

Annex B

Context for decisions on the Debt Management Office's financing remit

Introduction

- B.1 This annex provides the context for the government's decisions for the Debt Management Office's (DMO) gilt and Treasury bill issuance in 2019-20, setting out the qualitative and quantitative considerations that have influenced them.
- B.2 The government's decisions on the structure of the financing remit, which are taken annually, are made in accordance with the debt management objective, the debt management framework and wider policy considerations (see Chapter 2).
- B.3 In determining the overall structure of the financing remit, the government assesses the costs and risks of debt issuance by maturity and type of instrument. Decisions on the composition of debt issuance are also informed by an assessment of investor demand for debt instruments by maturity and type as reported by stakeholders, and as manifested in the shape of the nominal and real yield curves, as well as the government's appetite for risk.
- B.4 Alongside these considerations, the government takes into account the practical implications of issuance (for example, the scheduling of operations during the course of the year and the appropriate use of different issuance methods).

Demand

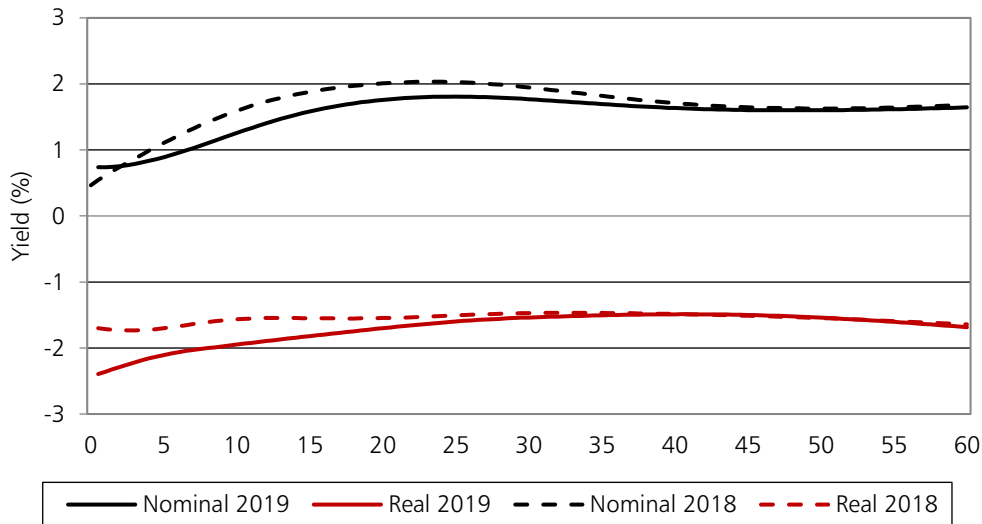
- B.5 Both Gilt-Edged Market Makers (GEMMs) and gilt investors have reported ongoing demand for conventional and index-linked gilts that is well diversified across the maturity spectrum and by investor type.
- B.6 At the annual consultation meetings in January 2019, attendees noted that the relative strength of demand has moved from the ultra-long area of the curve for all gilts to medium and long maturities for conventional gilts and long maturities for index-linked gilts.¹

¹ Minutes of the meetings are available at: www.dmo.gov.uk/media/15769/sa220119.pdf and www.dmo.gov.uk/media/15777/sa280119.pdf

Cost

- B.7** In assessing the cost of different types of debt issuance by maturity and type, the government undertakes an analysis of the nominal and real yield curves. Chart B.1 shows the shape of the nominal and real spot curves at 31 January 2019 and 31 January 2018. Yield curves are little changed compared to last year. The wedge between real and nominal yields illustrates the continued cost-effectiveness of issuing gilts right across the yield curve.

Chart B.1 Nominal and real spot yield curves (31 January 2018 and 2019)



Source: DMO.

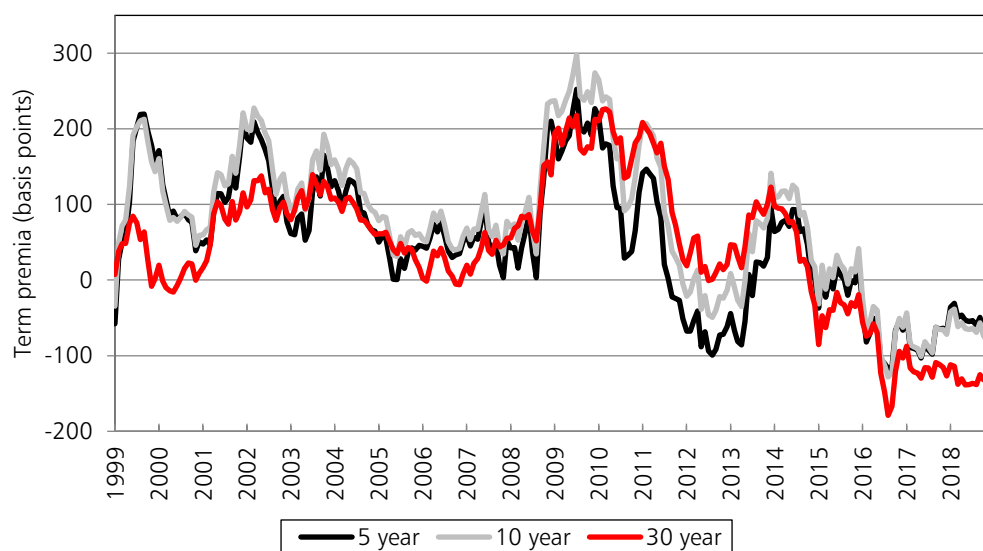
- B.8** Asset pricing theory suggests the observed yield on a bond can be decomposed into 2 components: a 'risk neutral' yield representing the implied forward path of short-term rates; and a risk premium to compensate holders for the longer-term maturity. The risk neutral yield is the interest rate under 'pure expectations'.² In practice, forward yields may follow a different path, as markets typically demand higher yields in order to protect investments against a variety of longer-term risks, which gives rise to a risk (or term) premium.³ The variability and trends in risk premia reflect investors' risk preferences over time. It is cost-effective for a government to issue at maturities where the risk (or term) premium demanded by investors is lowest relative to other maturities.
- B.9** Analysis of the risk (or term) premia in the nominal yield curve between January 1999 and January 2019 indicates the existence of time-varying

² The investor typically charges the issuer through yields for risks associated with investment in bonds. For example, the investor may charge a premium for illiquidity and/or inflation risk. The 'pure expectations' referred to here excludes these premia.

³ The risk premium has several components, including, but not limited to: (i) a premium which compensates investors for duration risk that increases for longer maturity investments; (ii) a credit and default risk premium; (iii) a liquidity discount or premium owing to the different levels of liquidity in some bonds or maturities, which enhances or restricts investors' ability to hedge; and (iv) an inflation risk premium to compensate investors in nominal bonds for uncertainty owing to inflation. In general, the premium is the extra return investors expect to obtain from holding long-term bonds as opposed to holding and rolling over a sequence of short-term securities over the same period. The risk premium estimated by the DMO's model also includes a 'convexity premium' component – this increases with maturity and yield volatility and it offsets to some degree the other risk premium components as it represents a 'charge' that the investor pays the issuer.

premia in the conventional gilt market that are usually positive (Chart B.2).⁴ Further, as a general rule, the premia increases with maturity, although the premia at different maturities have recently been in a compressed range. In 2018-19, term premia remained close to historically low levels at all key benchmark maturities. This suggests that, on this measure, conventional gilts across the maturity spectrum are more cost-effective than has historically been the case.

Chart B.2 Term premia in the conventional gilt market



Source: DMO.

- B.10** Alongside this analysis of the relative cost-effectiveness of conventional gilts across different maturity sectors, the government undertakes an evaluation of the cost-effectiveness of index-linked gilts. It compares long-run historic inflation with market-implied breakeven inflation rates to assess the cost-effectiveness of inflation-linked gilt issuance relative to conventional gilts.⁵
- B.11** Similar to nominal yields, real gilt yields can be decomposed into 3 components: the nominal gilt yield; an expected inflation rate; and a premium (or discount) for affording investors inflation protection. These last 2 components constitute the 'breakeven inflation rate' which represents the market-implied average rate of inflation over the life of the bond. For illustrative purposes, if the long-run historical average inflation rate is assumed to remain at 3%, then a breakeven inflation rate of 3.25% suggests investors are paying a premium of 25 basis points to hold an index-linked bond over conventional gilts. The government benefits from the premium but takes the risk that future inflation – in terms of the Retail Prices Index (RPI) – might be higher than 3.25%, on average. Therefore, for investors this risk premium is a combination of 'protection' against a sustained rise in RPI

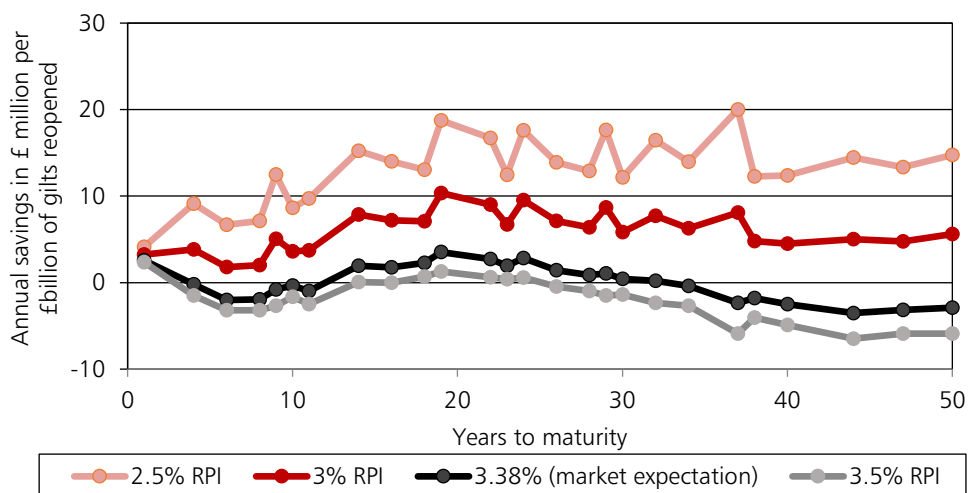
⁴ This analysis is based on academic research: 'The Affine Arbitrage-Free Class of Nelson-Siegel Term Structure Models', Christensen, Diebold and Rudebusch, *Journal of Econometrics*, 2011.

⁵ A more detailed explanation of the methodology used in this analysis can be found at: www.oecd-ilibrary.org/finance-and-investment/assessing-the-cost-effectiveness-of-index-linked-bond-issuance_5k481881kjwh-en and www.bankofengland.co.uk/working-paper/2015/the-informational-content-of-market-based-measures-of-inflation-expectations-derived-from

inflation above 3.25%, factors such as liquidity and the product of an imbalance of demand and supply.

- B.12 The government can choose either to pay the inflation risk premium and the level of inflation priced in the conventional gilt yield, which is 'fixed' at issue for the life of the bond; or it can issue an inflation-linked gilt, pay future realised inflation at a later time and bear the inflation risk. The 2 strategies are cost-equivalent if future realised inflation turns out to be equal to the level implied in the breakeven inflation rate at issue.
- B.13 When considering the split of issuance between index-linked and conventional gilts, the government takes into account cost-effectiveness. At end-January 2019, the DMO's model shows that for an assumption that RPI remains constant at 3% over the life of the bond, index-linked gilts offer better value to the government than equivalent maturity conventional gilts across the maturity structure (as shown in Chart B.3).

Chart B.3 The cost-effectiveness of index-linked gilts under different RPI assumptions (end-January 2019)¹



¹ Current in the RPI 3.3.8% line is based on the breakeven inflation rate as of January 2019, which is the difference between the yield of a nominal bond and an inflation-linked bond of the same maturity.

Source: DMO.

Risk

- B.14 In the context of the long-term focus of the debt management objective, the other key determinant in the government's decisions on debt issuance by maturity and type of instrument is its assessment of risk. In reaching a decision on the overall structure of the remit, the government considers the risks to which the Exchequer is exposed through its debt issuance decisions and assesses the relative importance of each risk in accordance with its risk appetite.
- B.15 The government places a high weight on minimising near-term exposure to refinancing risk. This exposure is managed partly by maintaining a sizeable proportion of long-dated debt in the portfolio, which reduces the need to refinance debt frequently. The government places importance on avoiding, when practicable, large concentrations of redemptions in any one year. To

achieve this, the government will issue debt across a range of maturities, smoothing the profile of gilt redemptions.

- B.16** As part of the government's responsible approach to fiscal risk management – and as set out at Budget 2018 – the government will look to reduce the proportion of index-linked gilt issuance in a measured fashion as a share of total issuance over the medium term, in line with the 1 to 2 percentage point reduction planned in 2018-19.⁶ Decisions on precise levels of index-linked and conventional gilt issuance will continue to be taken as part of the annual financing remit and in consultation with market participants. Consistent with this, the 2019-20 financing remit includes a 2 percentage point reduction in index-linked gilt issuance compared to that planned at the start of the previous year.
- B.17** Prudent debt management is also served by promoting sustainable market access, which the remit is designed to support. The government places significant importance on encouraging a deep, liquid and efficient gilt market and a diverse investor base in order to maintain continuous access to cost-effective financing in all market conditions.
- B.18** Promoting these features of the gilt market will also serve to minimise debt costs to the government because investors reward an issuer for providing a continuous and ready market and a globally recognised benchmark product.

Modelling of cost, interest rate and refinancing risk

- B.19** The analysis underpinning the government's decisions on its issuance strategy includes an exercise in which debt interest cost and risk simulations are generated to illustrate the cost-risk trade-off associated with different issuance strategies. This allows the government to investigate the medium-term implications of different possible future issuance skews relative to the current annual issuance strategy.
- B.20** Debt interest cost is defined as the cost of the coupon payments and redemptions associated with government debt, accrued over the life of each bond, measured in terms of the relevant yield. Risk is defined as the standard deviation of debt interest cost or debt interest cost volatility, reflecting potential variation in the relevant yield. This can be seen as a measure combining both interest rate risk and refinancing risk.
- B.21** As in previous years the exercise has been carried out over a 15-year horizon, close to the average maturity of the gilt portfolio, and therefore captures a rollover of approximately half of it. The metrics resulting from this analysis combine the impact from alternative issuance strategies for financing new government debt (to meet the central government net cash requirement and the refinancing of redemptions) with the existing characteristics of the debt portfolio inherited from previous financial years.

⁶ The 2018-19 financing remit planned to issue 21.1% of total issuance via index-linked gilts. On the basis of the updated financing arithmetic set out in this document, index-linked gilts are expected to account for 21.7% of total issuance at the end of 2018-19. This compares to 23.1%, which was the index-linked share of total gilts planned for issuance in the 2017-18 financing remit.

B.22 The DMO’s Portfolio Simulation Tool (PST), which calculates debt interest cost, is used in conjunction with a macroeconomic-based Vector Autoregressive (VAR) model, which provides two alternative distribution assumptions for simulating the yield curve, to depict risk in cost terms. In this way, the PST maps the projected yield curve distributions to a debt interest cost distribution so that simulated cost and risk metrics can be analysed.

B.23 In undertaking this analysis for consideration of the 2019-20 financing remit, the 2018-19 issuance skew planned at the start of 2018-19 was used, which was well diversified across maturity ranges (see Table B.1).

Table B.1: Gilt issuance strategy composition for 2018-19 (%)¹

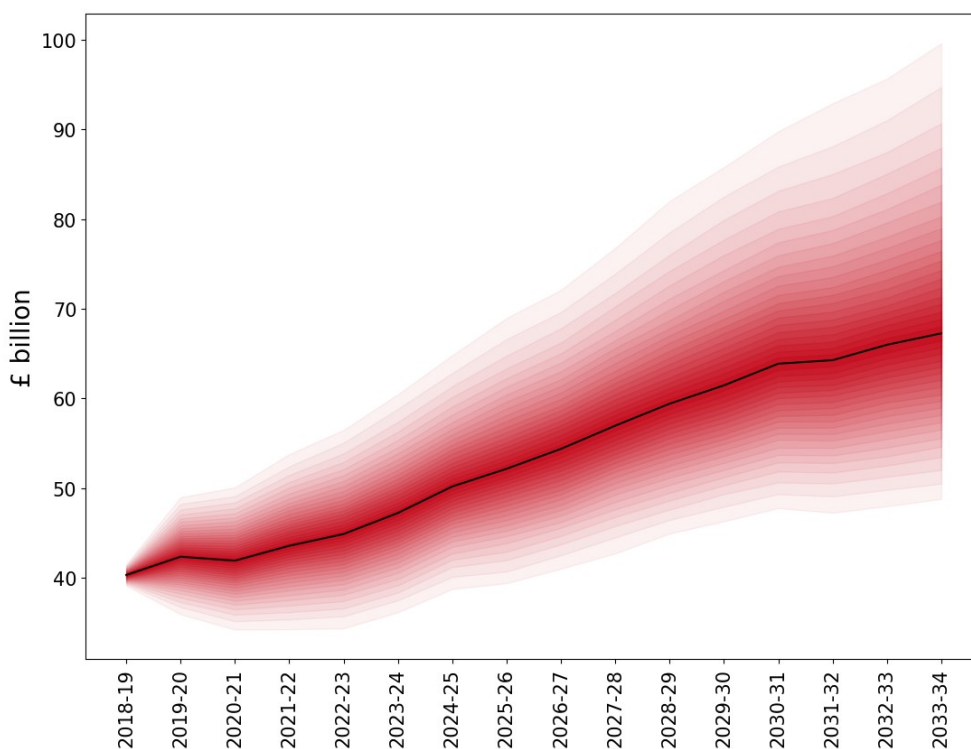
	Short conventional	Medium conventional	Long conventional	Index-linked	Unallocated
Issuance skew for 2018-19	24.2	19.7	28.5	21.1	6.4

¹ Figures may not sum due to rounding. Maturities are defined as follows: short (1-7 years), medium (7-15 years), and long (over 15 years).

Source: *Debt management report 2018-19*.

B.24 The resulting probability distributions of debt interest costs (if issuance continued to follow the current issuance maturity skew for the next 15 years) is shown in Chart B.4. It is worth noting that the projected yields are not in line with current market expectations. This supports the view that there are currently negative risk premia priced in to the gilt yield curve.

Chart B.4 Probability distribution of debt service costs (normal distribution)¹



¹ This is net of the Bank of England’s Asset Purchase Facility.

Source: *DMO*.

- B.25** The central line of the fan chart represents the median debt interest cost after 1,000 simulations using the PST model (each simulation has an alternative yield curve) for each financial year. The shaded red areas (from darker to lighter red respectively) around the median debt interest cost projection represent the percentiles of the probability distribution, with each colour area representing an additional 5% probability. The debt interest values in the lightest shades of red at the top and at the bottom of the fan chart represent the 'tails' of the distribution, with only 5% probability associated with each. For example, debt interest values on the upper tail of the distribution would not be expected to be reached with a 95% probability. Forecast uncertainty increases further into the future and, therefore, the 'fan' widens over the horizon. Overall, at the 15-year horizon, it can be said with 90% certainty (i.e. excluding the 10% top and bottom 'tails' of the distribution) that debt interest costs will be between £52 billion and £88 billion, with a median value of around £66 billion.
- B.26** It is important to note that the debt interest simulations in Chart B.4 reflect the combination of simulated future yields and projected debt issuance together with the unfolding of existing portfolio dynamics. As a consequence, debt interest appears to pick up in the latter part of the horizon. This reflects the redemption profile of the debt portfolio, with a higher volume of redemptions that will mature and be refinanced at new interest rates, among other factors. Given the long average maturity of the UK's debt, which creates 'stickiness' in the evolution of the portfolio,⁷ any impact from debt issuance is slow to take effect. In the 2018-19 issuance skew example, only about half of the entire debt interest cost bill would have been refinanced at new yield levels after 15 years.

Gilt distribution

- B.27** Auctions will remain the primary method of issuance.
- B.28** Any type and maturity of gilt can be sold through syndication and the DMO will announce on a quarterly basis its planned syndication programme, which may include short and medium conventional gilt issuance if judged appropriate by the DMO. However, the DMO's current planning assumption is that the syndication programme in 2019-20 will be used to launch new long conventional and index-linked gilts and/or for re-openings of high duration gilts.
- B.29** Reflecting the larger financing requirement in 2019-20 relative to 2018-19, the government's initial planning assumption is that it will hold 5 syndicated offerings in 2019-20.
- B.30** Gilt tenders may be used in 2019-20 to issue any type and maturity of gilts. Further details are set out in the DMO's 2019-20 financing remit announcement.
- B.31** The government remains committed to the GEMM model to distribute gilts through auctions, syndications and tenders and the government recognises

⁷ Owing to the maturity structure and outstanding size of the debt portfolio, any change in issuance takes a long time to affect its composition.

that GEMMs play an important role in helping to facilitate liquidity in the secondary market.

Gilt issuance by maturity and type in 2019-20

- B.32** In determining the split of gilt issuance, the government has considered its analysis of the relative cost-effectiveness of the different gilt types and maturities, its risk preferences including for the portfolio as well as the issuance programme, and the market feedback it has received.
- B.33** Continuing demand for short conventional gilts is anticipated, in particular, due to redemption reinvestment flows. The government places a relatively high weight on managing its near-term exposure to refinancing risk which has also influenced its decision on the amount of short-dated conventional gilts to be issued.
- B.34** In deciding the proportion of medium conventional gilts to issue, the government recognises the important role that medium conventional gilts (particularly in the 10-year maturity) play in facilitating the hedging of a wide range of gilt market exposures through the futures market, which helps underpin liquidity in the sector. Market feedback suggests that demand for medium conventional gilts may be relatively stronger in 2019-20 compared to other maturities.
- B.35** Market feedback suggests ongoing demand exists for long conventional gilts from domestic investors in particular. Additionally, in determining the amount of long-dated conventional gilts to issue, the government has taken into account the role of long conventional issuance in mitigating its near-term exposure to refinancing risk.
- B.36** For conventional gilts, the term premia analysis suggests that issuance across the maturity spectrum is more cost-effective than has historically been the case. Under market-implied inflation expectations, index-linked gilts are expected to be more cost-effective to issue than equivalent maturity conventional gilts at all maturities. As set out in Chapter 2 and above, as part of the government's responsible approach to fiscal risk management, the 2019-20 financing remit includes a 2 percentage point reduction in index-linked gilt issuance compared to that planned at the start of the previous year.
- B.37** A similar portion of issuance will be held in an initially unallocated form in 2019-20 compared with 2018-19. The main purpose of the unallocated portion of issuance is to give increased flexibility to the DMO to issue any type or maturity of gilt by any issuance method, while remaining consistent with the principles of openness, predictability and transparency.

Treasury bill issuance in 2019-20

- B.38** Treasury bills are used for both debt and cash management purposes. With regard to the former, changes to the Treasury bill stock have historically offered an efficient way to accommodate in-year changes to the financing requirement.

- B.39 The government does not target a planned end-year Treasury bill stock. Information on the outstanding stock of Treasury bills will continue to be published monthly in arrears on the DMO's website.⁸
- B.40 It is expected that the net contribution from Treasury bills to debt financing in 2019-20 will be £4.0 billion.

⁸ www.dmo.gov.uk/data/treasury-bills