Northern Gas Networks

A34 – NGN RIIO-2

Halo Effect & Additional Costs of Borrowing at RIIO-2

together we are the network

NERA
ECONOMIC CONSULTING

HALO EFFECT AND ADDITIONAL COSTS OF BORROWING AT RIIO-2

A REPORT FOR ENA

26 SEPTEMBER 2019

© NERA Economic Consulting

Insight in Economics™

We investigate Ofgem's supposed "halo effect", and provide evidence on additional costs of borrowing: transaction, liquidity, cost-of-carry, NIP, and CPI switching costs

- On behalf of ENA, we have been asked to:
  - Review Ofgem's estimate of the "halo effect" in its recent Sector Specific Methodology Decision (SSMD)
    - as part of our review, we also consider evidence for new issue premium (NIP)
  - Analyse evidence on companies' additional costs of borrowing and set out an estimate of these costs drawing on company data, market evidence, and regulatory/ rating agency requirements for cost-of-carry
  - Analyse evidence on the cost of mitigating basis risk from switch to CPI indexation

- Structure of report:
  - Section 1: Updated evidence on the halo effect and NIP
  - Section 2: Evidence on transaction costs, liquidity costs, and cost-of-carry
  - Section 3: Evidence on costs associated with CPI indexation
  - Section 4: Conclusions

© NERA Economic Consulting

Conclusion: We find no evidence for the halo – instead we estimate a new issuance premium of 13bps. We estimate additional borrowing costs of at least 28-57bps, and 53-82bps including NIP and CPI switching costs

- At SSMD, Ofgem re-estimated halo of 7bps based on relative credit spreads of networks' bonds vs the iBoxx index
- To replicate Ofgem's approach, we have had to draw on credit spreads reported by Bloomberg and IHS Markit. However, we find that these measures of credit spread do not accurately control for differences in network bond and iBoxx tenor
- Using a more robust measure of credit spreads based on BoE yield curve, we derive a "negative halo" of -13bps
  - the negative halo can be explained by networks facing a new issue premium (NIP)
  - Our estimate is consistent with other recent studies' NIP estimates for corporate debt
- Even if credit spreads reported by IHS Markit and Bloomberg provide reliable measure of halo (which they do not), we show that the "halo" is not statistically different from zero
- Our conclusion that there is no halo – and indeed evidence for a NIP – is consistent with other studies, e.g. CMA findings at BGT 2015 and our previous studies at RIIO-1
  - implication is that Ofgem should allow companies to recover additional costs of borrowing in full

- Drawing on company data and market evidence, we estimate the following additional costs of borrowing for networks over RIIO-2
  - Transaction costs of 7bps, drawing on company public bond issuance
  - Liquidity cost of 4.5bps, or 9bps if facility half-drawn
    - (In summing costs, we assume no draw-down to avoid any potential double-count with cost-of-carry)
  - Cost-of-carry of 16 to 45bps based on companies meeting sufficiency of resource and rating agency requirements to meet obligations for 12 to 24 month period
- Overall, we estimate 28 to 57bps for transaction, liquidity costs and cost-of-carry
- In addition, we estimate NIP of 13bps, and costs for switch to CPI indexation of 12bps. Overall, additional costs of borrowing lie in range 53-82bps
  - Individual company circumstances may dictate where a company lies in range

Additional borrowing costs	**bps**
Transaction cost	7
Liquidity cost	4.5
Cost-of-carry	16 - 45
Sub-total	**28 – 57**
New issue premium	13
CPI indexation associated costs	12
Total	**53 – 82**

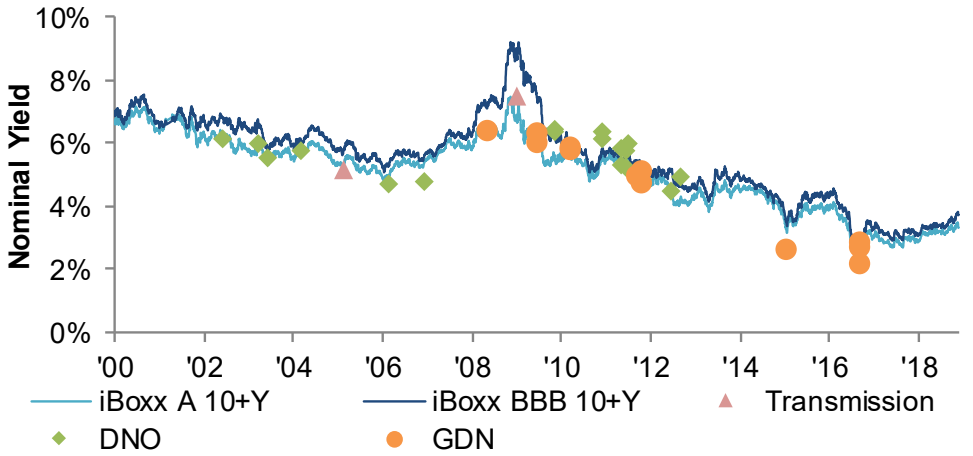
© NERA Economic Consulting

1 Updated evidence on the halo effect and new issue premium

In our March 2019 ENA study, we showed that CEPA's halo effect – based on a comparison of yield-at-issuance – failed to compare bonds on like-for-like basis. Correcting for errors, we found no halo

- In Feb 2018 report for Ofgem, CEPA estimates halo effect of 38bps for nominal bonds based on a comparison of the yield-at-issuance of network bonds and iBoxx indices
  - CEPA proposes 10-25bps downward adjustment to iBoxx allowance for perceived outperformance
- We were commissioned by ENA to review CEPA's findings. We identified two flaws, which when corrected, eliminate halo:
  - *CEPA uses coupon as its measure of the cost of debt:* understates companies' cost of debt because many of the GBP bonds were issued below par
  - *CEPA fails to correctly control for bonds' rating at issue:* Energy networks' bonds were predominantly A rated *at issuance*, especially during the pre-2010 period (80 per cent of the energy bonds A rated)
    - Unsurprisingly, a comparison of predominantly A rated bonds at issuance to the average of A and BBB rated iBoxx indices will show "outperformance"
- CEPA also identified halo effect for ILD issuance. We show CEPA's ILD analysis has similar problems, around use of coupon and controlling for rating
  - ILD issuance has disappeared, and under CPI indexation future CPI ILD may be issued at a premium to benchmark given illiquidity

Correcting for CEPA's errors, we identify a negative halo of 3bps



	NERA analysis
CEPA "halo effect"	38 bps
NERA replicating CEPA (wider sample)	20 bps
Correcting for yield at issue	*-8 bps*
Controlling for rating at issue	*-15 bps*
Final "halo effect" for nominal bonds	-3 bps (negative halo)

Sources: CEPA (February 2018) : Review of cost of capital ranges for Ofgem's RIIO, p.29-p.32.)

Source: NERA (14 March 2019) Cost of debt at RIIO-2, A report for ENA, section 3

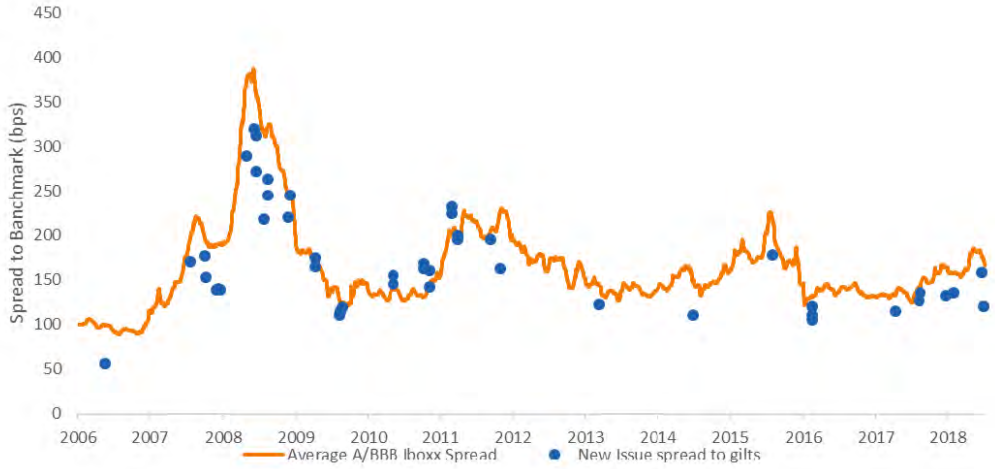
© NERA Economic Consulting

In its SSMD, Ofgem re-estimated the halo effect based on a comparison of relative credit spreads. Ofgem estimates outperformance of 7bps

- In its SSMD, Ofgem proposed an alternative method for measuring the halo (relative to the previous approach employed by its advisers CEPA, and replicated by us)[1]
- Instead of examining relative yield-at-issuance for network bonds vs iBoxx indices, Ofgem re-estimated the halo effect as the difference between companies bond spreads and the iBoxx indices spread. Ofgem considered that this approach would better control for differences in tenor than its earlier approach , i.e.:
  - *Halo effect = iBoxx index spread – company's bond spread*
- Using a sample of fixed rate bonds exceeding 10-years maturity at issue, Ofgem concluded that the halo effect is 14bps or 7bps when rating at issue is controlled for, i.e. comparing network BBB rated bond spreads to the iBoxx BBB index spread
- Drawing on market reported measures of credit spread (as provided by IHS Markit and Bloomberg), we closely replicate Ofgem's results (see Table)

Ofgem estimates a halo effect of 7 bps

Figure 2: Network bond new issue credit spreads compared to average A/BBB iBoxx credit spreads



Source: RIIO-2 Sector Specific Methodology Decision, p.21

Drawing on market reported measures of credit spread, we broadly replicate Ofgem's results

"halo effect"	Ofgem	NERA replicating Ofgem's analysis
Not controlling for rating at issue	14bps	15bps
Controlling for rating at issue	7bps	6bps

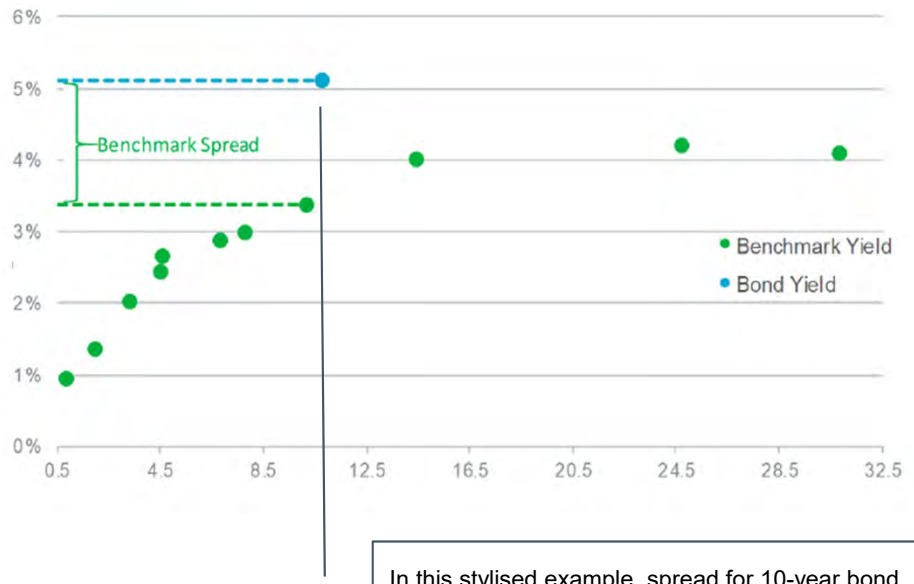
Sources: Ofgem (24th May 2019) RIIO-2 Sector Specific Methodology Decision – Finance, p.20, para 2.72.)

© NERA Economic Consulting

The market reported credit spreads, which we use to derive halo results in line with those reported by Ofgem, do not precisely control for tenor

- In replicating Ofgem's halo effect, we use the following market reported data for credit spreads:
  - IHS Markit data on spread to benchmark gilts for the iBoxx indices, available from 2006 onwards; and
  - Bloomberg data on issue spread for each debt issue or, where this was unavailable, we calculate the issue spread based on the issue price and yield to the relevant benchmark gilt
- However, IHS Markit and Bloomberg acknowledge that their spreads do not control for tenor precisely. The spread for the iBoxx or company bond is calculated relative to a specific benchmark gilt
  - there may not be a benchmark gilt that exactly matches the tenor of the bond issue
  - notably, there tend to be fewer long-dated benchmark gilts available to match the long tenor of the iBoxx bonds or companies' bonds
- As a result, Ofgem's supposed halo also reflects the tenor mismatch between the network bonds/iBoxx index and the relevant benchmark gilt

IHS Markit explains that its credit spreads do not account for tenor precisely, particularly for long-dated bonds



In this stylised example, spread for 10-year bond will be matched with ca 10-year benchmark, a close tenor match. However, spread for 20-year bond will be calculated with respect to benchmark of much shorter or longer tenor

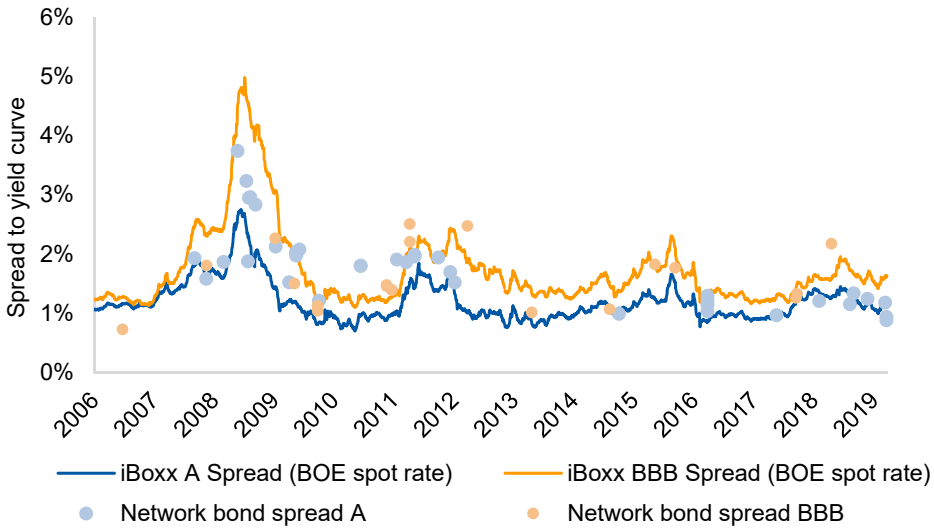
Sources: Ofgem (24th May 2019) RIIO-2 Sector Specific Methodology Decision – Finance, p.20, para 2.73-2.75.)

© NERA Economic Consulting

We derive a “negative halo” of 13bps using a more robust measure of credit spread based on BoE yield curve. The negative halo can be explained by networks facing a new issue premium (NIP)

- We calculate credit spreads that match more precisely the tenor of the iBoxx/ company bond by drawing on the Bank of England nominal spot curve
  - Yield curve fits a smoothed function over observed benchmark gilt yields, and allows us to match tenor precisely
- We estimate an average “halo effect” of -3bps (as compared to Ofgem’s 14bps), while controlling for rating at issue yields an average of -13bps (as compared to Ofgem’s 7bps)
- The negative halo should not be surprising but can be explained by networks facing a new issue premium (NIP), i.e. the company’s yield at issue is higher than secondary traded yields, as represented by the iBoxx index
- NIP arises from the need for corporate bond issuers to offer a yield premium to incentivise participation in the newly issued bonds, so that primary corporate market bond issues need to have higher yields than secondary issues. (see, e.g. Adams and Smith (2019))
- Our estimate – and approach to estimating NIP – in line with recent studies:
  - Maitra and Salt (2018) estimates an average NIP of 14bps for European corporate bond since 2009
  - Rischen and Theissen (2018) estimates the NIP to be 10bps, measured as the under-pricing in the primary issues of European corporate bonds

We estimate a “negative” halo based on BoE's spot curve, after controlling for rating at issue



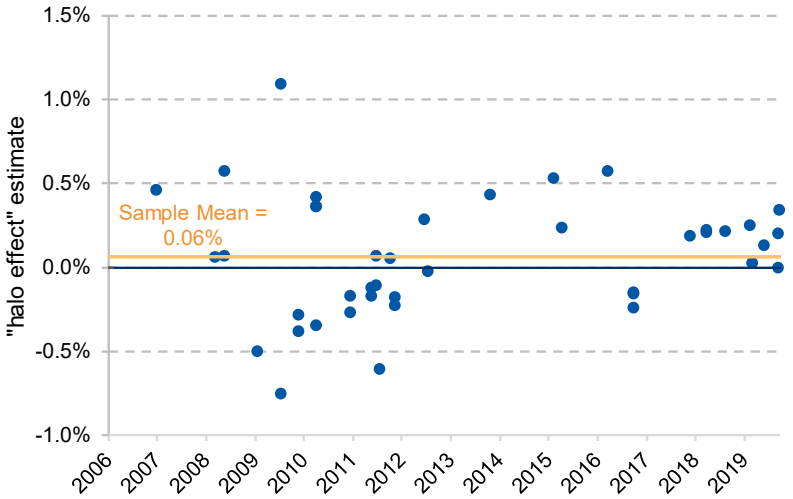
Source: Maitra and Salt (May 2018) New issuance premium in European corporate bonds, Lombard Odier Asset Management; Rischen and Theissen (2018), Underpricing in the euro area corporate bond market: New evidence from post-crisis regulation and quantitative easing, CFR Working Paper, No. 18-03, University of Cologne, Centre for Financial Research; Adams and Smith (2019), “Fixed Income Analysis”, John Wiley & Sons, p. 839.

© NERA Economic Consulting

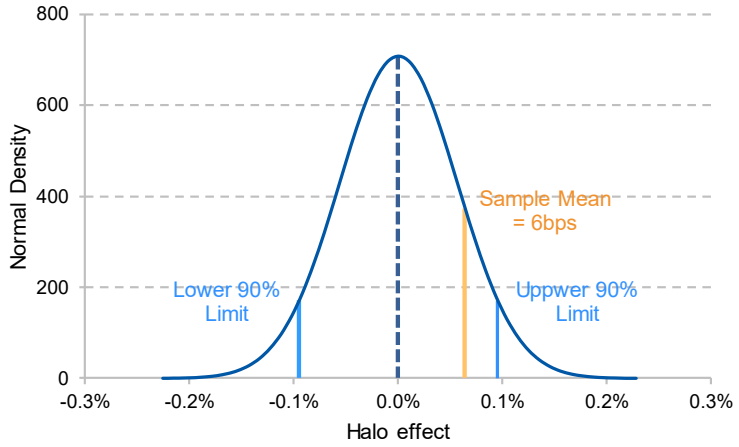
Even if credit spreads reported by IHS Markit and Bloomberg provide reliable measure of halo (which they do not), Ofgem's halo is not statistically different from zero

- The variation and size of the relative credit spread (or supposed "halo effect") for individual bonds is significant:
  - the standard deviation of "halo effect" in our sample is 36bps, more than five times the average "halo effect" of 6bps
  - In other words, individual credit spreads exhibit a high degree of variation because of the different characteristics of bonds
- We consider whether Ofgem's estimated mean halo is statistically different from zero, by calculating the standard error of the sample average, a measure of the robustness of the mean estimate. That is:
  - We construct the 90 per cent confidence interval for "halo effect" sample mean and consider whether the observed sample mean of 6bps is statistically different from zero
  - We find sample average "halo effect" is not statistically different from zero (at 10 per cent significant level)

Relative credit spreads are high and variable; Ofgem's mean estimate is not statistically different from zero



We show that Ofgem's halo is not statistically different from zero at the 10 per cent confidence level

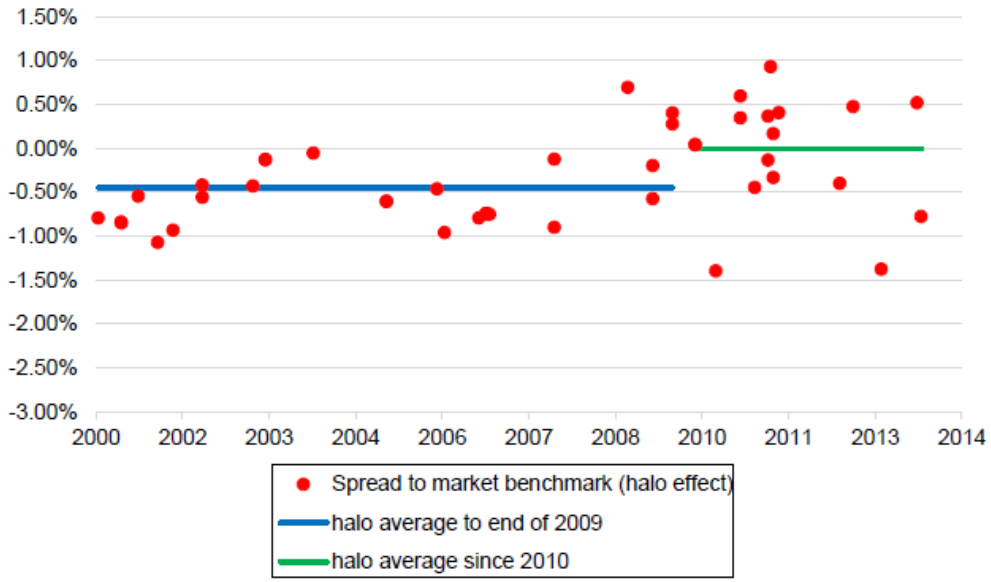


© NERA Economic Consulting

Other studies also demonstrate that there is no halo, including CMA BGT 2015 appeal

- In the RIIO-ED1 appeal by BGT, the CMA also considered the halo effect. Based on comparison of yield at issue of DNO bonds and iBoxx (as per Ofgem GD1/T1 approach), CMA found some evidence of halo before 2009 (blue line below) and no evidence of "halo" since 2010 (green line below), and upheld Ofgem position
  - We consider CMA's evidence pre-2009 fails to control for stronger company rating relative to benchmark; whereas companies average rating moves into line post 2010
  - Likewise, at GD/T1 and ED1, we conducted studies that show there is no halo effect (see Appendix)
- In its DD, Ofwat stated that there is no requirement to adjust for tenor and differences in rating in measuring halo. We disagree. Ofwat (like Ofgem) sets the cost of new debt allowance for a notional company and therefore, for consistency, it must assume that companies issue debt at the notional rating (average of A and BBB, as per its benchmark index) and for a tenor consistent with this benchmark index (at around 20 years). CMA agreed at BGT that we must control for tenor and rating
- In conclusion, various studies that employ different sampling periods and methods find no support for a regulatory halo. The implication is that Ofgem should allow companies to recover additional costs of borrowing in full

CMA found no halo in period from 2009



Source: CMA (September 2015), CMA BGT vs GEMA Final determination, p.150

Source: Ofwat (July 2019), PR19 draft determinations, p. 66

© NERA Economic Consulting

Conclusion: We find no evidence for regulatory halo. Indeed, we find evidence of a NIP of 13bps consistent with recent studies

- Conceptually, there is no reason to believe that regulated companies can outperform benchmark index because of the quality (or otherwise) of the regulatory regime
  - Rating agencies take into account the credit support offered by the regulatory framework in their assessment of the issuers' bond rating, and therefore any halo will be fully reflected in the rating (in other words, the effect of the framework is "fully priced in")
  - As a consequence, a comparison of the yield-at-issuance or spread for an A-rated energy network company bond should equal the yield-at-issuance or spread for an A-rated non-energy corporate bond, all other things equal (such as tenor)
  - Even if we were to accept the conceptual basis for a halo (which we do not), heightened political and regulatory risk means that it is unlikely to be evident over RIIO-2 (and was never evident, in our view)
- Rather than a regulatory halo, we find evidence that network companies face NIP of 13bps in line with recent academic studies of NIP for corporate debt issuance
- The implication is that Ofgem should allow companies to recover additional costs of borrowing in full, including an NIP

© NERA Economic Consulting

2 Evidence on transaction costs, liquidity costs, and cost-of-carry

Companies incur transaction costs of 7bps, comprising mainly upfront underwriting/arrangement/listing fees, and on-going rating agency fees

- We collect evidence on transaction costs associated with public bond issuance distinguishing between:
  - Underwriting fees, Bond advisory fees, Arrangement fees, Rating agency fees, Legal fees, Auditors fees, Listing fees etc.
  - We also asked companies to distinguish between up-front costs and on-going/annual costs
- Taking into account amounts issued and tenors, we calculate the up-front transaction cost to be recovered as an annuity over the life of the bond
- We calculate transaction costs as:

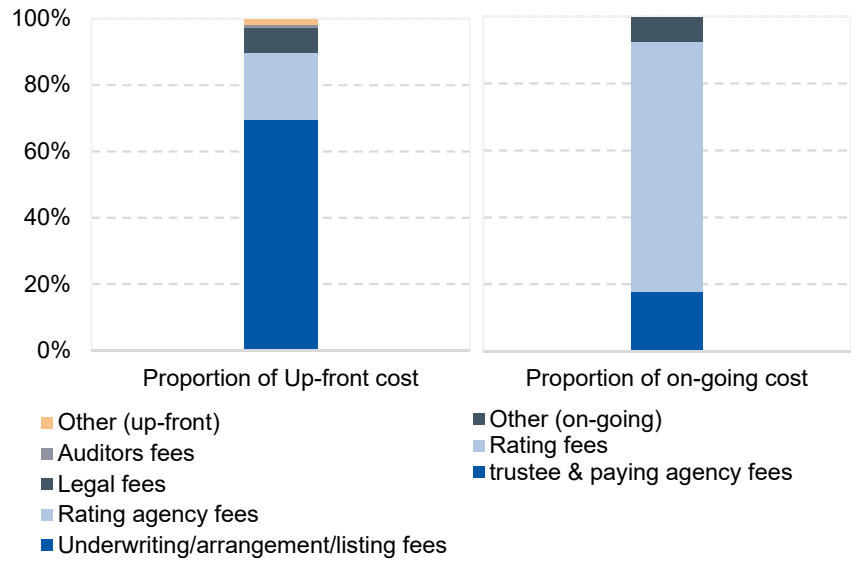
  Transaction cost =

  (Upfront fees / Tenor of the debt instrument

  + Per annum costs) / debt amount issued + total annualized common costs / notional debt

- We estimate networks' debt transaction costs to be 7bps on average.
- Companies' report that ca 50% of annualised costs are up-front. Of these up-front fees:
  - Underwriting fees and/or arrangement fees make up around 70 per cent of up-front costs
  - Rating agency fees and legal fees providing the other material components
- On-going costs are mainly rating fees, followed by trustee & paying agency fees

Break-down of up-front and on-going trans. costs



© NERA Economic Consulting

Ofgem cites evidence of liquidity costs of 3.5-4.5bps (of notional debt) but does not allow for any draw-down. Assuming facilities half-drawn, we estimate costs of 9bps

- Networks also bear the cost of maintaining liquidity facilities
  - driven by the requirement to manage day-to-day cash flow operations
  - separate to cost-of-carry, which relates to pre-financing costs

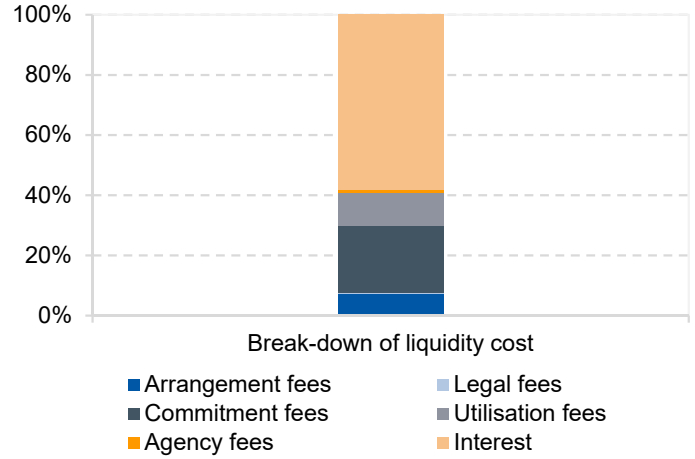
  Liquidity costs =

  (Annuitised upfront fees + annual on-going costs) / Notional Debt Amount
- Ofgem cites evidence of liquidity cost of 3.5-4.5 bps from Europe Economics (EE), based on the costs associated with commitment fees on revolving credit facilities of 35-45 bps, and assuming facilities cover 10 per cent of companies' debt
- Approach ignores other potential costs, although these additional costs are smaller:
  - Upfront arrangement fees of, say, 30bps of facility size (annuitised over 5 yrs = 0.6 bps of notional debt)
  - Upfront legal fees and annual (agency) fees

Source: Ofwat (July 2019), PR19 draft determinations, p. 66; Europe Economics, "PR19-Initial Assessment of the Cost of Capital", 11th December 2017, page 72

- Of greater importance, Ofgem ignores potential draw-down costs. Companies will in practice draw down facilities to manage volatility in cash-flow requirements
- Drawing on company evidence, we estimate the average liquidity cost to be at 9bps of notional debt based on these further assumptions (in addition to EE's commitment fee and facility size):
  - Annual utilisation fee: 20bps of drawn credit facility amount
  - Interest on the liquidity facility: LIBOR + 35 bps
  - Assume facilities are on average half drawn

Break-down of NERA estimate of 9 bps liquidity cost (assuming facility half-drawn)



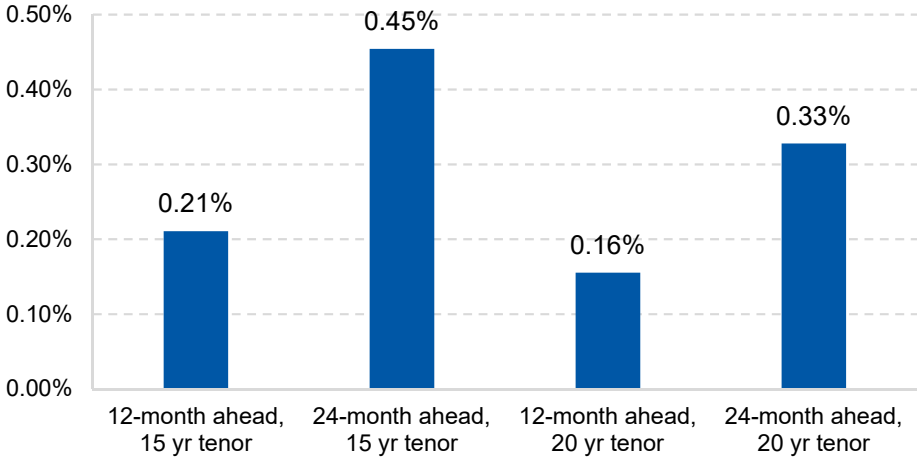
© NERA Economic Consulting

Licence requirements and rating agency criteria stipulate companies should have sufficient liquidity to meet obligations over 12 to 24 month period, suggesting a cost-of-carry of 16-45bps

- Cost-of-carry is defined as the requirement to issue debt ahead of maturity to meet sufficiency of resources requirement, rating agency and debt covenant requirements etc.
- License requirement and credit rating agency liquidity methodology require companies to have sufficient liquidity to meet obligations over a period of 12 to 24 months
  - Ofgem licence requirement: Standard Special Condition A37 (Availability of Resources) requires network companies to ensure that they have sufficient financial resources and financial facilities available to carry out business for a period of 12 months;
  - Credit rating agency requirement: S&P requires corporate issuers to achieve “adequate” or “strong” assessment on liquidity to receive a credit rating of BBB- and above
    - To achieve “adequate”, sources of liquidity must be at least 1.2x the uses of liquidity over the next 12 month period
    - To achieve “strong”, sources of liquidity least 1.5x the uses of liquidity over the next 12 months with at least 1.0x for the subsequent 12 months (i.e.12 to 24 months)

- We calculate cost-of-carry range from 16 to 45bps, assuming:
  - pre-financing period to be between 12 to 24 months in line with licence requirement and rating criteria
  - debt tenor to be between 15 and 20 years (refinancing 1/15 or 1/20 of debt each year)
  - Net carry cost of A/BBB iBoxx less Libor on cash-deposits, based on 5-year average interest rate differentials (calculated as new debt cost less cash-deposit interest received on pre-financed cash)
- Costs would be higher if assumed tenor is aligned to a trailing average that is shorter than 15/20 years, e.g. costs lie in range 33 to 74 for 10 year tenor

Cost-of-carry of 16-45bps based on 12 to 24 months pre-financing and 15-20 year debt tenor



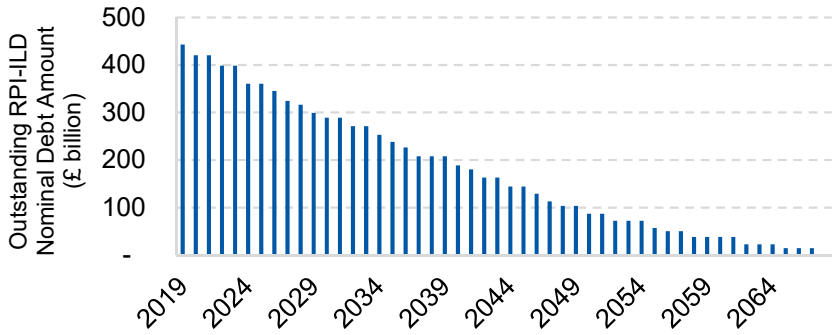
Note: We assume that carry costs are amortised over the tenor of the bond as opposed to expensed as cash cost within period, as per Ofgem/ regulators' approaches to other costs.

© NERA Economic Consulting

3 Evidence on costs associated with CPI indexation

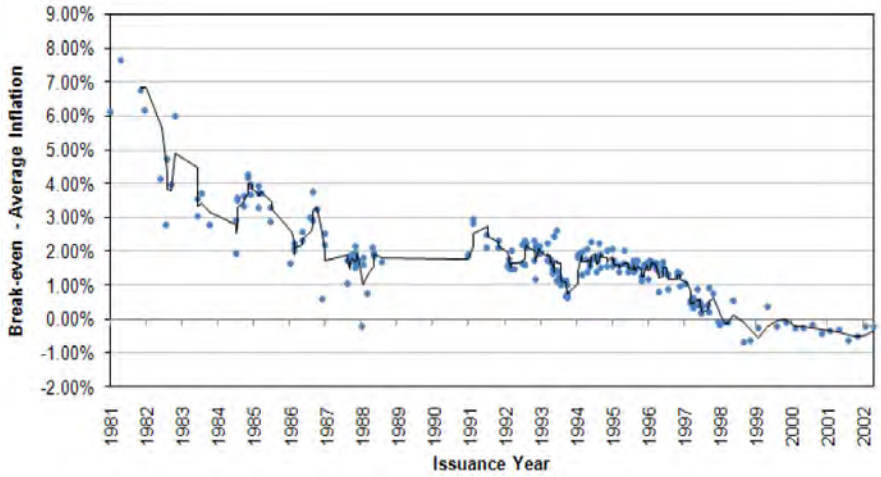
Energy and other regulated networks will need to consider switching to CPI ILD, but evidence from CPI Gilt market suggests CPI ILD market is unlikely to develop in the near term

- In RIIO-2, the RAV will be indexed by CPI, hence companies will need to consider switching from RPI ILD to CPI ILD issuance
- CPI(H) corporate ILD market is unlikely to develop absent a decision by the Treasury's Debt Management Office (DMO) to develop a CPI(H) ILD gilt market
  - The Treasury has not set out any firm plans to issue any CPI (or CPIH)-linked sovereign debt
  - Existing stock in RPI-linked gilts will not fully mature until 2068, so CPI-linked debt would have to compete with the alternative RPI-linked investment vehicles for decades (shown in Figure below)
  - Development of CPI-linked assets would fragment the ILD market, create potential illiquidity in both CPI and RPI markets and increase costs
- In Sept. 2019, govt announced it would continue to issue RPI index linked gilts until at least 2025



Source: NERA analysis of Debt Management Office data; Letters between the Chair of the UK Statistics Authority and the Chancellor on proposed reforms to RPI

- We estimate it could take 20 years for CPI gilt market to fully develop
  - DMO data shows that the weighted average maturity of existing RPI-linked gilt is around 20 years, implying that if CPI IL gilts were issued from now on to refinance maturing RPI IL gilts, it will take around 20 years to reach 50 per cent share of the overall IL gilt market, assuming no incremental issue or buy-back of RPI debt
  - In addition, it could take 20 years for CPI IL gilts to achieve level of liquidity observed in RPI IL gilt market, as it took RPI IL gilt as long as 17 years to reach a high level of liquidity
    - Illiquidity premium for RPI gilts stabilised over 20-year period (1981 to 1998), as measured by break-even to outturn inflation spread

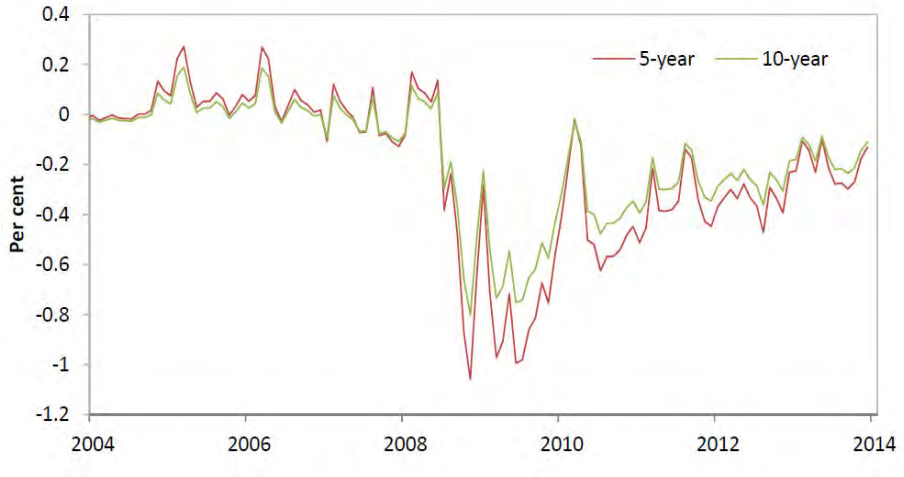


Source: DMO (October 2012), Assessing the cost effectiveness of index-linked bond issuance, p.5.

© NERA Economic Consulting

Evidence suggests potential illiquidity premium associated with future CPI ILD issuance and/or CPI derivatives could be between 15-80 bps. Assuming companies maintain 25% ILD, this translates into additional costs of c.12bps

- Evidence from the RPI ILD market shows that the illiquidity premium increased to around 80bps during the financial crisis (when market liquidity declined), which may be reflective of a premium for an illiquid CPI(H) ILD market
  - Bank of England estimated the historical evolution of liquidity premium of RPI-linked gilts relative to nominal gilts (shown in figure below)
  - The ILD premium was around 20-30bps post-2009, but increased to 80bps (10-year maturity) during the financial crisis when market liquidity declined, which may be reflective of a premium for a nascent CPI-linked debt market



Note: The figure shows the liquidity premium of nominal gilts over ILD, hence negative.
Source: Bank of England.

- The evidence on RPI and CPI inflation swaps suggests a premium of around 15bps for CPI, based on the relatively higher bid-ask spreads for CPI products
  - A 2011 report by Pension Insurance Corporation stated that liquidity in the CPI swap market is low and hence transaction costs are high
  - Bid-ask spreads quoted by banks on 20 and 30-year CPI swaps tend to be around 20bps, compared to just 5bps for RPI swaps of the same maturities, which implies a 15bps liquidity premium for CPI swaps over RPI swaps
- We estimate a cost of 12bps to issue new CPI ILD and to mitigate basis risk of remaining RPI ILD, based on following assumptions:
  - Companies maintain ILD of around 25 per cent of notional debt as assumed in Ofgem's Sector Methodology
  - Companies issue CPI ILD (or swap existing RPI ILD into CPI) at an additional cost of c. 50bps, the mid-point of 15 to 80bps premium for CPI products
    - implies additional cost of around 12bps on notional debt (25%*50bps)

© NERA Economic Consulting

4 Conclusions

We estimate average additional borrowing costs of 28-57 bps. Adding NIP and costs associated with CPI indexation, we calculate the total additional borrowing cost to be 53-82bps

- Drawing on company data and market evidence, we estimate the following additional costs of borrowing for networks over RIIO-2
  - Transaction costs of 7bps, drawing on company public bond issuance
  - Liquidity cost of 4.5bps, or 9 bps if half-drawn
    - (In summing costs, we assume no draw-down to avoid any potential double-count with cost-of-carry)
  - Cost-of-carry of 16 to 45bps based on companies meeting sufficiency of resource and rating agency requirements to meet obligations for 12 to 24 month period
- Overall, we estimate 28 to 57bps for transaction, liquidity costs and cost-of-carry

- In addition, we find evidence for NIP of 13bps, in line with recent studies
- We also estimate cost of 12bps for companies to mitigate risk associated with notional RPI ILD, and to ensure that switch to CPI indexation is value neutral
- Overall, additional costs of borrowing over RIIO-2 could be in the range of 53-82bps
  - Ofgem allowed (implicit) 20bps at RIIO-1 is insufficient to fund companies over RIIO-2
- Companies may also face other costs, e.g. costs of mitigating risk that iBoxx allowance (based on average of daily data) differs from the realised cost on day of issuance through options ("daily setting risk")

Estimates for additional cost of borrowing over RIIO-2

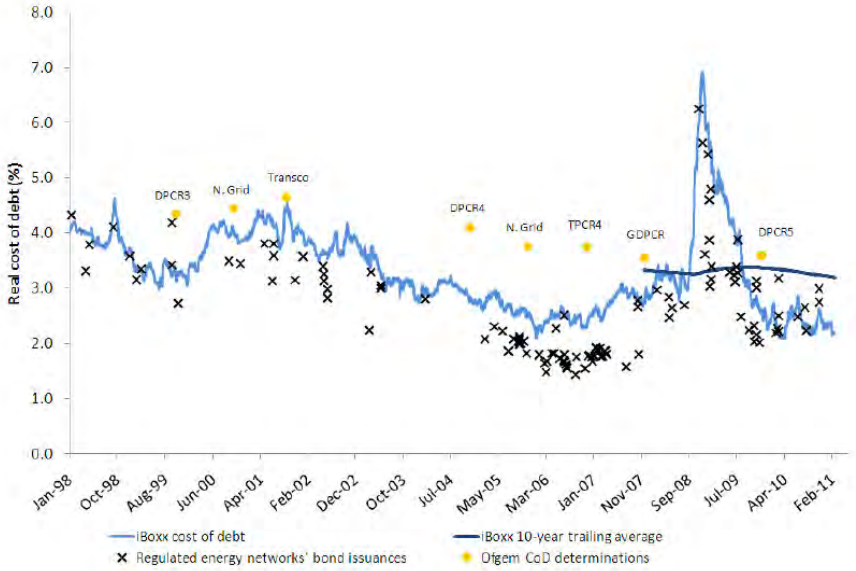
Additional borrowing costs	bps
Transaction cost	7
Liquidity cost	4.5
Cost-of-carry	16 - 45
Sub-total	**28 – 57**
New issue premium	13
CPI indexation associated costs	12
Total	**53 – 82**

© NERA Economic Consulting

Appendix | Halo Effect at RIIO-1 Price Review

At RIIO-1, Ofgem did not provide explicit transaction cost allowance, as it considered covered via energy companies' outperformance of benchmark index ("halo effect")

- At RIIO-1 controls, Ofgem concluded that energy companies were able to issue debt below iBoxx benchmark due to beneficial impact of regulatory regime on credit risk ("halo effect")
- Ofgem presented two types of analysis to support its estimates of "halo effect" at RIIO-1 controls
  - T1/GD1: Comparison of yield at issue for utility bonds to A/BBB iBoxx benchmark (LHS)
  - ED1: Comparison of remaining yield to maturity for DNO bonds to iBoxx benchmark (RHS)



Source: Ofgem (March 2011), Strategy decision GD1/T1 Financial Issues, p.29

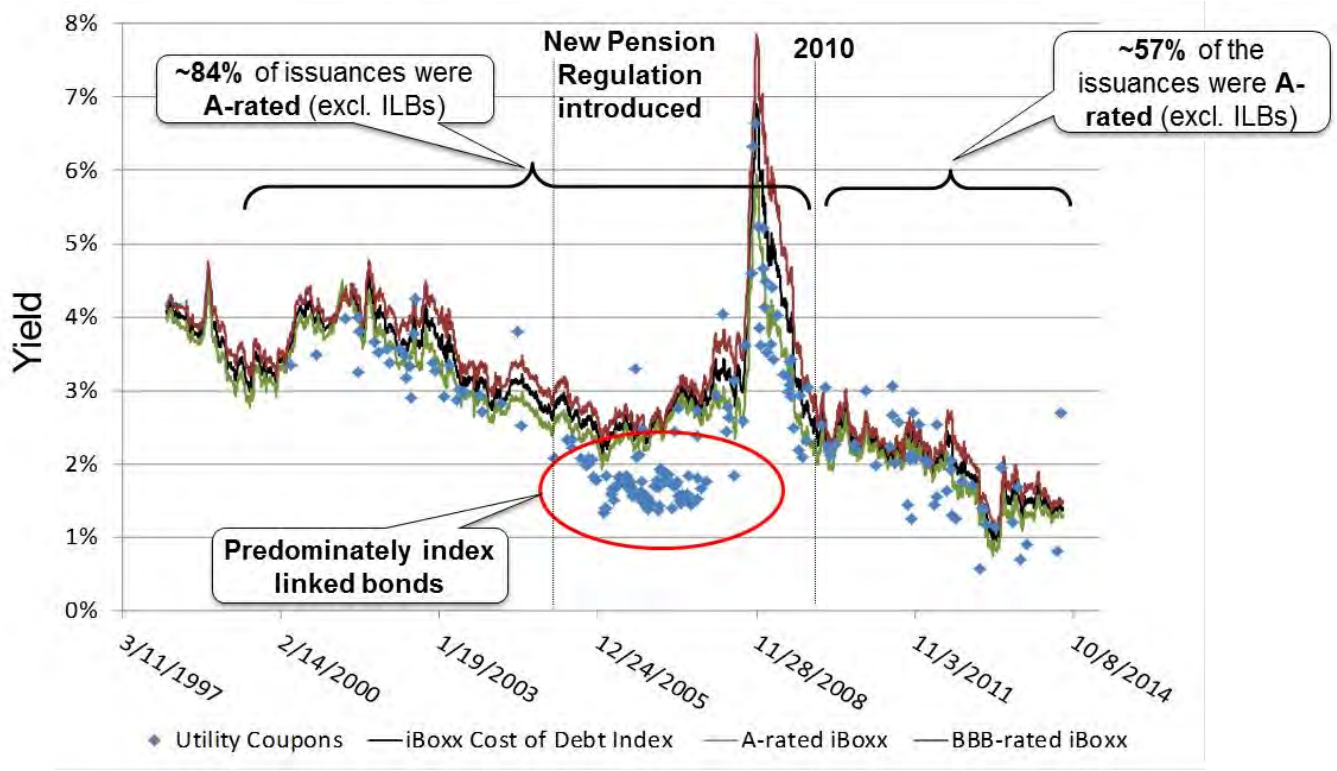
Source: Ofgem (July 2014), RIIO-ED1 Draft Determinations Financial Issues, p.15

- Ofgem used "halo" argument to justify not including explicit allowance for debt transaction costs of around 20bps

© NERA Economic Consulting

At GD1/T1, we have shown that Ofgem's analysis of halo reflects failure to compare bonds on a like-for-like basis, notably control for tenor and/or rating

Ofgem GD1/T1 "halo" driven by i) inclusion of ILD from mid 2000s and ii) failure to control for rating differences between utility bonds and iBoxx. The issuance of relatively inexpensive ILD/wrapped debt in mid 2000s was one-off event, and ILD issuance has fallen away (particularly under CPI switch)



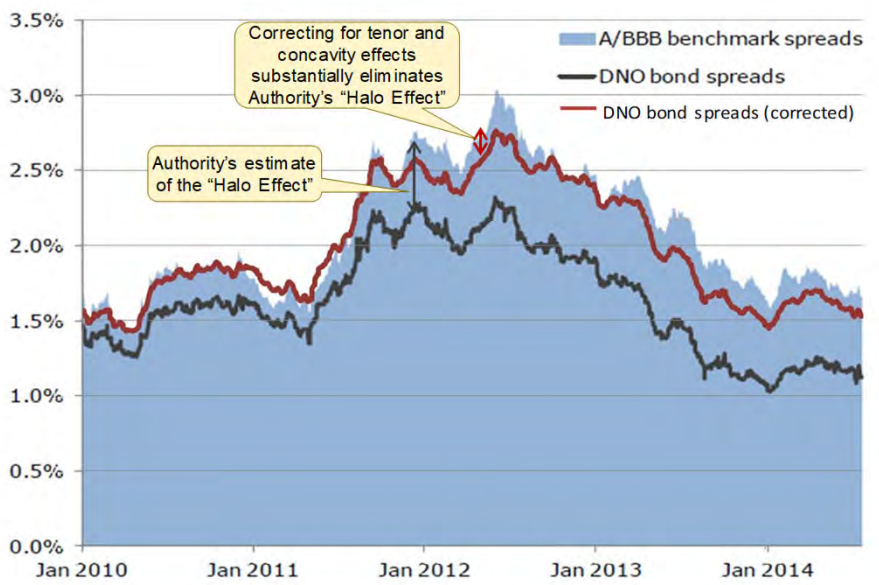
	Entire period (2000 -)	Recent (2010 -)
Ofgem "halo effect"	57 bps	11 bps
Excluding ILDs	- 29 bps	-2 bps
Correct benchmark	-23 bps	- 6 bps
Final "halo effect"	**5 bps**	**3 bps**

© NERA Economic Consulting

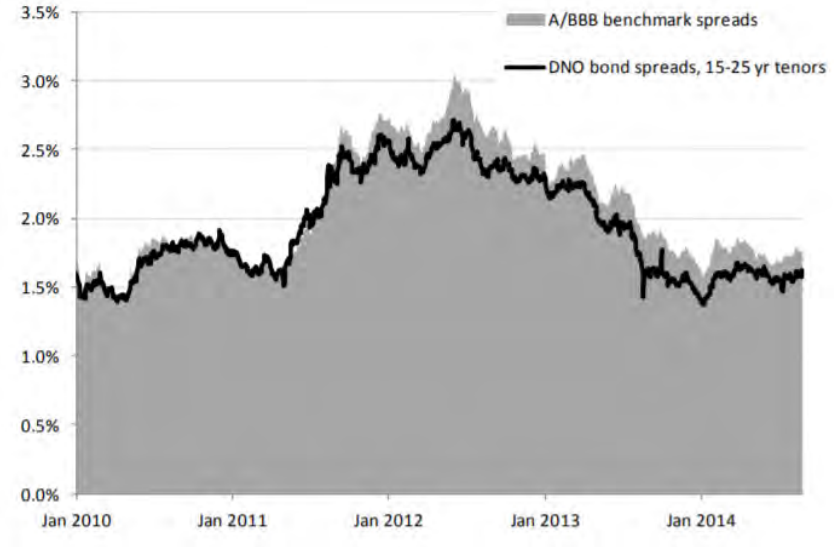
For ED1, we have shown that Ofgem's analysis of halo reflects failure to compare bonds on a like-for-like basis, notably tenor

- For ED1, Ofgem presented alternative analysis, comparing *yield to maturity* data (i.e. trading data) for DNO bonds and iBoxx index
  - Ofgem concluded DNO bonds' spread over UK gilts systematically smaller than iBoxx index.
- We show apparent halo reflects:
  - Shorter tenor: Ofgem's estimate of the halo increases over period; but this reflects the declining tenor of the sample (the sample was fixed at Jan 2010 and declines by ca 5 years over period)
  - Concavity effects: Ofgem's sample of bonds includes bonds of variable maturity. But average yield of two bonds with a maturity of 5 years and 25 years is less than the yield on a 15-year bond (i.e. a bond with their average maturity), given concavity of yield curve
- Ofgem's revised analysis in FD takes account of tenor issues, and finds that halo effect is negligible before 2012. However, Ofgem determined that there is 20bps halo effect post 2012
  - Ofgem final conclusion at odds with CMA, as described in section 1

Ofgem's initial analysis on halo failed to control for tenor and concavity effects



Ofgem revised downwards halo estimate at FD



© NERA Economic Consulting

NERA

ECONOMIC CONSULTING