

Title: Cash Ratio Deposit scheme IA No: 4219 RPC Reference No: RPC-HMT-4219 Lead department or agency: HM Treasury Other departments or agencies: Bank of England	Impact Assessment (IA)			
	Date: 21/03/2018			
	Stage: Final			
	Source of intervention: Domestic			
	Type of measure: Secondary legislation			
	Contact for enquiries: raj.patel@hmtreasury.gsi.gov.uk			
Summary: Intervention and Options				RPC Opinion: GREEN

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB in 2014 prices)	One-In, Three-Out	Business Impact Target Status
£-19m	£300m	£55m	Not in scope	Qualifying provision

What is the problem under consideration? Why is government intervention necessary?

The cash ratio deposit (CRD) scheme funds the Bank of England's monetary policy and financial stability operations. Under the scheme, eligible deposit-taking financial institutions (e.g. banks and building societies) place non-interest bearing deposits at the Bank of England ("the Bank"). The Bank then invests these deposits in government debt securities (gilts), and the income earned on those investments is used to fund the relevant policy costs. The scheme has been reviewed every five years since 1998, the last review was in 2013. The scheme's current calibration would fail to generate sufficient income to fund the Bank's policy costs for the five-year period 2018-23.

What are the policy objectives and the intended effects?

The scheme is intended to finance the Bank's monetary policy and financial stability policy functions. The intended effect of amending the scheme is to ensure that the income generated by it is in line with its forecast policy costs for these activities (£845 million) over the next five-year period, 2018-23.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

The review considered various alternative funding mechanisms, including those used by other central banks. However, these were not directly comparable to the Bank (see Chapter 6 of the consultation document). The review also considered whether a fee-based model would be appropriate, but concluded that such a model would require more in-depth analysis, and was therefore not recommended as an option in the near-term. Therefore the review concluded that the existing scheme should be amended to seek to improve the scheme's performance.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: Month/Year				
Does implementation go beyond minimum EU requirements?			N/A	
Are any of these organisations in scope?			Micro Yes	Small Yes
			Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)			Traded: N/A	Non-traded: N/A

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible SELECT SIGNATORY:  Date: 27 March 2018

Summary: Analysis & Evidence

Policy Option 1

Description: Do nothing

FULL ECONOMIC ASSESSMENT

Price Base Year -	PV Base Year -	Time Period Years 5	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate: N/A
COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)		Total Cost (Present Value)
Low	Optional		Optional		Optional
High	Optional		Optional		Optional
Best Estimate					
Description and scale of key monetised costs by 'main affected groups'					
N/A					
Other key non-monetised costs by 'main affected groups'					
N/A					
BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)		Total Benefit (Present Value)
Low	Optional		Optional		Optional
High	Optional		Optional		Optional
Best Estimate	N/A		N/A		N/A
Description and scale of key monetised benefits by 'main affected groups'					
N/A					
Other key non-monetised benefits by 'main affected groups'					
N/A					
Key assumptions/sensitivities/risks					Discount rate
N/A					

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: N/A	Benefits: N/A	Net: N/A	

Summary: Analysis & Evidence

Policy Option 2

Description: Do minimum - Increase the CRD ratio to meet the Bank's forecast costs

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	PV Base Year 2018	Time Period Years 5	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate: -17

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	35	164
High	N/A	122	559
Best Estimate	N/A	72	335

Description and scale of key monetised costs by 'main affected groups'

This option means increasing the ratio from 0.18% to 0.35%, to meet the costs of the Bank's forecast policy expenditure over the period 2018-23. That ratio would remain fixed until the scheme is next reviewed. The main affected groups are banks and building societies with eligible liabilities (approximately sterling and foreign currency deposits) in excess of £600 million. The direct cost is the income foregone on the deposit paid by institutions.

Other key non-monetised costs by 'main affected groups'

For some firms, making an additional CRD deposit may reduce their liquid assets such that their Liquidity Coverage Ratio (LCR) falls below the regulatory requirement. Those firms may then need to draw down on other assets to restore their liquid assets to the minimum requirements.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate	0	69	318

Description and scale of key monetised benefits by 'main affected groups'

Under the central scenario, the income generated by the scheme under this option will be £343 million greater, relative to the status quo, over the five-year period.

Other key non-monetised benefits by 'main affected groups'

CRD deposits are invested to meet the costs of discharging the Bank's financial stability and monetary policy objectives. CRD payers benefit from access to the Bank's Sterling Monetary Framework (SMF), including the Bank's provision of liquidity insurance. These operations are designed to reduce the cost of disruption to critical financial services, including liquidity and payment services, delivered by SMF participants to the UK economy.

Key assumptions/sensitivities/risks	Discount rate	3.5
<p>The ratio of 0.35% (and the corresponding deposit size) is conditioned on two key assumptions: Firstly, expectations for growth in eligible liabilities of 2.9% per annum over the five years 2018-23. Secondly, the yield the Bank will receive on the CRD deposits has been approximated by the forward yields implied by the gilt yield curve in the 10 working days to 26th January 2018. The estimate of foregone income is based on market-implied forecasts of the yield on five-year gilts.</p>		

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:	In scope of OIOO?	Measure qualifies as
Costs: 61	No	IN
Benefits: 0		
Net: 61		

Summary: Analysis & Evidence

Policy Option 3

Description: Introduce a mechanism which indexes the CRD ratio to prevailing market yields

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	PV Base Year 2018	Time Period Years 5	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate: 19

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	Optional	£143m
High	Optional	Optional	£457m
Best Estimate	N/A	69	£300m

Description and scale of key monetised costs by 'main affected groups'

This option involves indexing the CRD ratio to a market-based measure of gilt yields, which is recalculated every six months. The main affected group are banks and building societies with eligible liabilities (approximately sterling and foreign currency deposits) in excess of £600 million. As with option 2, the cost to these firms is the opportunity cost of the income which could have been earned on their deposit.

Other key non-monetised costs by 'main affected groups'

In addition to the non-monetised costs noted for option 2, eligible institutions paying into the scheme would face some degree of uncertainty over the longer-term if they needed to forecast their required deposit.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate	0	69	319

Description and scale of key monetised benefits by 'main affected groups'

Under the central scenario, the income generated by the scheme under this option will be £343 million greater, relative to the status quo, over the five-year period

Other key non-monetised benefits by 'main affected groups'

In addition to the benefits to the whole economy noted under option 2, there would be greater certainty over the income generated by the scheme.

Key assumptions/sensitivities/risks	Discount rate	3.5
Expectations for growth in eligible liabilities of 2.9% per annum over the five years 2018-23. Estimates for the ratio and corresponding deposit size depend on forecasts for the yield on the eight-year gilt. The estimate of foregone income is based on the yield on five-year gilts. All gilt yield forecasts are as implied by the market yield curve, neither the Bank nor HM Treasury forecast gilt yields.		

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:	In scope of OIOO?	Measure qualifies as
Costs: 55	No	IN
Benefits: 0		
Net: 55		

Evidence Base

1. Background

- 1.1 The cash ratio deposit (CRD) scheme funds the Bank of England's monetary policy and financial stability operations. Under the scheme, deposit-taking financial institutions¹ (e.g. banks and building societies) place non-interest bearing deposits at the Bank of England ("the Bank"). The Bank then invests these deposits in government debt securities (gilts), and the income earned on those investments is used to fund the relevant policy costs.
- 1.2 The size of each institution's deposit is a proportion of its eligible liabilities, defined as an institution's aggregate sterling and foreign currency liabilities. The proportion ("the ratio") is then applied to those eligible liabilities over a threshold value band.² The last review in 2013 amended the ratio to 0.18%, from 0.11%, and increased the threshold value band to £600 million, from £500 million.
- 1.3 The size of the deposit required from eligible institutions is revised every six months, through the Bank issuing 'call notices' payable in June and December. As of December 2017 there were 352 institutions eligible under the scheme, of which 146 had eligible liabilities above the threshold value band, and so were required to make a deposit ('payers').
- 1.4 Following the passage of the Small Business Enterprise and Employment Act 2015, changes to the CRD scheme fall within scope of the government's business impact target. This impact assessment presents the government's proposals, the policy options considered and an economic assessment of these options.

2. Policy Objectives

- 2.1 Price stability and financial stability are key pre-requisites for the government's economic objective to create strong, sustainable and balanced growth. This is set out in the remits for the respective policy committees of the Bank. The CRD scheme is intended to finance the Bank's monetary policy and financial stability policy functions, and as such the intended effect of amending the scheme is to ensure that the income received by the Bank is in line with its forecast policy expenditure for these activities.
- 2.2 As the principal purpose of the scheme, any preferred option should meet the forecast costs of the Bank's policy costs, £845 million over the next five years as set out in the consultation document.³
- 2.3 Timeliness was also a consideration. At the last review in 2013 the government committed to conduct a formal review of the scheme within five years at the latest. The growing shortfall in income generated by the scheme (see Chart 1), led to the view that any preferred option should be implemented by the June 2018 call notice. Further detail on the scheme's performance can be found in Chapter 2 of the consultation document.
- 2.4 The review recognised the trade-off between the simplicity of the scheme and accuracy in terms of cost recovery. It was agreed that any solution should be transparent for payers and minimise uncertainty.

¹ UK deposit-taking institutions authorised under the Financial Services and Markets Act 2000, and European institutions not authorised by the Prudential Regulation Authority, but having permission according to the Capital Requirements Directive 2013/36/EU to operate a branch in the UK for the purposes of accepting deposits or other repayable funds from the public.

² Further detail can be found in Schedule 2 of the Bank of England Act 1998.

³ <https://www.gov.uk/government/consultations/review-of-the-cash-ratio-deposit-scheme-consultation-on-proposed-changes>

Chart 1: CRD scheme income relative to forecast costs by CRD period

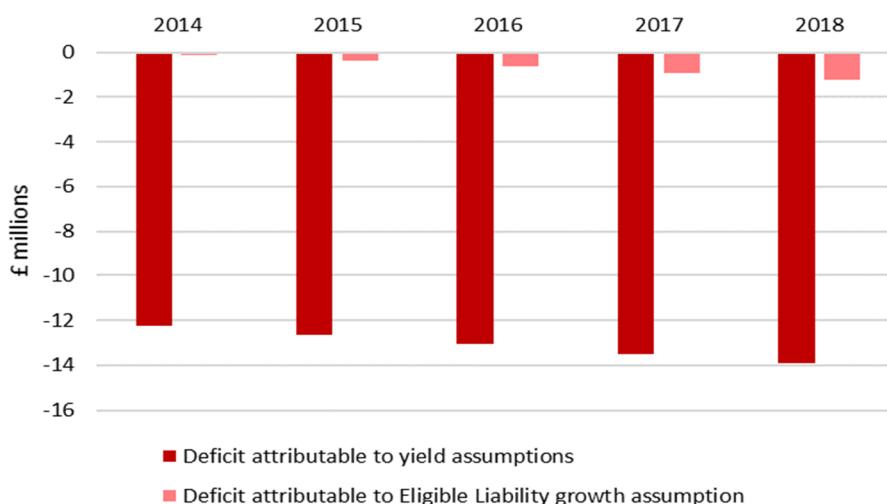


3. Rationale for government intervention

3.1 The last review of the scheme in 2013 envisaged a formal review within five years. The scheme parameters set at that review were conditioned on a set of assumptions for the determinants of CRD income over the subsequent five years: gilt yields and eligible liabilities. Under the status quo of leaving the scheme parameters unchanged, these assumptions would no longer apply, and the scheme's income would no longer match the Bank's forecast expenditure. A shortfall in income would inhibit the Bank from discharging its functions in pursuit of its statutory objectives in respect of monetary policy and financial stability. A surplus would mean that payers were required to place excessive funds with the Bank.

3.2 As set out in Chart 1, the scheme income has in the past deviated from the forecast at the review. In the 2013-18 period the shortfall in income from the scheme was £70 million¹. This was principally due to the divergence between yields achieved on the portfolio, and those expected at the 2013 review. Growth in eligible liabilities was also below forecast, however this is of secondary importance. This is illustrated in Chart 2 which disaggregates the cumulative deficit in 2013-18 shown in Chart 1 by year.

Chart 2: Source of scheme deficit, by year



Note – These figures are based on the average annual forecasts used at the 2013 review where yields were expected to average 3.0% (actual: 2.7%); growth in eligible liabilities was expected to be 3.3% (actual: 3.1%).

¹ In addition to the scheme's income shortfall, the Bank's costs also exceeded forecast expenditure by £74 million, bringing the Bank's total deficit to £144 million. Further detail can be found in Chapter 2 of the consultation document.

3.3 The purpose of the scheme is to meet the financial needs of the Bank. Under the current scheme the income generated is volatile relative to policy costs, which may compromise the Bank's financial position if it were forced to draw on its capital and reserves. The ratio is conditioned upon forecasts of yields which are only updated every five years. This means that as yields diverge from those expected at the outset, the income to the Bank (and the corresponding opportunity cost to institutions) diverges from the Bank's policy costs.

4. Consultation

4.1 The Treasury ran a public consultation on the CRD scheme between 8 February 2018 and 9 March 2018.² All eligible institutions under the CRD scheme were contacted and proactively invited to respond. This includes 146 institutions that currently pay into the scheme, as well as trade associations. The Treasury received three responses, with the remaining eligible institutions offering no views on the proposed changes. This followed an earlier informal consultation from December 2017 to January 2018. Nineteen responses were received.³ These responses were considered and reflected in the formal consultation.

4.2 The review also drew on the Bank's market intelligence and policy expertise in regards to the design of the scheme and the burden on firms.

5. Policy options and analysis

5.1 This section analyses the costs and benefits of three shortlisted options:

- Option 1: Do nothing, all scheme parameters remain unchanged.
- Option 2: Do minimum, the CRD ratio is adjusted to meet the Bank's forecast policy expenditure over the next five years.
- Option 3: Introduce a mechanism to index the CRD ratio to a measure of gilt yields.

5.2 The first option is the status quo, and so all additional costs are relative to this option. The additional costs and benefits are introduced for each option, however only the direct costs, and some of the direct benefits, have been monetised. Indirect costs and benefits are discussed, but are not monetised.

Long list appraisal

5.3 The review considered alternative funding mechanisms as used at other central banks, however as noted in Chapter 6 of the consultation document these were not directly comparable to the Bank. As per paragraph 2.3 any solution should be ready for implementation in June 2018. The review considered whether a fee-based model would be appropriate, but concluded that such a proposal was not possible within the scope of the existing legislation, and could not be implemented in time. There are also difficult issues around how to apportion a fee in a fair and efficient way, which would require more in-depth analysis. The Bank intends to do further analysis of alternative funding arrangements.

5.4 In past reviews the threshold value band has been adjusted, however the review decided against pursuing this option. Responses to the informal consultation included arguments to both raise and lower the threshold. A movement in either direction by £100 million would have a negligible impact on the income generated or the number of firms affected. Reducing the threshold to £500 million would result in six additional firms paying into the scheme, whereas raising the threshold to £700 million would result in four fewer firms paying into the scheme. The lower level of market yields and higher policy budget means that the scheme requires a greater deposit over the next five years, therefore there was no case for concentrating that burden on a smaller number of firms. Nor was there a case for drawing in more firms, which would do little to alleviate the burden on existing payers. Under all options the threshold value band remains at £600 million.

²https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/680352/Consultation_cash_ratio_deposit_web.pdf

³ The last review in 2013 received three responses to the public consultation and twenty-two responses to the informal consultation.

Overarching assumptions

- 5.5 The direct cost of the amendments proposed in options 2 and 3 will reflect the foregone income (or 'opportunity cost') from the additional deposit required under the status quo. This cost falls on eligible institutions as defined in Section 1. The foregone income will be unique to each institution and its various deployment options for those assets. When CRD payers make their payment to the Bank, it reduces their reserves, which are remunerated at Bank rate. The requirement to make an additional CRD deposit therefore displaces some of a firm's liquid assets. Typically, liquid assets amongst institutions include short-dated sterling denominated securities such as gilts. Therefore the five-year gilt has been used to proxy the foregone income.
- 5.6 The discount factor used to calculate the Equivalent Annual Net Direct Cost to Business⁴ (EANDCB) is 3.5% in line with the Green Book guidance for appraisal. All Net Present Value (NPV) and EANDCB figures have been calculated using the Better Regulation Executive's Impact Assessment calculator.⁵
- 5.7 The assumption for eligible liability growth is based on the Bank's forecast for growth in broad money (M4 excluding intermediate other financial corporations), averaging 2.9% per year over the five-year period⁶.
- 5.8 All yield forecasts in this document are forward rates implied by the gilt yield curve⁷, averaged over the 10-day period to 26 January 2018. Neither the Bank nor HM Treasury forecast gilt yields.

Option 1 – Do nothing (maintain the status quo)

- 5.9 Under this option the ratio is maintained at 0.18% on eligible liabilities above £600 million. The CRD portfolio would grow in line with aggregate eligible liabilities over £600 million, meaning the portfolio would reach £5.5 billion by December 2022. The average yield would fall as higher yielding assets mature and funds are reinvested in more recently issued gilts which have lower yields than the current portfolio.
- 5.10 Given the assumptions set out above, the scheme would generate a total income of £501 million over the period 2018-23, which is £343 million below projected costs. Based on the yields implied by the gilt forward curve, the average yield on the portfolio would be 2.0%. The sensitivity analysis below shows that, for the scheme to generate sufficient income, the return would need to be around 3.3%, given our assumption of eligible liabilities growing at 2.9% per year on average.

Table 1: Additions and deductions to five-year income forecast cost from different assumptions under Option 1

CRD Ratio = 0.18%		Average annual growth in eligible liabilities (%)		
		0.5	2.9	6.0
£m				
Portfolio return (%)	2.0	-373	-343	-311
	3.3	-58	0	55
	3.5	-10	43	109

Costs and benefits

- 5.11 As the do-nothing option, this option forms the benchmark against which the other options are judged, therefore there are strictly no additional costs or benefits.
- 5.12 It should be noted that this option results in a deficit against the Bank's projected policy costs, and therefore does not satisfy a key objective of the scheme as set out in paragraph 2.2. If the

⁴ For the purposes of the Business Impact Target, the Equivalent Annual Net Direct Cost to Business is expressed in 2014 prices.

⁵ <https://www.gov.uk/government/publications/impact-assessment-calculator--3>

⁶ This is the Bank's own forecast.

⁷ All yield data has been sourced from Bloomberg.

Bank cannot fund its policy functions, this would likely inhibit the Bank's ability to meet its statutory objectives as set out in the Bank of England Act 1998. There would then be negative implications for the UK's macroeconomic policy.

Option 2 – Increase the CRD ratio to 0.35%

5.13 This option involves adjusting the ratio such that the scheme recovers sufficient income to meet the costs of the Bank's monetary policy and financial stability costs over the period 2018-23. The methodology by which this is achieved is set out in Box 1.

Box 1: Setting the CRD ratio to meet projected policy costs

Option 2 uses the same methodology as has been used in past reviews. The key inputs are:

- The forecast growth rate of eligible liabilities. This approximates to growth in broad money, and is used to determine the growth in the size of the total CRD deposit.
- The forward yields implied by the gilt yield curve. These are used to forecast income from new investments at given points in the future.
- The existing holdings of gilts in the portfolio which matches the CRD deposit.

These inputs enable us to identify a schedule of gilt purchases over the course of the five-year period, and which complies with the Bank's risk framework. These new purchases are combined with the existing portfolio to forecast cash flows received from coupons, and amortisation of the existing stock of gilts, to calculate total income from the portfolio.

The ratio required to breakeven against forecast policy costs is calculated by an iterative process, seeking to minimise the difference between income and costs.

5.14 By adjusting the ratio in the model (effective from June 2018), the level of CRD deposits available to purchase gilts changes. A larger portfolio of gilts will be able to generate a greater income. Given the increased size of the portfolio, the central estimate for the portfolio yield would be reduced to 1.8% (from 2.0% in Option 1), as new purchases at current gilt yields would be lower than the average yield in the existing portfolio.

Table 2: Additions and deductions to five-year income forecast cost from different assumptions under option 2

Ratio = 0.35%		Average annual growth in eligible liabilities (%)		
		0.5	2.9	6.0
£m				
Portfolio return (%)	1.5	-166	-121	-66
	1.8	-30	0	89
	2.0	60	120	193

5.15 The forecast policy costs which the scheme seeks to cover are £845 million over the five-year period. Table 2 illustrates deviations from that target according to changes in the key assumptions, and assuming a ratio of 0.35%. The central estimate of average annual growth in eligible liabilities is 2.9%.

5.16 The forecast yields used throughout this impact assessment were taken from forward yields implied by the gilt yield curve, averaged over the 10 working days to 26 January 2018. Note that if this were updated to the 10 working days to 1 March 2018, then the appropriate ratio would be 0.33%. This underscores the key weakness with this option: a fixed ratio would be conditioned on a set of yield assumptions which would be unlikely relate to the yield the Bank will achieve on its portfolio, nor respond to the opportunity cost faced by firms paying into the scheme.

Direct costs

- 5.17 Under this option, the higher ratio would result in eligible institutions being required to make a greater deposit than under the status quo. As set out in paragraph 5.5 the yield on the 5-year gilt has been chosen to proxy the income foregone by eligible institutions on the additional deposit.
- 5.18 For estimating the costs, market-implied forward yields have been used as the central estimate, then stressed higher and lower to produce high and low yield scenarios. The size of those stresses is approximately 1.75 percentage points relative to the central scenario by the end of the five-year period. These are consistent with the yields used to estimate costs under Option 3. Chart 3 illustrates these scenarios relative to the 5-year yield over the last twenty years. Further details on methodology can be found in paragraph 5.35.

Chart 3: Historic yields on the five-year benchmark gilt and projections used in cost estimates



Table 3: Direct costs arising from option 2, under three different yield scenarios

£m (unless otherwise stated)	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Required deposit at 0.18% (status quo)	4,869	5,008	5,150	5,297	5,448	
Additional deposit at 0.35%	4,598	4,729	4,864	5,003	5,145	
Baseline scenario						
Foregone interest on additional deposit	51	61	72	84	94	362
Present Value of Costs (2018 prices)	51	59	67	76	82	335
High yield scenario						
Foregone interest on additional deposit	57	88	122	155	188	610
Present Value of Costs (2018 prices)	57	85	113	140	164	559
Low yield scenario						
Foregone interest on additional deposit	48	42	36	29	18	173
Present Value of Costs (2018 prices)	48	41	34	26	16	164

*Note: For ease of illustration figures have been grouped by year on a June/June basis. The additional deposit is the figure required at the start of the period, costs are those incurred by the end of the period.

- 5.19 The central estimate of foregone income over the five-year period is £362 million or £335 million on a present value basis. The EANDCB, for the purpose of the Business Impact Target, is £61 million under the central scenario. The total CRD deposit would grow to around £10.6 billion by December 2022.
- 5.20 The focus of the above analysis is on yields, rather than the assumption on eligible liability growth. As set out in paragraph 3.2 the latter is of secondary importance to the scheme. By way of illustration, if the annual growth rate of eligible liabilities was 100% greater than is assumed, this would only change the total cost by 7% (to £389 million).

5.21 Note that the ratio of 0.35% is conditioned on yields consistent with the central estimate. If yields are higher or lower than the central estimate, this implicitly shifts the burden of costs. Under a higher yielding scenario, the Bank will receive higher than expected income, and eligible institutions will have a higher opportunity cost. Conversely, under a lower yield scenario eligible institutions will have a lower opportunity cost and the Bank will have an income shortfall. This is a key risk inherent in the fixed ratio scheme.

Indirect costs

5.22 Since the last review, the framework of capital and liquidity requirements for UK banks and building societies has evolved. As part of the assessment of costs, the indirect costs of a higher ratio on institutions' balance sheets was considered. These are being treated as indirect costs, since the cost depends largely on how institutions manage the adjustment to their balance sheets. It also depends on the initial position of each individual institution and it is difficult to establish a single relevant counterfactual for all institutions in aggregate.

5.23 In terms of meeting capital adequacy requirements, CRD deposits have a zero-risk weighting under the Basel III framework, therefore it is considered that there will not be an additional cost from changes to capital relating to risk weighted assets.

5.24 In respect of the UK leverage ratio framework, which currently applies only to a small number of major UK banks and building societies, the change from 0.18% to 0.35% is unlikely to have any impact on individual firms' ability to meet their leverage ratio requirements. Currently, these firms have sufficient headroom above their minimum requirements⁸.

5.25 For liquidity management purposes, the deposit is not eligible as a high-quality liquid asset under the EU Liquidity Coverage Ratio (LCR) framework. An increase in CRDs will therefore lower CRD payers' liquid holdings relative to their requirements. UK banks currently hold over £600 billion of high quality liquid assets, and in aggregate banks and building societies hold significant buffers above their regulatory requirements. The increase also needs to be set against the fact that the Cash Ratio Deposits scheme helps pay for the Bank's liquidity insurance framework. As at end-February 2017 banks and building societies held £550 billion of collateral at the Bank that could be drawn against in these facilities, after applying the Bank's valuation and haircut methodology the total value of this collateral available to drawdown was £421bn.

Benefits

5.26 CRD deposits are invested to meet the costs of discharging the Bank's financial stability and monetary policy objectives. Under this option, the scheme will generate an additional £343 million in income relative to the status quo (£318 million in present value terms), to meet the forecast policy costs of delivering these objectives. The Bank protects and enhances the stability of the financial system, and is responsible for meeting the government's inflation target. The benefits of these monetary policy and financial stability functions are to the whole economy including the banking sector.

5.27 CRD payers benefit from access to the Bank's Sterling Monetary Framework⁹(SMF), including the Bank's provision of liquidity insurance. These operations are designed to reduce the cost of disruption to critical financial services, including liquidity and payment services, supplied by SMF participants to the UK economy. The Bank does this by standing ready to provide liquidity in the event of unexpected developments by offering to swap high-quality but less liquid collateral for liquid assets. The Bank's Independent Evaluation Office 2018 review¹⁰ of the SMF noted the progress the Bank has made in opening up access to its facilities, making them cheaper and more flexible. It also noted the role of SMF facilities in reducing the costs of potential liquidity disruption to participants and the wider economy.

5.28 CRD payers also benefit from low and stable inflation and a resilient financial system. Responses to the consultation recognised that the range and scope of the Bank's functions had expanded since the last review, and accepted that this would result in higher costs.

⁸ Tier 1 capital as a proportion of total exposures are required to be at least 3.25%. Over 2017 Q3 the aggregate UK leverage ratio averaged 5.5%. <https://www.bankofengland.co.uk/financial-stability-report/2017/november-2017>

⁹ Further information available here: <https://www.bankofengland.co.uk/markets/the-sterling-monetary-framework>

¹⁰ <https://www.bankofengland.co.uk/news/2018/january/ieo-evaluation-of-the-boe-approach-to-providing-sterling-liquidity>

5.29 The nature of these wider benefits is diffuse, and whilst the income generated from the scheme under the status quo would materially inhibit the Bank from performing its statutory objectives, it is not easy to specify which additional benefits are achieved from ensuring that policy costs are met. Rather, it is more suitable to frame the benefits of this option in the sense of cost-avoidance. A study by the National Institute of Economic and Social Research suggested that a permanent reduction in the probability of a banking crisis occurring of just 1% would lead to an expected GDP increase of £4.5bn per annum in net present value terms.¹¹ This was not included for the purposes of calculating benefits.

Option 3 – Indexation of the CRD ratio

5.30 Paragraph 3.3 identified that the income from the scheme can be volatile relative to the cost of the Bank’s operations. Much of this volatility, and the shortfall in income over the last review period, has been principally due to differences in gilt yields from those expected at the last review, as illustrated in Chart 2. This option seeks to address this by indexing the ratio to a measure of gilt yields which reflects the income the Bank will receive from its investments, and which is also more responsive to the interest foregone by eligible institutions than at present.

5.31 The formula for determining the ratio would be as follows:

$$\text{CRD ratio} = \frac{\text{Target income}}{\text{Aggregate eligible liabilities} * \text{Portfolio yield}}$$

5.32 Under this approach, target income will be fixed at £169 million per year, which is the result of evenly dividing the £845 million expected policy expenditure into five annual periods. The aggregate eligible liabilities term reflects the sum of all eligible liabilities above the £600 million threshold value band, and will also be fixed in the formula until it is next reviewed, at the latest in five years’ time. This will be based on the average of forecast eligible liabilities in the £600 million value band, across 2018-23, under the assumption set out in paragraph 5.7.

5.33 The portfolio yield term is an approximation of the yield from the Bank’s investments, based on externally sourced market-based measure of gilt yields.¹² The average duration of the Bank’s portfolio is eight-years¹³, therefore the yield on an eight-year gilt is used in the portfolio yield formula:

Portfolio yield

$$\begin{aligned} &= 0.55 \text{ (average of 8yr gilt yields over prior 13 years)} \\ &+ 0.42 \text{ (average of 8yr gilt yields over May 2018 to Nov 2018)} \\ &+ 0.03 \text{ (average of 8yr gilt yields over prior six months)} \end{aligned}$$

5.34 The portfolio yield calculation is made up of three terms, each weighted to reflect their relative proportions in the portfolio. The first term represents the yield on the existing long-term holdings of gilts, averaged over a lookback period of 13 years – chosen to reflect the current portfolio. The second term is required to account for the initial step-change in the size of the Bank’s portfolio in June 2018, therefore the relevant yields are those which prevail in the first six-month period of the scheme. From the second six-month period onward, the yield for this term will be known with certainty, and it will become a constant in the formula. The third term reflects the expected reinvestments from maturing gilts, in each six-month period.

¹¹ http://www.legislation.gov.uk/ukia/2015/62/pdfs/ukia_20150062_en.pdf

¹² Further operational details and a worked example can be found in annex A of the consultation document.

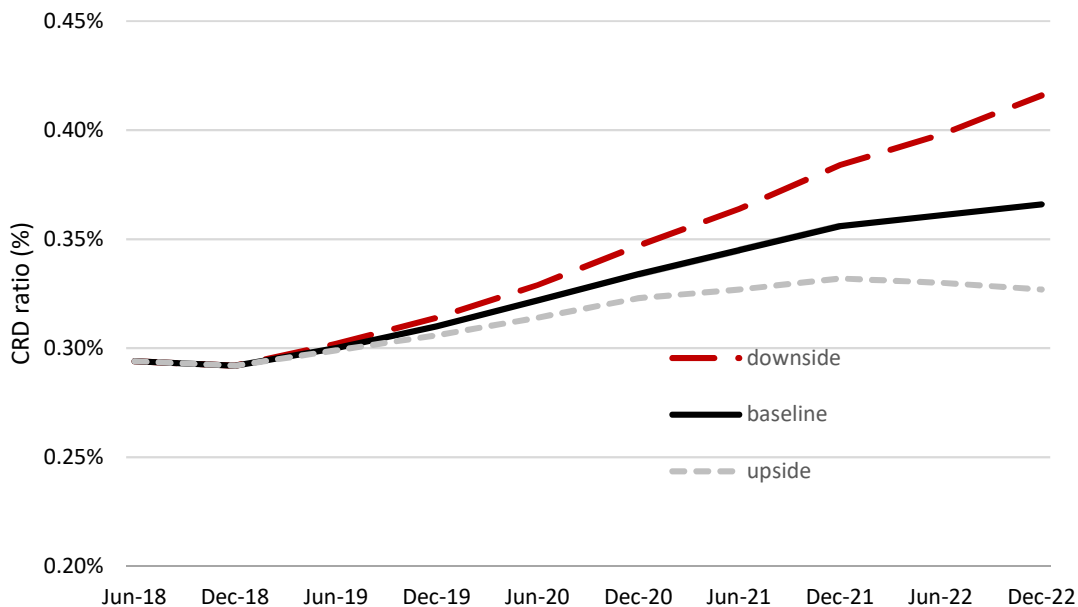
¹³ This is governed by the Bank’s risk framework, and is not a policy choice.

Chart 4: Historic yields on the eight-year benchmark gilt and projections used in cost estimates



5.35 The chart below illustrates how the ratio would behave under three different yield scenarios illustrated in Chart 4. The baseline scenario is formed using the market-implied forward yields for the eight-year gilt. The scenarios either side of that baseline are set to diverge by 1.75 percentage points by December 2022 (to apply through to June 2023). These stresses put a range of 3.5 percentage points around the central scenario by the end of the CRD period, and is severe but plausible. Based on the last twenty years of eight-year yield data, the rolling five-year range has only exceeded 3.5 percentage points for roughly 10% of the time (following the financial crisis). The stressed scenarios for the five-year gilt yields used in Option 2 (and for costing both options), are consistent with the stressed scenarios of the eight-year gilt yield as detailed in paragraph 5.37.

Chart 5: CRD ratio under three illustrative yield scenarios



Box 2: Key methodological differences between Option 2 and Option 3

The indexation model gives a slightly lower average ratio to that in the fixed model over time. Both a fixed CRD regime and indexation are designed to meet the same target income over the next 5 years, assuming gilt yields follow the path implied by the current forward curve, although the portfolio will evolve quite differently under each approach. The current forward curve is upward sloping, so yields expected further in the future are higher than near-dated yields.

With a fixed ratio, the portfolio will increase substantially in size at the start of the five-year period as the ratio increases from 0.18% to 0.35%, which amounts to a c.£4 billion increase in the size of the deposit. Once fully invested, the income achieved on these new purchases will be broadly constant over the next five years. The income achieved from historic purchases will trend lower, as older higher-yielding purchases mature. This means that, while a fixed ratio is calibrated to meet the income total over the next 5 years, it will likely do so by achieving a higher income at the start of the five-year period, and a lower income towards the end, as historic purchases mature over time.

In contrast, the indexation model is calibrated to more evenly achieve the income target across each six-monthly period. At the start of the five-year period, when the portfolio has a larger proportion of legacy purchases, the new investment will be smaller than under the fixed ratio regime. As legacy purchases mature, and new investments are made to replace that income, that reinvestment is expected to take place at higher yields than those of early investments. Therefore, instead of a substantial increase in the size of the portfolio at the start of the period as is the case

Direct costs

5.36 The five-year gilt scenarios illustrated in Chart 3 are used as the basis for the central, high and low estimates of costs. A consequence of the indexation approach is that as gilt yields increase relative to the baseline case, opportunity costs increase but the level of required CRD deposits falls with the ratio. By construction, the effect of the opportunity cost dominates the effect from the movement in the ratio, as the effect of yields for the latter are smoothed by the portfolio yield formula. Hence, the high-yield scenario has higher direct costs to business as shown in Table 4.

5.37 Table 4 shows the direct costs under three yield scenarios for the eight-year gilt yield which determines the portfolio yield and therefore the ratio. For each scenario, the yield on the five-year gilt (the proxy for foregone income, as per paragraph 5.5) is adjusted to match the corresponding change in the eight-year gilt yield.¹ These yields are consistent with those used to cost Option 2.

5.38 The best estimate of costs for Option 3 is £327 million over the five-year period, or £300 million in present value terms. For the purposes of the Business Impact Target the EANDCB is £55 million. For reasons outlined in Box 2, the size of the additional deposit under Option 3 is expected to be slightly lower than under the central estimate in Option 2. The estimated direct costs in the central scenario are therefore slightly lower in Option 3 than in Option 2.

¹ Forecasts for the difference between the two yields (the basis) has been derived from the market-based forward curves, however this does not have a material impact on the cost estimates, and so no sensitivity analysis is included.

Table 4: Direct cost to firms arising under Option 3 under three gilt yield scenarios

£m (unless otherwise stated)	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Required deposit at 0.18% (status quo)	4,869	5,008	5,150	5,297	5,448	
<u>Baseline yield scenario</u>						
CRD ratio under baseline scenario	0.29%	0.30%	0.32%	0.35%	0.36%	
Additional deposit relative to status quo	3,041	3,284	3,991	4,776	5,395	
Foregone interest on additional deposit	34	45	63	84	102	327
Present Value of Costs (2018 prices)	34	43	58	76	89	300
<u>High yield scenario</u>						
CRD ratio under high yield scenario	0.29%	0.30%	0.31%	0.33%	0.33%	
Additional deposit relative to status quo	3,041	3,257	3,766	4,255	4,471	
Foregone interest on additional deposit	38	64	99	136	164	500
Present Value of Costs (2018 prices)	38	61	92	123	143	457
<u>Low yield scenario</u>						
CRD ratio under low yield scenario	0.29%	0.30%	0.33%	0.36%	0.40%	
Additional deposit relative to status quo	3,041	3,339	4,188	5,326	6,498	
Foregone interest on additional deposit	32	32	34	32	24	153
Present Value of Costs (2018 prices)	32	31	31	29	21	143

**Note: For ease of illustration figures have been grouped by year on a June/June basis. Ratios are start of period, costs are those incurred by the end of the period.*

Indirect costs

5.39 The indirect costs of an indexed CRD regime, relative to a fixed ratio of 0.18% are the same as described for Option 2 in paragraphs 5.22 to 5.25, given that the regulatory treatment would be the same.

5.40 Options 1 and 2 involve fixing the ratio for a period of up to five years. Moving to an indexation-based approach would mean that institutions no longer have the same degree of certainty over the ratio which will be applied. However, the weightings within the portfolio yield measure mean that short term fluctuations in yields have a relatively small impact on the overall ratio. These variations are relatively small compared to CRD payers' balance sheets, the average change in total CRD deposits each year will be around £500 million or less than 0.01% of CRD payers' total liabilities.

5.41 After the December 2018 call notice, the middle term of the portfolio yield formula (42% weighting) becomes a constant. If, for example an institution wanted to forecast the ratio that would apply in one year's time, it would need to estimate yields prevailing over the next two six-month periods. These data points would have a combined weighting of around 10% in the portfolio yield calculation, therefore 90% of the weighting used in the calculation is known. For each additional year added to the forecast horizon the known portion of the portfolio yield formula would fall by 10%.¹

5.42 Institutions affected by the scheme are accustomed to sourcing yield forecasts in the course of their ordinary business. Some respondents to the informal consultation noted that their planning horizons for managing assets such as the CRD deposit were shorter than the full five years of the period, and that uncertainty over the ratio alone was unlikely to present a significant challenge.

¹ A worked example of the indexation calculation is included in Annex A of the consultation document.

Benefits

5.43 The benefits set out in paragraphs 5.26 to 5.29 for Option 2 are also included in the benefits of Option 3, since the policy budget being funded by the scheme is the same under both options. However, under Option 3 the certainty of that income is much greater, and the risk to both Bank income and foregone income of CRD depositors described in paragraph 5.21 is minimised.

5.44 An indexed regime reduces the chance that there is a significant deficit or surplus in income, as has been the case in the past two decades. This would help ensure that the Bank can cover its policy costs and so can discharge its policy objectives.

6. Wider impacts

Equalities impacts

6.1 The measure concerns changes to the CRD scheme, which is paid only by banks and building societies. No impact is expected for individuals.

Small and microbusiness impacts

6.2 This measure is not expected to have an impact on small or microbusinesses. The threshold value band means that only firms with eligible liabilities of greater than £600 million are required to pay any deposit. Of the firms currently paying into the scheme, we do not believe any to have fewer than 50 employees. Given the threshold value band HM Treasury does not anticipate small or microbusinesses being drawn into the scheme in the near-term.

7. Monitoring and evaluation

7.1 The review clause included in the Statutory Instrument ensures the scheme will be reviewed within five years at the latest.

8. Summary and preferred option

8.1 Out of the options presented only options 2 and 3 will meet the principal objective of the scheme to meet the Bank's policy costs relating to monetary policy and financial stability, which are expected to be £845 million over the 2018-23 period.

8.2 Under Option 3, the scheme generates the target income with a greater certainty than under Option 2, such that the deficits and surpluses seen in the past (Chart 1) are unlikely to be as severe in the next period.

8.3 The benefits of the Bank's monetary policy and financial stability functions are to the whole banking sector as well as the wider economy. It is therefore in the long-term interest of all parties that the Bank's policy expenditure is met.

8.4 The direct costs fall on eligible institutions with greater than £600 million in eligible liabilities. Although the deposit remains an asset of those institutions, the deposit is not interest-bearing. The direct cost is therefore the foregone interest on the deposit. Both options 2 and 3 require a deposit which is greater than the status quo. Based on current market-based forecasts for gilt yields, the deposit required under Option 3 is slightly lower than that required under Option 2.

8.5 In terms of indirect costs, those firms which are required to pay a CRD deposit will see a change in their Liquidity Coverage Ratios. However, given that the CRD ratio is proportional to balance sheet size and the context outlined in paragraph 5.25, the extent to which firms must mitigate this change is not an inevitable consequence of the scheme alone.

Table 5: Comparison of cost estimates for options 2 and 3

£m, 2018	Present Value of Costs		
	Low	Central	High
Option 2	164	335	559
Option 3	143	300	457

8.6 Option 3 is the preferred option. It satisfies the principal objective of the scheme, to meet the costs of the Bank's policy functions, and in expectation does so at a slightly lower cost and with greater accuracy than the fixed ratio model presented in option 2 (see Table 5 above). The introduction of an indexed ratio does give rise to some uncertainty for institutions however it substantially improves the ability of the scheme to generate sufficient income, and more effectively aligns that with the opportunity cost to payers. The determination of the ratio is transparent and market-based such that it could be forecast and verified by institutions.