

Risk analysis working paper

Summary

1. This working paper considers at a high level the types of risk involved in the rolling stock leasing market and the extent to which these impact on the ROSCOs.
2. The ROSCOs list a wide range of causes of risk that they argue justify, in the round, the margins that they seek in their lease transactions. Neither the ROSCOs nor the DfT uses any established numerical risk modelling to ascribe risk according to the various factors in any particular transaction. Therefore the relative importance attributed to different causes of risk is qualitative, rather than quantitative.
3. We consider risk by reference to the financial impact of different risk scenarios, including both the likelihood of any particular risk occurring and the consequences to the ROSCOs if it does. This assessment of risk leads us to a number of initial high-level views.
4. The most significant category of risk appears to be asset re-lease risk in which, for a given fleet or class of vehicles, the consequences may include:
 - (a) the whole fleet being off lease for a significant period of time—hence the ROSCO receives no rental income but instead incurs potentially warm storage costs [✂];
 - (b) a part of the fleet being off lease for a significant period—hence the ROSCO suffers a reduction in income and potentially incurs some warm storage costs; and
 - (c) a reduced rental for an indeterminate period—hence the ROSCO suffers a reduction in income [✂].
5. During the period in which the ROSCO is suffering a reduction in income the remaining useful economic life in the fleet is diminishing.

6. From the examples we have been told about, the likelihood of such consequences transpiring, in relation to any given fleet or class of vehicles, is non-trivial.
7. There appear to be some measures that can be applied by ROSCOs to minimize the likelihood of being exposed to the consequences of asset re-lease risk. For example, ROSCOs can choose to finance only high-quality assets with a high level of general utility and interworking capability and encourage the procurement of generic vehicle types [X].
8. We have also been told of relative gains to date for the ROSCOs—such as extended use of life-expired assets—which may go some way towards offsetting losses that do crystallize in practice.
9. The other main categories of risk—financial; asset operation and maintenance; and modification expenditure risk—appear to us to be of a lower order of significance, having potentially less severe consequences in relative terms and/or which can potentially be managed and mitigated more directly by the ROSCOs.

Introduction

10. This working paper analyses at a high level the types of risk involved in the rolling stock leasing market(s) and the extent to which these impact on the ROSCOs.
11. The purpose of the paper is:
 - (a) to identify and consider the range of potential causes of risk and the respective evidence and views that have been submitted to us; and
 - (b) to develop a view of the general risk exposure for the ROSCO arising from the range of potential risk scenarios.

12. This will inform our consideration of lease pricing and profitability analysis. The ROSCOs have told us that they do not use a mathematical model for quantifying risk. Rather it is a subjective judgement of the overall proposition. Given this, we are not in a position to conduct such an analysis ourselves. Therefore most of the analysis is qualitative. However, we have used available evidence of asset impairments and the shortening of asset lives as well as maintenance forecast and actual cost data to assist in establishing a view of relativity.

13. It should be noted that the term 'risk' may be used variously to describe: causes (scenarios or events); likelihood (probability); consequences (outcomes); as well as combinations of these. We are interested particularly in risk to the extent that it is an 'effect' on pricing and we use the term risk in this paper accordingly to refer to a potential impact, positive or negative, on the business as a result of a particular scenario—reflecting both the likelihood and the consequences associated with that scenario.

14. We have aimed initially to identify and consider all the risk scenarios to which the ROSCOs may be exposed, regardless of whether or not they may be considered to be normal within a typical competitive market situation or potentially increased by particular features of the structure of the rolling stock leasing market or the influence of the Government on that market.

15. We have identified four broad categories of risk:¹
- asset re-lease risk: the risk that future lease rentals on the rolling stock are insufficient to recover the residual value² and meet the lessor's anticipated profit projections;
 - financial risk: including risk arising from lessee credit and insolvency; changes in interest rates, tax rates and economic conditions;
 - asset operation and maintenance risk: the risk inherent in owning, running and maintaining rolling stock; and
 - modification expenditure risk: the risk of significant modification or updating of the rolling stock becoming necessary as a consequence of external changes.
16. It appears to us that asset re-lease risk has particular significance. Therefore we have examined it in particular detail. Thus we consider in this paper:
- (a) For asset re-lease risk:*
- (i) What risk scenarios have the ROSCOs told us about?
 - (ii) How do the ROSCOs evaluate the risk in these scenarios?
 - (iii) How have the ROSCOs perceived the risk when leasing?
 - (iv) What is the DfT's view of these risk scenarios?
 - (v) How have the ROSCOs been able to mitigate or share the risk?
 - (vi) How and when has asset re-lease risk crystallized?
 - (vii) What have other parties said about risk?
- (b) For the other categories of risk:*
- (viii) What risk scenarios have the ROSCOs told us about?

¹From an economic perspective we consider that the headline risk for the ROSCO is that the total cash investment in an asset together with a 'reasonable' margin are not realized. This could be manifested, in comparison with expectation, by: a shorter economic life; lower rentals; unplanned investment; additional maintenance or finance costs or a period of time when the asset is off lease (together with related storage costs). In economic terms the realization of these risks will be manifested in the lifetime margin on the asset. In accounting terms, this could result in accelerated depreciation charges and impairment provisions when the discounted future cash flows are lower than the current accounting net book value (NBV) of any asset.

²Residual value (RV) is the value remaining in the asset at the end of the contracted lease period, as stated in the accounts. The RV may be recovered in whole or in part by further contracted rentals or potentially increased by further investment in the asset. We note that in this market there is negligible trading in assets and that lease rentals are the practical means of recovering residual value.

- (ix) How do the ROSCOs evaluate the risk in these scenarios?
 - (x) How have the ROSCOs perceived the risk—how does this vary between different types of lease?
 - (xi) What is the DfT's view of these risk scenarios?
 - (xii) How have the ROSCOs been able to mitigate or share the risk?
 - (xiii) How and when has the risk crystallized?
17. We also consider risk associated with the procurement and introduction of new rolling stock prior to the commencement of its use as an asset (new rolling stock procurement risk). However, we do not examine it in detail in this paper. In our view, as far as the rolling stock leasing market is concerned, new rolling stock procurement does not constitute a distinct category of risk. Rather it provides specific examples of asset re-lease risk, asset operation and maintenance risk and modification expenditure risk. Hence we consider:
- (a) What risk scenarios have the ROSCOs told us about?
 - (b) To what extent do these risk scenarios impact on leasing of the rolling stock?

Asset re-lease risk

18. Asset re-lease risk arises principally because the asset has a 30- to 35-year-life and the lease periods are typically only seven years.
19. Asset re-lease risk may be characterized as revenue risk³—the risk of forecast future revenues not being realized due potentially to:
- (a) rentals being lower than forecast;
 - (b) the life of the rolling stock being reduced;
 - (c) the rolling stock being off-lease for a period during its life; or

³There are less significant risks to revenue within our category of financial risk such as lessee credit risk. However, these are mitigated by existing contractual provisions.

(d) a combination of these conditions.

What risk scenarios have the ROSCOs told us about?

20. There are a number of scenarios that may give rise to asset re-lease risk. The ROSCOs have described a range of risk scenarios that is largely consistent although there are differences in the way that they have been defined and categorized by each ROSCO. We have categorized for our analysis the risk scenarios broadly as follows:
- performance issues with the rolling stock itself;
 - alternative more competitive rolling stock becomes available;
 - the rolling stock is overtaken by a change in the requirements—for a variety of reasons; and
 - political or regulatory uncertainty and influence.
21. We have summarized these potential risk scenarios in Table 1 along with examples where available to help explain each scenario.

TABLE 1 Scenarios giving rise to asset re-lease risk

Risk scenario	Examples (from the submissions)
<p><i>(a) Performance issues with the rolling stock</i> Rolling stock performs at below the standard expected of it at its age and when compared with other equivalent/typical rolling stock. Performance may be considered in technical or economic terms—for example: reliability; availability; operational suitability; cost of maintenance; or track access costs.</p>	<p>Porterbrook stated that the Class [REDACTED] fleet rental was reduced partly due to significant technical problems. [REDACTED]</p>
<p><i>(b) Alternative rolling stock becoming available</i> Other types of used rolling stock become available from cascades or from new rolling stock procurement potentially offering a better package for the lessee and displacing incumbent or hitherto optimal rolling stock.</p>	<p>HSBC stated that the price of new vehicles fell after privatization forcing a reduction in rentals on its Class [REDACTED] vehicles in order to compete with the threat of new rolling stock.</p>
<p><i>(c) Change in the requirements for the rolling stock</i> The original specification for the rolling stock and its utility is overtaken by a change in requirements. In particular:</p>	<p>HSBC stated that the DfT's IEP initiative had extended beyond the original HST replacement objective [REDACTED]. Angel stated that new Class 350 Desiro vehicles on the new West Midlands franchise would replace the incumbent Class 321 vehicles allowing standardized operation and maintenance regimes with the existing Class 350s.</p>
<p><i>(i) Franchising and other DfT strategies</i> Rolling stock having appropriate utility for the current duty and having economic life remaining is displaced by other rolling stock. These movements in rolling stock requirements are potentially driven directly by the franchise specifications contained within the Invitations to Tender (ITTs) issued by the DfT or by franchise remapping (as in the case of the recent 'Midlands 3**').</p>	<p>[REDACTED]</p>
<p><i>(ii) Changes to route utilization</i> Increases in passenger traffic demand on a route give rise to a change in the types of service provided and hence the rolling stock required in order to utilize the available route capacity.</p>	<p>[REDACTED]</p>
<p><i>(iii) Infrastructure developments</i> Major railway development schemes, such as Crossrail and Thameslink, impact on current operations and give rise to changes in the requirement for rolling stock. The existing fleets become suboptimal when the revised operations commence and a different or homogeneous fleet is required.</p>	<p>HSBC cited the European Rail Traffic Management System (ERTMS) as an example costing up to £250,000 per unit/train.</p>
<p><i>(iv) Technological obsolescence risk</i> Network-wide introductions of new technology and operating regimes are considered to be more easily implemented on new rolling stock whilst it is being built and relatively more difficult and more expensive to implement on existing fleets with limited life remaining.</p>	<p>All ROSCOs refer to the Mark I replacement programme and the RVAR deadline of 2020.</p>
<p><i>(v) Regulatory changes</i> Existing rolling stock is overtaken by regulatory changes. The modifications required to achieve compliance are more difficult and more expensive to implement on existing vehicles and become difficult to justify on vehicles with limited life.</p>	<p>HSBC stated that the Shadow Transport Minister (Clare Short) stated immediately pre-privatization that a Labour Government would re-nationalize the railways if it were elected, resulting in most bidders for the ROSCOs withdrawing from competition and a reduction in the ROSCO sale prices.</p>
<p><i>(d) Political risk</i> Uncertainty over the impact that Government intervention and changes in strategy will have on the realization of long-term (30- to 35-year) returns required in order to finance new and existing rolling stock assets.†</p>	

Source: ROSCO submissions.

*West Midlands, East Midlands and Cross Country franchises let simultaneously in 2007.

†We have identified the risk of the Government changing its rail strategy and the market itself as distinct from Government involvement within the market potentially in accordance with a particular strategy as in the case of, for example, scenarios (c)(i) to (v) above.

How do the ROSCOs evaluate the risk in these scenarios?

22. The ROSCOs have told us that they do not use a numerical model for quantifying individually the various causes of risk associated with leasing rolling stock. Rather

they discuss and assess the range of risk scenarios relating to the rolling stock fleets qualitatively and in the round. This discussion and assessment is reflected in the internal board/ business papers and is then taken into consideration by the ROSCOs in the final price/margin.

23. Angel stated that it did attempt six or seven years ago to develop an insurance-based model to quantify risk. However, the result of the theoretical modelling was a large increase in the rentals which Angel did not feel it could justify and it remained with its existing subjective methods for evaluating risk.
24. The ROSCOs have described in their submissions and in the hearings the risk scenarios as they see them and the consideration that they give them, with the help of examples. In the submissions to their boards and credit committees we have seen evidence of the risk scenarios that have given the ROSCOs most concern, the way they have been assessed and weighed against the overall transaction and, to some degree, their general business strategy.
25. HSBC incorporates in its re-leasing and new rolling stock investment proposals a discussion of risk broken down into areas such as safety and regulation, performance, market appeal and commercial terms. Individual risk scenarios are graded low, medium or high and scaled using values where practicable for financial exposure (for example, for modifications). The risk discussion is underpinned where appropriate with a residual value risk table setting out the potential threats to the residual value and proposed preventative and mitigation measures for each cause of risk.
26. Angel includes an equivalent discussion of key risk scenarios in its board papers.

27. Porterbrook's board papers discuss a number of issues—competitive constraints; risk facing the rolling stock or negotiated deal; pricing; non-price factors; modifications; and TOC negotiations—which together provide indications of the view taken of risk. The papers refer particularly to three areas of risk: residual value risk, regulatory risk and maintenance risk.

How have the ROSCOs perceived the risk when leasing?

28. The ROSCO submissions and board papers emphasize a number of key areas of risk, particularly political (or regulatory) risk, asset re-lease (or residual value) risk⁴ and maintenance risk arising from various causes. We discuss political and regulatory risk and asset re-lease risk below and we discuss maintenance risk later.
29. The ROSCOs have told us that two of the most significant risks they perceive are political risk and residual value risk, with much of residual value risk also being underpinned by political risk.

Political or regulatory risk

30. The ROSCOs have cited changes to the market and uncertainty over the impact that Government intervention and changes in rail strategy will have on the realization of the long-term (30- to 35-year) returns required in order to finance new and existing rolling stock assets. They have mentioned particular examples of political risk:
- (a) *Porterbrook*:
- (i) the DfT's procurement approach for IEP suggesting that the Government may not see a future requirement for the role of the ROSCO;
 - (ii) changes in governance—OPRAF to the SRA to the DfT—leading to changes in rail strategy; and

⁴Asset re-lease risk is not the same as residual value risk but does form the major part of it.

(iii) changes to the franchising policy – 20-year to 7-year franchises.

(b) HSBC:

(i) the DfT asking the ORR to refer the ROSCOs to the CC;

(ii) direct influence from political strategy outside the rail sector as in the requirement by the Mayor of London for new rolling stock on the North London Line in time for the 2012 Olympics; and

(iii) statements of intent by the Government impacting on the commercial environment for long-term rolling stock investment decisions (such as remarks by the Shadow Transport Minister Clare Short immediately pre-privatization leading to the withdrawal of bidders for the ROSCOs during the original sale).

(c) Angel:

(i) threat of the Government amending its railway policy after commercial decisions have been taken on the basis of that policy.

31. [REDACTED]

32. The ROSCOs have also cited the involvement of the DfT within the market, such as in changing the scope of franchises (as in the case of Gatwick Express becoming subsumed by Southern in 2008), re-mapping franchises (eg Midlands 3), altering route utilization strategies (as removed the requirement for HSBC's nine-car Class 222s) and in directing the allocation of rolling stock during franchise competitions.

[REDACTED]

33. HSBC stated that compared with shipping and aircraft leasing the UK rolling stock leasing market experiences greater regulation and intervention by the Government.

Asset re-lease or residual value risk

34. We have seen evidence suggesting that the ROSCOs seek to minimize residual value risk in their lease transactions. [✂] (see also comments on part fleets— paragraph 39).
35. We have also seen evidence that the ROSCOs are concerned about risk of displacement of their stock by vehicles available from other ROSCOs. For example, in one of its board papers Porterbrook stated that its potential ability to displace Angel Diesel Multiple Units (DMUs) on the new First Great Western (FGW) franchise would prompt Angel to offer its own package of Class 150 and 158 DMUs ‘at a very attractive price’ to threaten the displacement of Porterbrook stock.
36. In relation to new rolling stock, we have seen evidence suggesting that the ROSCOs may either price to reflect areas of perceived future risk regarding flexibility and substitutability in the rolling stock or decline to bid altogether in order to protect their long-term residual value position. [✂]
37. The ROSCOs have told⁵ us that they do not generally seek section 54 undertakings. Rather, they are offered by the DfT in specific circumstances such as to maintain long-term lease rates when a franchise term is shortened after the point at which the lease has been negotiated.⁶
38. The ROSCOs have told us that they consider the DfT’s call option (described in the Industry background working paper), granting the DfT contractual power to extend an existing lease for up to three years at the same rental and exercisable in the event

⁵As a specific exception HSBC stated that it insisted on section 54 support for its investment in Class 395 Javelins.

⁶There is some divergence in view among the ROSCOs here. HSBC suggested that the DfT could provide section 54 support for a minimum of seven years to reduce risk for new rolling stock, whilst Porterbrook stated that it did not attribute huge value to section 54 undertakings.

that the terms proposed by the ROSCO were not considered acceptable, to have varying impacts, including:

- (a) the pricing of leases to include for the risk of the call option being exercised in this way;
- (b) constraining the ROSCO to offer a short-term lease whenever reasonably requested; and
- (c) constraining lease prices and ROSCO behaviour to avoid provoking use of the call option.

39. The ROSCOs have told us that the risk associated with having a proportion of a particular fleet off lease is significant, with a small number of vehicles of a particular type being attractive only to a TOC that both requires additional rolling stock *and* already operates the type of vehicle offered. ROSCOs have also argued that this factor is significant in reducing any potential comfort given by (and increasing the risk associated with) the DfT's section 30 'step-in' duty and call option—neither of which obliges the DfT to take *all* the rolling stock previously leased.

What is the DfT's view of these risk scenarios?

40. The DfT considered that there were four key types of risk faced by ROSCOs:
- (a) lessee credit and insolvency risk;
 - (b) asset maintenance risk;
 - (c) asset re-lease risk; and
 - (d) economic obsolescence risk.
41. We broadly agree with these categories and we consider (a), (b) and (d) primarily as financial risk, operation and maintenance risk and modification expenditure risk to be discussed later. We consider (c) asset re-lease risk here.

42. The DfT stated that it did not consider performance issues with particular rolling stock as giving rise to asset re-lease risk for the ROSCO. The DfT stated that it believed that the Class 180 Adelantes had been returned to Angel due to performance issues but that this did not truly reflect stranding risk (the risk of rolling stock being left without a lessee). The DfT stated that, as a party to the agreements for manufacture and supply as well as sometimes for maintenance, the ROSCO was in a position to negotiate contractual protection from the manufacturer for losses incurred as a result of poor reliability.
43. The DfT stated that the leasing of the Class 185 Desiros to TransPennine was an example of ‘the rolling stock market being largely impervious to access charges’—the very high axle weight leading to higher variable track usage charges, speed restrictions and extended journey times. The DfT further suggested that the ROSCO would be able to project the likely charges (in relative terms) and evaluate the comparative advantages or disadvantages against other stock prior to committing to finance the vehicles.
44. The DfT further argued that rolling stock with performance issues ‘will only go off lease or be reduced in price in a situation where there is *also* a lack of demand for the type of stock in question’ and that unpopular stock with relatively poor reliability (eg Pacer units) continued to be used because it was needed.
45. The DfT considered asset re-lease risk to be principally an issue as to whether there was a market or demand for the rolling stock at the end of the current lease period.
46. On this basis, the DfT argued that the asset re-lease risk was ‘very low’ due to (and evidenced by) the low level (1.4 per cent) of off-lease stock and evidenced by the high level of retention (90 per cent) of incumbent rolling stock on new franchises. The

DfT also stated that the asset re-lease risk was very low due to the supply and demand characteristics of the market, the absence of competition faced at renewal and the Government having no plans to invest in creating a surplus supply of rolling stock.

47. The DfT stated that this risk was further reduced for most new rolling stock procured since privatization by section 54 undertakings.⁷
48. The DfT suggested that, in common with other assets made available for periods shorter than their economic life, short periods 'off hire' should be considered normal for rolling stock during a 30-year life. The DfT expected that allowances for such off-hire periods would be built into the ROSCO's business model and accordingly into the pricing for the lease.
49. The DfT also argued that short-term periods off hire 'could not be expected to have any material impact on the financial returns the ROSCOs were earning on the rolling stock in question in the context of that rolling stock's full asset life'.
50. The DfT noted, however, the risk arising from the Rail Vehicle Accessibility Regulations (RVAR) and the Disability Discrimination Act (DDA) to vehicles that had life beyond the deadline but for which compliance was not physically possible. The DfT stated that any vehicle physically capable of being made compliant would be made compliant and that the modification would be treated as a mandatory modification, the costs of which will either be rentalized or paid for directly by the TOC or the DfT. For those vehicles for which compliance is not physically possible and for which non-compliance is marginal or of little material effect, the DfT stated that it

⁷Our analysis in the Capacity working paper indicates that 47 per cent of the new vehicles introduced up until July/August 2007 were supported by section 54 undertakings. The vehicles were all introduced from 2002 onwards—mainly in 2003 and 2004 [3].

intended to seek agreement with Disabled Users Committees⁸ for adaptations to vehicles to allow them to 'pass beyond 2020'. The DfT estimated that 2,957 vehicles would require 'modification' or 'rectification' and stated that it was 'working with the owners' (the ROSCOs) to 'ensure that fleets with a life beyond 2020 do not become stranded'.

51. The DfT has a different view from that of the ROSCOs regarding the stranding risk associated with small proportions of a ROSCO's total fleet. During its negotiations with the ROSCOs over lease price reductions, the DfT perceived that a 'usage' undertaking to the ROSCOs for a significant proportion of the fleet should be attractive. However, in response to these proposals Porterbrook stated that the rental reduction expected would have impacted substantially on the profitability of the company. Angel stated that the risk exposure of the remaining [X] per cent of its fleet being displaced would be 'catastrophic' compared with the value of the guarantee on the other [X] per cent. The DfT stated that in response to a [X] per cent usage undertaking HSBC advised that such an approach 'does not achieve the desired result of any meaningful transfer of risk and in return any material reduction in rentals'. However, HSBC stated that [X].

52. The DfT argued that the risk exposure for ROSCOs was reduced in comparison with asset financiers in the aviation and shipping sectors by the particular support provided by the Government (section 30, section 54 undertakings, etc).

⁸Disabled Persons Transport Advisory Committee (DPTAC) established by Act of Parliament as an independent body to advise Government on the transport needs of all disabled people across the UK.

How have the ROSCOs been able to mitigate or share the risk?

53. The ROSCOs have told us that the asset re-lease risk is carried entirely⁹ by the ROSCO. However, there are various steps that the ROSCOs can and do take to mitigate or share the risk.
54. Each ROSCO can review the re-leasing potential for its rolling stock. The ROSCOs have told us that they actively manage the lease accounts for their rolling stock and they are able to obtain feedback on the condition and performance of the fleet and the lessee's perception of it. Therefore the ROSCO has some scope to assess the potential for securing future rentals to eliminate further residual value risk in the fleet and identify appropriate actions as available to improve the leasing prospects.
55. Potential mitigation measures include the following:
- (a) improving the performance of existing rolling stock;
 - (b) considering their fleets on a portfolio basis;
 - (c) investing in high-quality new rolling stock assets;
 - (d) negotiating section 54 undertakings with the DfT where appropriate;
 - (e) taking out residual value guarantees; and
 - (f) allowing for a sufficient margin to cover the potential eventualities identified.

Improving the performance of existing rolling stock

56. Each of the ROSCOs retains significant in-house technical expertise and management resource (see also paragraph 95) which can be deployed to devise and procure improvements in the performance and presentation of the fleet.

⁹Angel noted that the carrying of the asset re-lease risk by the ROSCO was the fundamental tenet behind the operating leasing model.

57. Where there is no manufacturer liability remaining, as in the case of the MOLA stock, we have seen that the ROSCO can develop and implement improvements itself. As an example, HSBC stated that it had spent £[redacted] million on reliability improvements to the [redacted] since 1996 and will spend a further £[redacted] million on reliability improvements [redacted]. The ROSCO may or may not be able to rentalize the cost of the improvements—we have been given examples of each case.¹⁰
58. We have seen evidence that where the train manufacturer is still liable for the performance of the rolling stock, the ROSCO may in some cases be able to pass back the cost of mitigation to the manufacturer [redacted]. However, we have seen no evidence of guarantees of rentals being linked to performance improvement. [redacted]¹¹

Portfolio approach

59. Porterbrook and HSBC have told us that they mitigate risk by considering their fleets on a portfolio basis—Porterbrook by taking into account the range of fleet types, customers, UK regions and lease maturity dates when making its business decisions and HSBC by purposefully pursuing and maintaining a wide such range.

Investing in high-quality new rolling stock assets

60. HSBC stated that, in adding new rolling stock to their portfolio, ROSCOs could seek to procure reliable, generic vehicles that would interwork with existing fleets and that possessed a measure of flexibility to allow adaptation to new requirements—although Angel noted that the specification must ultimately be acceptable to the TOC and potentially the DfT.

¹⁰[redacted]
¹¹[redacted]

61. We have seen this in practice to some extent with the fleets of Electrostar and Desiro units purchased to replace the Mark I fleets creating a critical mass to which additional supplementary vehicle fleets can be added (as in the case of the additional 68 Class 450 Desiro vehicles for SWT and 48 Class 377 Electrostar vehicles for Southern).
62. We have seen evidence of ROSCOs declining to finance rolling stock where they think that a lack of flexibility or capability to interwork with other vehicles gives rise to a higher residual value risk. [REDACTED] (see paragraph 36).

Section 54 undertaking

63. The ROSCOs can reduce residual value risk by accepting a section 54 undertaking from the DfT where it is offered.

Residual value risk guarantee

64. The ROSCOs can reduce residual value risk by taking out a form of residual value risk guarantee.
65. For example, Voyager Leasing stated that pursuant to the original lease structure, the residual value risk on the Class 220/221 Voyagers after the initial lease contract to 2012 was shared between various parties. [REDACTED]
66. We have also been told that HSBC is protected on the residual value risk of its [REDACTED] rolling stock by an option to return the fleet in 2021 to the original manufacturer (at a fleet age of 25 years) for a known residual value of about £[REDACTED] million, put in place by British Rail before privatization—although HSBC stated that it had not used residual value guarantees since, due to the rates not being economically viable.

67. [X]

Margin

68. Given that the ROSCOs assess risk qualitatively and in the round, a backstop mitigation for risk is potentially to seek to secure sufficient margin to cover the potential eventualities identified.

69. For example, HSBC stated that it sought as a risk mitigation to achieve a return of [X] per cent over the cost of funds (this margin does not cover overhead expenses).

How and when has asset re-lease risk crystallized?

70. The ROSCOs have told us about situations in which rolling stock has been displaced and/or is earning rentals at a level below that which has been anticipated. However, rolling stock may be placed on lease again at a later point in its remaining life on terms that allow the residual value to be recovered (see paragraph 86).

71. Until the lifetime margin for the rolling stock can be determined with certainty—possible only after the withdrawal of the asset from service and its subsequent disposal—the ROSCO cannot be certain that the asset re-lease risk has resulted in the total cash investment in an asset together with a ‘reasonable’ margin not being realized.

72. A potential measure of when asset re-lease risk is more likely to crystallize in practice is provided by those instances in which the ROSCO has raised an impairment provision. Since impairments are a statutory accounting requirement, they are a reasonable indicator that the lessor cannot be confident that recoupment of the value in a company asset is achievable. It should be noted, however, that impairment

provisions may be released in whole or in part at a later point within the asset's life— as can be seen in Table 2.

73. It is theoretically possible that an asset could still have a positive lifetime margin whilst an impairment provision has been made in the accounts, depending on timing and how much margin has been earned prior to the impairment position. Whilst impairment provisions should be made promptly, they need not necessarily be released so promptly. Above all, it is the real lifetime returns made on the assets that are of particular relevance for our inquiry, not necessarily interim accounting treatment.
74. A further indicator of an asset having the potential to require impairment in future is the reduction of the asset's economic useful life (EUL). Whilst the shortening of the life of an asset does not necessarily mean that the stated value will not be recouped (the asset value may be recouped well before the expiry of the EUL), a shorter life means by definition fewer months or years in operational service and has a direct impact on the asset's potential to earn revenue. A reduction in the EUL may also indicate that the costs of owning, operating and maintaining the asset are turning out to be greater in practice than was forecast.
75. At this stage we do not have actual lifetime margin information, and therefore in this section we simply consider current impairment and EUL data, looking specifically at:
- impairments that have been charged in the accounts and have the prospect of not being released during the remaining life of the rolling stock; and
 - reductions in EUL that have been made.

Impairments

76. Each of the three ROSCOs undertakes a regular review of its rolling stock for impairment. The ROSCOs are guided by reference to International Accounting Standard (IAS) 36 'Impairment of Assets', although the ROSCOs differ in the methodology used for these reviews. Under IAS 36, a ROSCO should impair (or write down in value) an asset if its 'carrying value' exceeds its 'recoverable amount'. Carrying value is defined as an asset's NBV or cost less accumulated depreciation; and recoverable amount is defined as the higher of an asset's net selling price and its 'value in use'. Since rolling stock is not traded in an active market, a net selling price is not readily available and therefore a calculation is made of the rolling stock's value in use. This is calculated as the discounted present value of anticipated future cash flows arising from the asset's future use and disposal at the end of its useful life. Therefore it is necessary for the ROSCOs to estimate the expected future cash flows for each of their rolling stock assets and to update these estimates based on alterations to the underlying lease contracts (ie when rolling stock comes off-lease or is re-leased).
77. The data provided by the ROSCOs regarding impairment charges and subsequent impairment releases is listed in Table 2.

TABLE 2 Impairment charges and subsequent releases made by the ROSCOs

Class	Pre-2003	2003	2004	2005	2006	2007	£'000 Total
HSBC				✂)
Angel				✂)
Porterbrook				✂)

Source: ROSCO impairment data and responses to follow-up questions.

[✂]

78. There have been a number of impairments that have been released subsequently and we have considered only those impairments that are likely to remain and hence suggest real potential for crystallization of asset re-lease risk.

79. The key impairments shown in Table 2 at the 'Total' position amount to a total of £[✂] and are: [✂].

80. Looking forward, the ROSCOs suggested that there might be some further impairments arising from the 2020 RVAR deadline once the strategy became clearer. However, in the meantime the ROSCOs have indicated that they have excluded any effects from their analysis (see also paragraph 50).

Reductions in economic useful life

81. Under the original sale of the ROSCOs the rolling stock assets were valued on the basis of a 35-year life for EMUs and electric locomotives and a 30-year life for all other vehicles. [✂]

84. We have also seen evidence of EUL having been increased. We have listed in Table 3 the increases in life that we have been told about.¹² [X]

85. [X]

86. However, we have seen evidence of value in use significantly exceeding NBV in some cases. [X]

What have other parties said about risk?

87. Passenger Focus¹³ questioned whether residual value risk was overplayed given the lack of substitutability of rolling stock to other duties in Great Britain.

88. First stated that the ROSCOs did carry some residual value risk but that the risk did not apply to new vehicles built only for a particular use (and given section 54 protection), and the 'carrying cost' of older rolling stock was not substantial. First also stated that if vehicles did not operate as expected, the manufacturer and the TOC bore the risk.

89. [X]¹⁴

Other categories of risk

90. The ROSCOs have told us about a number of scenarios that may give rise to financial risk, asset operation and maintenance risk or modification expenditure risk.

91. We have seen that comparatively similar scenarios may give rise to different categories of risk. For example, whether a modification necessary to comply with

¹²Where we have not been advised the EUL by the ROSCO but have used data indicating when the vehicles cease to be leased, we are effectively determining a practical EUL rather than a book life (which may be longer).

¹³Independent public body set up by the Government to protect the interests of Britain's rail passengers.

new legislation or a change in technology gives rise to asset re-lease risk or modification expenditure risk would depend on a number of factors, including: the cost and practicability of the modification; the remaining life in the asset; and its attractiveness notwithstanding whether or not the modification is undertaken.

What risk scenarios have the ROSCOs told us about?

92. We have summarized the potential risk scenarios in Tables 4, 5 and 6 along with examples where available to help explain each scenario.

TABLE 4 Scenarios giving rise to financial risk

<i>Risk scenario</i>	<i>Examples given by the ROSCOs</i>
<i>(a) Lessee failure and insolvency</i> The lessee fails to honour its rental or other payment obligations under the lease (due to financial difficulties etc).	No specific example given.
<i>(b) Supplier failure and insolvency</i> The maintainer fails to honour its obligations under the contract (due to financial difficulties etc).	[✂]
<i>(c) Financial (general)</i> Returns are reduced as a result of changes in accounting or taxation treatment, changes in interest rates etc.	Angel cited the change from GAAP to IFRS in the treatment of depreciation.

Source: ROSCO submissions.

¹⁴Passenger ticket revenue.

TABLE 5 **Scenarios giving rise to asset operation and maintenance risk**

<i>Risk scenario</i>	<i>Examples given by the ROSCOs</i>
<p><i>(a) Design and endemic faults</i> A design or endemic fault requires a programme of modifications to be developed and implemented across a significant number of vehicles or an entire fleet.</p>	[X]
<p><i>(b) Maintenance</i> The ROSCO's obligations in the maintenance of the rolling stock are greater in practice than anticipated, in particular:</p>	
<p><i>(i) Uncertainty of costs</i> The ROSCO incurs greater costs than will be covered by the non-capital rental.</p>	[X]
<p><i>(ii) Asset return condition</i> The rolling stock is returned at the end of the lease in a condition that is not suitable for onward leasing with resultant remedial costs to the ROSCO.</p>	[X]
<p><i>(iii) Non-availability of rolling stock</i> The ROSCO incurs penalties that are not recoverable from the supplier due to the rolling stock being unavailable to the TOC for longer than the period agreed in the lease due to extended repairs (such as for corrosion) or rectification of defective work under warranty.</p>	No specific example given
<p><i>(iv) Non-performance by supplier</i> The ROSCO incurs penalties for non-performance (such as poor workmanship etc) of the maintenance supplier which cannot be recovered.</p>	[X]
<p><i>(v) Specification risk</i> The specification is inappropriate for the anticipated rolling stock performance and maintenance programme and for ensuring safety.</p>	No specific example given
<p><i>(c) Safety</i> A vehicle or range of vehicles is subject to a major safety hazard or incident leading to prosecution and/or reputational damage.</p>	No specific example given

Source: ROSCO submissions.

TABLE 6 **Scenarios giving rise to modification expenditure risk**

<i>Risk scenario</i>	<i>Examples given by the ROSCOs</i>
<p><i>Mandatory modifications and technological upgrading</i> The rolling stock requires significant expenditure in order to comply with new standards or legislation.</p>	[X] HSBC cited the European Rail Traffic Management System (ERTMS) as an example costing up to £250,000 per unit/train.

Source: ROSCO submissions.

How do the ROSCOs evaluate the risk in these scenarios?

93. The ROSCOs have told us that they assess the range of risk scenarios relating to the rolling stock fleets qualitatively and in the round as part of the same discussion and assessment as for the asset re-lease risk (see paragraph 22).

How have the ROSCOs perceived the risk—how does this vary between different types of lease?

94. The ROSCOs argued that (in the event of lessee default), despite the DfT's section 30 duty, a ROSCO could be left with rental arrears and other unrecoverable costs as well as unleased rolling stock that the DfT did not consider to be needed for the committed train service.
95. The ROSCOs have told us that they place a high level of importance on the management of maintenance and the risk it presents to their business and that they retain significant expertise and resource accordingly. They have also told us that they accept the risk and feel well placed to manage it. HSBC stated that it was a business committed to the long-term asset management of rolling stock and had a workforce to suit. Angel stated that it had 62 engineering and technical staff engaged in fleet engineering, management of maintenance contracts, management of refurbishment projects, planning, procurement, audit, engineering standards and warranty.
96. The ROSCOs have told us that they evaluate the maintenance risk as part of their qualitative discussion and assessment in the internal board/business papers and final price/margin, and in particular the impact on the asset re-lease risk. For example, Angel stated that its approach to maintenance was focused on protecting the residual value of the rolling stock and optimizing the opportunities for re-leasing.
97. We have seen evidence of the ROSCOs' concern regarding the various operation and maintenance risk scenarios. However, two types of operation and maintenance risk feature particularly in their consideration of risk in managing their business: maintenance costs and asset return condition.

Maintenance costs

98. In wet and soggy leases (defined in the Industry background working paper) the ROSCOs have told us that they perceive a risk of incurring more costs than will be covered by the non-capital rental due to:
- maintenance prices not necessarily being fixed with the supplier for the term of the lease; or
 - maintenance turning out to be more involved than forecast.
99. Angel and Porterbrook both stated that the availability of suitable suppliers to perform the maintenance represented a risk (albeit manageable) to the ROSCO in being able to secure the capacity and skills required as well as competitive pricing.
100. Porterbrook stated that the heavy maintenance costs to the ROSCO over the duration of the lease might vary but the non-capital rental was agreed in advance subject only to inflation and the ROSCO took the risk of securing a suitable supplier and acceptable prices—third party heavy maintenance contracts were generally negotiated separately by the ROSCO and typically had a duration of less than three years. However, in cases where the TOC was the supplier, the maintenance contract could be made to coincide with the period of the lease and the time and costs of vehicle movements could be avoided, reducing the risk.
101. The ROSCOs have told us that maintenance may be significantly more involved than the basic overhaul specification and arising remedial work, such as corrosion repairs, can increase the cost of the overhaul significantly (see paragraph 120).
102. However, in dry leases where the TOC or its subcontractor takes on the maintenance, the ROSCOs told us that they saw the risk of unscheduled maintenance and

potentially design and endemic defects¹⁵ as well as non-performance or late re-delivery by the maintenance supplier as transferring to the lessee.

103. HSBC stated that dry leases increased the risk of its whole life cost model being inaccurate since it had lower visibility of the costs of maintenance charged by suppliers within contracts to which it was not a party. HSBC also indicated that wet or soggy leases offered the ROSCO greater opportunity to manage and improve the long-term attractiveness and utility of assets and hence minimize residual value risk.

Asset return condition

104. The ROSCOs perceived a particular risk of the lessee not returning the rolling stock at the end of the lease in a condition that would permit it to be re-leased immediately without significant remedial work by the ROSCO. HSBC stated that such inadequate return condition included a lack of information on the maintenance undertaken or proof of compliance with the maintenance programme as well as shortcomings in the physical condition of the rolling stock.
105. The ROSCOs have told us that the asset return condition risk is increased significantly in a dry lease. Angel stated that it would offer dry leases where:
- it was satisfied that the lessee or its subcontractor was capable of ensuring that maintenance was carried out to a standard sufficient to protect the value in the fleet and optimize the likelihood of re-leasing; or
 - the age of the rolling stock and the length of the lease meant that there would be no significant residual value left at the end of the lease to protect.

¹⁵[3<]

106. Despite the risk, ROSCOs have large numbers of vehicles on dry leases. Our analysis indicates that 67 and 27 per cent of the Porterbrook and HSBC vehicles respectively are on dry lease, although [✂] Porterbrook stated that it was seeing a movement of some dry leased fleets back towards the soggy lease structure. The proportion of vehicles on dry lease does not necessarily reflect the proportion of residual value at risk on dry leases.

What is DfT's view of these risk scenarios?

107. Regarding lessee credit risk, the DfT considered that the section 30 duty to ensure that train services continued and the terms of the direct agreement meant that there was 'very nearly a Government guarantee of the rental for the lease period, effectively giving the ROSCOs a counter party risk which is "near Government" and lower than for "typical asset financiers"'.

108. The DfT stated that the risk of rolling stock assets becoming economically obsolete was relatively low and was mitigated:

(a) principally by the costs of meeting mandatory modification requirements lying with Government; but also

(b) by the long lead time for the introduction of technical requirements, meaning rolling stock was typically life expired in any case; and where this was not the case

(c) the facility (for the Government) to issue derogations from the technical requirements.

109. The DfT considered that maintenance risk in terms of working capital or payment exposure was limited because:

- (a) shortfalls in the maintenance cash reserve could be recovered from the TOC under certain circumstances (eg if attributable to higher than anticipated usage levels); and
- (b) the DfT's section 30 duty as well as a TOC performance bond providing security for the ROSCO.

How have the ROSCOs been able to mitigate or share the risk?

110. We have seen evidence of steps that the ROSCOs can and do take to mitigate or share risk as well as some inherent mitigations in the contractual framework.
111. Lessee credit risk is borne by the ROSCO initially but is in effect shared by the DfT due to its duty under section 30 of the Railways Act 1993 to ensure that passenger services continue to be provided even if a franchisee should fail. Under the direct agreement with the ROSCO, however, the DfT is not obliged to take on all the rolling stock that was previously leased by the TOC and the ROSCOs have told us that the leasing of partial fleets is a significant concern to them (see paragraph 39).
112. The ROSCOs can mitigate the risk of maintenance costs arising from a TOC's usage of the asset but not being paid for by that TOC by using a maintenance 'reserve' charge arrangement. HSBC stated that it collected a maintenance reserve charge in its wet and dry leases in order to mitigate the risk of maintenance charges failing to cover the maintenance work required as a result of usage during those leases. Porterbrook stated that it generally required a maintenance reserve arrangement in its dry leases. Angel has told us that it does not use a maintenance reserve charge arrangement.
113. The ROSCOs saw dry leases as transferring some risk to the lessee where the TOC or its subcontractor took on the maintenance. Angel stated that under a dry lease the

risk of unscheduled maintenance and design and endemic defects was typically taken on by the lessee. However, Porterbrook stated that asset return condition risk and residual value risk increased in a dry lease.

114. The ROSCOs can obtain security in respect of the TOC's lease obligations by requiring the lessee to arrange a bond or guarantee. HSBC stated that the asset return condition risk might be mitigated partly by the ROSCO through obtaining an 'asset return bond' in the form of a parent company guarantee or a bank guarantee against the asset return condition. HSBC stated that TOCs would negotiate hard to avoid granting these guarantees, [REDACTED]. Porterbrook stated that for a dry lease it would normally require a maintenance reserve agreement in which the TOC paid towards a share of the 'lumpy' heavy maintenance costs.
115. In the initial MOLA leases the risk of mandatory modifications was shared with the DfT (or its predecessors) with the Government bearing 60 per cent of those costs in excess of the first £20 million that arise on mandatory modifications in any given year. Under this arrangement the expenditure incurred by the ROSCOs on mandatory modifications has been significant.¹⁶ However, since the expiry of the initial MOLA leases the DfT now bears the full risk through the TOC (although only for rolling stock on lease).
116. The ROSCOs have told us that the risk of design and endemic faults on new rolling stock can also be transferred to the manufacturer for an initial period of time.
117. The ROSCOs have told us that they retain considerable engineering expertise and experience in rolling stock maintenance and have confidence in their own manage-

¹⁶[REDACTED]

ment of maintenance under soggy and wet leases (whilst being dependent always on the underlying capability of their maintenance contractors). As a result they are able to use past experience to improve their forecasts of future maintenance requirements and costs.

118. Having been able to accumulate cost data since privatization, the ROSCOs have the facility to revise non-capital rentals at the inception of each new lease to reflect more accurate forecasting of future maintenance requirements.

How and when has the risk crystallized?

119. In considering risk attendant on the management of the asset, we are particularly interested in the realization of expenditure significantly in excess of forecast. The ROSCOs have referred to other scenarios but they cited particularly the risk of excess maintenance costs, inadequate asset return condition and the emergence of design and endemic defects.

Maintenance costs

120. The ROSCOs have told us about specific examples of excess maintenance costs. However, the supporting expenditure figures provided do not indicate whether or not there has necessarily been a direct impact on the overall margin. They do suggest that the situation for individual ROSCOs may have been different.

121. [REDACTED]

122. [REDACTED]

123. [REDACTED]

124. [REDACTED]

125. [REDACTED]

126. [REDACTED]

127. [REDACTED]

Asset return condition

128. [REDACTED]

129. Angel stated that its short-term (20 months) lease with FGW for the Class 180 Adelantes was an example of asset return condition risk crystallizing. [REDACTED]

130. [REDACTED] it appears that the risk to the ROSCO has been mainly the risk of additional remedial expenditure and the residual value risk of not being able to re-lease the fleet if it was returned in the condition anticipated.

Design and endemic defects

131. The ROSCOs have cited a number of instances of design and endemic defects. For example, Angel stated that it had spent:

- £[REDACTED] million on Class 165 bodyside crack repairs;
- £[REDACTED] million on Class 465/466 Networker bearings;
- £[REDACTED] million on HST crankcase spares; and
- £[REDACTED] million to date on Brake hanger brackets (with a further £[REDACTED] million still to be spent).

New rolling stock procurement

132. There are specific risk scenarios associated with the procurement of rolling stock prior to the commencement of its use as an asset. However, in our view, new rolling stock procurement does not constitute a distinct category of risk. Rather it provides specific examples of asset re-lease risk, asset operation and maintenance risk and modification expenditure risk.
133. Our interest is particularly in those risk scenarios that are not addressed wholly within the price paid by the ROSCO for the rolling stock or through specific project management activities and costs that the ROSCO identifies for the procurement process and introduction to service.
134. There are a number of scenarios that the ROSCOs have described that may give rise to what we have categorized as risk arising from new rolling stock procurement.

What risk scenarios have the ROSCOs told us about?

135. We have summarized the potential risk scenarios in Table 7 along with examples where available to help explain the scenarios.

TABLE 7 Scenarios giving rise to risk arising from new rolling stock procurement

<i>Risk scenario</i>	<i>Examples given by the ROSCOs</i>
<i>(a) Change in service requirements</i> The original demand for a particular fleet is found later not to exist.	HSBC stated that the nine-car Class 222 Meridians were already being procured when the SRA/DfT determined that the requirement no longer existed on Midland Mainline for the Class 222s to provide a high-speed service between London and Leeds.
<i>(b) Acceptance and certification risk</i> The vehicles fail to be accepted into service and/or achieve certification for use, have restrictions placed on their use or require additional works before being accepted and certified.	Angel stated that this was a significant risk requiring intensive project management and financial levers to secure manufacturer commitments [X].
<i>(c) Infrastructure risk</i> Upgrades necessary to the introduction of the rolling stock or to the benefits on which its investment case were justified do not progress as envisaged, which results in the suitability of the stock being undermined.	Angel stated that part of the rationale behind procuring the Class 390 Pendolino fleet was the upgrading of the West Coast Main Line to 140mph operation along the entire route—apparently backed by a letter of comfort from the Government. [X]
<i>(d) Manufacturer performance risk</i> The rolling stock is not delivered to the agreed specification.	Porterbrook stated that the Class [X] fleet rental was reduced partly due to significant technical problems.
<i>(e) Manufacturer credit risk</i> The manufacturer fails to perform its obligations (due to financial difficulties etc).	No specific example given.
<i>(f) Intellectual Property Rights risk</i> The necessary maintenance information is not provided.	No specific example given.
<i>(g) Exchange rate risk</i> Materials sourced from overseas are more expensive than anticipated.	No specific example given.

Source: ROSCO submissions.

To what extent do these risk scenarios impact on the leasing of rolling stock?

136. We have not asked the ROSCOs specifically to categorize the new rolling stock procurement risk scenarios according to this definition. However, from the information they have provided we are able to assemble some views.

137. Although the risk scenarios are different in new rolling stock procurement, we would suggest that the result is in some cases effectively asset re-lease risk. For example, a change in service requirements or failure to carry out necessary infrastructure upgrades (items (a) and (c) in Table 7) both lead to similar situations to items (c)(i), (ii) or (iii) in Table 1—change in requirements.

138. We perceive a particular risk that may arise in the case of new rolling stock procurement is that the value in the rolling stock may have been linked partly to a requirement that will not now materialize.
139. For example, Angel stated that it had paid a higher capital price for the Class 390 Pendolinos to be capable of 140mph on the West Coast Main Line and the fleet may be threatened with displacement in future by cheaper 125mph vehicles if the DfT proceeded to introduce IEP on the West Coast route south of Birmingham.
140. The manufacturer performance risk scenario (item (d) in Table 7) is equivalent to item (a) in Table 1—performance issues with the rolling stock—and may similarly lead to asset re-lease risk or potentially may transpire as asset operation and maintenance risk or modification expenditure risk.
141. The remaining risk scenarios would in our view most probably be addressed within the purchase price of the rolling stock through guarantees and appropriate pricing.

Conclusion

142. Although there are specific risk scenarios associated with the new rolling stock procurement activity, where these have an impact on the leasing of the rolling stock, this would be reflected mainly within the asset re-lease risk category—albeit potentially with a higher level of asset re-lease risk depending on the particular circumstances.