



Europe Economics

# Implications for debt-raising and the cost of debt of changing the minimum termination notice period for NERL's licence

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# 1 Introduction

This report has been commissioned from Europe Economics by the Civil Aviation Authority (CAA). It concerns potential changes to the minimum termination notice period applicable to the licence for NATS (En Route) plc (NERL).

## 1.1 What is a minimum termination notice period?

Regulated entities often have a licence to carry out their business. Such a licence will be subject to a minimum termination notice period (MTNP). The MTNP is the sum of the guaranteed period (if any) before termination notice can be served plus the period of notice. So, for example, when the UK water and sewerage companies were privatised, the government guaranteed that it would not serve notice upon the companies for 25 years, and that if notice were then served there would be a 10 year period before the licence finally expired. Hence the MTNP in that case was 35 years.

In 2002, the licences for the water and sewerage companies were amended, so that there is now a rolling 25 year notice period.

In the case of NERL, we understand that notice cannot be served until 2021 and there would then be ten years' notice. Hence the current minimum termination notice period is 16 years at the time of writing, and the period is declining.

## 1.2 The issues to be considered

In September 2011, following an application from NATS, the Department for Transport consulted on a Government proposal to amend the terms of the licence under which NERL operates as follows:

- an increase the notice period after which the licence can be terminated from 10 to 25 years; and
- the removal of the restriction which specifies that notice may not be served until the 20th anniversary of the grant of the licence.

Taken together, these changes would have the effect of ensuring that the licence could not be terminated for at least 25 years following the decision to terminate and the serving of notice.

Within this context, Europe Economics was asked by the CAA to provide the following support:

- Conduct a high-level benchmarking study across other regulated sectors, to assess how NERL's current licence, and the options considered for changes to it, compares to those of other regulated utility.
- Evaluate NATS' ongoing ability to access long-term financing at optimum pricing, and the potential for this to affect its ability to support effectively all of the licence obligations.
- Provide a critical assessment of the arguments put forward by NATS for extending the notice period and reintroducing a licence exclusivity in favour of NERL.

We note that it falls outside our remit here to offer advice as to whether the notice period should be extended — particularly because to offer such advice we would need to take account of many additional factors that have not been considered within the narrow scope of this study.

### 1.3 Comparator set

The analysis is based on a number of UK utilities operating in different sectors and which are exposed to differing licensing regimes and/or have been subject to changes in their licensing regimes. The list of relevant companies used for the analysis and corresponding information related to the licensing regimes are provided in the table below.

**Table 1.1: List of comparators**

Sector	Company	Length of licence/notice period	Changes to the licensing framework
Aviation	<b>NERL</b>	<b>10 years notice</b>	
<b>Electricity</b>	CE Electric UK	25 years notice (after 10 years fixed)	
	e-on		
	UK Power Networks		
	Scottish Power		
	SSE		
	Electricity North West		
	Western Power Distribution		
<b>Gas</b>	National Grid	25 years notice (after 10 years fixed)	
	Wales & West Utilities		
	Northern Gas Networks		
	Scotia		
<b>Water</b>	Northumbrian WG	25 years notice	Notice period was extended from 10 to 25 years on 15 October 2002
	Pennon		
	Seven Trent		
	United utilities		
<b>Telecom</b>	BT	10 years notice	

### 1.4 Data

For our analysis, we collected daily bond data from Bloomberg from 01/01/2000 up until 20/07/2015. Bloomberg data was collected for all companies listed in Table 1.1 and the following variables were included in our data set:

- daily yield data;
- notional amount issued per bond;
- issue date; and
- maturity date.

Moreover, the final set of bond data was restricted to only include bonds that were issued in GBP and to exclude perpetual, callable and puttable bonds. These restrictions are imposed in order to facilitate comparability across the universe of bonds from different companies.

### 1.5 Structure of the report

The rest of this report is structured as follows:

- In Section 2 we consider how one might expect a change in termination period to affect debt-raising.
- In Section 3 we set out our quantitative analysis regarding the impacts of notice period upon the profile of debt.

- In Section 4 we set out our quantitative analysis regarding the impacts of the notice period upon the cost of debt.
- In Section 5 we produce our conclusions.

## 2 How One Might Expect a Change in Termination Period to Affect Debt-Raising

In this section we set out some of the theoretical and intuitive reasons one might or might not expect a change in the minimum notice period to affect debt-raising and, insofar as one would expect an impact, the conditions under which such an impact would be larger or smaller.

### 2.1 The core idea

The natural expectation is that there should be some difference between debt raised that matures beyond the MTNP from debt that matures within it. The reason is that beyond the MTNP there is an additional risk — that the licence expires because of notice being given.<sup>1</sup> That additional risk would be expected to mean:

- debt raised after the MTNP is more expensive (requires higher promised yields at issuance) than debt of the same maturity would be if it fell within the MTNP;
- if the difference in risk is sufficiently high, debt raised after the MTNP may be of a lower credit rating than debt of the same maturity would be if it fell within the MTNP; and
- because debt raised after the MTNP is more expensive and of a lower credit rating than debt of the same maturity would be if it fell within the MTNP, the profile of debt issuance becomes more weighted to shorter-term debt, falling within the MTNP, than would be the case if the MTNP were longer.

### 2.2 Contrary points and countervailing factors

First it is worth noting that regulated entities face a number of risks even within the MTNP. The MTNP is not a guaranteed period of non-bankruptcy. Firms may be negligent or incompetent in ways that lead to early licence revocation. Firms may mismanage their finances, misread the likely scope for opex outperformance or the cost of capital in future price reviews, face new competition from alternative technologies or new entrants, find their business circumstances overtaken by changes in the regulatory environment, changes in tastes or changes in the business needs of their customers, or simply be unlucky in other ways that lead to them defaulting on their debts.

One possibility is that these other factors dwarf the significance of the MTNP, such that even if the MTNP had a yield impact of some few basis points, that would fall well within the normal fluctuations in yields driven by evolving opinion about these other factors — so it was little more than added noise. Another possibility is that notice being served would be expected to be a subset of the conditions under which these other factors were in play — so, for example, perhaps all possible worlds in which notice were served would be worlds in which the technology used in producing the regulated activity were rendered

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<sup>1</sup> We note here that some regulated entities may have more than one licence or a collection of licences with the same MTNP). We set aside this complication for the moment. In practice regulated entities may be part of wider businesses that include unregulated elements. Again, we abstract from this.



obsolete well in advance, meaning the firm defaulted well before the MTNP anyway.<sup>2</sup> In such a case there would be no additional impact of the MTNP.

Another consideration might be the de facto collateral comfort provided to borrowers by the assets of the regulated entity. If the firm's assets have lives that extend well beyond the MTNP and if those assets would be able to be re-sold, upon termination of the licence, to the new licence-holder (assuming there were one), then the MTNP might be expected to have relatively little impact. Contrariwise, if the regulated entity's assets were all company-specific, the presence of a licence would provide lenders with comfort (the comfort that the licence-holder would be able to continue in business) and the expiry of the licence would be expected to be a significant event in credit terms.

## 2.3 Other factors affecting the appropriate minimum termination notice period

Our task in this project is to assess the impact of changes to the MTNP upon debt-raising. We note, however, that there are a wide range of other factors that might be relevant to the choice of an MTNP, some of which might provide insights into the potential impact on debt-raising of changes in the MTNP.

It might be, for example, that an MTNP is best designed to match, approximately or at least to be informed by the typical life of the company's assets. The idea here would be that upon being awarded a licence a company may need to engage in a certain amount of investment in order to discharge its responsibilities as the licence-holder. The thought would then be that since the award of the licence implies carrying out the activities required, the licence period should be sufficient to allow for an investment cycle adequate to allow such a carrying out.

An alternative thought might be that the MTNP should be designed not with all assets in mind, but instead only with those assets investment in which would naturally involve the raising of debts. So for example if a company had a large proportion of its assets being short-lived company-specific intangibles, it might have an average asset life of only a few years. That might suggest, from the considerations above, that it should have an MTNP of only a few years – matching its average asset life. But it is well known in corporate finance that firms are less likely to fund intangible assets with debt. Debts tend to be more popular for the funding of investment in fixed assets. The thought would then be that if a company's average asset life were only a few years (because of its having a high proportion of short-lived intangible assets) but when it did need to invest in tangible fixed assets these were long-lived, that might imply a longer MTNP.

Another is that the MTNP might be influenced by what the licence-issuer regards as the minimum plausible period over which there is no material likelihood of the regulatory environment, other policy environment or technology changing such that either the scope of the licence (e.g. the services to be provided or the geographic scope) will change, there might be significant and effective competitors to the licence-holder, or there might be a significantly superior alternative licence-holder.

This could have a potential impact upon the cost of debt if an extension to the MTNP meant that regulation therefore kept the regulated entity in a monopoly position for longer than technology or market conditions would require.

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<sup>2</sup> We observe in passing that some licences may have the effect of excluding competitors even if they use a radically different technology for delivering the same service. That would still leave open the possibility that technology means there is suddenly much less demand for the service at all — e.g. one could imagine technological changes that would remove the need for a central electricity grid (perhaps all electricity supply would become local) or that made hub airports obsolete.

There are a range of further factors that could be relevant to the setting of an MTNP. We emphasize that our conclusions within the narrow scope of this project should therefore not be interpreted as pre-judging any broader overall assessment of the best MTNP.

## 3 Impacts of Notice Period upon the Profile of Debt

As noted in Section 2, it is natural to imagine that when the notice period is longer, other things being equal the profile of debt raised will be longer.

If a company is today, say, 20 years before its licence can be revoked (if the MTNP is 20 years), does it issue debt only with a maturity of less than 20 years? If we observe such a “cap” on debt maturity, then it might indicate that investors perceive an increased risk post-revocation of the licence. Alternatively, even if it does issue some debt with a maturity beyond the MTNP, does it tend to issue longer debt if the MTNP is longer or is debt maturity largely independent of the MTNP?

As noted in Section 2, if we do not observe any impact of the MTNP on average debt maturities, that might indicate that other factors such as the level of interest rates and other indicators of the credit market state might dominate the potential perception of increased risk post revocation, or perhaps that investors regard the key issue for the continuation of the licence to be the company’s conduct, technology and the general policy context, rather than the notice period itself.

We have tested this empirically and present the results of our tests in this section.

### 3.1 Approach

The analysis conducted here aims at assessing whether differences in the length of the licence notice period and/or changes thereof, are statistically associated with observed levels of in maturity debt profiles.

For each company in our comparator set (see Section 1.3) we measured the weighted average debt maturity profile as follows:

$$y_{i,t} = \frac{\sum_{j=1}^{n_i} m_{j,t} a_j}{\sum_{j=1}^{n_i} I_{j,t} a_j}$$

where,  $n_i$  is the total number of bonds issued by company  $i$  over the relevant period,  $m_{j,t}$  is the number of years to maturity at time  $t$  of bond  $j$ ,  $a_j$  is the amount issued for bond  $j$ , and  $I_{j,t}$  is an indicator function which takes value one if bond  $j$  is active at time  $t$ , (i.e. it has already been issued but has not matured yet), and value zero otherwise.

### 3.2 Current debt maturity profiles

The table below provides the average debt maturity profile (calculated over the period 01/01/2000-20/07/2015) for each utility company.

**Table 3.1: Weighted average debt maturity profile (average value over the Jan-2000-20-Jul-2015 period)**

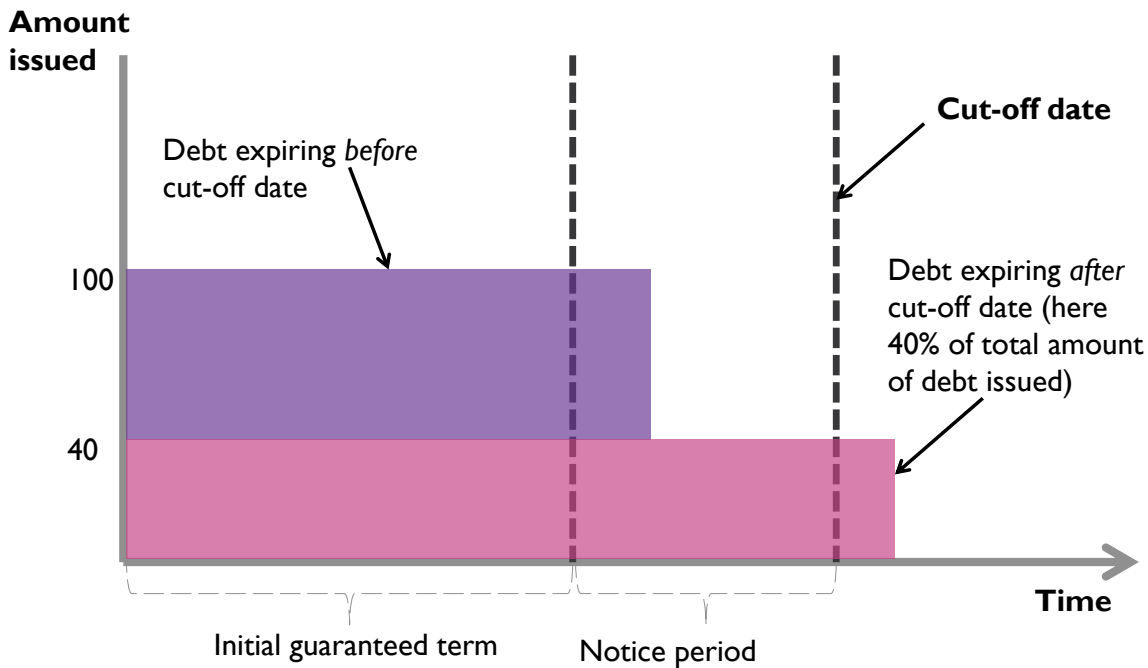
<b>Sector</b>	<b>Company</b>	<b>Average debt maturity profile (years)</b>	
<b>Electricity</b>	CE Electric UK	17.4	
	e-on	15.8	
	UK Power Networks	17.3	
	Scottish Power	14.1	
	SSE	17.9	
	Electricity North West	18.3	
	Western Power Distribution	20.2	
<b>Gas</b>	National Grid	16.2	
	Wales & West Utilities	12.3	
	Northern Gas Networks	20.3	
	Scotia	17.2	
<b>Water</b>		Pre Oct-2002	Post Oct-2002
	Northumbrian WG	15.2	21.1
	Pennon	n.a.*	28.7
	Seven Trent	22.5	21.9
	United Utilities	7.4	22.7
<b>Rail</b>	Network Rail	22.3	
<b>Telecom</b>	BT	13.0	
<b>Aviation</b>	NERL	16.7	

Source: Bloomberg and EE calculations. \* No bonds available on Bloomberg for the relevant time period.

### 3.3 The MTNP as a cap on debt maturity

The following diagram illustrates how we measured whether companies tend to issue debt that will expire before the potential end of their revocation period. For NATS, the earliest notice period can be given is 2021, and it is a 10 year notice period. Therefore we looked at whether NATS tends to issue debt that expires before 2031. For electricity distribution companies the cut-off year is 2025 (with notice of termination not to be served earlier than 2000 with a notice period of 25 years). For gas distribution networks, which do not have a minimum term the cut-off date is a 25-year from the given day.

**Figure 3.1: Methodology for estimating existence of cap on debt maturity (illustrative example)**

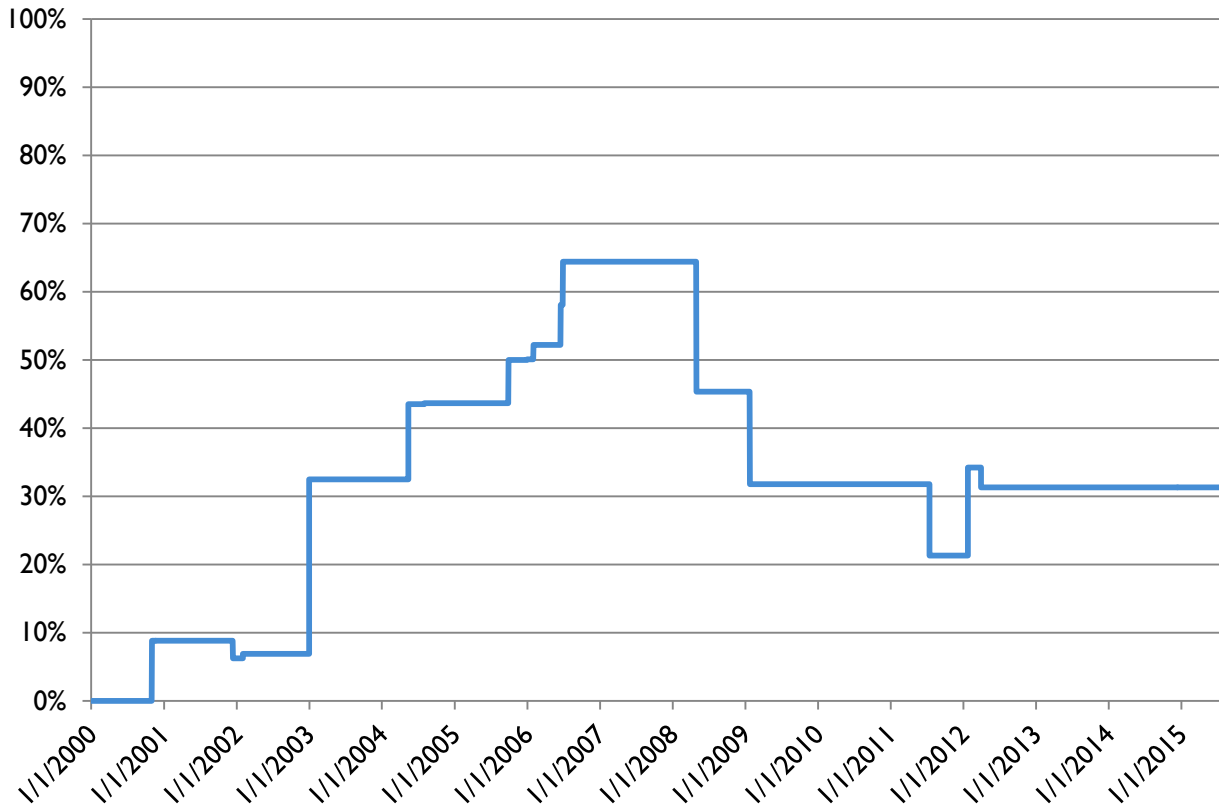


Source: Europe Economics illustration.

We have produced a time-series analysis in order to capture the potential appearance or disappearance of the “cap” over time. For each day since 1 January 2000, we estimate the amount of debt in the company’s book that will expire *after* the date from which the notice could potentially be revoked. E.g. for NATS, we calculate on 1 January 2000, the amount of debt in its book that will expire post-2031. We then express this amount as a percentage of the total debt in in the company’s book. A lower ratio indicate that the company more tends to issue debt that expires before the potential revocation of its licence. A higher ratio indicates the cut-off date exerts less constraint on the company debt maturity decisions.

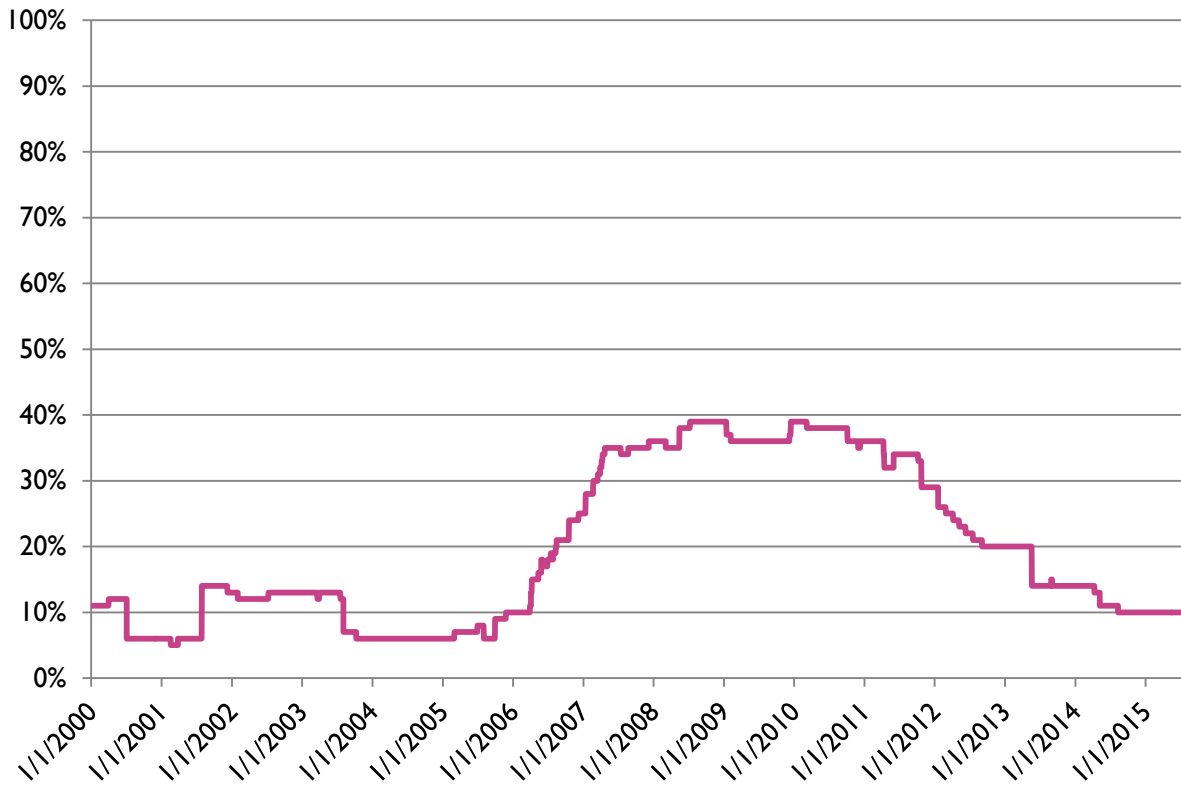
We show in the next diagram how the proportion of debt that expires after the cut-off date varies over time for one company in each of five sectors (water, electricity, gas, telco and rail).

**Figure 3.2 Proportion of debt expiring after the cut-off date: Northumbrian Water**



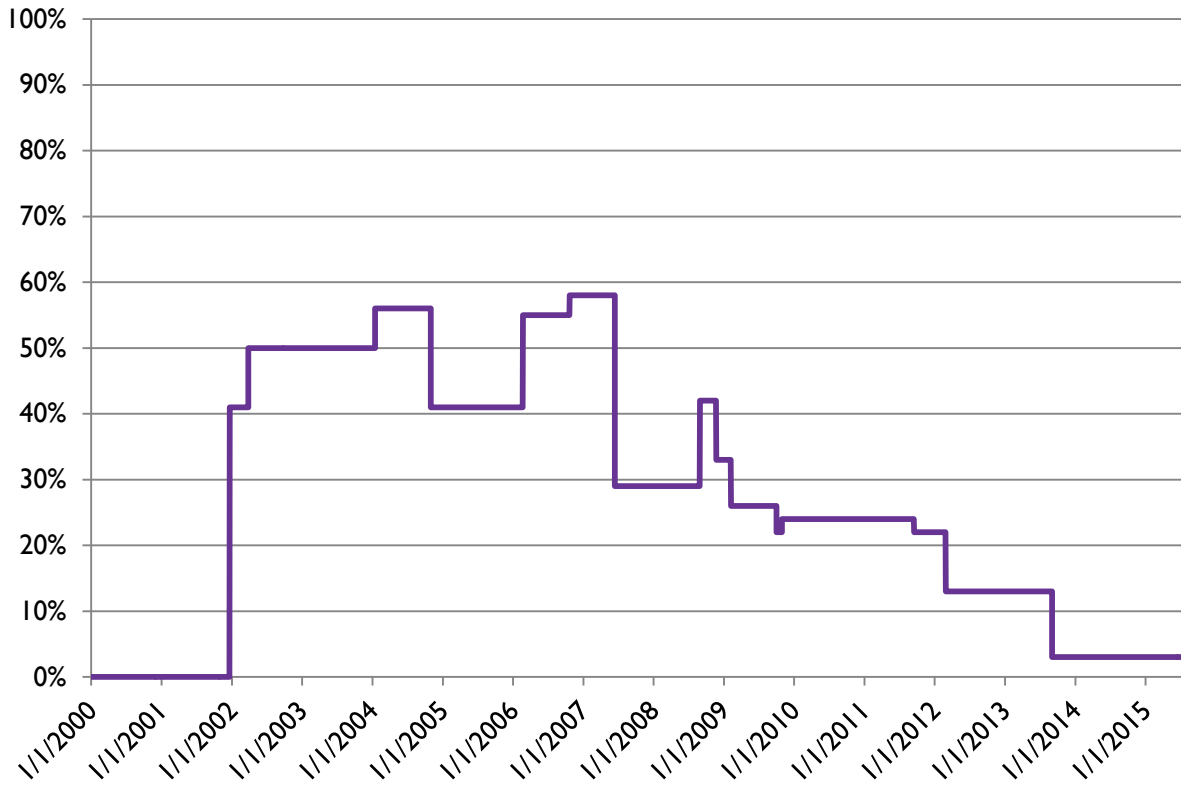
Source: Europe Economics, Bloomberg.

**Figure 3.3 Proportion of debt expiring after the cut-off date: National Grid**



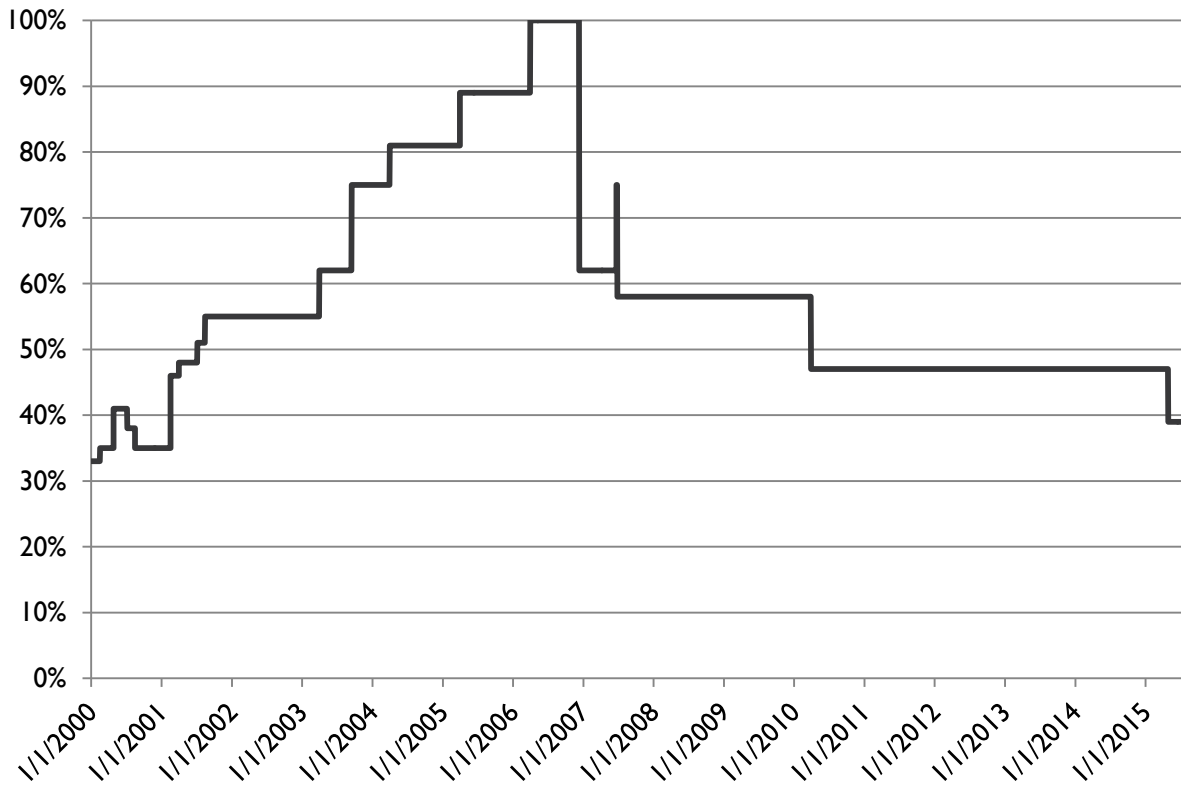
Source: Europe Economics, Bloomberg.

**Figure 3.4 Proportion of debt expiring after the cut-off date: SSE**



Source: Europe Economics, Bloomberg.

**Figure 3.5 Proportion of debt expiring after the cut-off date: BT**



Source: Europe Economics, Bloomberg.

NATS has zero per cent of debt expiring after their potential licence revocation date, i.e. the one bond they have issued and which satisfies our data collection criteria matures in 2026 while the earliest possible licence cut-off date is 2031).

We infer the following points from observing the profile of debt expiring after the cut-off date shown in the four previous charts and the point on NATS:

- Companies do issue material volumes of debt — 30 per cent and more, at times — beyond the MTNP. It does not appear to act as any sort of “cap” on debt-raising.
- The proportion of debt expiring after the cap peaks for most companies around 2006/07 or 2002, i.e. when banks were lending easily to corporates. This is a sign that credit conditions may be much more important than the influence of the cut-off date.
- The amount of debt expiring after the cut-off date has decreased steadily across companies from 2007 to today, as credit conditions have become tougher in Europe, which again reinforces the idea that macroeconomic conditions dominates the impact of the relative proximity to the cut-off date.
- A company like BT, which has a short notice period (10 years), has relatively more debt that expires after the cut-off date. BT has consistently had level of debt expiring after the cut-off date above 40 per cent. It may indicate that companies make decision on the maturity of their debt independently from the proximity of the cut-off date. We observe, however, that BT has a very large unregulated component to its business (around half), which may be an important additional factor in the profile of its debt, reducing the significance of the MTNP.
- NATS appears as an outlier as it is the only company which does not have any bonds issued post cut-off date.

### 3.4 Econometric model of MTNP versus average debt maturity

As noted above, even if companies do issue material volumes of debt beyond the MTNP, that still leaves the question of whether average debt maturities tend to be longer when the MTNP is longer. We have investigated this question by estimating a panel-data econometric model with bond specific fixed effects and time fixed effects (to control for the evolution of the general macroeconomic environment). The dependent variable (MATURITY) is the Weighted Average Maturity Profile (in Months). The main substantive control variable is the number of months remaining in the MTNP.

It should be emphasized that the econometric model is based upon debt maturity profiles and notice periods through time, by company, so the number of data points is large (not simply 17 data points for 17 companies).

**Table 3.2: Relationship between Months to MTNP Cut-off Date and Weighted Average Maturity Profile (in Months) — All companies**

Dependent Variable: WEIGHTED AVERAGE MATURITY

Method: Panel Least Squares

Sample: 2000M01 2015M12

Periods included: 187

Cross-sections included: 17

Total panel (unbalanced) observations: 2793

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20.89349	21.63094	-0.965908	0.3342
MONTHS of MTNP	0.829537	0.075890	10.93073	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)



We can interpret this result as follows. For every additional month left until the MTNP expires, a company’s average debt profile will be longer by 0.83 months.<sup>3</sup>

This would be consistent with the idea that the MTNP has quite powerful implications for debt-raising. Firms extend average debt maturity periods getting on for one-for-one with the MTNP. This suggests that if the MTNP for NATS were permitted to continue to shorten, one should expect NATS’ debt profile to shorten almost in line.

### 3.5 Summary

In this section we have found that

- a) the minimum termination notice period does not act as a cap upon debt-raising — firms do raising significant proportions of their debt to mature after the MTNP; but
- b) the MTNP has a powerful effect upon average debt maturities — firms extend average debt maturity periods getting on for one-for-one with the MTNP.

<sup>3</sup> Because BT has a rather different credit rating from the other firms in our comparator set, we have often performed cross-checks on our results by considering a comparator set excluding BT. Here is the result for that reduced comparator set in this case. We can see that it makes no material difference to the result.

**Table: Relationship between Months to MTNP Cut-off Date and Weighted Average Maturity Profile (in Months) — BT Excluded**

Dependent Variable: WEIGHTED AVERAGE MATURITY

Method: Panel Least Squares

Sample: 2000M01 2015M12 IF VAR01 <>"BT"

Periods included: 187

Cross-sections included: 16

Total panel (unbalanced) observations: 2606

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.18254	23.38505	-1.333439	0.1825
MONTHS of MTNP	0.845433	0.078774	10.73236	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

## 4 Impacts of Notice Period upon Cost of Debt

As noted in Section 2, it is natural to imagine that

- when debt matures after the minimum termination notice period the required yield will be higher; and
- the amount by which required yields will be higher after the termination notice period will depend (*inter alia*) upon the effective collateral provided by the firm's asset, which in turn will depend upon asset lives and the proportion of assets that are tangible.

In this section we test these hypotheses and quantify the relevant effects.

### 4.1 Approach

As set out in Section 1.4, for the comparator set we have used, we have assembled a range of bond market data. That data allows us to identify whether the maturity date of a bond falls within or outside the minimum termination notice period. We have used this data to consider whether, and if so how, a bond's maturing after the MTNP affects yields.

We also have data on asset lives and (for a more limited set of bonds) on the proportion of total enterprise value that is constituted by tangible fixed assets. We have considered both how these factors affect yields in themselves and also how they affect any additional yield on bonds maturing after the MTNP. (In technical terms, we have estimated interaction variables.)

For all companies' bonds with maturities that fall beyond the earliest day in which the licence notice period can be served, we have defined an *event date* as the date at which the bond's time to maturity changes from being beyond the minimum notice period to being within that period. So, for example, if at the time of issuance a bond matures one year after the MTNP, then (unless notice is served) one year later its maturity date will come back within the MTNP.

If investors regard the formal possibility of notice being served as not entirely encompassed within general expectations about the likelihood of licence revocation, a change in the policy context, or some technological change, the formal expiry of the possibility of licence revocation before bonds mature would be a financially significant event, affecting yields.

If, on the other hand, formal notice is not material compared with these other factors (or if the risk thereof is, in a formal sense, dominated by the risks of these other factors), we might expect there to be no measurable impact on yields of such *event dates*.

Accordingly, for each company's bond, we have tested whether the yields in the period preceding the *event date* (i.e. for bonds maturing after the MTNP) are significantly different from the yields after the event date (i.e. when the bonds' maturity date comes back within the MTNP). This empirical test has been carried out by estimating a panel model with monthly data frequency in which the relevant event variable is expressed as a dummy variable taking value one if a bond's matures before the earliest day in which the licence notice period can be served, and zero otherwise. We have controlled for the way that the risk-free yield curve and inflation expectations (both of which will be common across the market) change through time by estimating the model with time fixed effects.

## 4.2 Results

### 4.2.1 Impact of event date

**Table 4.1: Impact of a bond maturing after the MTNP on yields**

Dependent Variable: Yields				
Method: Panel Least Squares				
Sample: 2000M01 2015M12				
Periods included: 187				
Cross-sections included: 132				
Total panel (unbalanced) observations: 11655				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Bond maturity < MTNP	-0.466785	0.021192	-22.02668	0.0000
Constant	5.092153	0.019534	260.6749	0.0000
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.663784	Mean dependent var	4.694334	
Adjusted R-squared	0.658302	S.D. dependent var	1.374705	

*The analysis is based only on companies' bonds that are not index-linked.*

In Table 4.1 we see that when the bond maturity falls within the MTNP, bond yields are 0.47 percentage points lower (e.g. if they were 4.5 per cent for bonds maturing outside the MTNP, they would, on average, be 4.03 per cent for bonds maturing inside). The impact is statistically significant and material. This suggests that investors do not regard the increased risk of default after the MTNP as dominated by other factors.

### 4.2.2 Impact of asset life

As noted above, if a firm's assets could be re-sold if its licence were revoked, those assets provide de facto collateral against loans and might therefore be expected to reduce the impact of bond maturity dates falling beyond the MTNP.

Asset lives differ amongst the comparator set we have analysed, as per the following table. We can see that NATS has rather shorter average asset lives, even for that element of its asset base that is fixed assets (we note that this table does not include NERL's intangible assets), than is common in other regulated sectors.

**Table 4.2: Asset lives for regulated assets**

	<b>NATS</b>	<b>Airports</b>	<b>Electricity Distribution</b>	<b>Electricity transmission</b>	<b>Gas Transmission</b>	<b>Water</b>
<b>Average lifespan of relevant assets (years)</b>	15	30	Regulatory depreciation 45 years going forward. (20 years on existing assets with 8 year transition period)	Regulatory depreciation 45 years going forward. (20 years on existing assets with 8 year transition period)	Regulatory depreciation 45 years	Company has some discretion on rate of depreciation - (RCV run off) - based on financing needs. (Typically long lived assets.)

We investigated whether asset life is an important determinant of average debt maturity. In a univariate model with time fixed effects, asset life is a statistically significant determinant of average debt maturities but the coefficient is only 0.07 — i.e. one extra month of asset life provides less than two days of additional average debt maturity. Furthermore, the effect is not robust to specification — when we add in a control for the MTNP the sign on asset life reverses.<sup>4</sup>

However, it is possible that some of this non-robustness is attributable to non-linearities associated with asset lives being far beyond the MTNP versus being only a little beyond it. When we reduced the set of first considered to only those with assets lives five years or less beyond the MTNP<sup>5</sup>, the coefficient on asset life becomes much bigger — 0.46, implying that an extra month of asset life provides almost half a month's additional average debt maturity. Furthermore, in this case the effect is more robust to specification — when we add a control for MTNP the sign on asset life remains positive and the coefficient increases slightly to 0.56. There thus does appear to be some evidence that greater asset life is a factor in debt maturity, where asset life is only modestly greater than the MTNP.

We have also estimated a version of our econometric model estimating the impacts on yields of bonds maturing beyond the MTNP adding in controls for the potential impact that asset life might have on yields. We have done this by introducing an additional variable defined as the difference between the earliest date in which the licence notice period can be served and the company's average asset life.<sup>6</sup> This additional control variable has been included in the regression both as a separate stand-alone term and as a term interacting with the dummy variable indicating whether the bond matures within the MTNP. The results of these two model specifications are reported in below.

<sup>4</sup> We note that we are using regulatory asset life and there is no variation over our period and relatively limited variation across companies.

<sup>5</sup> This still left 11 firms in the set to be considered.

<sup>6</sup> The average asset life has been estimated based on the average lifetime of relevant assets. For most companies this information was provided by the CAA. For water companies we have used the upper bound of the range provided by BofAM in the Appendix of "Consideration on Licence Maturity", dated 7th July 2011. We took the upper bound based on the indication from CAA that water companies use "typically long life assets". For BT, we have used 18 years as indicate in Ofcom's guidance.

**Table 4.3: Impact of a bond maturing after the MTNP on yields — (adding asset life as a control)**

Dependent Variable: Yields				
Method: Panel Least Squares				
Sample: 2000M01 2015M12				
Periods included: 187				
Cross-sections included: 132				
Total panel (unbalanced) observations: 11655				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Bond maturity < MTNP	-0.461954	0.020813	-22.19557	0.0000
MTNP - Asset life	0.013372	0.000650	20.58741	0.0000
Constant	5.155272	0.019427	265.3603	0.0000
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.675770	Mean dependent var	4.694334	
Adjusted R-squared	0.670453	S.D. dependent var	1.374705	

**Table 4.4: Impact of a bond maturing after the MTNP on yields — (adding an asset life/event interaction term as a control)**

Dependent Variable: Yields				
Method: Panel Least Squares				
Sample: 2000M01 2015M12				
Periods included: 187				
Cross-sections included: 132				
Total panel (unbalanced) observations: 11655				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Bond maturity < MTNP	-0.495673	0.022647	-21.88699	0.0000
MTNP - Asset life	0.019325	0.001709	11.30585	0.0000
(Bond maturity < MTNP)*(MTNP - Asset life)	-0.006956	0.001847	-3.765081	0.0002
Constant	5.183955	0.020857	248.5436	0.0000
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.676170	Mean dependent var	4.694334	
Adjusted R-squared	0.670832	S.D. dependent var	1.374705	

In Table 4.3 and Table 4.4 we see that the introduction of controls for asset life does not materially affect the coefficient for the test of whether bonds mature within the MTNP — in the first variant model that coefficient falls from 0.47 to 0.46 whilst in the second it rises to 0.50.

Asset life does have an impact on yields. When asset lives are shorter (when the difference between the MTNP and asset lives is greater), yields are higher – as would be expected to be the case if longer asset lives implied greater collateral comfort. Extending asset lives by around 35 months (just under three years) is sufficient to offset the impact of bonds maturing outside the MTNP.

In Table 4.4 we attempt to disentangle the impacts of asset life between an element that involves simple greater collateral from longer life in general and an element that provides greater collateral only when bonds mature beyond the MTNP. In this case, each month that the asset life is greater than the MTNP takes 0.007 percentage points off the elevation in yields that occurs if a bond matures after the MTNP,

over-and-above the general collateral comfort provided by a longer asset life (to bonds falling within or outside the MTNP), which in this case is slightly higher (0.019 percentage points for each month of additional asset life). So if asset lives were 71 months (about six years) longer than the MTNP, that would eliminate, entirely, the consequence of a bond's maturing after the MTNP.

In addition to the above, we also explored the possibility of controlling for the proportion of enterprise value constituted by the fixed assets. Unfortunately data was not available that allowed us to conduct such a test on a basis consistent with the analysis presented.

# 5 Conclusions and Review of Claims made by Bank of America Merrill Lynch on Behalf of NERL

## 5.1 Summary of main results

In this study we have considered the impact the minimum period before which a licence can be termination has upon the volumes and costs of debt-raising by regulated companies. We have found the following.

- Regulated companies do raise significant volumes (30 per cent and sometimes more) of debt that matures after the minimum termination notice period. The minimum termination notice period does not act as a hard “cap” on the ability of firms to raise debts.
- When the minimum termination notice period is longer, firms tend to raise debt with a longer maturity profile — each additional month of extension in the minimum termination notice period means average debt maturity profiles of almost one month greater.
- Debt that is raised beyond the minimum termination notice period is materially more expensive — the cost of debt maturing beyond the minimum termination notice period is around half a percentage point greater than of debt maturing inside (other things being equal).
- When asset lives are longer, this tends to offset the impact of bonds maturing beyond the minimum termination notice period. If assets have a life of more than six years greater than the minimum termination notice period, that entirely offsets the yield elevation of maturation lying beyond the period.
- It is plausible that when the proportion of a company’s assets that are intangible is higher, the impact of bonds maturing beyond the minimum termination notice period is greater. We have not, however, been able to test this hypothesis with the data available, within the scope of this project.

## 5.2 Review of claims made by BoA ML on behalf of NERL

In a document dated 7 July 2011, Bank of America Merrill Lynch makes a number of contentions in arguing that the NERL license period should be longer. We shall now step through these contentions in turn, responding to them using the results of our study here.

- BoA ML claim NERL’s licence period “[r]educes the ability of NATS to secure optimal long-term funding”.
  - Insofar as this implies that NERL would be or is unable to secure debts maturing after the MTNP, our analysis here suggests that that is incorrect. Insofar as it is a more general claim about the mix and cost of debt, we respond below.
  - At present, NERL does not have debts maturing after its MTNP. Other regulated entities, however, are able to secure 30 per cent or more of their debt at maturities beyond the MTNP.
- BoA ML claim NERL’s licence period “[i]ncreases the cost of debt capital given shorter maturities”.
  - We find that having a longer licence period would be likely to mean NERL’s average debt maturity profile would be longer.

- We find that, insofar as NERL started to raise debts beyond its MTNP, a longer MTNP would mean a reduction in yields. Debts raised beyond the MTNP have yields around 50 basis points more expensive than debts raised within the MTNP.
- BoA ML claim NERL's licence period implies more frequent re-financing, increasing execution risks.
  - Recent UK regulatory determinations have included (explicitly or in some cases implicitly) about a 10 bps allowance for issuance costs of new debt. More frequent issuance implies more regular incurring of such costs. By issuing on a shorter-term basis, with debts maturing before the MTNP, the yield elevation discussed above could be avoided with the implication of bearing the yields on shorter-term debt instead of longer and bearing issuance costs more frequently. The yield curve tends to be upwards-sloping, meaning shorter-term debt often has lower yields than longer-term debt (even for debt within the MTNP), but issuance costs would be borne. To the extent that companies would genuinely prefer to borrow longer than the MTNP (e.g. in order to match borrowing profiles to asset lives), such a cycle of shorter-term issuance and reissuance will only be undertaken if it ends up being cheaper than bearing the additional expense of borrowing beyond the MTNP. It follows, therefore, that this cannot be an issuance additional to the implications above and below — it is merely an argument that the effects we describe above and below are unlikely to be mitigated costlessly by borrowing shorter.
- BoA ML claim that it would be optimal for NERL to be able to raise debts at a 20-40 year maturity, matching the life of significant fixed assets funded by such debt such as “the replacement flight data system, the electronic data display update system, the radio and distance measuring equipment as well as the new Prestwick centre”.
  - As we understand matters, NERL's ability to offer full security over its assets is limited.
  - It appears to us that NERL's average asset lives are rather shorter than average asset lives of other regulated — averaging only 15 years even for the regulated fixed and intangible assets in the RAB.
  - The question of how “optimal” or otherwise it would be to facilitate NERL's raising debts over a 40 year period is one that would require a broader overview of the purposes of the licence period than falls within our scope in this project. We merely observe that it would raise considerable broader regulatory issues to have a licence guaranteed for so long.
- BoA ML claim that although other companies (specifically BT and Network Rail) have licences with 10 year notice periods and yet have accessed debt markets for debts of longer maturity, this is because of special factors.
  - It is not only BT and Network Rail that have borrowed at maturities greater than the MTNP. Doing so was normal for all the companies in our sample except NERL. We observe that all companies in our sample have asset lives longer than their MTNPs. If BoA ML is correct in claiming that it is normally optimal for companies to borrow at maturities close to asset lives for significant fixed assets (noting that, in the case of UK utilities, we found a positive relationship between asset lives and average debt maturities in the region of the MTNP), that could be an important reason NERL tends to borrow at shorter maturities.
  - BoA ML argues that in the case of NATS, “many assets have considerably shorter expected lifespans, perhaps as short as 5-10 years”. This would appear to be a strong argument for having a shorter MTNP, since it means that most of the investment required to execute on a licence has depreciated within the first few years. The regulatory life of all assets tangible and intangible is 15 years.
  - BoA ML argues that whereas the fixed assets of electricity, gas or water companies that lost their licences might be sold to pay off debts, that would be less true of NATS. That may be correct, insofar as NATS raised a significant portion of its debt at maturities longer than the MTNP, and we have found that longer asset lives mean a larger impact of debts falling beyond the MTNP. But on the other hand, shorter asset lives also appear to imply that the optimal maturity of debts should be



lower (at least for asset lives only modestly longer than the MTNP). The only assets investment in which would appear to require longer-term funding would be precisely those assets that would have longer asset lives and that would be able to be re-sold in order to pay off debts in the event of licence revocation.