to be below the threshold for stamp duty than commercial property. However, without much more detailed data on transaction values it is difficult to produce an alternative method.

## 4. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

**Figure 3.6: Estimated SDLT generated by commercial property**



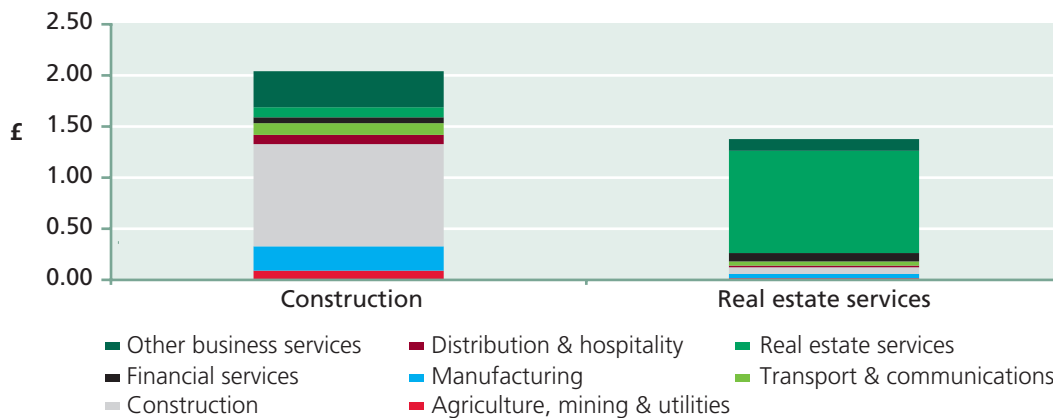
Source: Oxford Economics/HMRC

### 3.3 Indirect economic impacts

The commercial property sector also has indirect economic impacts outside the sector, through the goods and services purchased from other suppliers and through consumer spending supported by the wages paid to its employees in order to generate output.

Figure 3.7 sets out estimated total value added across sectors associated with a £1 increase in value added in commercial property construction (based on the all-sector construction data<sup>11</sup>) and real estate services. These are estimated by manipulating the ONS input-output tables (the 2005 Domestic Use Table). The estimates take into account supply chain and consumer spending multipliers and leakages from the economy due to savings, taxation and imports. Consumer spending on real estate has been modified to exclude the imputed rent of owner-occupiers.<sup>12</sup>

**Figure 3.7: Value added sectoral impacts associated with £1 increase in commercial property construction or real estate services**



Source: Oxford Economics

<sup>11</sup> These are Type 2 multipliers in the terminology of input-output analysis. The ONS input-output tables do not identify income from self-employment, which is a serious omission for the construction industry. The estimates shown here use a modified version of the tables that include income from self-employment in wage income and the analysis assumes that self-employment income has the same effect as wage income on generating consumer spending.

<sup>12</sup> The imputed rent of owner-occupier is included in the real estate industry by ONS. This gives a false impression of both the size of the real estate industry and the size of its multiplier. It has been excluded here to give a more realistic estimate of the multipliers for commercial property.

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

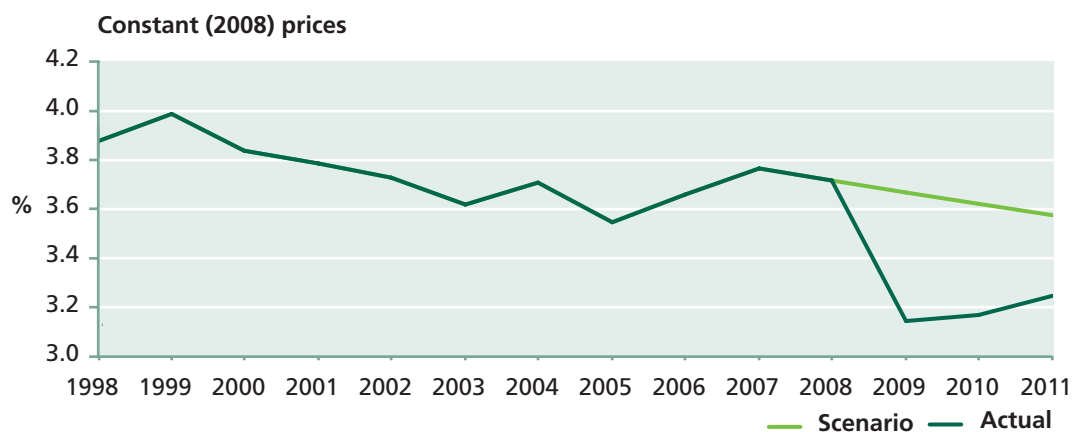
In addition to the sectors concerned, the industries benefiting most from an increase in commercial property construction GVA (CPCGVA) are business services and manufacturing, where a £1 increase in CPCGVA is associated with an increase of 35p and 24p respectively. The industries benefiting most from an increase in commercial property real estate services are financial services, business services and construction, although these effects are somewhat smaller than in the case of construction.

In summary, a fall of £1 in the value added of commercial construction is associated with a fall in value added for the economy as a whole of £2.09, and the equivalent figure for 'real estate services' is £1.42.<sup>13</sup> For comparison, the equivalent figure averaged across all sectors is £1.94. This implies that the fall in commercial property GVA from 2008 to 2011 (approximately £8bn) was associated with a wider loss of GVA of around £17bn.

#### 3.4 The economic crisis and commercial property investment

The impact of the commercial property sector on the downturn in the UK economy over the past few years is examined, considering the direct impacts in terms of the scale of lost GVA and jobs arising from the tougher conditions facing the sector, although there have been second- and third-round effects. For example, as the demand for and value of commercial property have fallen over the course of the recession, the value of collateral on banks' balance sheets has been adversely affected, requiring them to put aside more capital for provisioning purposes. In turn, this limits their ability to lend to the wider economy. These impacts are not considered here, since this is in itself a substantial modelling exercise, but, instead, analysis focuses on the first-round effects.

**Figure 3.8: Commercial property's share of GVA**



Source: Oxford Economics/Haver Analytics

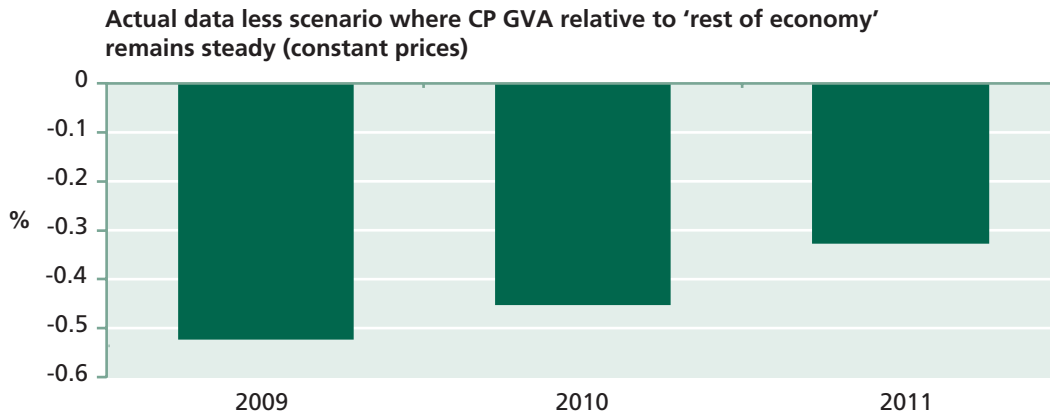
Figure 3.8 shows the share of UK constant price GVA accounted for by commercial property construction, R&M and real estate service activities. This share fell steadily from 1998 (the first point for which data are available) to 2005, before picking up, then collapsing in 2009 as the global financial crisis took effect. A theoretical scenario (denoted by the light green line) simulates what the impact might have been had commercial property's share reverted to its pre-2005 trend, rather than falling so sharply in 2009.

<sup>13</sup> Note that these are value-added multipliers (the change in whole economy value added associated with a change in value added in construction or real estate). The equivalent (more commonly quoted) Type 2 gross output multipliers are 2.75 and 1.67 respectively. Gross output multipliers are bigger than the corresponding value-added multipliers as there is some double-counting of gross output from different stages of the supply chain.



### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

**Figure 3.9: Impact of the global financial crisis on the commercial property sector**



Source: Oxford Economics/Haver Analytics

Figure 3.9 illustrates how actual GVA outturns have performed against this theoretical scenario. In 2009 economic output was around 0.5% lower in real terms than would have been the case if the scale of commercial property activity relative to the rest of the economy had remained in line with the long-run trend. The impact diminished in 2010–2011 as commercial property activity/sectors recovered slightly relative to wider economic output, but the impact in both years was 0.3–0.4% of constant price GVA.

Assuming that labour productivity in the sector would have moved to the same extent as in the actual data, Figure 3.10 sets out the implications for employment in the sector of the theoretical scenario (of reverting to pre-2005 share of GVA trend). Had the share of commercial property in total GVA trended down in line with the longer-run average then, using the same output per worker figures, employment in the sector would now be around 80,000 higher (860,000 versus an actual level of 781,000).

**Figure 3.10: Employment in the commercial property sector**



Source: Oxford Economics/Haver Analytics

### 3. THE ECONOMIC IMPACT OF COMMERCIAL PROPERTY

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It is also interesting to consider the drivers of the downward trend in the share of commercial property in overall GVA. One possibility is that buildings are becoming more efficient. For example, retail developments that offer more versatile and accessible space enable retailers to manage their stock more efficiently, and cut down on warehouse space. Another set of drivers concern wider structural shifts in the economy. For example the changing structure of the UK economy, away from industrial activities that demand a large amount of space towards a knowledge-based economy in which workers sit close together, or even work from home, would lead to a trend decline in the need for new space relative to output. Finding the balance between these two sets of drivers of a trend decline in the share of commercial property output relative to whole economy GVA may merit further examination in subsequent research.

#### 3.5 Key conclusions

Totalling the three sub-sectors of commercial property (construction, R&M and real estate services), total output in the sector in 2011 was around £41bn (around 3.2% of total UK GVA), and total employment just under 800,000.

The sector has a substantial multiplier effect on the rest of the economy, although this is not out of line with the average across the economy as a whole. Each £1 of GVA generated in the construction and repair and maintenance sub-sectors is associated with an additional £1.09 GVA in other sectors, and each £1 of GVA in commercial property real estate associated with an additional 42p in other sectors.

The sector makes a substantial contribution to the Exchequer. It is only possible to estimate the contribution the sector makes through VAT and PAYE income tax, but these contributions totalled around £6.5bn in 2009–2010, down from around £8bn in 2008–2009. Adding in the estimated contribution SDLT paid on commercial property contributes a further £1.5bn in 2010–2011.

Commercial property has suffered more than the economy as a whole during the downturn, given the cyclicity of business investment and reduced spending on new premises. Output in constant prices fell by around £9bn from 2007 to 2011. Had GVA in the sector evolved in line with its longer-run trend relative to GVA (which is still a trend decline), total GVA in the UK economy would have been around 0.5% higher in 2009, 0.4% higher in 2010, and 0.3% higher in 2011 (even without taking any multiplier effects into account). Business rates contribution is estimated at around £25bn in 2011–2012, making a total tax contribution by the sector in the order of £33bn, excluding tax generated by the sector's multiplier effect in the rest of the economy.

As a consequence of the fall in demand, in particular in commercial property construction, employment in the wider sector is around 250,000 lower than in 2007. Again, had the sector suffered a more moderate correction, back to 2004–2005 levels, employment in the sector would be around 80,000 higher than today (even without taking account of any multiplier effects).

With a gross multiplier of 2.09 compared to an all-sector average of 1.94, commercial construction offers a relatively capital-effective way of contributing to economic recovery.

## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

### 4.1 An alternative approach to measuring the stock of commercial property

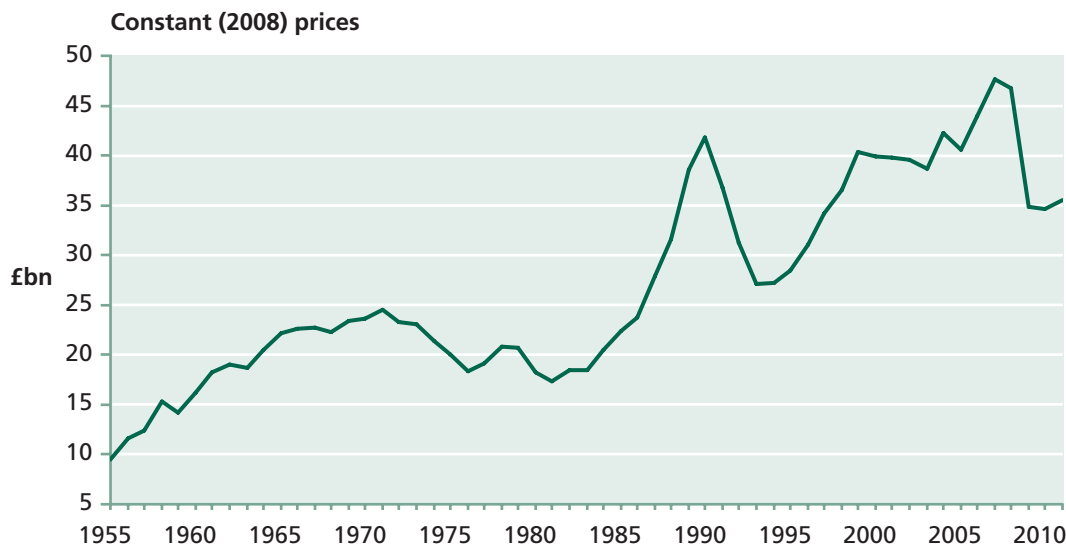
Appendix A considers a physical measure of the commercial property stock – the amount of commercial property recorded by the VOA in England and Wales. While this is a comprehensive measure, it has the disadvantage of giving equal weight to all kinds of commercial property, regardless of age, location or economic worth and of omitting Scotland and Northern Ireland.

An alternative to this method is to take the National Accounts approach to estimating the net capital stock (net of depreciation). This cumulates past levels of investment (inflation adjusted<sup>14</sup>) and makes assumptions about the rate of depreciation in order to arrive at an estimate of the capital stock. This is a more economics-orientated approach in that it values investment in monetary terms rather than just the floorspace constructed and it explicitly allows for the concept that the economic value of assets will depreciate over time.

### 4.2 The estimated value of the net capital stock in commercial property

Figure 4.1 shows the ONS estimates of the volume of new construction work while Figure 4.2 shows the estimated net capital stock in commercial property based on the ONS new work data and the assumptions discussed above.

**Figure 4.1: Value of new work in commercial and industrial construction**

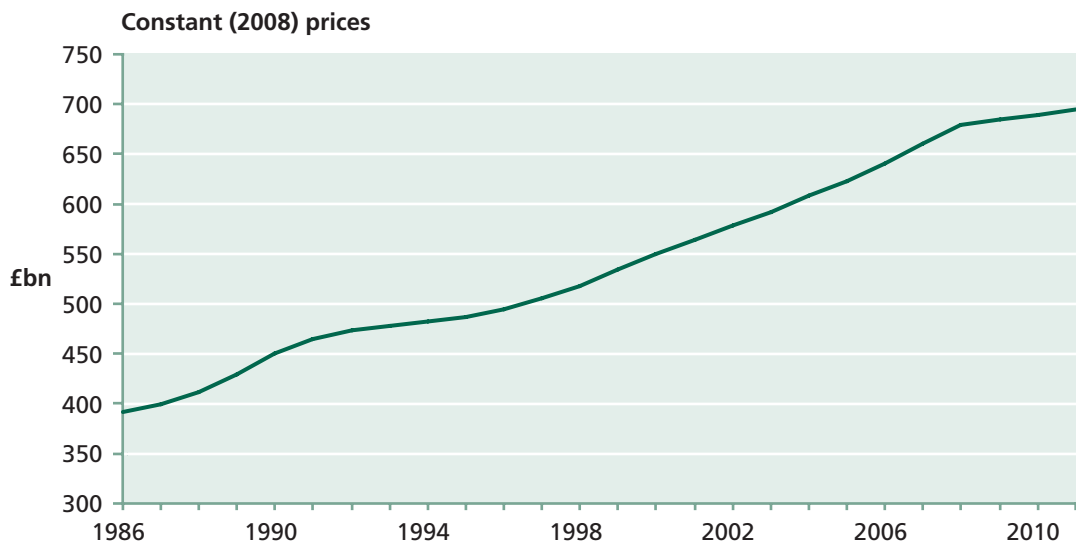


Source: ONS

<sup>14</sup> The interest in this section is in commercial property as a factor of production rather than as a stock of wealth, so an inflation-adjusted measure of investment is appropriate. This is the equivalent of current cost accounting. The alternative, historic cost accounting, does not permit a meaningful comparison of investment made in one year with investment made in another year when prices were different.

## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

Figure 4.2: Estimated net capital stock in commercial property



Source: Oxford Economics

The perpetual inventory method used here, with a 30 year service life assumption, requires 30 years of data to produce a capital stock estimate. Hence, the capital stock estimates start in 1985 (end of) while the new work data start in 1955. The estimate of £386.3bn (2009 prices) comprise the sum of all new work between 1955 and 1985 less depreciation. After 1986, changes to the capital stock estimate are the equivalent of the value of new work less depreciation (all in 2008 prices). There are a number of points to note about Figures 4.1 and 4.2:

- As the estimates are built up from new work and depreciation data, it is not possible to undertake any estimates before 1985 as the new work data collection only commenced in that year and 30 years of data (the assumed service life) are required.
- The net capital stock data are much smoother than the new work data because the capital stock estimates are essentially a moving average of the new work data and, hence, fluctuations are smoothed.
- As illustrated in Figure 4.1, new work starts have fallen substantially in recent years but remain positive. There may be a lack of new development work but the ONS data indicate that there is still a substantial amount of capital spending even if it is substantially down on 2008 levels.
- The fall-off in new work shows up in a marked slowdown in the growth of the net capital stock rather than a contraction. A similar slowdown happened during the early 1990s recession.
- The capital stock estimates are for Great Britain (i.e., unlike the floorspace estimates, they include Scotland).

Although compiled in a different way, the net capital stock estimates shown are not dissimilar to the ONS estimates for buildings and other structures in the corporate sector. The ONS estimate for 2008 is £668bn compared to the £661bn shown here (both in 2008 prices). The commercial property net capital stock (GB) is the equivalent of around 22% of the UK's total net capital stock and of 52% of the non-residential net capital stock (all measured in 2008 prices).

## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

The growth in the net capital stock has been much greater than the growth in floorspace. The estimated capital stock increased by 26.5% between 2000 and 2011 compared with an increase of only 3.3% in the Valuation Office's measure of total floorspace.

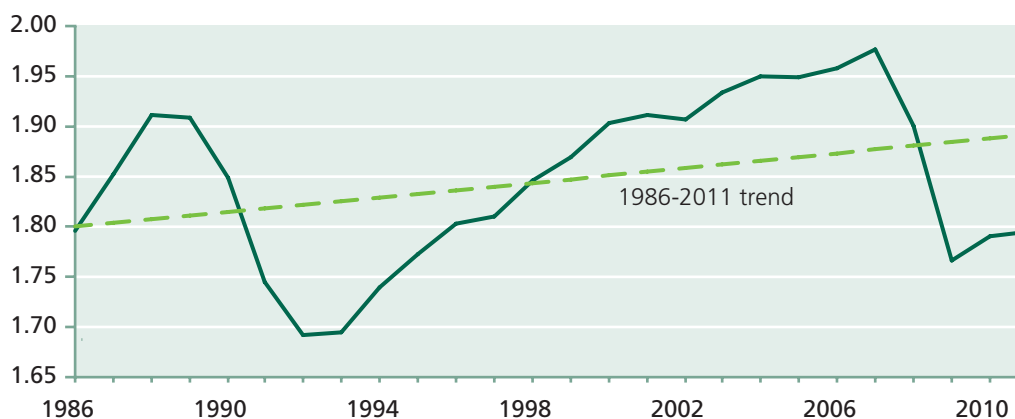
The latter is because the floorspace data are weighed down by legacy space, much of which is of dubious economic value. This means that new space makes a smaller addition (in proportionate terms) to the total than new work does in the net capital stock estimates. The net capital stock estimates presented here give a much better indicator of the growing input of commercial property into the UK economy than do the floorspace data.

### 4.3 The Commercial Property Stock and the Economy

The purpose of this research is to illustrate the relationship between commercial property and the broader economy rather than just to produce capital stock estimates for their own sake. Figure 4.3 shows how the ratio of non-oil GVA<sup>15</sup> to the estimated net capital stock in commercial property has moved since 1986 (because the capital stock is valued at the end of the year, the 1985 figure is taken as being representative of the capital input for 1986, etc). There are broad gyrations in the ratio (caused by fluctuations in GVA as the capital stock estimates are relatively smooth) but the long-run relationship is surprisingly stable. The ratio of GVA to the net stock of commercial property in 2011 is actually the same as it was in 1986.

There is, in fact, a modest upward trend of about 0.2% per annum,<sup>16</sup> indicating that GVA becomes gradually more efficient in its use of commercial property over time. The stable ongoing relationship between non-oil GVA and the net stock of commercial property also indicates that commercial property is a necessary input into the production of non-oil GVA.

**Figure 4.3: Ratio of non-oil GVA to net capital stock in commercial property**



Source: Oxford Economics

<sup>15</sup> Non-oil GVA rather than GDP is used as the oil component of GVA (or GDP) which has been large and volatile is considered to have very little commercial property input relative to GVA in the industry. A more sophisticated approach would be to weight all of the industries that make up GDP and to give a zero or very low weight to oil. Simply using GDP in the analysis, however, gives a similar result as for non-oil GVA.

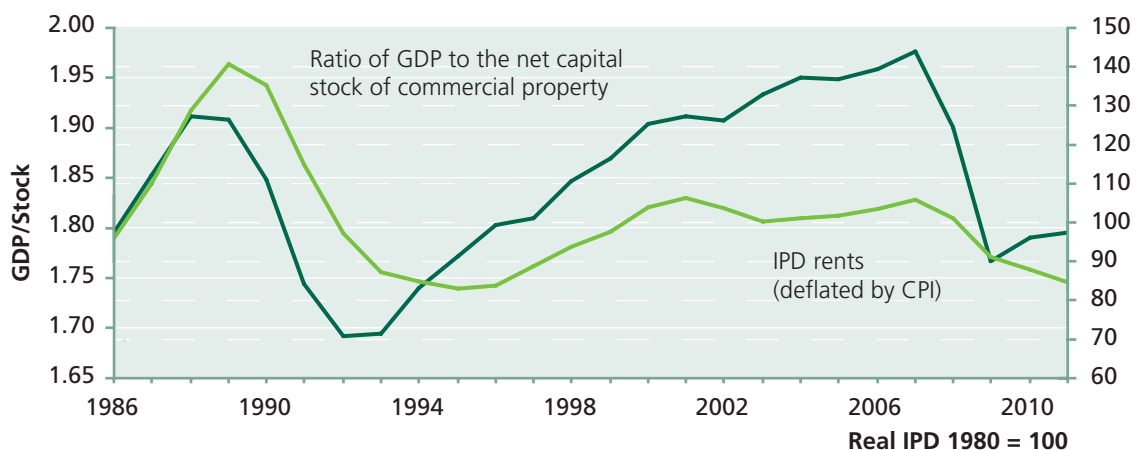
<sup>16</sup> The t-statistic is 1.73 which is significantly different from zero at the 10% level, though not at the 5% level.

#### 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

The relationship between non-oil GVA (as a proxy for demand) and the net capital stock of commercial property (as a proxy for supply) also shows up in occupier markets.

Figure 4.4 shows the relationship between IPD all-property rents, deflated by the Consumer Price Index, and the ratio of GVA to capital stock. There is a clear relationship, even though its precise nature appears to change around 1994. In fact, a stable relationship can be estimated between real IPD all-property rents, the non-oil GVA to commercial property stock ratio and a segmented time trend.<sup>17</sup> This is remarkable, given the high aggregate nature of both the rental and the economic data.

**Figure 4.4: GVA to capital stock ratio and rents**



Source: Oxford Economics

The fluctuations in the ratio of non-oil GVA to the net capital stock in commercial property illustrated in Figure 4.3 illustrate something about the dynamics of the commercial property–non-oil GVA relationship. In the latter stage of economic upswings, non-oil GVA runs ahead of the commercial property stock and the ratio line in Figure 4.3 moves above its long-run average (in 1986–1989 and 1998–2008). Whether new work is contemporaneous with non-oil GVA or lags behind (as in the late 1980s/early 1990s), the result is that the commercial property stock either continues to increase after non-oil GVA has fallen (late 1980s/early 1990s) or it levels off when non-oil GVA falls (2009–2010). Either way, the ratio of non-oil GVA to the net capital stock of commercial property falls sharply and, in the context of Figure 4.3, there is a surplus of commercial property, and rents fall while vacancy rates rise.

Commercial property is a factor of production and a key input into value added in the economy as a whole. As such, the demand for commercial property should increase as the economy grows in the long run (derived demand in economics terminology). In the short run there may be periods where there is a surplus or shortage of commercial property but these will disappear over time. It is difficult to argue the opposite, that an increase in the stock of commercial property would increase overall economic activity in the long run, except through a complicated argument that emphasises the role of a bigger capital stock in increasing capacity which then permits fast economic growth without an increase in inflation (the output gap theory of inflation).<sup>18</sup>

<sup>17</sup>  $\ln(\text{RIPD}_{t_2}) = 1.18 \cdot \ln(\text{RIPD}_{t_1}) - 0.47 \cdot \ln(\text{RIPD}_{t_2}) + 1.22 \cdot \ln(\text{GVA}/\text{Stock}_{t_1}) - 0.68 \cdot \ln(\text{GVA}_{t_1}/\text{Stock}_{t_2}) + c + a$  segmented time trend with a 'kink' in 1994. The estimated t-statistics are 9.8, -5.3, 6.2, -2.4, -5.0a and 4.6 respectively. The 'kink' in 1994 is an empirical observation rather than an allowance for a known event.

<sup>18</sup> Oxford Economic Forecasting (2006), "The Contribution of Commercial Property to the UK Economy", Section 4 thereof elaborates on this argument.

## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

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The process of building the stock (i.e. new construction work) will generate extra demand in the economy<sup>19</sup> in the short run but a short-term investment boom does not generate a permanent increase in economic activity. What is clear from Figure 4.3 is that there is a long-run relationship between economic activity and the net capital stock of commercial property<sup>20</sup> and, by inference, even if there is a surplus of commercial property at any particular time, the process of economic growth and depreciation will eventually erode the surplus and there will eventually be a renewed need for additions to the stock of commercial property.

Comparing the ratio of non-oil GVA to net capital stock of commercial property rather than the ratio of non-oil GVA to the total stock of floorspace produces a fundamentally different view of the role of commercial property in the economy. Non-oil GVA has increased much more rapidly than the total amount of floorspace in the past with the implication that there is a high rate of growth of commercial property productivity (measured by non-oil GVA over total floorspace). This may lead to the conclusion that future economic growth can be accommodated through productivity growth rather than additions to the stock or even that there is little relationship between economic activity and the demand for commercial property. The net stock of capital in commercial property, however, has increased at a rate that is much closer to that experienced by the non-oil economy as a whole, implying that productivity growth is low and that economic growth will generate a near-equivalent increase in the demand for (the net capital stock in) commercial property.

This is not to suggest that the economy cannot grow without an immediate and corresponding increase in commercial property supply. There can be surpluses of commercial property (as clearly indicated in Figures 4.3 and 4.4 as well as by vacancy data). What it does suggest is that in, the long run, any expansion of the economy is likely to be matched by a corresponding increase in the demand for commercial property (less an allowance for a modest rate of productivity growth).

### 4.4 The Future Need for Commercial Property

Figure 4.3 and the equation in footnote 17 imply that there will be consequences if the net capital stock of commercial property fails to keep up with non-oil GVA in the long run (less any 'productivity' trend that might be contained within the line shown in Figure 4.3). In the occupier market, the implication will be ever-rising real rents (and vice versa if the change in the stock continually exceed non-oil GVA growth). For the economy of a whole, rising real rents will reduce the return on other capital. If other capital and labour can be substituted for commercial property there will also be a decline in labour and total factor productivity growth.

If new commercial construction work stays at its 2011 level, the stock of commercial property will level off and the underlying demand (non-oil GVA<sup>21</sup> adjusted for the trend) is predicted to overtake supply (i.e. the net capital stock) in 2016. There have been substantial deviations of the non-oil GVA to the net stock of commercial property ratio before (Figure 4.3), but eventually a static net capital stock of commercial property would begin to cause problems for the economy through steeply increasing real rents and productivity effects.

<sup>19</sup> In strict statistical terms, new construction work tends to lag (be Granger caused by) economic growth rather than the other way around.

<sup>20</sup> As commercial property is only one of a number of factors of production, its relationship with non-oil GVA should be examined in combination with the other factors of production. An Augmented Dickey-Fuller (ADF) test, however, indicates a stable one-for-one long-run relationship between the net capital stock of commercial property and non-oil GVA (and a time trend) over the period for which the capital stock estimates are available. The test just passes at the 5% level (ADF = -2.992, critical value to 2.991) but even this result is quite good given the limited number of cycles covered. The same is not true of the relationship between non-oil GVA and the total stock of floorspace as defined by the VAO.

<sup>21</sup> Based on the June 2012 Oxford Economics non-oil GVA forecast. This shows growth of 0.2% in 2012, 1.7% in 2013 and an average of 2.8% for 2014–2016 and 2.6% for 2017–2025.

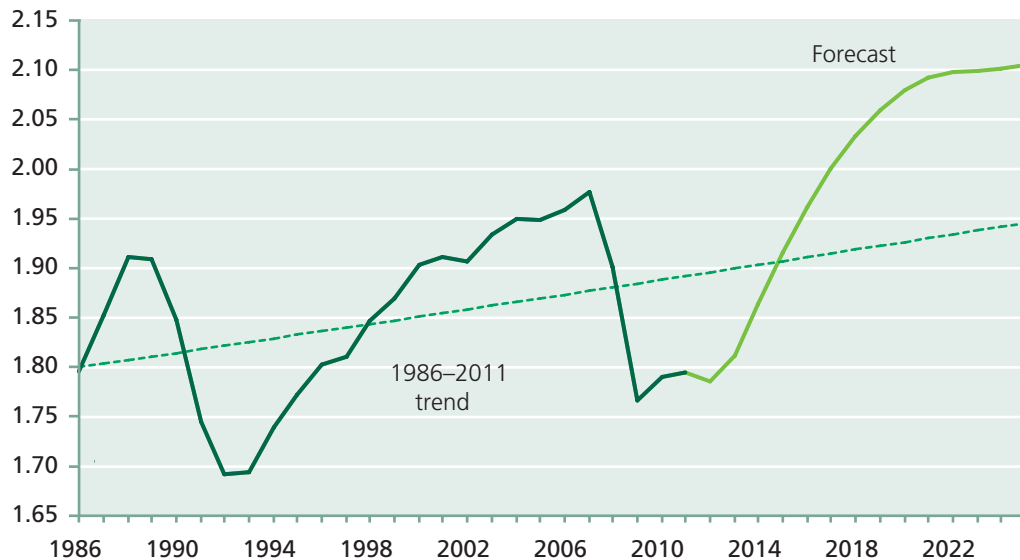
#### 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

Such an outcome is very unlikely; the market mechanism and an eventually improving investment climate would mean that new commercial and industrial construction work would eventually pick up. It is interesting, however, to pose the question: what levels of construction work would be required to maintain the underlying ratio of non-oil GVA to net stock of commercial property closer to its long-run trend?

The June 2012 Oxford Economics forecast for non-oil GVA shows very weak growth in 2012, a modest pick-up in 2013 and then a more rapid recovery from 2014. The forecasts are not out of line with the consensus (note that stripping out oil production increases forecast growth by around 100bp a year). Increased economic activity (i.e. increased non-oil GVA) will eventually increase the demand for commercial property and will lead to a requirement for an increase in new commercial and industrial construction work.

There is no single path of future new construction work that will deliver a net capital stock for commercial property that is consistent with future non-oil GVA growth. It could be achieved by a rapid bounce back followed by a relatively flat period or by a more moderate bounce back followed by a period of sustained growth. What is clear, however, from experiments with the perpetual inventory model, is that current levels of new construction work are unsustainably low. Figures 4.5–4.7 illustrate a possible future path for new construction work and the net capital stock in commercial property produced by a simple stock-adjustment model that relates new work to non-oil GVA and the lagged capital stock (see Appendix B for details). The forecasts are produced using the June 2012 Oxford Economics non-oil GVA forecast.

**Figure 4.5: Forecast ratio of non-oil GVA to net capital stock in commercial property**

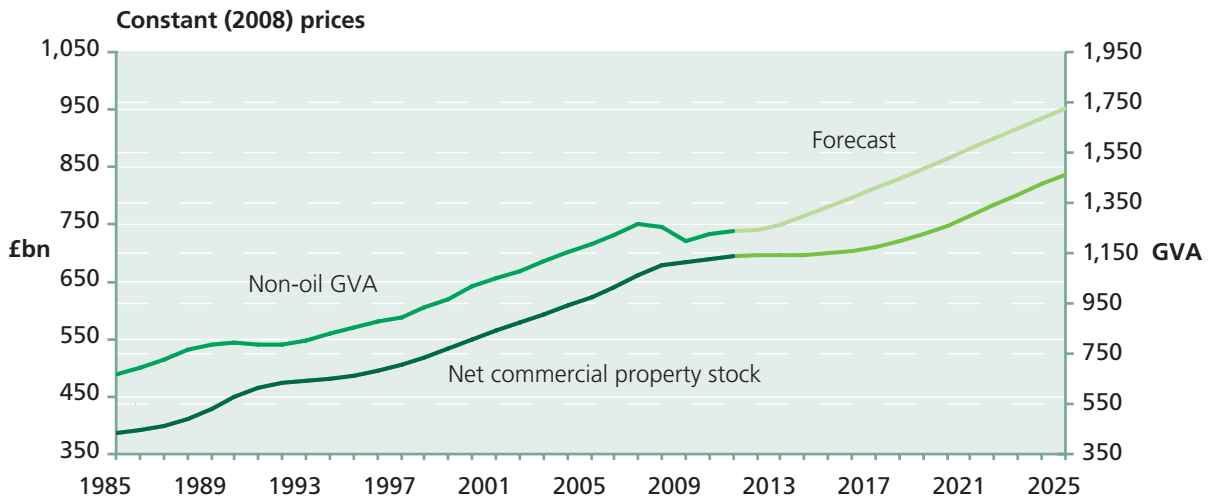


Source: Oxford Economics



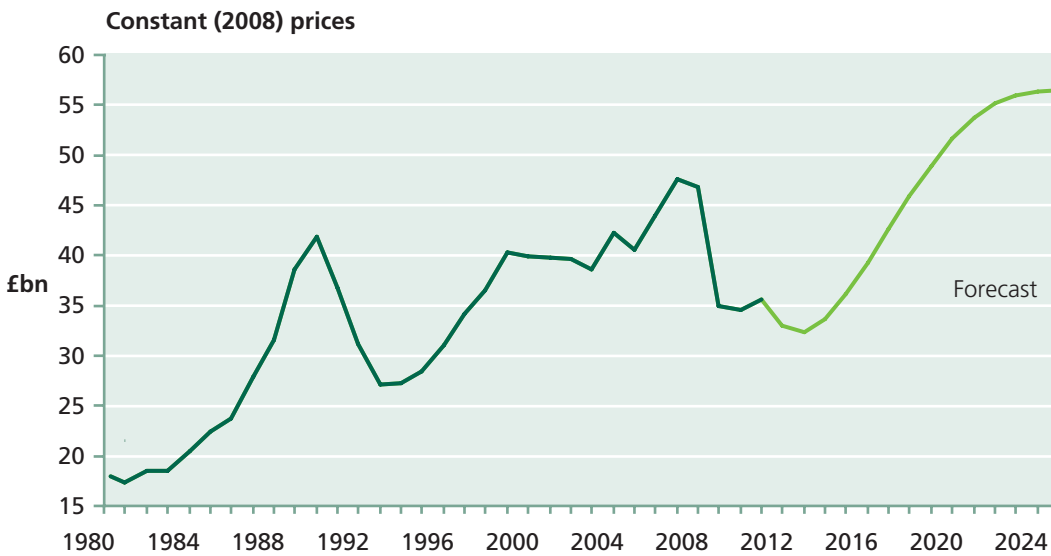
## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

Figure 4.6: Non-oil GVA and net commercial property stock



Source: Oxford Economics

Figure 4.7: Commercial and industrial new work



Source: Oxford Economics

Figure 4.7 shows another weak year for new work in 2012<sup>22</sup> (down 7.3%) and a further fall in 2013 (down 1.9%) but volume bounces back in 2014 (plus 3.9%) and averages 8.1% over 2015–2018 before levelling off in the later years.

<sup>22</sup> This model-based forecast was made in mid-2012. Initial ONS estimates of the 2012 out-turn are now available and they show a 9.4% fall in 2012.

## 4. AN ALTERNATIVE 'MACRO' APPROACH TO THE RELATIONSHIP BETWEEN COMMERCIAL PROPERTY AND THE ECONOMY

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This might look optimistic in the present climate but it only generates the very gradual upturn in the net capital stock of commercial property projections shown in and the ratio of non-oil GVA to the net stock shown in Figure 4.5. The ratio shown in Figure 4.5 remains above the historic trend by 2025 and the scale of the projected recovery is also not out of line with the recovery from the early 1990s recession.

The lessons from this are clear: if developers and builders are to deliver the amount of new construction work that is consistent with the demands of a growing economy and with the replacement, refurbishment and modernisation needs of the existing stock, there will have to be a substantial increase in new work – eventually to the peak seen in 2007 and beyond. Of course, the path will not be as smooth as that suggested in Figure 4.7. Future, un-forecast fluctuations in non-oil GVA will affect the demand for commercial property and other more short-term influences are bound to affect the path of new work. Nonetheless, the basic prognosis is still sound. If non-oil GVA is to recover as predicted and if the perpetual inventory model correctly forecasts replacement demand, there will be a major bounce back in new work followed by an ongoing upwards trend.

There are a number of caveats to these conclusions. Most obviously, non-oil GVA might not recover as forecast. In this case, the demand for commercial property and new construction work will be lower. Such an outcome cannot be ruled out, but at least this framework can still be used to test the implications for future demand and new work.<sup>23</sup> Second, the model used to generate the net capital stock estimates and forecasts might not be valid. However, the arguments advanced above and the estimates generated make sense in the context of GVA and rental growth.

Finally, it must be recognised that this is a highly aggregative model that conceals a myriad of details. A useful extension of the work would be to disaggregate it into the different property sectors. Disaggregated data on new work, however, are only available back to 1980 (compared to 1955 for all new work) and a longer run of data is needed to repeat the perpetual inventory technique used here. As a result, such research would involve considerable work. While sectoral detail would be useful, it does not invalidate the conclusions from the exercise. Focusing on the aggregate allows clarity and emphasises what are very significant conclusions for the commercial property development and construction industries.

<sup>23</sup> Appendix C considers two downside scenarios, which further emphasise the link between the economy and new commercial property work.

## 5. CONCLUSIONS

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The analysis focuses on commercial property as a factor of production and the long-run relationship between economic activity and the demand for the net capital stock in commercial property.

The total amount of floorspace is a poor measure of the 'economic' input made by commercial property. This is because it matches new stock with old, modern with obsolete, and stock in prime areas with property in fringe markets.

Owing to the large amount of legacy stock, estimates tend to show only muted growth in the total amount of floorspace as a result of new additions to the stock. An alternative estimate, based on the perpetual inventory method used by national accounting statisticians and which assumes an economic life for new investment of 30 years, produces an estimate of the net capital stock in commercial property. This is a better measure of the economic input generated by commercial property, demonstrating that it has increased at a much faster rate than the growth rate of floorspace – the estimated net capital stock of commercial property increased by 26.5% between 2000 and 2011, compared with an increase of only 3.3% in the Valuation Office's measure of total floorspace.

Looking at the net capital stock in commercial property rather than the total amount of floorspace shows a much closer relationship between economic growth as a whole and the economic input from commercial property.

The growth of the net capital stock in commercial property is much closer to non-oil GVA growth over a period of years.

Commercial property is a key factor of production accounting for over half of the UK's non-residential capital stock.

There is a clear relationship between the economy (non-oil GVA) and new commercial construction work. The link is predominantly from the economy to new construction work, although there are feedbacks from new work to the economy in the shape of increased aggregate demand and the impact on rents.

Although there now appears to be a surplus of commercial property, consensus views of future economic growth, combined with analysis based on the perpetual inventory model and a stock adjustment model of new work, suggest that there will be a sharp bounce back in construction of commercial and industrial property sometime in the 2014–2018 period that will prevent the ratio of non-oil GVA to net capital stock in commercial property drifting further away from its historical trend.

Further research might provide a sectoral breakdown of the net capital stock of commercial property presented here, although there would be considerable data challenges involved. Additionally, investigations into the relationship between commercial property and the wider economy could help clarify how the demand for property in the future is likely to evolve.

## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

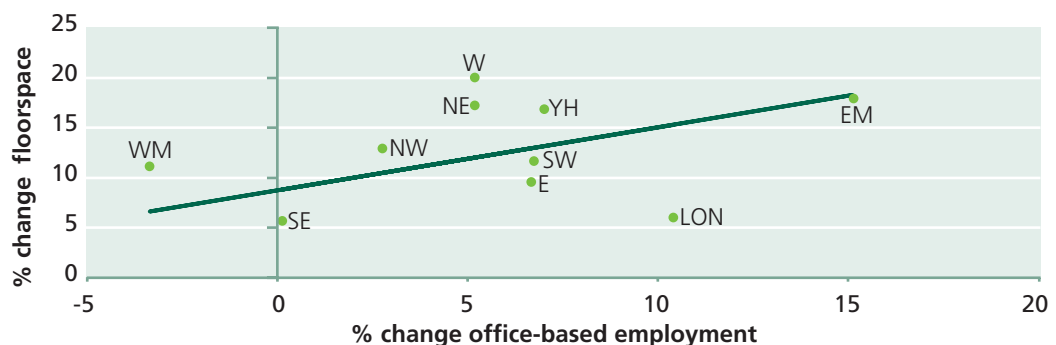
This appendix examines the historic growth in commercial floorspace relative to changes in demand for space, proxied by employment and output in relevant sectors. Ideally, it would be preferable to be able to perform the same analysis for Scotland and Northern Ireland, given that together these two regions account for 10% of total UK economic output. However, data for these countries are outside the remit of the VOA and are not easily available.

In this appendix, the focus is on the office market and the retail sector, which together account for approximately three-quarters of the total value of the commercial property stock.<sup>24</sup> Some brief comments are also made on the demand and supply drivers of industrial space, but data constraints and issues around classification make it harder to draw firm conclusions.

### A1 Office space

An analysis of recent trends in office development and the likely demand for office space has been conducted, using detailed ONS data on employment in specific occupations.

**Figure A1: Growth in office-based employment and space, 2002–2010**



Source: Oxford Economics/Haver Analytics/VOA

Note: Trend line excludes London

Figure A1 plots growth in office-based employment<sup>25</sup> against changes in office space, over the period 2002–2010 by region in England and Wales. The line in the chart denotes the fitted relationship between changes in office space and changes in office-based employment. The fitted relationship is weighted by office space and is only significant when London is excluded from the estimation, indicating that London's office market is structurally different to the rest of the UK.

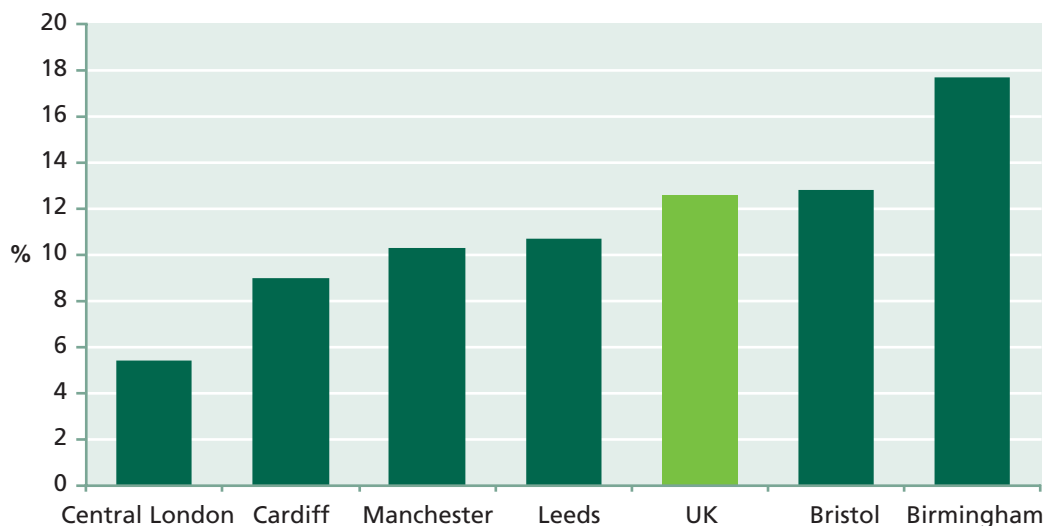
Entries above the line indicate that in that region office space became more readily available relative to the UK average, while entries below the line indicate office space becoming scarcer relative to the average. In the West Midlands, Wales and the North of England office space grew much more rapidly than employment, indicating a substantial supply overhang. In the East Midlands, the East and the South West, the demand for and supply of office space has grown at broadly similar rates. London has seen much more rapid employment growth relative to office space than any other region over the past decade.

<sup>24</sup> PIA Property Data Booklet, 2011.

<sup>25</sup> Estimated using data on the number of persons employed in managerial, senior official, professional and administrative occupations.

## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

Figure A2: Office void rates, Q1 2012



Source: JLL UK Office Market Outlook 2012Q1

Void rates imply that the Central London office market has less spare capacity than other major cities, although vacancy rates are higher in the remainder of London outside the central business district. This is illustrated in Figure A2, which plots void rates in major cities for which void data are readily available. This may reflect a focus on the core business district in the case of Central London, while the observations for other cities incorporate more peripheral stock. Having said that, this distinction between the UK's leading city and the rest is similar to that seen in most other advanced economies, where the capital city (or the leading financial centre) generally operates with a lower degree of void space than other locations. However, given the scarcity of data available, care should be taken in interpreting Figures A1 and A2.

Nevertheless, the relatively narrow margin of spare capacity in central London's market is important because London is generating an ever-increasing share of its Gross Value Added (GVA)<sup>26</sup> from office-based sectors. On latest estimates<sup>27</sup> London generates around 45% of its GVA through office-based sectors. Between 2012 and 2020 Oxford Economics' forecasts indicate that London will add around 20% more office-based jobs to the current total.

<sup>26</sup> GVA is the measure normally used to measure an industry's economic contribution and the size of regional economies by statisticians. At an aggregate level, it is equal to GDP plus subsidies and less taxes on products (similar to the old concept of GDP at factor cost).

<sup>27</sup> Oxford Economics estimates, using a number of ONS datasets.

## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

Figure A3: Projected growth in office-related employment, 2012–2020



Source: Oxford Economics/Haver Analytics

Looking ahead, much of the near-term growth in demand for additional office space in London will be met by pre-let property in the development pipeline – JLL estimate there is currently 779,000 m<sup>2</sup> in the pipeline in Central London alone, enough to accommodate around 40,000 additional workers based on an industry standard rule of thumb of 20 square metres per worker. For comparison, Oxford Economics' forecasts imply an additional 38,000 office-based workers in inner London boroughs in 2013–2014. As such, the market seems well supplied for the immediate future, although it will be important for supply to continue to respond to demand growth.

In the East, East Midlands and the South East of England, office space has only modestly outpaced demand over the past decade, and as such the degree of spare capacity is likely to be modest. Further north and west, available office space is unlikely to constrain the growth of office-based sectors for some time, thanks to a relatively high degree of spare capacity and modest demand growth.

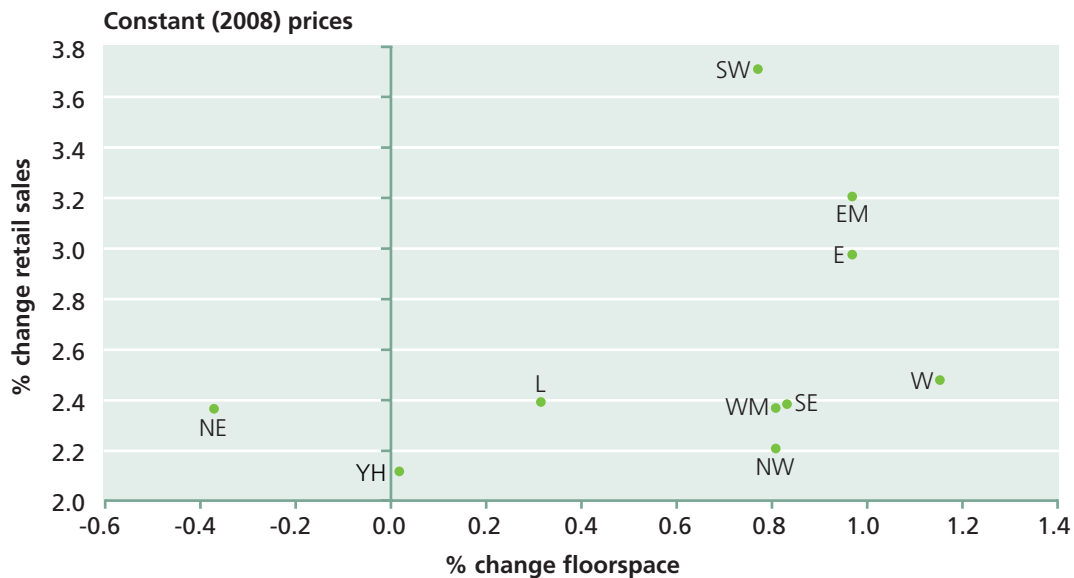
### A.2 Retail space

Figure A4 sets out the growth of retail floorspace across regions, alongside the growth of retail sales over the period from 2000 to 2010 (the last period for which regional retail sales data are available).

Interestingly, the regions with the fastest growth of retail space have not necessarily been those with the strongest growth in retail sales – for example Wales, West Midlands and the North West saw rapid expansions in overall retail space over the period, but much more modest growth in retail sales, whereas the East of England, East Midlands and the South West were the strongest performers in terms of retail sales.

## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

Figure A4: Average annual retail sales and retail floorspace growth, 2000–2010



Source: Oxford Economics/VOA/ONS

There is also substantial variation in the sales performance of retail property on a per square metre basis (as illustrated in Figure A5). In 2008 prices, the volume of sales per metre squared is almost 50% lower in Wales and the North East than in London, the South East and the East of England.<sup>28</sup> Assuming that the underlying rate growth in retail sales densities is similar across regions (that is, one region does not require a greater area of retail space to sell the same value of goods), driven by technological innovation and a change in the mix of goods, this may indicate that there is a greater portion of non-performing retail space in such regions.

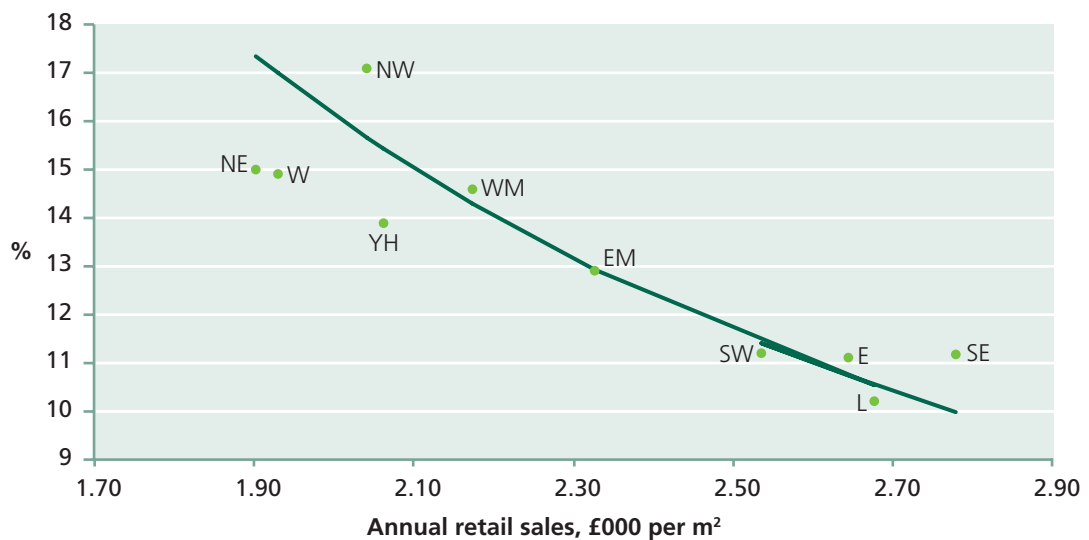
This is supported by the evolution of void rates around UK regions.<sup>29</sup> By and large the regions with the lowest density of sales per square metre of retail space have higher vacancy rates. These include Wales, the North West and North East, while London and the South East have much higher retail sales density and lower void rates. For reference, Scotland (not shown in Figure A5 as floorspace data are not available) recorded town centre voids of 14% over the same period.

<sup>28</sup> The data exclude UK residents spending abroad but include an allowance for spending by foreigners in the UK. The spending by foreigners element is based on data from the International Passenger Survey (IPS). Note that there is a suspicion that the IPS data understate spending by high-spending foreigners and this may have a disproportionate impact on the London figures.

<sup>29</sup> Note that town centre void rates are used here. The availability of out-of-town retail space will also have implications for town centre void rates.

## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

Figure A5: Town centre retail voids and retail sales densities, September 2011<sup>30</sup>



Source: Oxford Economics/Haver Analytics/VOA/LDC

For void rates in Wales, the North West and the North East to reduce to levels closer to those in the South of England, it would be necessary for retail sales to grow much faster than the UK average over the coming years or, alternatively, for the stock of floorspace to contract. Given the economic outlook in these regions, with their higher dependence on public sector employment, it seems unlikely that retail sales will outstrip the rest of the UK, implying that a substantial portion of retail space in these areas is effectively obsolete.

By contrast, the economic outlook is much brighter over the coming few years in the south and east of England, which should feed through into consumer spending and, consequently, the demand for retail space. Oxford Economics' forecasts indicate that consumer spending in London will grow by over 3% per annum in the period 2013–2016, compared to around 2% per annum in the North East and Wales. This implies that the imbalance between supply and demand in many regional retail property markets, evident in the comparative void rates, may well persist for the foreseeable future.

### A3 Industrial floorspace

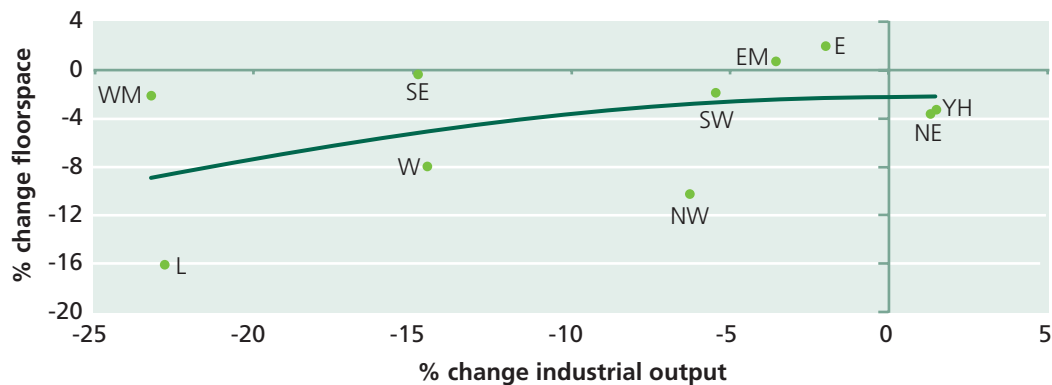
Finally, the growth of industrial floorspace through the UK over the decade to 2011 is considered and comparisons made with manufacturing output (Figure A6). Unsurprisingly, London has lost the greatest amount of industrial floorspace (c. 16%) and about a quarter of its manufacturing activity. However, more surprisingly, the West Midlands has also lost about a quarter of its manufacturing output (production of transport equipment having fallen by around 50% over this period).

<sup>30</sup> The trend line in Figure A5 is slightly kinked towards the bottom because of the estimation method used. The authors used a weighted least squares regression, which allows the regions with larger shares of retail activity to have a greater weight in the fitted values, but it also allows the relationship to deviate from a simple linear one.



## APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES

**Figure A6: Industrial floorspace and manufacturing output 2002–2011**



Source: Oxford Economics/Haver Analytics/VOA

It is possible to fit a trend between the loss of manufacturing output and industrial floorspace. Within this distribution, however, there are outliers: the West Midlands in particular has experienced much less contraction in the amount of available industrial space than might be expected given the loss of output, while the North West has seen the reverse – a much steeper reduction in the amount of available floorspace than one might expect given industrial activity. However, the correlation excluding London would be much more like a straight line, weakening the explanatory power of this trend in comparison with those found in the retail and office sectors.

Some regions have seen faster declines in industrial floorspace because of the growth of distribution warehouses, particularly on key transport routes. VOA data do not split out space used for ‘traditional’ industrial purposes (such as workshops and factories) from distribution space, so it is difficult to isolate exactly where this is the case. The VOA is in the process of trying to refine the estimates to track these different types of floorspace, but it will be some time before these data are available. In the meantime it is difficult to draw clear conclusions about the scale of obsolete industrial space around UK regions.

### A4 Key messages

There are important differences between regions in the supply of commercial floorspace and the underlying demand. In the office sector the evidence underlines the lower degree of spare capacity in central London’s office markets, and the extent to which this is likely to persist over the coming years, with the number of workers needing to be accommodated in offices forecast to rise by up to 20% between 2012 and 2020.

Office space in a number of regions (West Midlands, the North of England and Wales in particular) has substantially outstripped growth in office-based employment. Further, there is likely to be limited growth in office-based employment in these areas, meaning that high void rates may persist for some time.

This is also the case in the retail sector, where regions with the lowest retail sales densities (again Wales, North West and North East) have the highest rates of void retail space. The weak economic outlook for these regions means that a substantial portion of vacant retail space in these areas is unlikely to return to use.

## **APPENDIX A – THE STOCK OF COMMERCIAL PROPERTY IN ENGLAND AND WALES**

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Retail void rates are much lower in the south and east of England, and sales densities much higher. With the economic outlook in these regions more robust than in the north, the prospects are that void rates will remain lower than elsewhere in the country for the foreseeable future.

This is important because aggregate indicators point to a general surplus of commercial property floorspace. Regional and sectoral disaggregation show that part of the imbalance between supply and demand is far from uniform and that examples of relatively constrained supply co-exist with what appears to be structural excess supply in some regions and sectors.

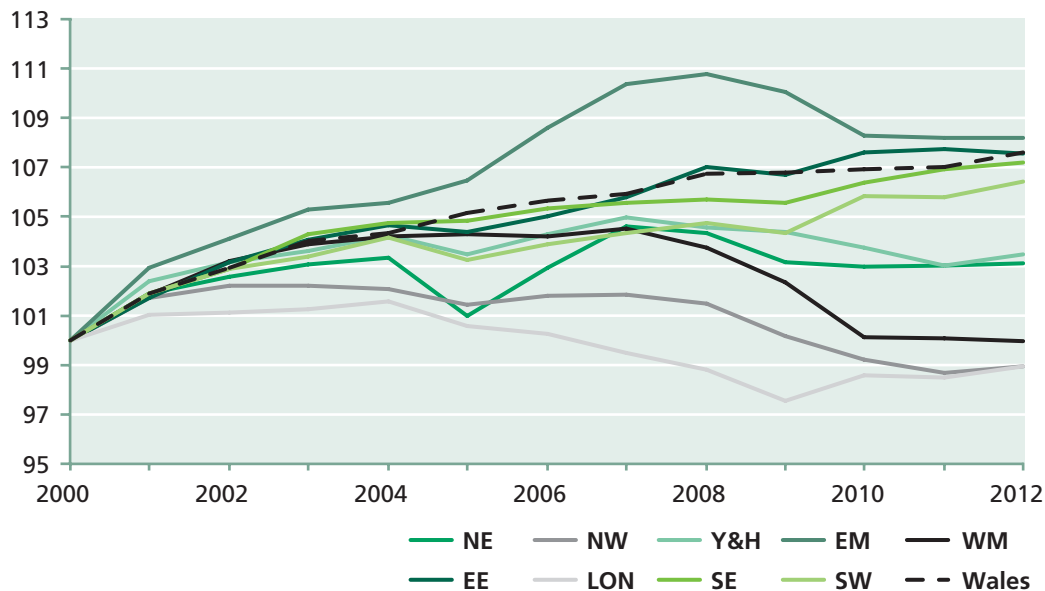
## APPENDIX B – RECENT DEVELOPMENTS IN COMMERCIAL FLOORSPACE IN ENGLAND AND WALES

This appendix provides a more detailed analysis of the composition of, and recent changes in, the stock of commercial property within England and Wales using recently published experimental statistics from the Valuation Office Agency on the stock of commercial property. Changes in the stock in different regions and cities are examined and possible explanations provided for what would otherwise appear to be some surprising results.

### B1 Recent changes in the stock of commercial property

The pattern of change in the commercial property stock around UK regions is considered, with a focus on the contribution of different types of property towards overall growth in the stock.

**Figure B1: Growth in total commercial floor space by UK region, 2000–2012**



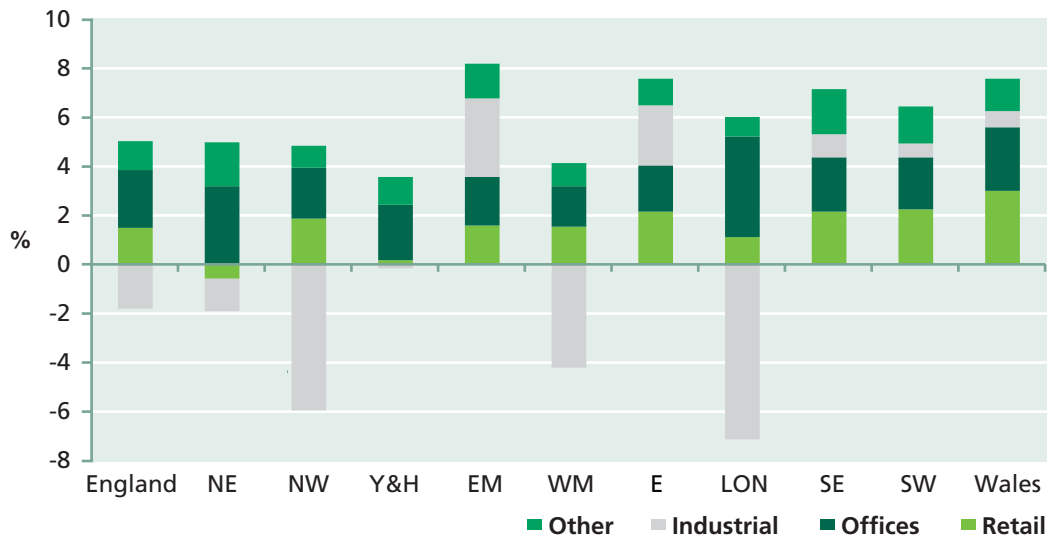
Source: Oxford Economics/VOA  
Note: 2000 = 100

At the regional level, the greatest gains in commercial floorspace have been in the East Midlands and East of England, with the stock rising by around 7–8% over the 2000–2012 period (Figure B1). The strong performance of these two regions relative to others seems to be due to an expansion in industrial floorspace. By contrast, industrial floorspace contracted in most other regions, except for a modest expansion in the South East and South West.

London's relatively weak performance in terms of overall floorspace is primarily accounted for by the contraction of industrial floorspace. There was moderate growth in office premises over the same period, although as considered later, this was more than matched by demand.

## APPENDIX B – RECENT DEVELOPMENTS IN COMMERCIAL FLOORSPACE IN ENGLAND AND WALES

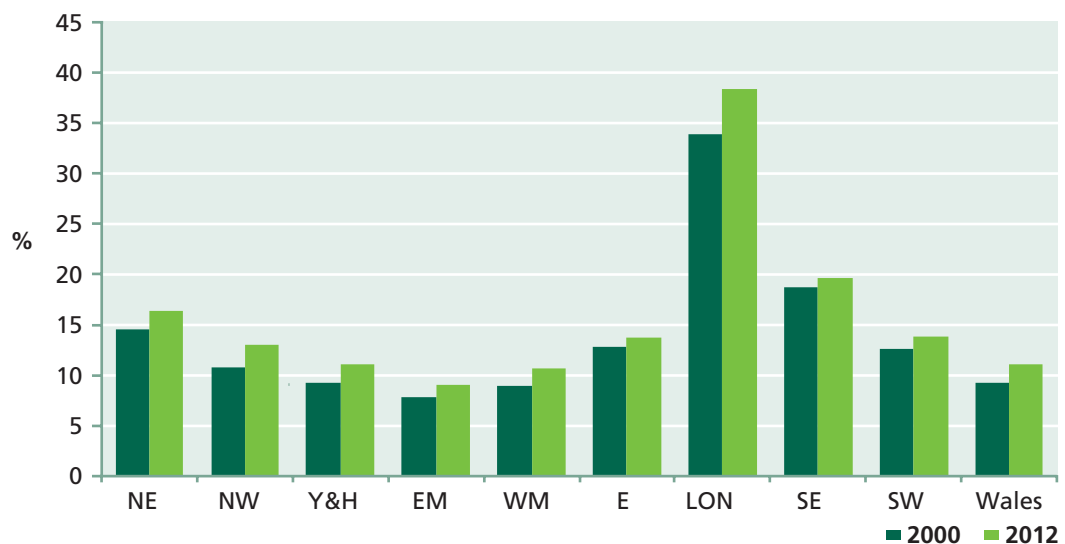
Figure B2: Type of property contributing to growth in regional commercial stock, 2000–2012



Source: Oxford Economics/VOA

There was a fairly uniform pattern in terms of the types of commercial space driving growth – office space grew in every region over the period, while only in the North East did the area of retail space fall (Figure B2). The ‘Other’ commercial space category<sup>31</sup> grew in all areas of the UK.

Figure B3: Share of offices in commercial floorspace



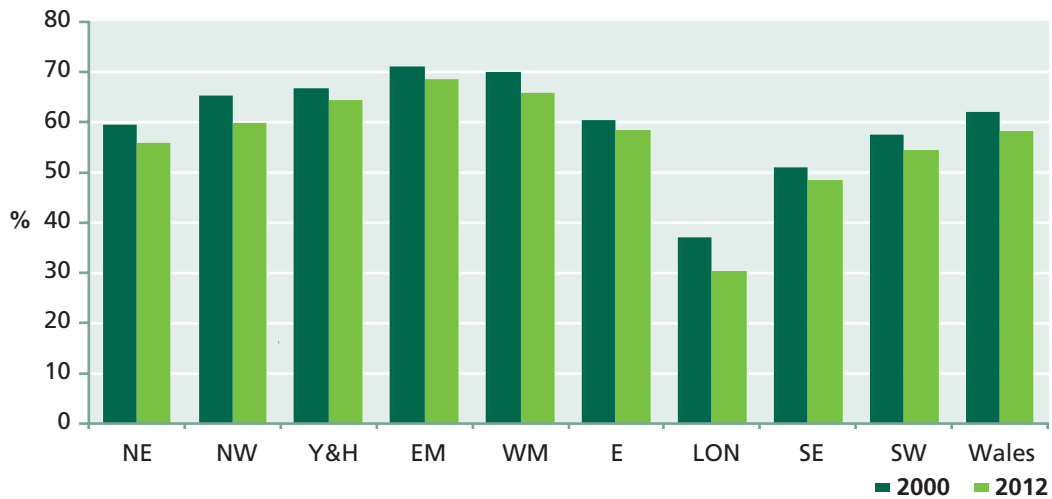
Source: Oxford Economics/Haver Analytics

Despite the growth of office space around the UK, the relative composition of commercial property stocks across the regions has not changed substantially. As might be expected, the share of commercial property accounted for by offices is substantially higher in London (at almost 40%) than in other regions – almost twice as high as the next highest, the South East. As a corollary, the share of industrial in total floorspace, already much lower than most other regions, is now well below 30% in the London area (Figure B4).

<sup>31</sup> For example, leisure and hospitality venues, sports facilities.

## APPENDIX B – RECENT DEVELOPMENTS IN COMMERCIAL FLOORSPACE IN ENGLAND AND WALES

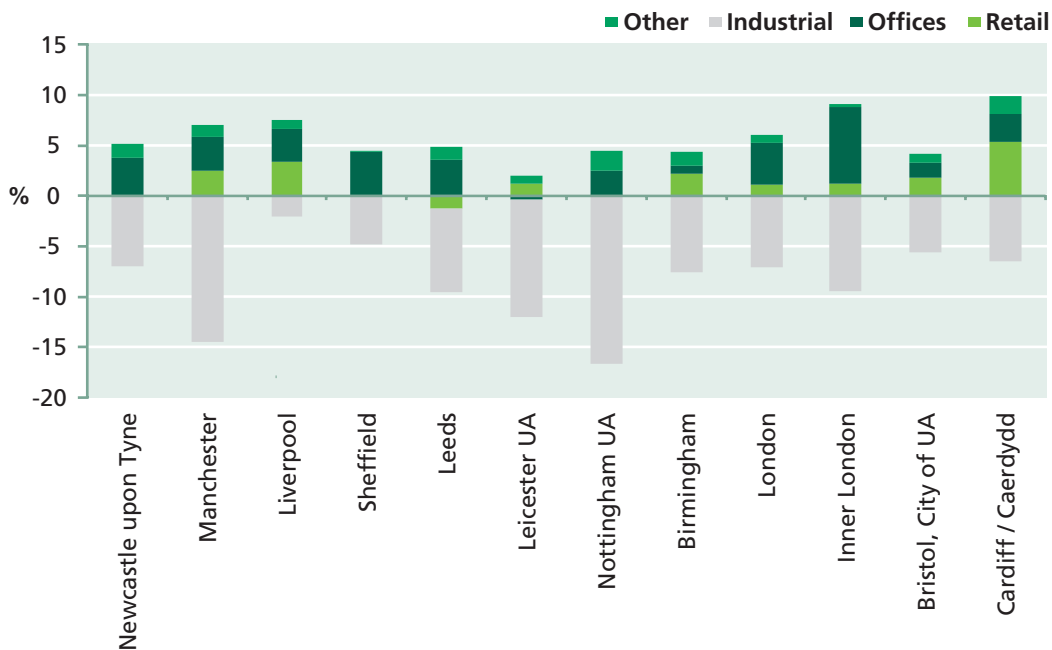
Figure B4: Industrial share of commercial property



Source: Oxford Economics/Haver Analytics

Figure B5 illustrates the relative positions within major cities in England and Wales. There has been a considerable spread in the overall growth of commercial property around the various cities, with those in the East Midlands demonstrating the weakest growth, although Manchester, Leeds and Birmingham have all also shed floorspace over the past decade. Cardiff and Liverpool have fared better, although in the case of Cardiff there has been substantial volatility, with the early half of the decade showing strong growth, before contraction between 2007 and 2009, followed by renewed expansion.

Figure B5: Contribution to changes in commercial property stock, 2000–2012

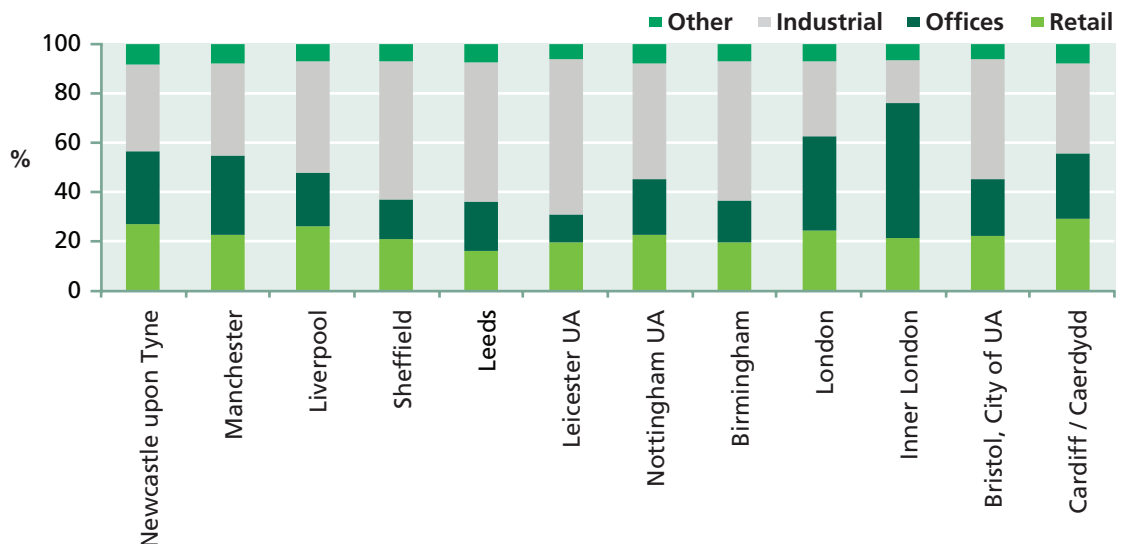


Source: Oxford Economics/Haver Analytics

## APPENDIX B – RECENT DEVELOPMENTS IN COMMERCIAL FLOORSPACE IN ENGLAND AND WALES

The current composition of floorspace within the major cities<sup>32</sup> is illustrated in Figure B6. In most cities the area of industrial floorspace declined over the past decade, with the sharpest shrinkages in Nottingham and Leicester (somewhat at odds with the regional picture, where the East Midlands has in fact added industrial space, which almost certainly reflects a decrease in genuine industrial space close to the city centres and an expansion of greenfield distribution centres near to motorways). In common with the regional picture, office and retail space have generally made positive contributions to the stock of commercial property floorspace, with Cardiff seeing the greatest increase in retail property and Central London the greatest contribution from offices. Birmingham, Bristol and Leicester have seen relatively muted contributions from office development.

**Figure B6: Composition of commercial floorspace, 2012**



As a result, the mix of the commercial property stock looks substantially different across the regions, as observed in Figure B6. The low share of industrial property at the London regional level shows up even more acutely in Inner London but a number of other cities still have substantial volumes of industrial premises. Cities in Yorkshire have particularly high shares of industrial property remaining, with much lower office shares than in other northern cities such as Manchester, Liverpool and Newcastle.

However, care is required when examining local authority data. This is because local authority boundaries can be relatively tightly drawn around cities, which can affect the interpretation of data. Sheffield and Leeds, for example, are relatively large local authorities, incorporating areas that encompass parts of the M1 and other motorways, where a number of distribution warehouses are located. Hence, while Sheffield and Leeds have lost industrial space closer to the city centre, there has been some offsetting increase in industrial (or, more precisely, distribution warehousing) space further away from the city centre. By contrast, Manchester Local Authority is tightly delineated by the metropolitan area and so is less likely to draw in industrial/warehousing property on the edge of town.

<sup>32</sup> Local Authority District (LAD) data are used as proxies for cities except for Inner London which is a collection of LADs.

## APPENDIX C – TECHNICAL DETAIL TO SECTION 4

### C1 Perpetual inventory method – technical issues

The method currently used by the Office for National Statistics (ONS) (and almost all other national statistical offices), to estimate the capital stock is known as the perpetual inventory method. Broadly speaking, this makes an assumption about the length of the service life of different asset types and then applies a straight-line depreciation (i.e. assets depreciate at a constant share of the initial value over the life of the asset). ONS are planning to introduce more direct survey-based information but, at present, have yet to release anything that is not based on the perpetual inventory method. The closest asset definition to commercial property released by ONS is for “Other (i.e. non-residential) Buildings and Structures”. As this includes such things as infrastructure, hospitals and schools, it is too broad. Another limitation is that the ONS estimates currently only run to 2009.

The alternative used here is to construct an estimate of the net capital stock in commercial property by applying the perpetual inventory method to the ONS’ construction output new work (commercial and industrial) data (i.e. by taking the construction output data as a measure of new investment in commercial property and then estimating the implications for the capital stock). This approach has the advantage of both being very up to date and of making the capital stock estimates fully consistent with the familiar ONS construction output data.

The main technical assumptions used by the perpetual inventory method are, therefore, the service life of the asset and the pattern of depreciation. ONS have assumed a relatively long service life for commercial buildings in the past<sup>33</sup> but this has been increasingly questioned. An international 1998 survey by Statistics Netherlands showed that the assumed service life for building in financial and business services ranged from 30 years (Belgium and France) to 85 years (Iceland). A more recent study in Canada,<sup>34</sup> based on surveys of companies depreciation policies (ex ante) and observations of the ex-post treatment of assets, showed the following:

**Table 4.1: Estimated building service lives (years)**

|  | Ex post | Ex ante |
|--|---------|---------|
| Offices                                  | 31.4    | 33.3    |
| Shopping Centres, Plazas, Malls & Stores | 20.3    | 30.7    |
| Other Industrial & Commercial Property   | 28.2    | 23.9    |

Source: Baldwin et al. (2005), based on Canadian data

These estimates confirm a service life that is closer to the assumptions used in Belgium and France than that historically used for the UK. Based on this evidence, the estimated net capital stock presented here assumes a service life of 30 years.<sup>35</sup>

<sup>33</sup> ONS do not currently publish their asset life assumptions but it appears to be around 50 years on average for private-sector buildings and structures, though it may be falling over time.

<sup>34</sup> Baldwin, Gellatly, Tanguay, M., & Patry A (2005), “Estimating the Depreciation Rates for the Productivity Accounts”, Statistics Canada.

<sup>35</sup> Rather than assume a single service life, most official estimates assume an average with a distribution around it. This has not been done here due to the limited time series of construction output. Experiments, however, indicate that it would make little difference to the estimated net capital stock.

## APPENDIX C – TECHNICAL DETAIL TO SECTION 4

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A 30-year service life is, however, a simplifying assumption. There are many examples of buildings in use that are more than 30 years old. What the assumption implies is that either these buildings have had substantial amounts of capital expenditure to make them economically useful today or, if still in use in their original state with no major improvements, that they form an insignificant part of the stock. Assuming a 30-year service life also has the advantage of excluding a large amount of old commercial floorspace that has little economic value (e.g. marginal retail space) that has not had the benefit of major modernisation or refurbishment spending.

With regard to the relationship between capital spending and the usefulness of a building it is interesting to note the strong relationship that Crosby et al.<sup>36</sup> found between capital spending and rental depreciation (the rate that rents decline on a building as it ages). This supports the argument that much of the value of a building of more than 30 years in age actually reflects the value of more recent capital spending.

The second assumption needed to generate net capital stock estimates using the perpetual inventory method is the pattern of depreciation. As mentioned, ONS assumes straight depreciation. The estimates presented here use an alternative assumption of hyperbolic depreciation, which is used in a number of other countries. This means that the economic value of investment is assumed to depreciate at a slower rate in the earlier years than in the later years. For example, a 5-year-old building is assumed to have 91% of the economic value of a new building while a 20-year-old building is assumed to have 75% of the value of a 15-year-old one. A straight-line depreciation assumption would give approximately 83% of the value in either case.

The hyperbolic depreciation assumption has been adopted because it is a better measure of changes to an asset's productive value as it ages, as well as it being the system adopted by many national accounting statisticians. The more rapid decline in the rental value of newer properties, by contrast, is considered to be an example of the new car phenomenon (i.e. the value falls immediately upon its purchase). There is a valid debate about the value of prestige and the contribution of intangible investment generally, which is beyond the scope of this research, but alternative estimates of the capital stock are given in Appendix B that show the effect of different depreciation assumptions.

The estimates of the net capital stock in commercial property presented in Section 4 are based on the assumption that depreciation follows a hyperbolic pattern. There is not a consensus on the pattern of depreciation in commercial property, however, and this appendix considers the sensitivity of net capital stock estimates and the conclusions of Section 4 to that assumption.

<sup>36</sup> Crosby, N., Devaney, S., Frodsham, M., Graham, R. & C. Murray (2010), "Depreciations of Office Investment Property in Europe", IPF.



APPENDIX C – TECHNICAL DETAIL TO SECTION 4

Figure C1: Alternative residual value depreciation assumptions

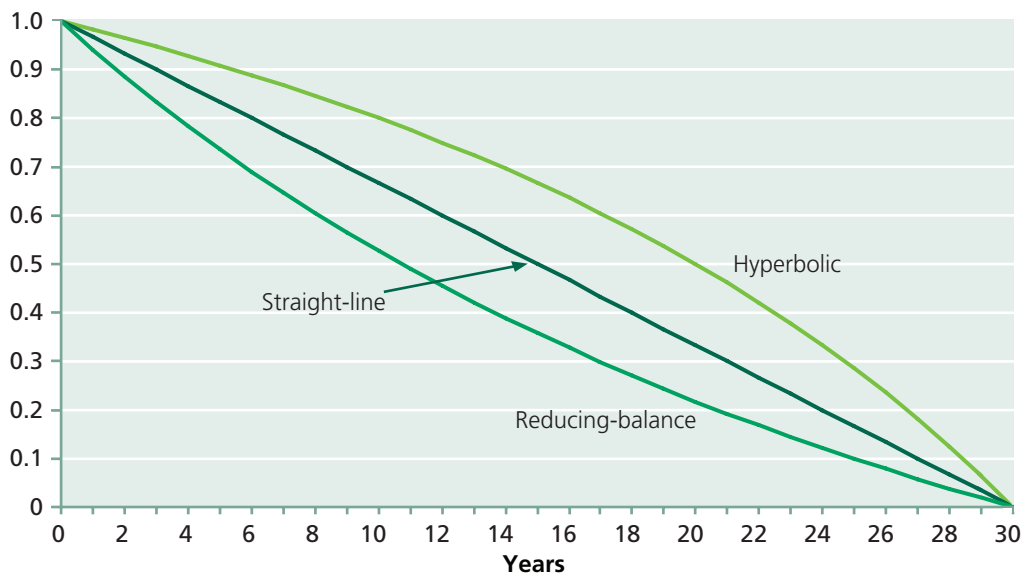
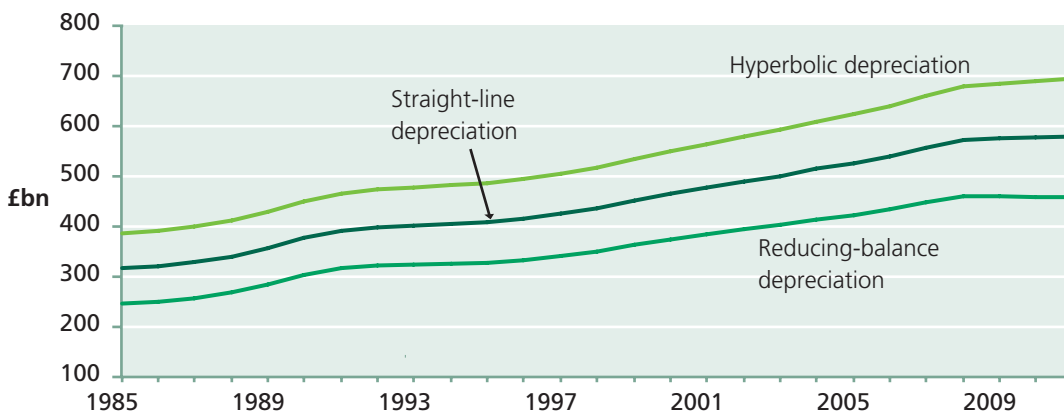


Figure C2: Alternative estimates of net capital stock in commercial property (2009 prices)



Source: Oxford Economics

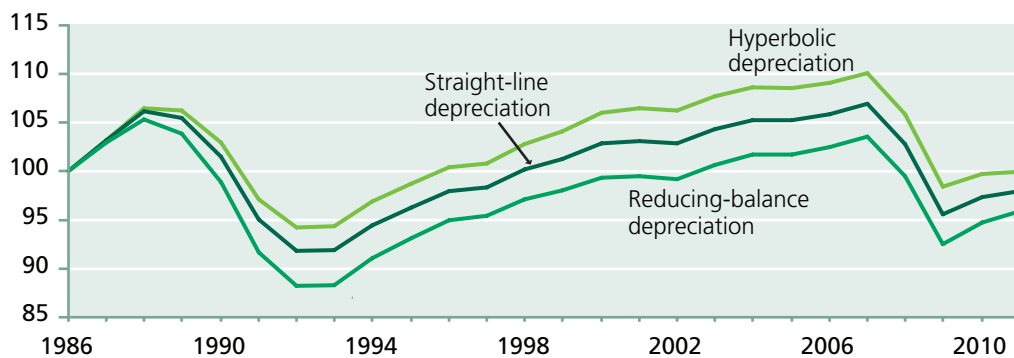
Figure C1 shows three alternative patterns for depreciation. Hyperbolic depreciation is assumed for the production of the net capital stock estimates presented in Section 4. Reducing-balance depreciation matches the view that assets depreciate more in the earlier years (as a proportion of the initial value) while straight-line depreciation is a neutral assumption where depreciation, as a proportion of the initial value, is evenly spread over the service life of the asset. The implications of these three alternative assumptions for the net capital stock estimates are shown in Figure C2.

## APPENDIX C – TECHNICAL DETAIL TO SECTION 4

Hyperbolic depreciation assumes that the economic value of an asset remains higher for longer so net capital stock estimates based on a hyperbolic depreciation assumption will be higher than estimates produced using alternative assumptions.<sup>37</sup> At the other extreme, assets depreciate more quickly with a reducing-balance assumption so the net capital stock estimates are lower. This is clearly illustrated in Figure C2.

That there are level differences between the alternative net capital stock estimates is of no particular economic significance. What is more important is that the growth rates can differ. Reducing balance gives more weight to recent investment, so net capital stock estimates constructed using a reducing-balance depreciation assumption will grow more rapidly than under other assumptions if the level of investment is trending up. With a hyperbolic depreciation assumption the net capital stock in commercial property increased by 79.9% between 1985 and 2011. With the straight-line depreciation method the estimated growth of the net stock is 82.9%, and the reducing balance assumption gives an estimate of 86.1% growth.

**Figure C3: Non-oil GVA to net capital stock in commercial property ratio**



Source: Oxford Economics/Haver Analytics  
Note: 1986 = 100

Figure C3 shows what impact the alternative depreciation assumptions have on the non-oil GVA to the net capital stock of commercial property ratio. The slight upwards trend in the ratio evident with the hyperbolic depreciation assumption disappears altogether with the alternative assumptions. In other words, the assumption of either straight-line or reducing-balance depreciation gives a growth rate for the net capitals stock of commercial property that moves almost exactly in line with non-oil GVA in the long run, although there are obvious shorter-term patterns.

The analysis presented in Section 4.4 makes an allowance for the apparent upwards trend in the non-oil GVA to net stock ratio. Using the other assumptions (i.e. straight-line or reducing-balance) means that this would not be required and, as a result, a higher growth rate of the net capital stock of commercial property would be required to keep it in balance with non-oil GVA in the future. As depreciation would also be higher, this means that there would be a higher estimated requirement for future new work (although it would not be that different from the projections shown in Section 4.5). This illustrates that the hyperbolic depreciation assumption does not bias the conclusion in favour of a greater implied need for new commercial work in the future and, if anything, strengthens the conclusions in Section 4.5.

<sup>37</sup> The whole-life economic value of an asset is the area under the curves in Figure C1. This is highest with hyperbolic depreciation, less so with a straight-line depreciation assumption and lowest with a reducing-balance assumption.

## APPENDIX C – TECHNICAL DETAIL TO SECTION 4

### C2. Forecasting new work and the capital stock

The following is an estimated relationship between new work, non-oil GVA and the lagged capital stock in commercial property:

#### Equation C1: Dependent variable: $\ln(\text{New Work}_t)$

| OLS 26 observations 1986–2011                                  |                       |                       |         |
|--|-----------------------|-----------------------|---------|
|  | Estimated coefficient | Estimated t-statistic | p-value |
| $\ln(\text{New Work}_{t-1})$                                   | 0.48                  | 4.34                  | 0.0003  |
| $d\ln(\text{Non-oil GVA}_t)$                                   | 1.82                  | 2.71                  | 0.0130  |
| $\ln(\text{Net Capital Stock}_{t-1}/\text{Non-oil GVA}_{t-2})$ | -1.87                 | -4.74                 | 0.0001  |
| Constant   | 4.25                  | 4.24                  | 0.0004  |
| $R^2$  | 0.90                  |                       |         |
| Serial Correlation $X^2(2)$                                    | 0.86                  |                       | 0.7000  |
| Chow Forecast $X^2(2)$   | 4.30                  |                       | 0.0800  |

This is known as a stock-adjustment model. There is a long-run relationship between the net capital stock in commercial property and non-oil GVA but it can deviate from it in the short run. In particular, a change in non-oil GVA will bring about a disproportionate change in new work. Increases in the net capital stock will decrease new work unless met by a corresponding increase in non-oil GVA. Note that the trend was omitted from Equation C1 as it was not found to be significant.

Equation C1 is a relatively crude approximation of reality as it only takes into account the relationship between commercial property and non-oil GVA directly without addressing changes in rent and yields, the chances for capital gains or the impact of changing construction costs. Nonetheless, the equation fits quite well and passes the diagnostic tests (for serial correlation and post-sample parameter stability).

The forecasts produced using Equation C1 are shown in the main text (Figures 4.5–4.7). The model can also be used for scenario analysis in order to show the sensitivity to the future path of non-oil GVA growth. Two such downside scenarios are illustrated below (the model can, of course, produce upside scenarios but the general focus of economic scenario generation at the time of writing (July 2012) is firmly on the downside).

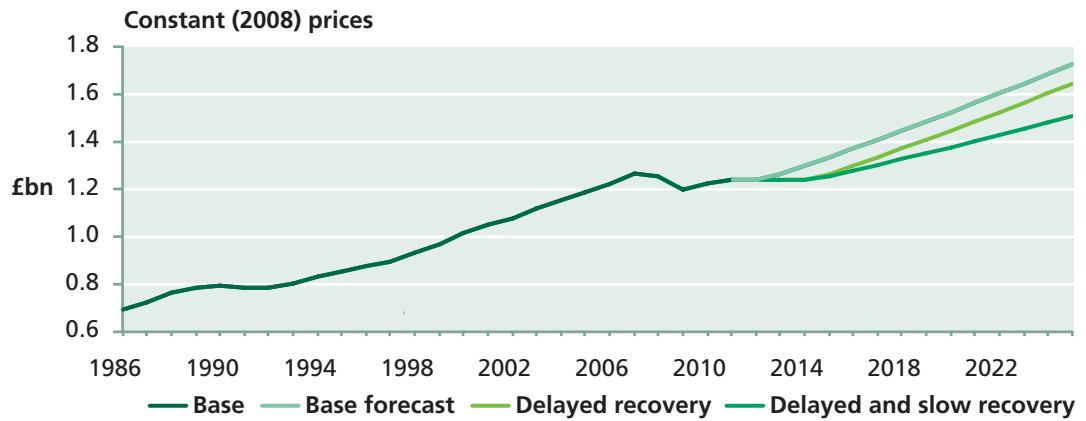
The scenarios are:

- delayed recovery – there is no change in non-oil GVA in either 2012 or 2013. From 2014, non-oil GVA increases in line with the Oxford Economics forecast only two years later.
- delayed and slow recovery – as above except that growth from 2014 is only two-thirds of that in 'delayed recovery'.

The scenario results are illustrated in Figures C4–C6.

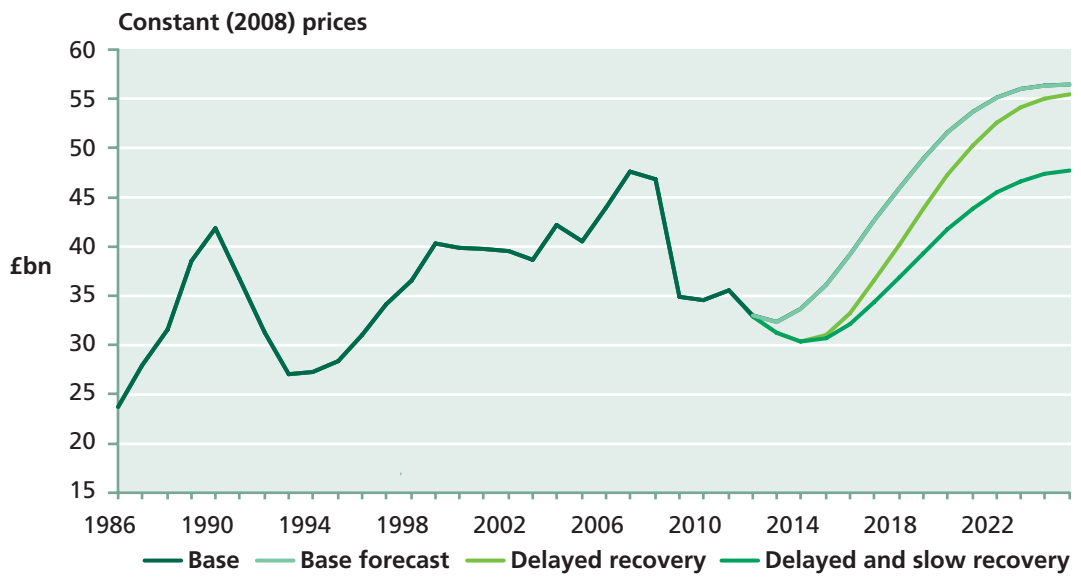
**APPENDIX C – TECHNICAL DETAIL TO SECTION 4**

**Figure C4: Non-oil GVA in three scenarios**



Source: Oxford Economics

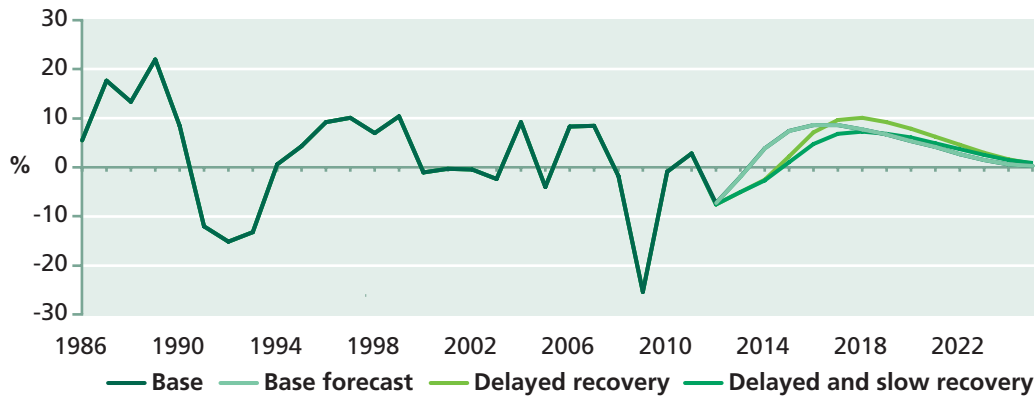
**Figure C5: New work in commercial and industrial construction**



Source: Oxford Economics

**APPENDIX C – TECHNICAL DETAIL TO SECTION 4**

**Figure C6: Change in new work in commercial and industrial construction**



Source: Oxford Economics

In both downside scenarios, the recovery in new work is delayed until 2015. Both scenarios do eventually see a bounce back. This is quite rapid in the 'delayed recovery' scenario with new work expanding by over 9% in each of 2017, 2018 and 2019. As might be expected, the bounce back is even more muted in the 'delayed and slow recovery' scenario. Nevertheless, growth is still over 6% in each year between 2017 and 2020.

## BIBLIOGRAPHY

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In preparing this report the authors have used data from a number of sources, including the Valuation Office Agency's floorspace statistics, Oxford Economics' own estimates and forecasts for sectoral employment and output, and a range of data series from the Office for National Statistics, relating to (amongst others) Gross Value Added in the UK economy and its composite sectors, estimates of the commercial property stock, and construction output series.

In addition, they have also drawn on the reports mentioned below:

- Property Data Report August 2011;
- Commercial Property Key Facts 2004, by Andrew Scott, London Business School;
- A Survey of the UK Taxation System 2011, Institute of Fiscal Studies;
- The Contribution of Commercial Property to the UK economy, 2006, Oxford Economic Forecasting; and
- Depreciations of Office Investment Property in Europe, 2010, Crosby, N., Devaney, S., Frodsham, M., Graham, R. & C. Murray, IPF.



**NOTES**

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