Margins and risk

Introduction

1. This appendix describes our analysis of the margins[1] on capital leases for each of the three ROSCOs for each of the fleets on lease in 2008 and earning revenue.

2. Our approach to analysing profitability is set out in Appendix 6.4. We decided to measure whole-life (or in the case of MOLA stock, remaining-life) profitability of fleets, preferably expressed as a margin over WACC.

3. We asked the ROSCOs for margin information on their fleets. For post-MOLA, all three ROSCOS were able to provide us with whole-life margins based on contracted and expected cash flows over the entire life of the asset, which was generally assumed to be 30 years. However, we were unable to obtain comparable data for MOLA stock.

4. Porterbrook provided us with remaining-life post-tax margins for its MOLA stock from the date it was acquired by its then current owner. HSBC provided us with pre-tax margins for its MOLA stock from the date the ROSCO was acquired by its current owner. Angel was unable to provide data on margins for its MOLA stock but instead provided IRRs for the shorter period of the current lease.

5. The asset value used as the basis for the margins or IRRs was based on the fair value allocated to the assets when the ROSCO was acquired. These values were therefore equivalent to the purchase price described in Appendix 6.5. We have applied the sensitivities described in Appendix 6.5 to enable us to consider the impact of a lower asset value on the margins.

6. We evaluated the impact of taxation on the relative comparison of MOLA and post-MOLA margins. We recognized that MOLA assets bear a higher effective tax rate than post-MOLA because lower capital allowances were available. For this reason we are seeking to compare post-tax margins. The ROSCOs profitability submissions included consideration of the impact of taxation. However, there were very significant differences between the ROSCOs concerning their assessment of the relative impact of taxation on both post-MOLA and MOLA profitability. Our analysis showed that the lifetime effective tax rate of post-MOLA stock was approximately zero. For MOLA stock, the remaining life effective tax rate varied according to the age of the stock, but we assumed the average rate to be approximately 30 per cent.

7. We have set out in Appendix 6.8 our analysis of overall ROCE which forms a sense check of our findings from this analysis of margins.

CC adjustments

8. We made adjustments to the margin and IRR data provided by the ROSCOs to enable us to assess their profitability. Each ROSCO provided a different dataset, so we first set out the adjustments that we have made for all three ROSCOs and then comment separately on the differences for each ROSCO.

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[1]The margin or IRR over the funding rate, depending on context.

Common adjustments

9. In addition to the margin data, each ROSCO also provided us with the average funding rate used in the derivation of the margin, which represented an internal funding rate.

10. We adjusted the margin to take into account the actual cost of debt at the time of privatization and re-lease. Our calculations of this cost of debt are set out in Appendix 6.6. For post-MOLA stock, we took the cost of debt to be that prevailing at the time of first lease. For MOLA assets, we took the cost of debt to be an average of the cost of debt at privatization and at re-lease. This average was weighted by the number of years between privatization and re-lease, and the number of years between re-lease and the end of the stock's useful economic life.

11. We also noted that margin data provided assumed 100 per cent debt funding. We therefore adjusted the margin to reflect the higher WACC which would arise from our chosen capital structure of 25 per cent equity and 75 per cent debt. Our calculations on the post-tax cost of equity showed that it was approximately 2 per cent higher than the post-tax cost of debt. With the gearing level above, this represented a downwards adjustment of 0.5 per cent to the margin.

12. The assumption of 75 per cent debt funding rather than 100 per cent (to allow for a reward to equity) leads to the loss of tax relief on the 25 per cent of debt that is no longer available as a taxable deduction. We therefore needed to account for the tax payable on the cash flows which would reward equity. This tax payable depends on the effective tax rate over the stock's useful economic life. We first adjusted our post-tax cost of equity on to a pre-tax basis and then adjusted for tax, on a lease by lease basis, as follows:

$$\left(\frac{E\%}{(1-Z\%}\right)\times Z\%\times 25\%$$

Where Z per cent is the effective tax rate on the lease and E per cent is the post-tax cost of equity. The work we performed to estimate the effective tax rate on leases for stock of different ages is set out in Annex 2.

13. The margins submitted to us did not take overheads into account. We therefore adjusted the margins to take into account an allocation of overheads to capital leases. The adjustment resulted in a 0.3 per cent reduction in margins for all leases. Our methodology in arriving at this 0.3 per cent is set out in Annex 1.

HSBC-specific adjustments

14. HSBC originally submitted pre-tax margins over cost of debt and therefore the tax cash flows relating to the corporation tax payable on the margin had not been taken into account. In other words, the margin is considered tax deductible in the lease analysis. Accordingly, we reduced the margin after all the adjustments described above by 30 per cent to reflect these tax cash flows.

15. HSBC subsequently submitted margin data that had been adjusted to a post-taxation basis. We considered these post-tax margins in greater detail alongside our estimate of taxation.

Porterbrook adjustments

16. Porterbrook originally submitted post-tax margins and therefore there were no additional specific adjustments concerning taxation.

17. The Porterbrook margin data was, however, adjusted to eliminate the revaluation at the time of the Abbey acquisition. This adjustment was made to represent the Porterbrook data based on the purchase price at the time of the earlier Stagecoach acquisition.

Angel adjustments

18. Angel originally submitted pre-tax margins for post-MOLA stock. Accordingly, we reduced the margin after all the adjustments described above by 30 per cent to reflect these tax cash flows.

19. Angel did not calculate margins for MOLA stock. It calculated IRRs for the remaining period of the current lease. These IRRs were presented on a pre-tax basis, and so we wanted to compare these to the pre-tax cost of capital.

20. In our calculation of a benchmark, we included an allowance of 0.3 per cent for overheads. Our methodology in arriving at this 0.3 per cent is set out in Annex 1.

21. Angel submitted an analysis which estimated a single, long-term effective tax rate for its activities of between [✂] and [✂] per cent based on a stylized lease. It also submitted assumptions that set out different gearing levels and tax rates for MOLA and post-MOLA fleets. It said that the gearing on MOLA stock was [✂] per cent debt and the effective tax rate was [✂] per cent. For post-MOLA, the gearing was [✂] per cent debt (similar to the 75 per cent used by the CC) and the effective tax rate was [✂] per cent.[2]

22. While we believe that our gearing of 75 per cent debt was the appropriate one to use for both MOLA and post-MOLA fleets, we wanted to reflect the difference in effective tax rates between MOLA and post-MOLA stock. We therefore used an average rate of 30 per cent for MOLA stock and zero for post-MOLA stock when seeking to compare post-tax returns.

ROSCOs margins

23. In this section we examine the margin data (and IRRs) submitted to us by the ROSCOs. We start with post-MOLA rolling stock for all ROSCOs and we then consider MOLA rolling stock margins separately for each ROSCO. In each section we first consider a simple average and then follow this with a weighted average. Margins are stated over WACC.

Post-MOLA leases

24. For the purposes of our analysis we have defined post-MOLA as rolling stock that is new since privatization. In Figure 1 we present the whole-life margins for all three

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[2]Angel said that the assumed effective tax rates for the ex-British-Rail and post-MOLA rolling stock, however, were informed by the actual relationship observed between pre-tax and post-tax whole-lifetime IRRs, derived from actual data (as reported in the Oxera profitability report). The gearing levels attributed to the two businesses in doing this were estimated by Oxera using a set of logical assumptions and observations about debt structure.

ROSCOs for post-MOLA assets by reference to the age of the asset. The margin data is presented after our adjustments.

FIGURE 1

ROSCOs' combined range of post-MOLA vehicles

[✂]

Source: CC analysis of data provided by HSBC Rail and Porterbrook.
Notes:
1. [✂]
2. Angel margins have been calculated by the CC from IRRs submitted by Angel.

25. Leases covering post-MOLA rolling stock form a relatively tight range of whole-life margins with two exceptions, and that there is no particular pattern visible from the distribution of the data points. We take the approximate range to be between the highest and lowest points of 2.7 to –1.6 per cent, but have excluded the outlying points of 3.2 per cent [✂] and –5.3 per cent [✂].

26. The simple average for post-MOLA margins (excluding the two outliers) is 0.6 per cent. The average for Angel is [✂] per cent, the average for HSBC is [✂] per cent and the average for Porterbrook is [✂] per cent.

27. We note that the investment in new assets is generally the cost of acquisition of the asset. For Porterbrook, however, there are a few exceptions, where there has been a revaluation at the time of the Abbey acquisition in 2000.[3] [✂]

28. In Figure 2 we re-present the data points from Figure 1 in the form of bubbles. The relative size of each bubble represents the relative scale of each margin point expressed as the number of vehicles.

FIGURE 2

ROSCOs' relative scale of 0- to 10-year vehicle leases

[✂]

Source: CC analysis of data provided by HSBC Rail and Porterbrook.

29. From a visual analysis of Figure 2, there appears to be no specific relationship between fleet size and margin.

30. Our analysis shows that expected lifetime returns on post-MOLA stock are close to our estimated WACC. The analysis may also imply that specific risk is very low.

HSBC margins

31. The margins for HSBC stock are set out in Figure 3. Three sets of data are presented: the blue points represent the data submitted to us by HSBC based on purchase price, the green points are the data after the CC adjustments set out above, and the red points represent the CC-adjusted margin after a 15 per cent downward

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[3] [✂]

revaluation in the opening asset value of the MOLA fleets as described in Appendix 6.5.

FIGURE 3

HSBC rail leases, margins over time

[✂]

Source: CC analysis of data provided by HSBC Rail.

32. Figure 3 shows that MOLA stock margins are generally [✂] than post-MOLA stock on HSBC's unadjusted margins.

33. We note that the HSBC average of margins for post-MOLA (after CC adjustments) is [✂] per cent. The average MOLA margin (after CC adjustments) is [✂] per cent and after the revaluation deduction this increases to [✂] per cent. On a weighted average basis this latter point is slightly [✂] at [✂] per cent.

34. In Figure 4 we re-present the data points from Figure 3 in the form of bubbles. The relative size of each bubble represents the relative scale of each margin point expressed as the number of vehicles.

FIGURE 4

HSBC all stock, adjusted margins (weighted)

[✂]

Source: CC analysis of data provided by HSBC.
Note: Post-MOLA bubbles are based on adjusted margin and MOLA bubbles are based on adjusted margin after 15 per cent revaluation deduction.

35. Figure 4 also shows that there is no clear relationship between fleet size and margin.

36. Our analysis of the HSBC data appears to imply that MOLA margins are on average [✂] than post-MOLA based on CC adjusted data and [✂] after the revaluation deduction. [✂] The scale of the difference between the MOLA and post-MOLA margins is also significantly affected by the revaluation sensitivity, to the extent that MOLA stock becomes more profitable than post-MOLA.

37. We also note that there are a number of MOLA leases earning revenue where a margin was not calculated by HSBC. These are situations where the assets are past their useful economic life (UEL) and are therefore fully depreciated, but remain on lease. As there is no cost base for these assets, most of the revenues would be additional margin.[4] [✂][5]

Porterbrook margins

38. The margins for Porterbrook are set out in Figure 5. Four sets of data are presented: the blue points represent the data submitted to us by Porterbrook, the green points are the data after the CC adjustments set out above, the red points represent the CC-adjusted margins after a 30 per cent downward revaluation in the opening asset

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[4] [✂]
[5] [✂]

value to approximate the Abbey revaluation effect (Appendix 6.5) and the yellow points represent a further 15 per cent downward revaluation in the opening asset value also as described in Appendix 6.5. The 30 per cent Abbey adjustment is intended to present the Porterbrook data as at the time of the Stagecoach acquisition, which we consider represents depreciated purchase price.

FIGURE 5

Porterbrook leases, margins over time

[✂]

Source: CC analysis of data provided by Porterbrook.

39. The Porterbrook average range of margins for post-MOLA, after CC adjustments, is [✂] per cent. The average MOLA margin (after CC adjustments) is [✂] per cent and after the Abbey revaluation deduction this increases to [✂] per cent and increases again to [✂] per cent after the general revaluation deduction. On a weighted average basis, these adjusted points are slightly [✂] at [✂] and [✂] per cent respectively.

40. In Figure 6 we re-present the data points from Figure 5 in the form of bubbles. The relative size of each bubble represents the relative scale of each margin point expressed as the number of vehicles.

FIGURE 6

Porterbrook all stock, adjusted margins (weighted)

[✂]

Source: CC analysis of data provided by Porterbrook.
Note: Post-MOLA bubbles are based on adjusted margins and MOLA bubbles are based on margin after combined 45 per cent revaluation deduction.

41. Figure 6 shows that there appears to be no relationship between margin and fleet size.

42. Our analysis of the Porterbrook data appears to imply that MOLA margins are on average [✂] than post-MOLA based on CC-adjusted data, [✂] after the Abbey revaluation deduction and [✂] after the general revaluation deduction. [✂] The scale of the difference between the MOLA and post-MOLA margins is also significantly affected by the revaluation sensitivity.

43. Porterbrook's submissions are based on post-tax data and therefore the margins on the MOLA and post-MOLA fleets appear to be comparable.

44. There are a number of significant post-MOLA fleets, accounting for £[✂] million revenue, where the data is not included in our tabular analysis. [✂]

45. We also note that there are a number of MOLA leases earning revenue where a margin was not calculated by Porterbrook. These are situations where the assets are past their UEL and are therefore fully depreciated, but remain on lease. As there is no cost base for these assets, most of the revenues would be additional margin. The annualized revenue for these assets is small compared with total revenue and is not likely to be significant.

Angel post-MOLA margins and IRRs

46. The Angel data represents contractual current lease IRRs for the MOLA stock, and whole-life IRRs for recent post-MOLA acquisitions, on a pre-tax basis.

47. Angel told us that 'for the MOLA fleets, IRRs are calculated by discounting both "real" and "accounting" cash flows over the contracted lease life including: opening accounting NBV[6] and goodwill;[7] any new investment; the lease cash flows; the projected end NBV and goodwill based on straight-line depreciation'. Angel described this as 'a simplistic mix of accounting and cash flow concepts'.

48. Figure 7 sets out a comparison of some of the post-MOLA leases where Angel has supplied both margin and IRR data.

FIGURE 7

Comparison of selected Angel post-MOLA margins and IRRs

[✂]

Source: CC analysis of data provided by Angel.
Note: [✂]

49. Our analysis of Angel's post-MOLA stock indicates that they generate a range of unadjusted whole-life margins of approximately [✂] per cent and the matching range of IRRs is [✂] per cent. The adjusted average margin for post-MOLA is [✂] per cent. Angel submitted an analysis showing the difference between the IRRs and the margins, illustrated in the following calculations for the [✂] fleet (circled in the figure):

    [✂]%—margin

    [✂]%—interest funding rate

    [✂]%—sum of margin and interest funding rate

    [✂]%—tax benefit

    [✂]%—pre-tax IRR

50. Angel believed that it was impossible to compare directly margins and IRRs, as it needed to be done on an asset-specific basis because the impact of tax might be different for each lease.

Angel IRR profile for MOLA stock

51. Figure 8 sets out a comparison of Angel's submitted IRRs for its MOLA and post-MOLA fleets with a profile of how a specific lifetime IRR is represented as a series of truncated IRRs over a 30-year asset life.

52. We noted Angel's comment that '... in a market where rentals are generally assume[d] to remain flat over the life of the asset, IRRs … will always show much higher returns for the asset when it is old than when it is new'. We note that this

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[6]Depreciated purchase price, straight line.
[7]Goodwill depreciated on a straight-line basis to the earliest of 2014 or the asset's UEL.

effect is in part due to the asset base declining over time following straight-line depreciation.

53. Angel submitted a profile which shows how they expect truncated IRRs to behave for a constant lifetime IRR and cash flow. We have used this profile to calculate a benchmark based on our estimate of the cost of capital (7.0 per cent) with the overhead adjustment of 0.3 per cent.

54. In Figure 8 the horizontal line is the whole-life 7.3 per cent IRR. The boxes show the calculated expected truncated IRR for that period using the 7.3 per cent whole-life IRR. Angel's IRR data can therefore be compared with the truncated profile.

FIGURE 8

Approximate comparison of actual IRRs

[✂]

Source: CC analysis.
Note: [✂]

55. Figure 8 shows that post-MOLA whole-life IRRs [✂].

56. From Figure 8, we cannot tell accurately the extent to which the truncated MOLA IRRs lie above or below the expected truncated IRR bars. We can see that [✂]. We are unable to calculate any average return for MOLA stock.

57. We also note that Angel's IRRs are based on purchase price including goodwill. The general revaluation deduction sensitivity (15 per cent) would have the effect of increasing the MOLA IRRs and this effect would be even greater if the goodwill was also excluded from the asset base.

Risk and its reflection in margin

58. In this section we consider some specific risks. In Appendix 6.4 we have explained how we are interpreting the effect of risk in our evaluation of margins. We note that these are 30-year assets, and that privatization occurred in 1996, so there is no available information on a whole-life out-turn. Our analysis can only present a current view of the risks that have materialized since privatization. In doing so, we understand that there may have been fluctuations in expectations of risk over the intervening time period, both positive and negative, and that this past is not necessarily a guide to the future.

59. Our analysis also includes consideration of the age of the asset and the current lifetime margin. These factors will have some bearing on the significance of any risk.

Reductions and extensions of useful economic life

60. The ROSCOs submitted data on fleets where UELs had either been reduced or extended. For currently operational stock we saw both extensions (mainly HST-related stock) and reductions (a variety of fleets of different classes) of up to six years. For non-operational stock there were also reductions and extensions—these consisted mainly of slam-door stock.

61. We noted that the presence of fleets which had had their lives increased and reduced meant that the risk of a fleet having its UEL reduced was balanced by the upside potential of UEL increases.

Impairment of assets

62. We next consider the fleets which have had impairments. Accounting impairments reflect the materialization of anticipated reductions in future cash flows triggered by known events. These reductions cause the NBV of the assets to be higher than the value of the discounted cash flows. An impairment is then recorded to reduce the NBV of the assets to the value of the discounted cash flows.

63. Therefore we might expect to find that assets where impairment is recorded are also examples of leases with low margins. There will also be other examples where the ROSCOs have experienced unanticipated rental reductions or void periods where an impairment has not been required because the discounted cash flows remain in excess of the NBV of the assets.

64. The presence and value of an impairment on a certain fleet is evidence of a crystallization of residual value risk. However, we noted that because impairments were made for accounting purposes and were required to be prudent in line with accounting principles, the value of an impairment may overstate the financial consequence of residual value risk. The value of the impairment would also depend on the accounting policies of the owning ROSCO. We also noted that if impaired stock was re-leased, the impairment was often reduced or reversed.

65. The ROSCOs submitted information on impairments, as set out in Table 1.

TABLE 1 **Impairment charges**

ROSCO	*Class*	*Number of vehicles*	*Franchise*	*Total impairment (2007) £'000*	*Time period*	*Age*
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]				[✂]		
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]				[✂]		
[✂]				[✂]		

Source: Response to market questionnaire and CC analysis; Re-letting reviews from each of the ROSCOs.

66. Impairments have been made on specific fleets which have either been displaced and are off-lease, or where there was an expectation that displacement (eg by new rolling stock) would occur in the future.

67. We also estimated impairment as a percentage of the NBV of the ROSCOs assets. The results are shown in Table 2.

TABLE 2 **Impairment as percentage of NBV**

ROSCO	*Impairment (2007) £m*	*Average NBV (2007) £m*	*Impairment as % of NBV %*
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	1.2%

Source: Response to market questionnaire and CC analysis; re-letting reviews from each of the ROSCOs and responses to financial questionnaires.

68. Where impairments are made, the financial effect is significant for the annual accounts and also for the individual fleets because the impairment reflects an expected reduction in loss of revenues over a number of years. Table 2 shows that the effect is much less significant as a percentage of NBV. The value of current impairments in 2007 as a percentage of total NBV for 2007 range from [✂] to [✂] per cent, with an average of 1.2 per cent.

69. The NBVs include revaluations, therefore the impairment percentage to NBV would increase if the revaluation effect were excluded from the NBV and the impairment were based on the original historic cost of the asset. The effect would be more significant for Porterbrook because the asset base will include the two revaluations made by Stagecoach and Abbey.

70. In margin terms the impairment could come from a reduction in the rental stream, leading to a lower lifetime margin. In the cases where an asset was already off-lease, the loss of revenue would also lead to a lower lifetime margin, and in this case there would also be additional costs for off-lease storage. Our analysis of margins reflects the expected adverse margin impact where this has occurred through reduced rentals.[8]

Non-rentalized refurbishment expenditure

71. We also considered capital expenditure undertaken at re-lease[9] by the ROSCOs which was not recovered through higher leasing charges. Unrecovered expenditure is typically undertaken by ROSCOs to improve the quality of older fleets and make them more attractive to TOCs. The expenditure is therefore mitigating the consequences of residual value risk, although it is also a reflection of the scale of that risk.

72. The ROSCOs submitted data on unrecovered capital expenditure at re-lease, and this is set out in Table 3.

[8] [✂]
[9] HSBC expressed its concern that we had not included unrecovered expenditure undertaken during a lease. While we accept that this expenditure may also provide evidence of risk, we do not consider that its exclusion from our analysis affects our findings on risk.

TABLE 3 **Refurbishments as percentage of NBV, 2002 to 2007**

ROSCO	*Refurbishment unrecovered £m*	*Average MOLA NBV (2007) £m*	*Refurbishment unrecovered as % of MOLA NBV %*	*EBIT 2002–2007 £m*	*Refurbishment unrecovered as % of EBIT %*
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Parties' response to market questionnaire and CC analysis; responses to financial questionnaires.

Notes:
1. As discussed in Appendix 6.5, Porterbrook NBV may be overstated.
2. Refurbishment unrecovered figures are based on total expenditure greater than £2 million.
3. These figures do not include unrecovered refurbishment expenditure undertaken during a leasing period.

73. The table shows that the three ROSCOs spent £[✂] million on unrecovered capital expenditure between 2002 and 2007. This represented [✂] per cent of the NBV of assets, or [✂] per cent of total profits before tax for the period. The unrecovered expenditure will have been capitalized and therefore is already reflected in the margins we have analysed.

Summary

74. The presence of impairments and unrecovered capital expenditure by ROSCOs demonstrates that there have been negative financial consequences of residual value risk faced by ROSCOs in the past. We note that the unrecovered refurbishment and the rental stream effects of the impairments are generally already reflected in the margins we are analysing. The evidence of both extensions and reductions in UEL suggests that the financial consequences arising from these changes may be positive or negative.

75. Therefore there appears to be some justification for lease rentals to reflect a margin above WACC to cover these specific risks. However, we are unable to quantify the size of margin from this work, and we note that different fleets may possess different risk characteristics. However, the analysis of post-MOLA margins and the comparison of post-MOLA to MOLA would suggest that the allowance for these risks would be relatively small.

Overheads

1. The ROSCOs incur overhead costs which relate to either capital or maintenance activities or are common to both. We wanted to estimate the proportion of overheads that should be allocated to capital leasing activities in order to take these costs into account in our margin analysis. The ROSCOs do not routinely allocate overheads between capital and maintenance.

2. We considered the evidence on overhead recovery, and noted the wide disparity in the ROSCOs' estimates of the proportion of overheads that should be applied to capital leasing. We did not believe that it was appropriate to allocate overheads entirely to capital leasing as there were undoubtedly overhead costs which could be identified and allocated to maintenance activities. We therefore estimated the effect of overheads on whole-life margin, by considering the margin required to recover overhead costs.

3. We considered a range of scenarios which resulted in a range between the lowest annual margin recovery of 0.1 per cent to the highest of 0.5 per cent. We therefore assessed whole-life margins after they had been adjusted for a factor of 0.3 per cent to represent the allocation of overhead. We considered that this is unlikely to understate the appropriate allocation of costs given the small difference between this estimate and the top and bottom of the range.

Taxation

1. This annex sets out the work we performed to estimate the effective rate of taxation on leases. First, we present a summary of the issues surrounding capital allowances and corporation tax for ROSCOs. Second, we summarize the parties' estimates of the different tax rates of MOLA and post-MOLA stock. Finally, we model the effects of capital allowances and estimate effective tax rates using a simple discounted cash flow model.

Summary of taxation issues

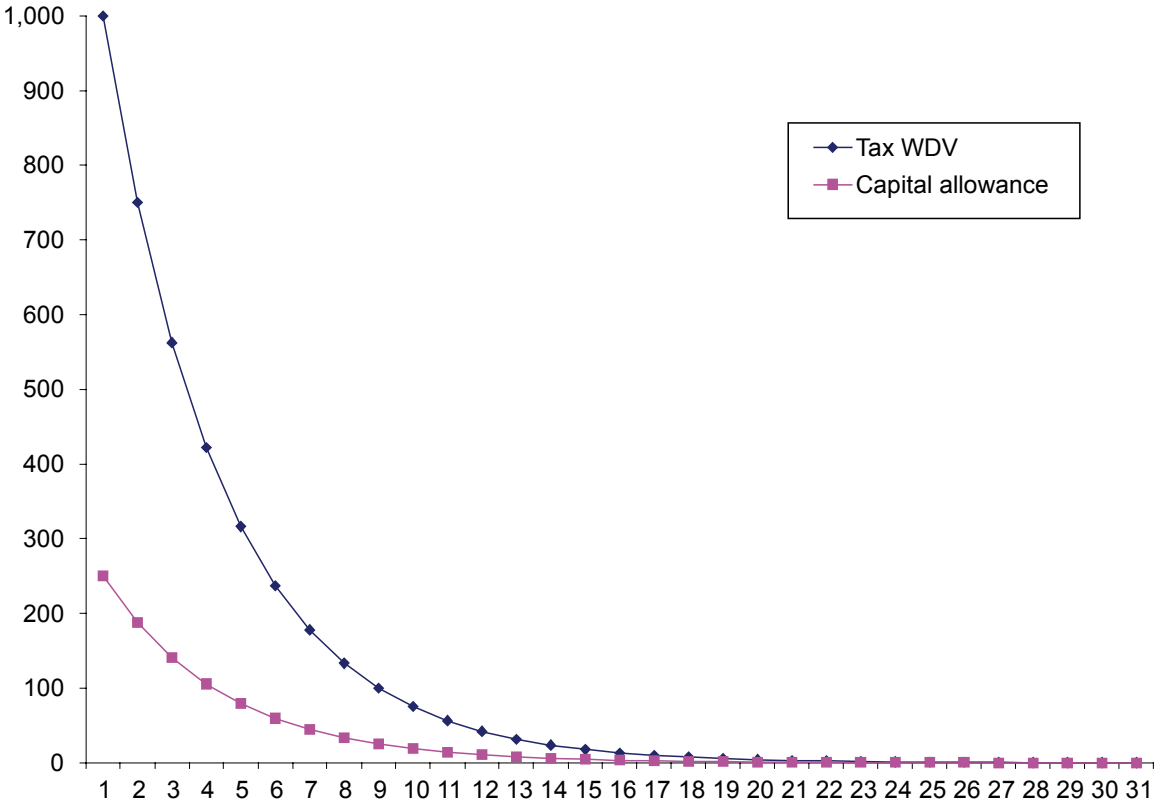
Capital allowances

2. Capital allowances offer companies an accelerated deduction from taxable income and hence a potential temporary deferral of corporation tax payable. Governments offer capital allowances to provide a financial incentive for capital spending.

3. The allowances are applied to assets on a 'reducing balance' basis. Over the life of an asset, the tax written down value (WDV) of an asset will diminish, and the annual value of capital allowances will also decrease. The chart below shows the tax WDV of an asset and the value of capital allowances using a rate of 25 per cent.

FIGURE 1

Capital allowances and tax WDV for a rolling stock asset



Source: CC analysis.

4. The chart shows the falling value of capital allowances over time, with annual allowances being insignificant in the second half of the asset's life. This demonstrates the different effects of capital allowances between older and newer stock.

5. The value of capital allowances will also affect the tax liability in the early years of an asset. The high capital allowances available in the early years of an asset's life may cause taxable losses to be made, whereas later in the asset's life the effect of capital allowances will be negligible, and so we would expect corporation tax to be payable during this later period on a profitable capital lease.

Corporation tax

6. Corporation tax payable will depend partly on the financial structure of the ROSCO or lease. Debt interest is a tax deductible item, so generally a more highly geared company will incur less corporation tax than one with lower gearing.

7. For our profitability analysis we estimated that a hypothetical stand-alone ROSCO would require a proportion of equity in its capital structure and based our cost of capital calculations on a structure using 25 per cent equity and 75 per cent debt.

Summary of the parties' submissions on taxation

8. The ROSCOs submitted varying quantities of information on taxation. The most detailed analysis was performed by Angel. It estimated that the effective tax rate on MOLA stock was [✂] per cent and for new build minus [✂] per cent. The gap between these figures was exaggerated by using a high gearing figure ([✂] per cent) for new build and a low gearing ([✂] per cent) for MOLA. Angel's model implied that these taxation and gearing figures led to a difference of [✂] per cent in the lifetime IRRs between MOLA and new build stock.

9. As part of margin calculations submitted by HSBC for one MOLA fleet (Class [✂]), it used an effective tax rate on accounting profits of [✂] per cent. Although this appears to be a plausible figure, we are unsure as to the effects of depreciation on the result.

10. Porterbrook calculated IRRs for its MOLA and non-MOLA stock on a pre- and post-tax basis. The results are set out in Table 1 below and show that on a post-tax basis, MOLA IRRs are lower than post-MOLA. This is not unexpected given that the IRRs are based on the Abbey acquisition value.

TABLE 1 **Porterbrook IRRs**

		per cent
	MOLA	*Post-MOLA*
Pre-tax IRR	[✂]	[✂]
IRR adjusted for tax impact	[✂]	[✂]

Source: NERA response to Annex C of ORR's paper Feb 2007.

Note: These IRRs all use Abbey purchase price asset values.

Modelling the effects of taxation on IRR

11. We wanted to ascertain the effects of taxation on assets of various ages. We therefore built a model to estimate the tax cash flows for a unit of rolling stock with a 30-

year life. By examining the pre-tax and post-tax IRRs for the remaining life of assets we could estimate the effective tax rate.

12. Our model made several assumptions. First, we assumed that the cost of capital was 8 per cent.[10] We assumed that the asset would depreciate on an actuarial basis using this 8 per cent discount rate over its useful economic life of 30 years. The choice of actuarial deprecation was made because it would best reflect the declining investment in a lease.

13. We assumed that the asset would receive constant annual rentals over its lifetime to give an IRR (net of overheads, but before tax and interest payments) of 12 per cent. Therefore the margin implicit in the asset is 4 per cent.[11] Other assumptions were that the lease was funded 75 per cent by debt and 25 per cent by equity, that capital allowances were available at 25 per cent a year on a reducing balance basis, that the rate of corporation tax was 30 per cent and that tax capacity was available at no cost and sufficient to absorb taxable losses as they arise. The model also ignores impairments and additional capital expenditure.

14. The results from the model showed significant variances in effective tax rates depending on the remaining life of the asset. It is worth noting that for a new asset, using the assumptions above, the present value of tax, discounted at the cost of capital, amounts to only 1.6 per cent of the present value of net income.[12] In effect, the capital allowance regime for new build stock is so favourable that the lifetime income from the asset is almost tax free.

15. We also calculated the pre- and post-tax remaining life IRRs for a new asset, and ones which were 5, 10, 15, 20 and 25 years old.[13] The effective tax rate was calculated using the formula 1-(post tax IRR/pre-tax IRR). The result is intended to provide an estimate of the effective tax rate for the remaining life of the MOLA stock at the time of privatization/first purchase. The results are shown in Table 2.

TABLE 2 **Effective remaining-life tax rate of rolling stock assets**

per cent

	Remaining life of fleet (years)					
	New	*5*	*10*	*15*	*20*	*25*
IRR pre-tax	12.0	12.4	13.0	14.1	16.2	22.1
IRR post-tax	12.5	10.3	9.7	9.5	9.4	9.0
Effective tax rate	–4.0	17.0	25.2	32.3	42.2	59.3

Source: CC analysis.

Note: These results are dependent on and sensitive to the assumptions set out.

16. The table shows the significant difference in effective tax rates between assets of different ages. Whereas a new asset has a negative effective tax rate over its life (ie the cash inflows of tax losses are such that the overall tax cash flows are positive when discounted),[14] the effective tax rate rises as the asset gets older, and a 25-

[10]In our profitability analysis, the cost of capital would be determined in part by the effective tax rate which we were seeking to find.
[11]12 per cent was chosen to approximate the potential IRR on a profitable MOLA lease.
[12]Both figures were discounted at 8 per cent.
[13]The opening investment value for the IRRs was determined using an actuarial depreciation profile.
[14]This gives a slightly different result to the finding that the PV of tax cash flows was 1.6 per cent of the PV of net income. This is because in the table the discount rate used is the IRR (12.5 per cent), and the 1.6 figure uses an 8 per cent discount rate.

year-old asset (the capital allowances of which will have been exhausted, and the interest outstanding on the remaining capital would be low) would have an effective tax rate of 59.3 per cent over the five-year remainder of its economic life.

17. The current capital allowance regime railway assets (including rolling stock) is due to change from 31 December 2010. All capital expenditure from this date will be subject to capital allowances at a rate of 10 per cent (previously 25 per cent). The effect of this will be to increase the lifetime effective tax rate for new stock.

DfT comments on the taxation model

18. The DfT had a number of comments on our taxation model and our treatment of taxation. It said that it considered that we had taken 'a position in relation to tax allowances which is over generous as far as the ROSCOs are concerned, and which if replicated in the CC's profitability analysis will mean that its estimates of ROSCO post tax returns are understated'.

19. It also said that the extent of capital allowances on MOLA stock was known by the purchasers of the ROSCOs at privatization and factored into the price paid for the companies. Furthermore, it said that it was not clear to them that the CC had understood the assumptions made by the ROSCOs at the point of acquisition, and the adjustments made for the different capital allowance and tax positions of the specific rolling stock under each lease.

20. The DfT also had some specific points on our model. Those were that:

    (a) It was not clear whether the CC had weighted the average remaining life tax rate for MOLA stock by the unamortized asset value of the stock. This would give a greater weighting to younger stock which would have a lower effective tax rate.

    (b) It noted that the results in Table 2 above implied that the post-tax IRR in the very early years of the asset's life was significantly higher than 12.5 per cent.

    (c) The effective tax rates were very sensitive to the assumed WACC used by the CC (and its components).

    (d) The CC had underestimated the ROSCOs' gearing, which would affect the CC's tax analysis directly as well as its WACC assumption.

21. We considered each of these points in turn. The purpose of our model was to try to allocate the capital allowances of MOLA stock to the remaining years of the stock's useful life. From this, we were able to estimate the effective remaining life tax rate on MOLA stock of varying ages. We were therefore able to estimate the effects of tax, and so perform our profitability analysis, on a lease by lease basis. We also estimated an average effective remaining life both for all MOLA stock and all post-MOLA stock; this was done to enable us to compare average returns.

22. We looked at the ages of MOLA fleets at privatization[15] and found a reasonable spread of ages. This suggested to us that an average effective remaining tax of 30 per cent (which corresponded to an average age of MOLA fleets at privatization of approximately 14 years[16]) was a reasonable assumption. We did not consider it

[15]It should be noted that our profitability analysis only looked at MOLA fleets which were still in service.
[16]This can be interpolated from the results in Table 2.

appropriate to weight the rates by the asset values of the fleets. The tax payable would be driven by the level of capital lease rentals, and although these rentals may vary by age of train, we did not consider this variance to be substantial enough for us to change our estimate.

23. We noted the DfT's comment that our model showed the IRR on a truncated basis was likely to be high in the first five years of a fleet's life. We do not find this surprising given the cash effects of tax losses driven by the high capital allowances in the early life of a fleet, and given the depreciation assumptions we used in the model. However, the purpose of the model was to estimate effective remaining life tax rates. We did not consider that the truncated IRR results produced by the model were particularly meaningful, given that we were unable to estimate residual values with any degree of accuracy, and given that we wished to look at whole or remaining life returns.