

# Agenda

## Advancing economics in business

### Index-linked bonds 2.0: introducing CPI-linked securities

The first ever CPI-linked bond in June 2015 heralds a milestone in UK capital markets. It follows calls for the Office for National Statistics (ONS) to make the consumer price index (CPI) the UK's headline measure of inflation, and for regulators to cease using the retail price index (RPI) in setting charges for utilities. What does this imply for the future of index-linked gilts, and how might it affect RPI - X regulation?

This year the Greater London Authority (GLA) issued the first CPI-linked sterling bond to part-finance the £1bn project for extending the Northern Line on the London Underground. The GLA CPI-linked bond raised £200m for 25 years, paying a coupon of CPI + 0.34%.

Historically, all inflation-linked bonds in the UK have been indexed to RPI. The GLA's decision to issue a bond linked to CPI therefore sets a precedent in UK markets. Not only does it mark a successful CPI entry into the UK bond market, but it also has the potential to affect several areas of the economy if adopted by regulators and government authorities in setting charge controls.<sup>1</sup>

This article looks at the CPI-linked bond issuance in more detail and considers its implications for capital markets and regulated industries.

#### Choosing an index

##### Overview of the index-linked market

The idea of indexing debt repayments to a measure of inflation is not new—for instance, the US state of Massachusetts issued securities linked to the price of silver as early as 1742.<sup>2</sup> While the market has evolved significantly since then, government issuers still dominate index-linked issuances, as illustrated in Figure 1.

In 1981, the UK was the first industrialised country to supplement its government bond issuances with index-linked bonds (linked to RPI),<sup>3</sup> and it is still among the top global linked issuers, as shown in Figure 2 overleaf.

As at 1 June 2015, the UK had £44bn of corporate and £258bn of sovereign index-linked bonds outstanding.<sup>4</sup> As at June 2015, all UK government bonds were linked

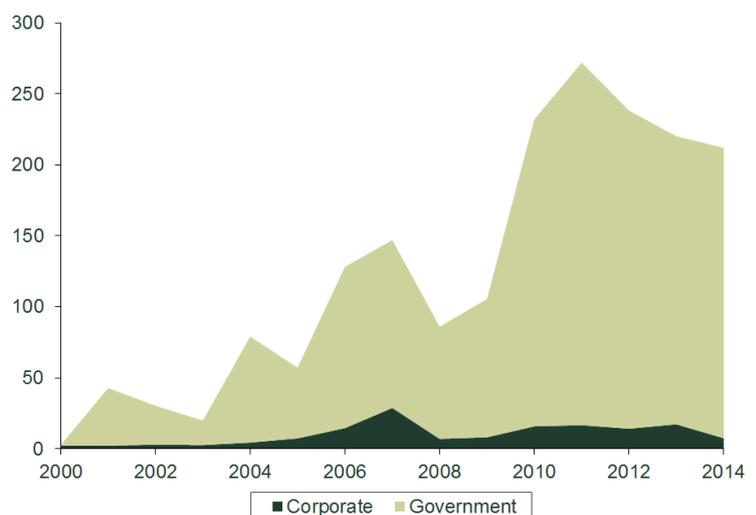
to RPI.<sup>5</sup> The issue of a CPI-linked bond by the GLA therefore represents a marked departure.

##### Overview of inflation indices

RPI was the main domestic measure of inflation until December 2003, when the then Chancellor of the Exchequer, Gordon Brown, announced that the inflation target would be switched to CPI.<sup>6</sup> From that point, CPI became a significant economic indicator. The main reasons cited for the switch were the consistency of CPI with international inflation measures, and a more accurate reflection of consumer behaviour.<sup>7</sup>

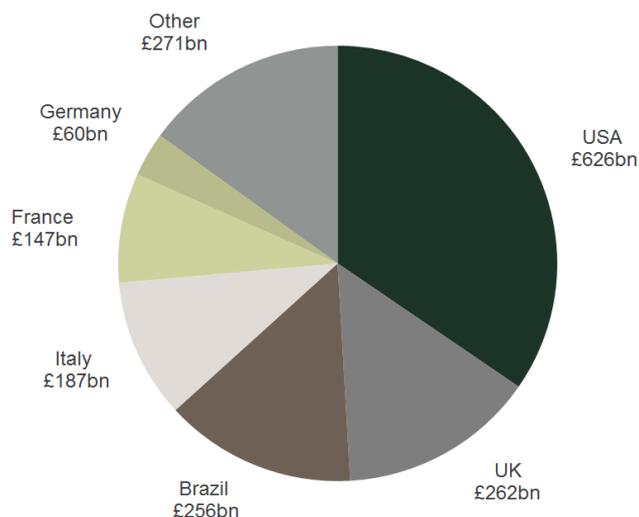
Since 2003, the Bank of England has primarily relied on CPI for setting inflation targets<sup>8</sup> and no longer extensively

**Figure 1 Annual global issues of index-linked bonds (£bn)**



Source: Oxera analysis based on Bloomberg data.

**Figure 2 Total sovereign issues of index-linked bonds in 1985–2015**



Source: Oxera analysis based on Bloomberg data.

discusses RPI in its inflation reports. CPI is also used to calculate income tax allowances and thresholds, indexation of pensions and benefits, pay-setting and wage negotiations, and business contracts.<sup>9</sup> However, RPI is still used by most regulators to set prices across utilities sectors, and is often adopted for wage settlements and contract negotiations. RPI is also the primary benchmark index for UK index-linked gilts. Despite its uninterrupted use for these purposes, RPI is no longer classified as a National Statistic by the ONS, on the grounds that the measure fails to meet international standards as an inflation metric.<sup>10</sup> The box illustrates the differences between the two inflation measures.

## GLA bond dynamics

The GLA CPI-linked bond raised £200m for 25 years, paying a CPI-linked coupon of 0.34%. The only investor was Rothesay Life, a specialist pensions insurer.<sup>11</sup> The projected profile of cash flows to Rothesay Life is shown in Figure 3 overleaf. While the real interest payments remain constant over the life of the bond, nominal interest payments increase over time in line with inflation (as the nominal interest rate is the real interest rate plus inflation). Moreover, the face value of the bond grows in line with the inflation index, which could lead to a significant value gain of the bond over 25 years.

In general, investors demand higher premiums in 'pilot' issues to compensate them for taking a 'journey into the unknown'. However, in this case the GLA did not offer a higher premium to the investor, and linking the coupon payments to CPI rather than RPI actually resulted in more favourable borrowing terms for the GLA, for the following reasons.

First, as shown in Figures 4 and 5 overleaf, RPI has historically been higher than CPI in most years, with the exception of 2009 when it was negative—primarily due

### Main differences in UK RPI and CPI

**Composition.** The prices of some goods and services are included in one index but not the other. For example, mortgage interest payments, council tax and housing depreciation are included in RPI, but not in CPI; whereas items such as stockbroker fees, university accommodation and unit trust fees are included in CPI, but not in RPI. There are also differences in how prices are measured: RPI uses movements in the prices of used cars as a proxy for new cars, while CPI uses a specific index for new cars (based on their 'list' prices).

**Coverage.** CPI draws from a wider population base than RPI. The latter excludes expenditure by the highest 4% of earners, pensioners who rely mainly on benefits, and residents of institutions, with the aim of representing price levels faced by the 'average' UK household. This information is included in CPI in order to take into account the spending patterns of all consumers.

**Combining price movements.** Raw price movements of the underlying items within each category of goods are combined differently in RPI and CPI. RPI uses the arithmetic average of the price indices of the underlying items, whereas CPI uses the geometric average. Since the arithmetic average of a set of numbers is (almost) always greater than the geometric average, this difference causes RPI inflation to be systematically higher than CPI inflation.

Source: Office for National Statistics (2010), 'Differences between the RPI and CPI Measures of Inflation'; Office for Budget Responsibility (2011), 'Working paper No. 2: the long-run differences between RPI and CPI', November.

to a sharp fall in house prices and mortgage payments following the financial crisis (these items are included in RPI but not in CPI). This effect was short-lived, and RPI inflation has since returned to pre-crisis levels and continued to exceed CPI.

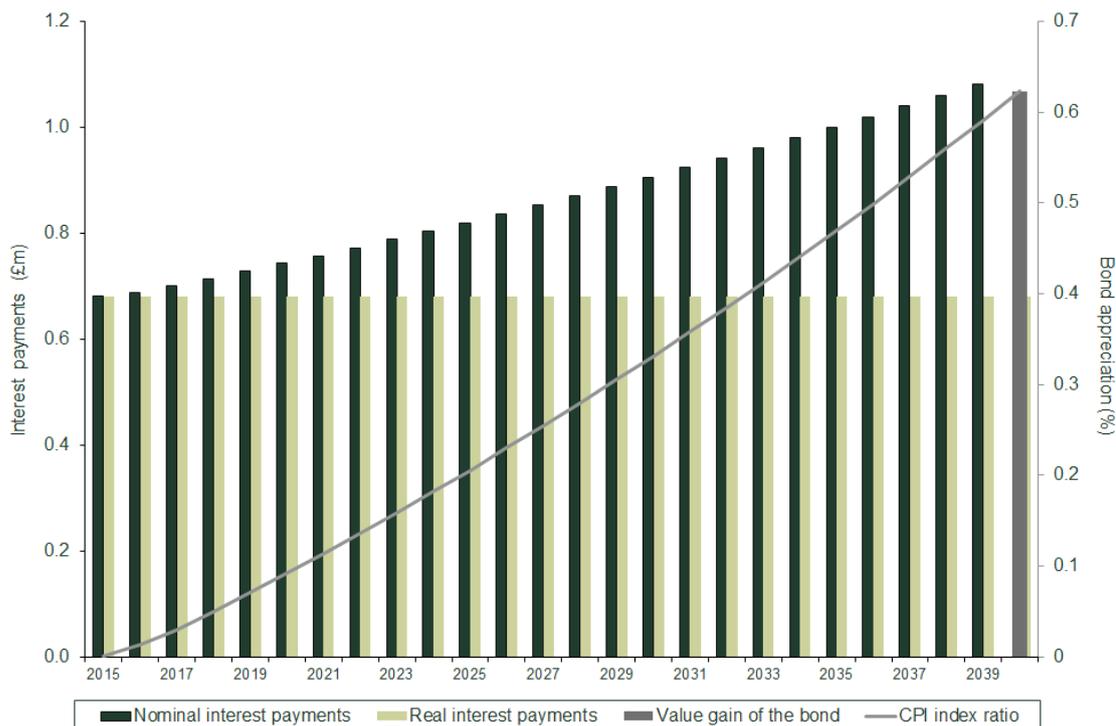
Second, the real interest charged over and above CPI is lower than one might expect. As illustrated in Figure 6 (on page 4), the debt spread for AA rated corporates over RPI was around 1.6% at the time of issuance, while the expected long-run RPI–CPI wedge amounted to 1%. The spread over CPI (the real interest rate with respect to CPI) implied by these figures is 0.6%, while the GLA issued the bond at a CPI-linked coupon of 0.34%.

Lastly, the 'pilot' nature of the bond issue may further justify a higher coupon rate.

Taking all these facts into consideration, the CPI-linked bond is expected to save the GLA around £40m.<sup>12</sup>

From an investor's point of view, the CPI-linked bond provides benefits that are not provided by an RPI-linked bond.

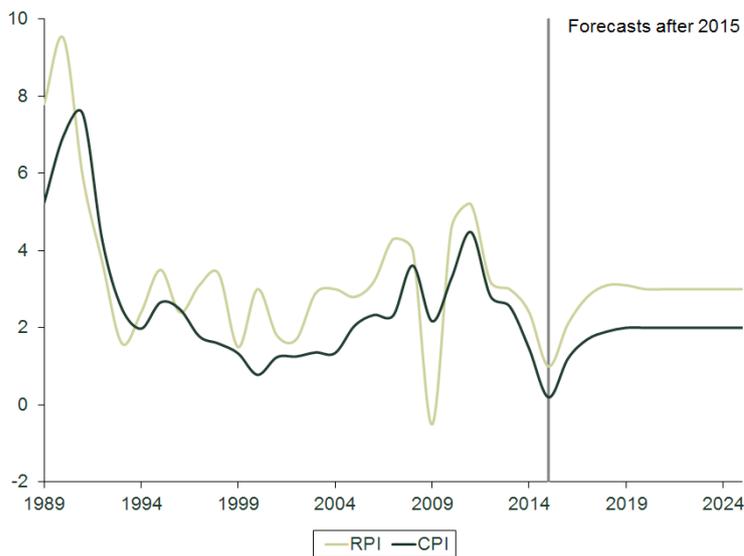
**Figure 3 Cash-flow profile of the GLA CPI-linked bond**



Note: The figure is for illustrative purposes only. The CPI index ratio represents by how much CPI is forecast to increase from the issue of the bond.

Source: Oxera analysis based on Datastream data and Lloyds Banking Group (2015), 'Lloyds Bank launch UK's first consumer price index sterling bond as new London tube link moves one step closer', May, p. 1.

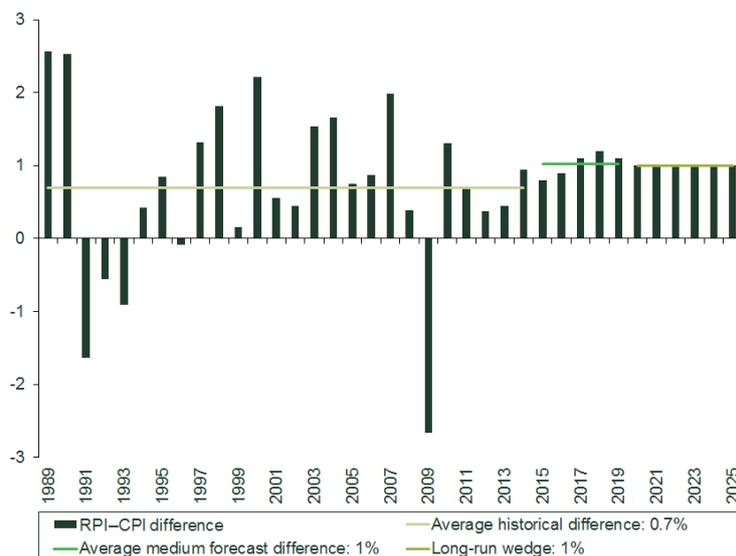
**Figure 4 Historical and projected inflation (%)**



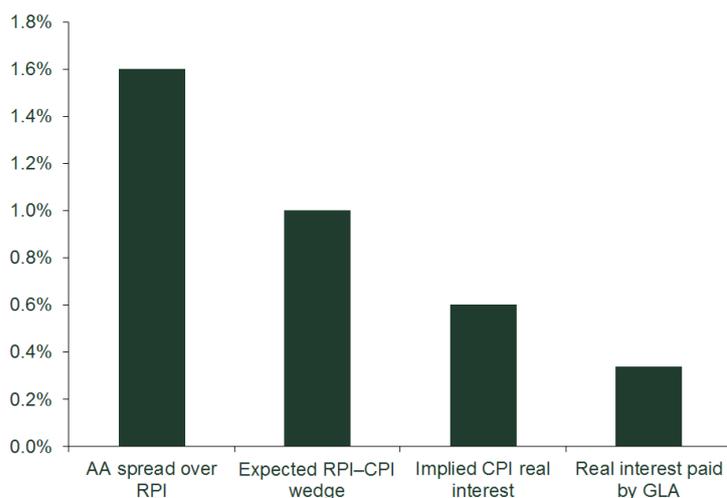
Note: Forecast RPI after 2015 is taken to be 3%, as the Office for Budget Responsibility considers a long-term CPI estimate to be 2%, and a CPI-RPI wedge (where RPI is higher than CPI) to be 1%. This implies a long-term RPI forecast of 2% + 1% = 3%. See Office for Budget Responsibility (2014), 'Fiscal Sustainability Report'; and Office for Budget Responsibility (2015), 'Economic and Fiscal Outlook'.

Source: Oxera analysis based on Datastream and data from Hills, S., Ryland, T. and Dimsdale, N. (2010), 'The UK recession in context – what do three centuries of data tell us?', Bank of England Quarterly Bulletin 2010 Q4, Data Annex, version 2.1; Office for National Statistics; Office for Budget Responsibility (2015), 'Economic and Fiscal Outlook', p. 87 and Box 3.3; and Office for Budget Responsibility (2014), 'Fiscal Sustainability Report', Table 3.5.

**Figure 5 Historical and projected RPI-CPI wedge**



Source: Oxera analysis based on Datastream and data from Hills, S., Ryland, T. and Dimsdale, D. (2010), 'The UK recession in context – what do three centuries of data tell us?', Bank of England Quarterly Bulletin 2010 Q4, Data Annex, version 2.1; and Office for National Statistics.

**Figure 6 Cost of GLA CPI-linked bond vs AA corporates**

Source: Oxera analysis based on Datastream.

First, the CPI-linked bond provides a good hedging opportunity to the investor by offering a previously unavailable market instrument. This may explain why the sole investor is a pensions insurance fund, whose liabilities are linked to CPI.

Second, the CPI-linked bond offers a lower duration than an RPI bond, while still being linked to a measure of inflation.<sup>13</sup> The peculiarity of index-linked bonds is that the majority of the cash flow comes when the indexed principal is repaid at maturity. Given that CPI tends to grow at a lower rate than RPI, the cash-flow schedule is less skewed towards maturity, thus lowering the duration of the bond.

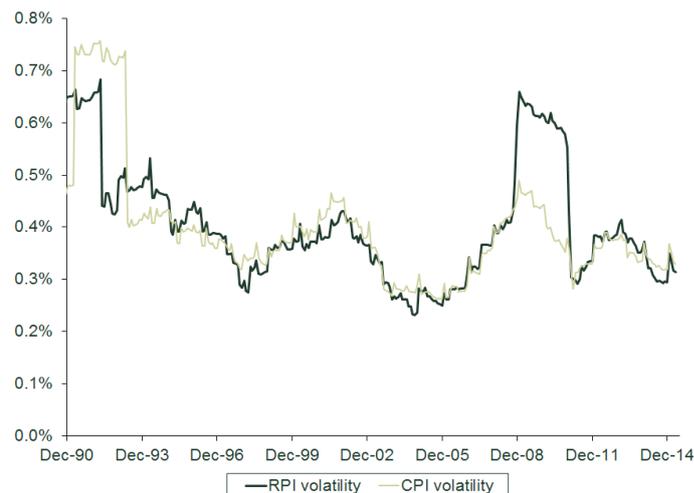
Finally, in the recent past, CPI has been less susceptible to volatility spikes than RPI, as shown in Figure 7. This is because of the inclusion of items such as house prices and mortgage payments in RPI that are inherently more volatile. Using CPI instead of RPI is likely to result in more stable cash flows, which benefits both parties.

## The path beyond

### RPI indexation loses favour

In the UK, RPI has lost its erstwhile status as a National Statistic, and Paul Johnson, Director of the Institute for Fiscal Studies, who was commissioned by the UK Statistics Authority to conduct an independent review of UK consumer prices statistics, has echoed views set out by the National Statistician that there are basic statistical flaws in the construction of RPI and that it is not a good measure of inflation.<sup>14</sup> He stated that:

it is time for the UK government to take the next, logical step and stop using RPI in any element of the tax, benefit and regulatory systems.<sup>15</sup>

**Figure 7 Historical volatility of RPI and CPI**

Source: Oxera analysis based on Datastream data.

The UK government continues to use both RPI and CPI. For example, in April 2011 the rate at which public sector pension scheme payouts are uprated was changed from RPI to CPI.<sup>16</sup> However, the interest rate applied to student loans is still linked to RPI.<sup>17</sup>

### Impact on pensions

Currently, the pensions industry appears to offer the most likely source of investors in CPI-linked debt securities. Although many private pension providers still use RPI, there has been a gradual switch towards adopting CPI. For example, following the government's lead on indexing pensions to CPI, BT (one of the largest private defined-benefit pension providers) followed suit, saving the telecoms company c. £3bn as a result.<sup>18</sup> In years to come, it is likely that more private defined-benefit pension schemes will uprate payouts by CPI.

As mentioned above, the sole lender for the first CPI-linked sterling bond was a pensions insurer. As the volume of CPI-linked pensions liabilities rises, an increasing number of pensions providers are likely to seek financial instruments to hedge inflation risk, thus expanding the buy-side market for CPI-linked securities.

### Impact on regulated utilities

As yet, the only examples of regulated industries adopting CPI are those of energy and telecoms. The strike prices of the Contracts for Difference (CfD) introduced as part of the Energy Market Reform (EMR) are indexed to CPI. In making this decision, the Department of Energy & Climate Change noted:

we consider that there is a clear case for CPI to be used for indexation: it is the preferred government measure of general inflation; is governed by international legislation; and

therefore is arguably more robust and durable than alternative indexation measures.<sup>19</sup>

The UK communications regulator, Ofcom, uses CPI in its charge control formula. This relates to how the price cap is set to calculate forecast charges from existing charges at the end of a control period.<sup>20</sup>

This is potentially a harbinger of wider adoption of CPI in the context of regulating the utilities markets, which might lead to its wider application in the energy industry and other regulated industries such as water, aviation and rail. In particular, a politically appealing approach to determining future rail fares could see some rail fares being linked to CPI instead of RPI in order to curtail price rises.

Over time, a shift in regulatory policy towards linking price rises to CPI would widen the pool of potential borrowers in the CPI-linked bond market. However, given the infancy of CPI-linked bonds and the lack of pricing benchmarks, it is unlikely that private organisations will be in any hurry to issue CPI-linked debt. The onus on broadening this market is therefore likely to remain with government bodies in the foreseeable future.

## The impact on government issuance

Given the size and importance of the current index-linked gilt market, it is unlikely that there is going to be a dramatic shift in central government policy with respect

to index-linked gilt issuances. Direct involvement from the Treasury is likely to occur gradually over a considerable period of time.

However, secondary and tertiary government organisations such as the GLA and even UK councils could be well placed to promote CPI-linked inflation bonds. In fact, earlier in 2015, over 60 local authorities across Great Britain formed the UK's Municipal Bonds Agency in order to reduce their long-term capital costs.<sup>21</sup> The UK government's agenda for devolution to local government is likely to provide further impetus to this initiative.<sup>22</sup>

## Concluding thoughts

In future, as public sector CPI-linked bond issuances increase in number and a yield curve begins to emerge providing a reference pricing benchmark, private players will be more willing to issue these instruments. The key factor in driving this development is the decline in importance of RPI relative to CPI. The financing of the Northern Line extension could have far-reaching implications for both bond markets and regulated charges.

<sup>1</sup> Previous *Agenda* articles have addressed the decline of RPI's acceptance in various sectors. See Oxera (2015), 'Is the end nigh for RPI?', *Agenda*, February, <http://www.oxera.com/Latest-Thinking/Agenda/2015/Is-the-end-nigh-for-RPI.aspx>; Oxera (2013), 'RIP RPI?', *Agenda*, January, <http://www.oxera.com/Latest-Thinking/Agenda/2013/RIP-RPI.aspx>; Oxera (2010), 'Choosing an inflation index: RPI, CPI and regulated utilities', *Agenda*, December, <http://www.oxera.com/Latest-Thinking/Agenda/2010/Choosing-an-inflation-index-RPI,-CPI-and-regulate.aspx>; and Oxera (2008), 'RPI – X: time to RIP?', *Agenda*, June, <http://www.oxera.com/Latest-Thinking/Agenda/2008/RPI-%E2%80%93-X-time-to-RIP.aspx>.

<sup>2</sup> Deacon, M., Derry, A. and Mirfendereski, D. (2004), *Inflation-indexed Securities: Bonds, Swaps & Other Derivatives*, John Wiley & Sons, Chapter 1, p. 2.

<sup>3</sup> Bank of England, 'Explanatory Notes – Yields', <http://www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/yields.aspx>, accessed 21 June 2015.

<sup>4</sup> Source: Bloomberg.

<sup>5</sup> Bank of England, 'Explanatory Notes – Yields', <http://www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/yields.aspx>, accessed 21 June 2015.

<sup>6</sup> Bank of England (2003), 'Remit for the Monetary Policy Committee of the Bank of England and the New Inflation Target', Annex: The new inflation target, 10 December, p. 1.

<sup>7</sup> BBC (2007), 'Q&A: UK inflation measures', April, <http://news.bbc.co.uk/1/hi/business/6266733.stm>, accessed 7 July 2015.

<sup>8</sup> Bank of England (2003), 'Remit for the Monetary Policy Committee of the Bank of England and the New Inflation Target', Annex: The new inflation target, 10 December, p. 1.

<sup>9</sup> Office for National Statistics (2013), 'Users and uses of consumer price inflation statistics'.

<sup>10</sup> Office for National Statistics (2013), 'National Statistician announces outcome of consultation on RPI', news release, 10 January.

<sup>11</sup> Other sources of funds included raising finance through an Enterprise Zone from 2016 for a period of 25 years. See Transport for London (2014), 'Northern line extension to Battersea gets go-ahead', press release, <https://tfl.gov.uk/info-for/media/press-releases/2014/november/northern-line-extension-to-battersea-gets-go-ahead>, accessed 20 June 2015. For details of the bond's terms, see Lloyds Banking Group (2015), 'Lloyds Bank launch UK's first consumer price index sterling bond as new London tube link moves one step closer', press release, May, p. 1.

<sup>12</sup> Lloyds Banking Group (2015), 'Lloyds Bank launch UK's first consumer price index sterling bond as new London tube link moves one step closer', press release, May, p. 1.

<sup>13</sup> The duration of a bond is a measure of how long, on average, the bond-holder has to wait before receiving cash payments. Hull, J.C. (2000), *Options, futures, & other derivatives*, Prentice-Hall, p. 108.

<sup>14</sup> Johnson P. (2015), 'UK Consumer Price Statistics: A Review', January.

<sup>15</sup> UK Statistics Authority (2015), 'UK Consumer Price Statistics: A Review', news release, 8 January, <http://www.statisticsauthority.gov.uk/news/news-release---uk-consumer-price-statistics--a-review.pdf>, accessed 7 July 2015.

<sup>16</sup> HM Treasury (2010), 'Budget 2010', 22 June.

<sup>17</sup> See Student Loans Company, 'Student loan repayment', [http://www.studentloanrepayment.co.uk/portal/page?\\_pageid=93,6678755&\\_dad=portal&\\_schema=PORTAL](http://www.studentloanrepayment.co.uk/portal/page?_pageid=93,6678755&_dad=portal&_schema=PORTAL), accessed 3 June 2015.

<sup>18</sup> *The Independent* (2010), 'Blow to BT pension scheme members', 4 November, <http://www.independent.co.uk/news/business/news/blow-to-bt-pension-scheme-members-2125090.html>.

<sup>19</sup> Department of Energy & Climate Change (2013), 'Electricity Market Reform – Contract for Difference: Contract and Allocation Overview', August, para. 4.22.

<sup>20</sup> Ofcom (2015), 'June 2015 LLCC Consultation – Annexes', Annex 9, p. 151.

<sup>21</sup> See Local Government Association, 'The UK's Municipal Bonds Agency', [http://www.local.gov.uk/finance/-/journal\\_content/56/10180/3684139/ARTICLE](http://www.local.gov.uk/finance/-/journal_content/56/10180/3684139/ARTICLE), accessed 7 July 2015.

<sup>22</sup> UK government (2014), 'The Implications of Devolution for England', December, Cm 8969, [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/387598/implications\\_of\\_devolution\\_for\\_england\\_accessible.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387598/implications_of_devolution_for_england_accessible.pdf), accessed 3 June 2015.