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Airports Commission

Interim Report

High-level Commercial & Financial Assessment of Selected Potential Schemes

10 December 2013

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Contents

1 Purpose

This Report provides preliminary, high-level views on the commercial viability of a range of potential schemes specified by the Airports Commission (AC), focusing on funding and financing. These financial and commercial perspectives are intended to help the Airports Commission consider which potential schemes it believes should be taken forward for more detailed analysis during Phase 2 of its work. The contents of this Report should be read alongside the technical and other analysis of potential schemes undertaken by others, as well as the high-level financial/commercial assessment commentary contained within the various summary report templates previously provided to the AC.

Submissions to the Commission to date have contained only high-level financial and commercial data. Further, the financial and commercial analysis of potential schemes undertaken for the purposes of developing this Report has been based on cost, revenue, assumptions and other information provided to us by others, the accuracy and reliability of which have not been assessed in preparing this Report and upon which any views and conclusions contained in this Report depend. The financial and commercial analysis, including the input data on which it has been based, has also necessarily involved a range of key assumptions, simplifications and estimates.

Accordingly, all analysis, views and conclusions presented in this paper should be considered as being purely preliminary and indicative and subject to further review, development and potential change.

The paper comprises two parts:

- Section 2 sets out a range of key factors that are typically of interest to potential investors in infrastructure schemes, as well as to government. The paper briefly highlights how these factors may be particularly relevant to the range of airport schemes currently being contemplated by the AC.
- Section 3 presents a high-level assessment of a range of schemes as instructed by the AC.

2 Key considerations in relation to commercial viability, funding and financing of infrastructure schemes

2.1 Investor Perspective

The financial deliverability or "financeability" of any proposed scheme will depend on a range of key factors as shown below.

2.1.1 Commercial viability

At the most basic level, is the proposed scheme commercially viable? For example:

- Do its projected revenues cover its projected costs, generate a sufficient margin to cover finance charges and provide an appropriate rate of return to investors over an acceptable time period and given their level of risk exposure?
- What are the various sources of revenue? Are the projected revenues likely to be achievable given relevant market factors, e.g.:
  - Limits on aeronautical charges that are achievable given the existence of other market competitors, noting airline/customer behaviours and business models.
  - Potential tactical and/or strategic moves by competitor airports and/or airlines prior to, during and/or after the proposed scheme is operational.
  - Decisions re existing airports (e.g. Heathrow remaining open/closing/being down-scaled).
  - Macroeconomic and geopolitical outlook.
  - Features and characteristics necessary for the scheme to operate in the capacity intended (e.g. in the case of a proposed hub scheme, will it sustain genuine hub operations e.g. given its achievable transit times).
- Are the estimated costs reliable, e.g. are they based on sound input data and analysis, do they include suitable contingencies for risk (see below), do they reflect sensible assumptions?
- On what (if any) government/regulatory/other support is the scheme dependent in order to render it commercially viable (e.g. grant funding, guarantees, risk sharing, development of critical ancillary infrastructure, etc.)? What (if any) legal obstacles are there which might affect achievability of this support (e.g. State Aid)?

2.1.2 Risk profile

This has a wide range of dimensions, most or all of which relate back to the basic commercial viability issues indicated above. Key examples include:

- Government policy risk – e.g. risk of current or subsequent administrations changing originally stated policy regarding the scheme or other matters materially affecting it.
- Government delivery risk – e.g. risk of government failing or delaying delivery of critical commitments upon which the scheme depends (e.g. development of ancillary infrastructure, exercise of statutory/other powers, etc.)
- Project development risk – planning, etc.

- Project delivery risk – e.g. nature and extent of engineering and construction complexity and risk, specifically the risk of time/cost overruns and revenue delays/shortfalls and the impacts of these. Have similar schemes been delivered previously and, if so, how successful were they? Does the contractor market have the capacity to deliver what is needed within the timescales?
- Revenue risk – stability and certainty of revenue streams.
- Operational risk – e.g. safety, industrial relations (much of this is encapsulated in revenue and other risks).
- Reputational/relationship risk – e.g. social/environmental impacts, public opinion, media publicity, etc.
- Regulatory risk – e.g. clarity, certainty and stability of any regulatory regime. This is more specific than the wider Government Policy/political agenda risks above and relates to the detail and impact of regulation for example Civil Aviation Authority rule changes.
- Market risk – e.g. changes in liquidity, interest rates, etc. that affect the availability and/or cost of private capital.
- Counterparty credit risk – e.g. of government/other bodies underwriting the scheme (e.g. in relation to funding, guarantees, risk sharing, etc.) and of the borrowing/investment entity itself.

To help demonstrate some of the issues above, the examples below cover various major infrastructure capital projects where outturn costs significantly exceeded those originally anticipated and/or where expected revenues did not materialise.

West Coast Main Line Modernisation

The 1998 West Coast mainline modernisation had forecast total costs of approximately £2.5 billion. In October 2001, Railtrack went into Railway Administration and by May 2002 its projection of the programme's final cost had risen to approximately £14.5 billion. By March 2002, Railtrack had spent approximately £2.5 billion on the programme, had committed some £500 million of further works, but had delivered only a sixth of the project scope. In 2003, the Rail Regulator's funding determination lowered the west coast programme budget for Network Rail (Railtrack's successor) to £8.3 billion. A wide variety of factors was considered to have contributed to the cost overruns, e.g. inefficient alliance arrangements, high compensatory payments to train operators due to loss of track access, high inflation in construction costs due to high levels of market demand, etc. In addition, as a result of the route upgrade not being delivered as Virgin had expected in its West Coast franchise bid, the Strategic Rail Authority paid substantial additional subsidies to the franchisee over the period 2003 – 2006.

[Source: National Audit Office]

Channel Tunnel Rail Link/HS1

Passenger demand for international services on the line proved to be much lower than forecast. This resulted from various factors, e.g. the growth of low-cost airlines and competitive responses by ferry companies. The revenue shortfall was a root cause of the failure of the original deal, requiring it to be fundamentally restructured and the Government now has to service the £4.8 billion debt.

[Source: Public Accounts Committee]

London Olympics 2012

At the time of London's bid to host the Games, the estimated gross cost was £4 billion. However, a budget in excess of £9 billion was announced in March 2007. There were various reasons for the

increase, e.g. a new provision of over £2.5 billion for programme contingency, over £800 million for VAT, £600 million for policing and wider security, major increases in the Olympic Delivery Authority's programme delivery budget, decrease in anticipated private sector funding from £738 million to £165 million, etc.

[Source: National Audit Office]

2.1.3 Basic investment proposition

- Scale, duration and nature of financing requirement – is the investment being sought consistent with the investor's investment criteria? What is the risk/reward profile? Is it within its financing capacity? Is the overall financing requirement within the market's capacity? What other investors would need to be involved? Are these acceptable as co-investors in terms of relationships, capability, reputation, etc? Does the scheme represent an unduly large single investment risk that might destabilise or skew the investment portfolio? How does it compare to other investment opportunities that are available in terms of risk/reward profile? Over what period would the investment be required? Is this timeframe acceptable? What is the required investment profile over that period? From what point would investment returns flow? What is the exit strategy?

2.2 Government Perspective

Government's considerations in relation to funding/financing are likely to include various factors, such as:

- Is the government funding requirement affordable (both CDEL and RDEL)?
- To what exposures/liabilities does the proposed strategy expose taxpayers and for how long?
- Are there any legal obstacles to providing the nature and extent of government support that is required? E.g. State Aid, procurement rules, etc.
- Setting aside any legal obstacles, what major legal risks or issues arise? E.g. what is the likelihood of disputes, arbitration, litigation, Judicial Review, etc. instigated against government by parties not in favour of the proposed scheme or who are significantly affected by it? What financial and resource burdens and political sensitivities would this create for government? Does it have the capability to absorb and address these?
- Does the proposed scheme and its associated funding/financing strategy represent value for money (VFM) to taxpayers? VFM covers a range of aspects, e.g.:
  - What is the nature and extent of government support that is required?
  - Given the above, are there sufficient incentives on investors and through the supply chain to drive the desired behaviours and drive efficient and timely delivery of the scheme?
  - Related to the above, do the advantages of accessing private capital outweigh its associated implications, e.g. in terms of cost of capital and implications for taxpayer exposure to risk (e.g. contingent liabilities)?
  - Would it be better/cheaper for the scheme to be wholly funded and delivered by government (to the extent this is not prevented by State Aid/other rules)?
- How would the required level of funding be allocated between taxpayers and users? Does this seem appropriate?
- Does government have the resources and skills to manage its participation in the scheme and protect taxpayer interests?
- What is government's exit strategy? i.e. at what point could it step out of the scheme and leave it to the private sector to proceed alone from that point? Or would the scheme require ongoing government funding (e.g. via subsidy of surface access routes e.g. rail)?

2.3 Relevance to airport schemes under consideration

This section briefly sets out how various factors outlined above have a bearing on the funding and financeability of the schemes currently under consideration by the AC. These are then revisited in further detail in Section 3.

2.3.1 Financing challenge

The capital cost of the potential schemes ranges from £16.6 billion to £115.5 billion. These are clearly very significant sums and we know of no precedent of this scale for any purely privately promoted and financed projects (without government or other support) in the UK or worldwide. We believe that the quantum of unsupported construction equity available in the market is unlikely to exceed approximately £1 billion assuming investment risk is reasonable (noting that for the higher-risk schemes, it is unlikely that any investors or contractors would be willing or have the financial capacity to accept full construction risk transfer[1]). Equity capital would therefore form a relatively small proportion of any private financing of any of the proposed airport schemes, absent Government and/or regulatory support mechanisms, although it could, perhaps, form a more significant proportion of certain components of a given scheme, e.g. surface transport elements such as road, rail that were structured as PPPs or other suitable forms.

This suggests that debt finance would be a critical element of any private financing strategy. However, here again, the financing requirement would far exceed the capacity of the bank debt market for short-term construction finance, which we believe is limited to approximately £1 billion-£2 billion. Bond financing would therefore be the most significant element of any debt financing strategy. The capacity of this market is large and regulated utilities backed by Regulated Asset Bases (RABs) have proven effective at raising large amounts of debt finance at relatively low financing cost. RAB-based regulation is well understood by infrastructure investors and ratings agencies alike and, assuming the financeability story is credible, both seem comfortable with the long payback periods involved with RAB investments. However, financeability based on sound credit metrics[2] continues to play a key role. Liquidity becomes progressively more constrained as rating levels fall and sharp increases in RAB growth (through, for example, significant enhancement capex relative to the size of an existing RAB) can be difficult to finance without some form of pre-funding or 'profiling' of revenues. As indicated in the scheme-specific summaries further below, this appears to be an issue in relation to some of the proposed schemes.

To achieve the required *de minimis* credit rating, mechanisms would need to be put in place to limit bond investors' risk exposure. To all intents and purposes, we believe it should be assumed that such investors will not be prepared to accept exposure to any material project delivery risk: these investment-grade bond investors are focused primarily on yield and simply seek stable, predictable returns.

2.3.2 Value for Money challenge

The scale of the proposed schemes and of the financing challenge associated with each points to the criticality of government support. Government support could take various forms. For example, as shown in relation to all of the schemes below, this could comprise government subsidy of scheme costs. The scale of this subsidy requirement varies by scheme but is in all cases substantial. The

[1] For smaller schemes construction contractors might, for a premium, provide a fixed price, date – certain construction contract. However, the complexity and sheer scale of at least some of the potential airport projects that are the subject of this Report is likely to prohibit such an arrangement.

[2] i.e. following tried and tested analysis of the economic sense and business rationale for a project through a thorough review of risks, structure and cashflows of a transaction or project.

preliminary assessment shows that this could theoretically be in the range of approximately £10 billion – £65 billion. However, in some cases, despite government subsidy, the scale of the private financing requirement remains so large as to appear unprecedented, suggesting that higher levels of government subsidy might be needed in practice, perhaps of the order of £80 billion or more in some cases, simply because the market capacity for debt for a single transaction has been exceeded.

Even then, scheme risk profile may mean that a range of risk mitigation measures will be required in order to access the desired quantum of debt financing. The nature of such risks is outlined above. Examples of risk mitigation measures could include: limitation of exposure to cost and/or time overrun risk; protection from political risk (e.g. change of policy) e.g. in the form of termination compensation provisions; protection from revenue risk (e.g. minimum revenue guarantees). Depending on market perceptions of the residual risks associated with whichever scheme is ultimately proposed even after application of the relevant risk mitigation measures, it is possible, for example, that lenders might want direct government guarantees of debt.

All such government support measures raise material value for money questions. Put simply, if the only way to attract the required private capital is to subsidise the proposed scheme to a large extent and/or to de-risk the project such that substantial risk and liability remains with the taxpayer, then is such support justified?

2.3.3 Competitiveness challenge

Even with suitable risk mitigation and other measures in place, commercial viability and financeability obviously also depend on the fundamental economics of the scheme in question. Revenues would need to be sufficient to cover all costs, including financing charges and returns, but could not exceed a level at which the new or expanded airport would be unable to compete adequately with other airports with lower aeronautical charges. Given the magnitude of the capital investment involved in some of the potential schemes, this could pose a material challenge to commercial viability, depending for example on the extent of public funding available and the basis on which it was provided.

2.3.4 Other potential issues

Various practical and logistical challenges could arise from any closure or 'downgrade' of Heathrow on which other potential schemes were predicated.

For example, any instantaneous 'switch-over' from Heathrow to a new hub airport – perhaps especially where this was at a distant location, e.g. the Thames Estuary – could potentially give rise to staffing issues, e.g. in terms of the availability of such staff to commence Day One operations at the new hub airport and, perhaps, concerns regarding attrition of staffing levels at Heathrow as some employees anticipated a move to the new hub location. Transitional costs would be expected to arise, including costs of establishing, training and developing the required professional and other staff prior to operational commencement. There may also perhaps be duplication of such costs during the period for which Heathrow remained operational as a hub airport in the lead-up to closure or downgrade. We understand that estimates of such costs are included within the input cost and revenue data on which this paper is based, however given the potential to underestimate the total cost in this area, the financing and other challenges that are noted below in respect of relevant schemes may become more acute.

These are essentially technical/operational matters outside the scope of this paper and the preliminary views set out below are presented from a purely commercial perspective. However, other than where technical/operational assessment indicates otherwise, such practical issues may give rise to financial consequences impacting the viability of the proposed solution. Potential reactions and behaviours of airlines would also be a critical component of this. We understand that

there are, however, certain precedents for such 'switch-overs", although consideration of such precedents and any associated issues is outside the scope of this Report.

3 Scheme-by-Scheme Commentary

3.1 General

The challenges set out above are relevant to all schemes, although the extent of the challenge in each case varies. This Section seeks to address some of the scheme-specific issues and places the general commentary above in the context of some preliminary, high-level indicative quantitative analysis, most notably the anticipated capital costs, revenues and likely borrowing requirement.

At the request of the AC, eight schemes have been included and have been subject to high-level, preliminary financial assessment over a time period to 2050. We understand that there was no particular basis for the selection of this time period, other than to help initial, indicative comparison of schemes on a similar basis. Given the asset life of the schemes under consideration, longer time periods could, for example, have been used.

The original remit for our analysis was to seek to assess the order of magnitude of the potential financing/funding requirement in respect of each scheme, based on cost and revenue projections provided to us, overlaying allowances for financing costs. Based on the results of this, the remit was then extended to include consideration of the level to which scheme revenues may need to be uplifted from the first year of operations in order to cover the estimated financing costs and enable repayment of debt by 2050. This date was an arbitrary choice consistently applied across schemes to allow comparison. Clearly, this is a highly simplified approach and all results need to be viewed accordingly.

The underlying expenditure and revenue assumptions were provided by LeighFisher/Jacobs. We understand that capital expenditure forecasts were based upon their independent estimate of cost and included an allocation for "on-going" capital expenditure in addition to the capital expenditure for construction of the specific option being considered; that operational expenditure forecasts were based upon observed costs at the individual airports, with an allowance made for transition costs as appropriate; and that aero and non-aeronautical revenues were based upon the current airports (taking into account the current Q6 regulatory settlements). We understand that the operating costs and revenues of new hub airport options were derived from those at London Heathrow. Finally, we understand that traffic volumes were based upon the forecast demand, rather than the maximum use of available capacity. In this context, we understand that, in certain cases (e.g. London Heathrow third runway), capacity is reached before 2050 and therefore traffic levels are constrained to capacity. In other cases (e.g. London Stansted second runway), we understand that capacity is not reached by 2050 and therefore demand remains unconstrained by capacity limits.

Assumptions have been made regarding the ongoing cost of capital for the existing airports (where relevant) using data from published CAA documents, which give a monetary value to 2018/19. The working assumption beyond that date is that there will be a flat cost of capital in relation to the existing debt and equity, the logic being that whilst existing debt may be repaid over time, the existing airport infrastructure will need to be constantly upgraded and the RAB in relation to that part of the airport maintained. This has been reflected in the cost projections, which have then been considered alongside the anticipated scheme revenues in order to seek to assess the scheme's viability.

The scheme-by-scheme commentary further below applies the option reference numbers that have been allocated to each option by the Airports Commission.

Readers' attention is once again drawn to the caveats previously indicated regarding the application of a range of key assumptions, simplifications and estimates in order to undertake the analysis required by the AC.

3.2 Preliminary indications from high-level analysis

On the basis set out above, none of the schemes is fully able to meet its borrowing cost, even assuming inflationary rises in aero revenue of 2.5% per annum. In each case, an estimate has been made as to the likely revenue increase or public subsidy that would be required to make the scheme viable. Note that this Report does not seek to assess the implications of any such revenue increases in terms of where this would place aeronautical or other charges in comparison with competitor airports. Similarly, this Report does not comment on potential legal or other issues relating to any public funding requirement, e.g. State Aid, which is an area requiring specialist legal advice.

3.3 Preliminary analysis using promoter data

The AC requested the high-level preliminary financial analysis to be run using promoters' data as well as data provided by the AC/LeighFisher/Jacobs. Capital cost estimates were submitted by promoters for all schemes, except for the four-runway configuration at London Heathrow Airport. Scheme cost data sources were as follows:

Scheme	Promoter data used for preliminary analysis
London Heathrow Northwest and Southwest third runways	Heathrow Airport Limited
Heathrow Hub north runway	Heathrow Hub
London Stansted second runway	Manchester Airport Group
London Gatwick second runway	Gatwick Airport Limited
Stansted Five Runway new hub	Mayor of London
Isle of Grain new hub	Foster and Partners

Promoters' projected scheme costs were reviewed by LeighFisher/Jacobs and separate estimates developed by LeighFisher/Jacobs in order to adjust for differences in the basis of those estimates and to seek to provide a degree of comparability. We understand that the differences between promoter projections were not only in terms of the quantum of estimated costs but also in relation to the different types of costs taken into account and the methodologies used to calculate them. For example, we understand that the approach to project risk allowances and/or surface access costs was not uniform across proposals: some proposals did not include any costs for these items, some assumed that government would cover the costs of surface access works, some assumed that there would be a government contribution towards the costs of surface access works, whilst others included all of these cost categories. Care must therefore be taken when seeking to make comparisons between data submitted by promoters for given schemes, and between promoters' estimates and those provided by LeighFisher/Jacobs. LeighFisher/Jacobs advise that their cost estimates were calculated in the same manner for all schemes that they considered and that their estimates can therefore be used to compare costs between schemes.

It will be seen that there are substantial differences between the cost estimates developed by LeighFisher/Jacobs and those submitted by promoters. We have based our analysis predominately on the LeighFisher/Jacobs estimates, but have also shown in each case the debt profile implied by promoter estimates, for comparison purposes. The cost estimates are clearly fundamental to the analysis that we have undertaken and to the views presented in this Report. Further information on the basis of the LeighFisher/Jacobs estimates are set out in their report"Long Term Options –

Approach and Assumptions", as well as to the scheme-specific report templates prepared by LeighFisher, Jacobs and others.

The results of the high-level preliminary financial assessment using promoters' costs are presented further below, subject to the above cautionary comments.

3.4 London Heathrow closure/down-scaling

In relation to the non-Heathrow schemes, the AC is interested to understand whether their commercial viability depends on closure or downgrade of Heathrow. As indicated above, none of the schemes is fully able to meet its borrowing costs, other than where revenue assumptions are increased and/or capital costs reduced through provision of public subsidy. Any continuation of Heathrow as a hub airport or as a smaller airport would tend to exacerbate the financing challenge, on the basis that, assuming there is a finite level of overall demand, Heathrow would retain a certain level of demand that would otherwise be expected to pass to the new airport. In a purely mathematical sense, this would reduce the revenues available to the new airport. Unless this was offset by a commensurate reduction in capital and other costs, this would result in a higher financing requirement, as well as reducing profitability.

In terms of airline behaviour, should Heathrow remain open, LeighFisher advises it is not certain that airlines would necessarily voluntarily vacate Heathrow, as the capacity released by their departure would benefit the airlines that remained, which could add further services from the same airport and increase their own connectivity. LeighFisher believes it is therefore likely that incumbent airlines would remain at Heathrow, with demand growth migrating to the new hub airport. They suggest that this would imply either that traffic would grow slowly over time at the new airport, or that sufficient incentives would need to be given to relocating airlines in order to shift demand – which would raise the question as to why Heathrow was being kept open. In either case, all else being equal, forecast revenues would be lower than those assumed in the financial analyses.

Further commercial viability and financeability problems may arise, depending on the basis on which Heathrow remained open. For example, if Heathrow was to remain open and operational as a hub as it is now, then, setting aside the obvious questions about overall level of demand, there may be general concerns about the viability of a two-hub model given past precedents.

Theoretically, the issues about reduction in revenues at the new airport, higher financing requirements and damage to profitability as a consequence of Heathrow remaining open might potentially be addressed through provision of a range of government support measures. For example, these might include minimum revenue guarantees, amongst other things. However, there would be a need to justify the value for money of such an approach, which could be challenging, certainly for any protracted period.

3.5 AC Option 62: London Heathrow – North West Runway Option

The capital cost of developing the scheme is estimated at £21.6 billion (comprising £18.7 billion of on-Airport costs and £2.9 billion of off-Airport surface access costs) and this is spread over a 19-year period with costs back-ended (the first five years' expenditure is just £1.3 billion). This is almost double the existing Heathrow RAB value and likely to require some form of pre-funding or revenue profiling to achieve a financeable credit rating. Even assuming simple indexation of revenues at 2.5% for the period beyond the current price control period (Q6) to 2019, the indicative borrowing would not be repaid by 2050.

In order to meet the full debt requirement, aero revenues must be increased by 19% and then indexed at 2.5% per annum thereafter. This would mean peak borrowing[3] of £24.2 billion being repaid in full by 2050. If indexation is ignored for the purposes of increasing the aero revenue (which might be closer to reality given the current regulatory settlement[4]) the initial aero revenue would need to be uplifted by 54% at the outset, although that reduces the peak financing requirement to £12.2 billion.

The above assumes that Heathrow's owners would be responsible for the entirety of the surface access costs outlined. If that assumption is removed, the revenues would need to increase by 13% at the outset (and indexed at 2.5% thereafter) to see peak borrowing of £21.8 billion fully repaid before 2050. Alternatively a rise of 46% in aero revenues at the outset with no subsequent indexation sees peak borrowing of £10.4 billion fully repaid in the period. Rises above these figures would allow a contribution to surface access costs.

The borrowing requirement for the all-in cost is large and well above precedent for finance to be raised in the context of a wholly privately financed, single transaction. Bond issuance under a RAB model might be possible for the on-airport-only options, although there might be investor concerns about investment concentration in a single asset. The preliminary conclusion therefore is that there will need to be a significant element of direct Government support.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £11.5 billion, the scheme is viable in the base case and this £11.5 billion is therefore an approximation of the level of Government support that might be required. In addition the borrowing requirement is still significant at £16.3 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	1.6	15.9	26.1	41.2	52.2	65.6	82.5	90.4
No surface access capex	1.4	13.2	21.4	33.9	41.4	49.8	59.4	63.5
No indexation	1.6	16.7	29.6	51.3	75.9	113	169	198
No surface capex or indexation	1.4	13.9	24.6	44.0	65.2	97.2	145	171

3.5.1 Assessment using promoter data

The promoter's capital cost estimate is £16.8 billion (£14.8 billion on-Airport costs plus £2 billion off-Airport surface access costs). Even assuming this lower value, preliminary analysis suggests that revenues would need to increase by approximately 15% and be indexed at 2.5% thereafter to see the associated peak borrowing of £23.3 billion fully repaid by 2050. This would be reduced to £17.3-19.3 billion if the Government agreed to provide the £4-6 billion contribution that the promoter has also suggested.

The indicative five-yearly debt profile using promoter data is shown below:

3 Debt is drawn gradually during the development phase and only starts to lessen when the airport opens and full revenue streams are triggered. Peak borrowing is the maximum debt exposure over this cycle.

4 In relation to Heathrow, for Q5 (2008 – 2013) there was a P0 (i.e. one-off opening price adjustment) of 23.5% and then annual real price increase of 7.5%. On a compounding basis we have calculated this as 10.5% annual real increase. For Q6 (Final Determination recently published) the real annual price increase has been set at 0%.

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	1.8	17.1	28.2	36.8	45.7	56.0	68.5	74.1

3.6 AC Option 63: London Heathrow – South West Runway Option

The capital cost of developing the scheme is estimated at £24.8 billion (comprising £21.7 billion of on-Airport costs and £3.1 billion of off-Airport surface access costs). This capital expenditure is spread over 19 years with relatively little of this (£1.5 billion) occurring in the first five years. This more than doubling of the existing Heathrow RAB value may point to the need for pre-funding and revenue profiling in order to meet financeability requirements. Even assuming simple indexation of revenues at 2.5% for the period beyond the current price control period (Q6) to 2019, the indicative borrowing would not be repaid by 2050.

In order to meet the full debt requirement, aero revenues must be increased by 21% and then indexed at 2.5% per annum thereafter. This would mean peak borrowing of £26 billion being repaid in full by 2050. If indexation is ignored for the purposes of increasing the aero revenue (which might be closer to reality given the current regulatory settlement), then the initial aero revenue would need to be uplifted by 58% at the outset although that reduces the peak to £12.8 billion.

The above assumes that Heathrow would be responsible for the entirety of the surface access costs outlined. If that assumption is removed the revenues would need to increase by 16% at the outset (and indexed at 2.5% thereafter) to see peak borrowing of £23.3 billion fully repaid before 2050. Alternatively a rise of 51% in aero revenues at the outset with no subsequent indexation sees peak borrowing of £10.9 billion fully repaid in the period. Rises above these figures would allow a contribution to surface access costs.

As per the North West runway option, the borrowing requirement is higher than precedent for finance to be raised in the context of a wholly privately funded, single transaction. The same points arise in relation to the potential for RAB-based bond finance and possible investor concerns about investment concentration. As before, we believe that there will need to be a significant element of direct Government support.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £13.6 billion, the scheme is viable in the base case and this £13.5 billion is therefore an approximation of the level of Government support that might be required. In addition, the borrowing requirement is still significant at £16.4 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	1.9	13.7	28.7	45.0	57.7	73.8	94.5	104
No surface access capex	1.7	11.6	23.7	37.7	47.0	58.0	71.4	77.4
No indexation	1.9	14.4	32.1	55.1	81.5	121	181	212
No surface capex or indexation	1.7	12.4	27.2	47.8	70.7	105	157	185

3.6.1 Assessment using promoter data

The promoter's capital cost estimate is £17.6 billion (£13.9 billion on-airport costs plus £3.7 billion off-Airport surface access costs). Even assuming this lower value, preliminary analysis suggests that revenues would need to increase by 13% and be indexed at 2.5% thereafter to see the associated peak borrowing of £22.6 billion fully repaid by 2050. This would be reduced £16.6-18.6 billion if Government agreed to provide the £4-6 billion contribution that the promoter has also suggested.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	1.8	12.8	26.6	34.4	42.2	51.0	61.1	65.4

3.7 AC Option 64: London Heathrow Hub – North Runway Works only

The capital cost of developing the scheme is estimated at £21.6 billion (comprising £16 billion of on-Airport costs and £5.6 billion of off-airport (surface access) costs). This capital expenditure is spread over 19 years with relatively little of this (£2 billion) occurring in the first five years. Here again, the significant increase over the current Heathrow RAB value suggests that pre-funding and revenue profiling may be needed in order to maintain financeable credit metrics. Even assuming simple indexation of revenues at 2.5% for the period beyond the current price control period (Q6) to 2019 the indicative borrowing would not be repaid by 2050.

In order to meet the full debt requirement aero revenues must be increased by 16% and then indexed at 2.5% per annum thereafter. This would mean peak borrowing of £23 billion being repaid in full by 2050. If indexation is ignored for the purposes of increasing the aero revenue (which might be closer to reality given the current regulatory settlement) the initial aero revenue would need to be uplifted by 50% at the outset although that reduces the peak to £10.9 billion.

The above assumes that Heathrow would be responsible for the entirety of the surface access costs outlined. If that assumption is removed the revenues would need to increase by 6% at the outset (and indexed at 2.5% thereafter) to see peak borrowing of £18.8 billion fully repaid before 2050. Alternatively a rise of 37% in aero revenues at the outset with no subsequent indexation sees peak borrowing of £7.6 billion fully repaid in the period. Rises above these figures would allow a contribution to surface access costs.

The same points arise under this option as are explained above for the North West and South West runway options in relation to precedent for financing of a wholly privately funded, single transaction, the potential for RAB-based bond finance and possible investor concerns about investment concentration. Here again, a significant element of direct Government support seems necessary.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £10.3 billion, the scheme is viable in the base case and this £10.3 billion is therefore an approximation of the level of Government support that might be required. In addition the borrowing requirement is still significant at £16.1 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	1.6	11.5	23.5	37.4	46.6	57.3	70.4	76.4

No surface access capex	1.2	7.8	14.5	24.2	27.2	28.9	28.7	27.7
No indexation	1.6	12.2	27.0	47.5	70.3	105	157	184
No surface capex or indexation	1.2	8.6	18.0	34.3	51.0	76.3	115	135

3.7.1 Assessment using promoter data

The promoter's capital cost estimate is £9 billion (£2.5 billion on-airport costs plus £6.5 billion off-airport surface access costs). This is clearly markedly different to Jacobs' estimates. Applying the promoter's lower estimate, it is possible that the associated debt could be repaid on existing revenue assumptions provided that indexation is assumed from 2019 at 2.5%. Peak borrowing would be £14.1 billion, with debt fully repaid by 2047.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	1.0	7.0	12.7	14.1	12.3	7.1	-	-

3.8 AC Option 68: London Heathrow – Four Runway

The capital cost of developing the scheme is estimated at £29.3 billion (comprising £25 billion of on-airport costs and £4.3 billion of off-airport surface access costs). Even assuming simple indexation of revenues at 2.5% for the period beyond the current price control period (Q6) to 2019 the indicative borrowing would not be repaid by 2050.

In order to meet the full debt requirement aero revenues must be increased by 21% and then indexed at 2.5% per annum thereafter. This would mean peak borrowing of £27.1 billion being repaid in full by 2050. If indexation is ignored for the purposes of increasing the aero revenue (which might be closer to reality given the current regulatory settlement) the initial aero revenue would need to be uplifted by 59% at the outset although that reduces the peak to £14.8 billion.

The above assumes that Heathrow would be responsible for the entirety of the surface access costs outlined. If that assumption is removed the revenues would need to increase by 14% at the outset (and indexed at 2.5% thereafter) to see peak borrowing of £23.5 billion fully repaid before 2050. Alternatively a rise of 48% in aero revenues at the outset with no subsequent indexation sees peak borrowing of £12.4 billion fully repaid in the period. Rises above these figures would allow a contribution to surface access costs.

The borrowing requirement is very large and the same issues arise as indicated above in relation to financing market capacity, issues related to potential RAB-based debt finance and the necessity for substantial government funding.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £15.8 billion, the scheme is viable in the base case and this £15.8 billion is therefore an approximation of the level of Government support that might be required. In addition the borrowing requirement is still significant at £17.2 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	1.9	13.5	28.3	37.0	59.5	75.7	95.4	104
No surface access capex	1.6	10.7	21.3	26.7	44.5	53.6	62.9	66.5
No indexation	1.9	14.3	31.8	47.1	83.3	124	184	216
No surface capex or indexation	1.6	11.4	24.8	36.9	68.2	101	152	178

3.8.1 Assessment using promoter data

There is no promoter estimate of the costs of this scheme.

3.9 AC Option 65: London Gatwick – Second Runway Option

The capital cost of developing the scheme is estimated at £16.6 billion (comprising £14 billion of on-airport costs and £2.6 billion of off-airport (surface access) costs). Whilst this capital expenditure is spread over 21 years, and much of the cost is back-ended (the first five years sees only £0.9 billion expenditure), the anticipated revenue assumptions do not allow debt to be repaid as there is insufficient income to cover the interest on the debt. This is after assuming revenues are indexed at 2.5% from 2019 the period beyond the current regulated cap. Further, at four times the current RAB value, it seems unlikely that the RAB model could be used as an effective means for raising finance for this option.

In order to repay total debt by 2050, aero revenue charges would need to increase by 136% and rise by 2.5% inflation year on year from 2019 and that would give rise to peak borrowing of £13.2 billion. Alternatively an initial rise of 209% with no further inflationary rise would also see a reduced debt of £8.5 billion fully repaid by 2050.

However, that analysis assumes that the airport pays for 100% of the off-airport capital expenditure. Assuming that it makes no contribution to those off-airport costs the revenue is still insufficient to meet interest costs but the increase required to repay the on-airport related debt is a 112% increase in aero revenues from 2019 and indexed at 2.5% thereafter. In that case peak borrowing would be £11.1 billion which could be reduced to £6.9 billion if the initial rise in aero revenues were 171% with no inflationary rise thereafter. Any increase in revenue above that would theoretically allow a contribution to the off-airport capital expenditure.

Whilst the cost of this scheme is low in comparison to the brand new hub options, it is still too large under the revenue assumptions provided to repay the capital cost and would therefore need some form of revenue increase, subsidy or grant from Government. Without a clear economic rationale it is unlikely that the remainder of the funding would be attractive to external investors or third party debt providers so the extent of the Government subsidy may need to be sizeable. It is noteworthy that the cost of the scheme is a few billion pounds less than Crossrail which has some private sector contribution at the margins but is in essence wholly funded by Government.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £17.7 billion, the scheme is viable in the base case and this £17.7 billion is therefore an approximation of the level of Government support that might be required. The additional borrowing requirement would fall to a more manageable £1.7 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	1.5	12.2	22.1	35.9	55.2	80.6	117	136
No surface access capex	1.3	9.8	17.8	29.6	46.0	67.1	97.5	113
No indexation	1.5	12.3	22.8	38.0	60.0	90.2	135	159
No surface capex or indexation	1.3	10.0	18.6	31.7	50.8	76.7	115	136

3.9.1 Assessment using promoter data

The promoter's capital cost estimate is £8.2 billion (£7.4 billion on-Airport costs plus £0.8 billion off-Airport surface access costs). Even assuming the promoter's lower estimate, preliminary analysis suggests that revenues would need to increase by 87% and be indexed at 2.5% thereafter to see the associated peak borrowing of £8.6 billion fully repaid by 2050.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	1.3	9.0	16.4	24.4	36.0	52.4	76.0	88.0

3.10 AC Option 66: London Stansted – Second Runway Option

The capital cost of developing the scheme is estimated at £17.6 billion (comprising £17 billion of on-Airport costs and £0.6 billion of off-Airport (surface access) costs). Whilst this capital expenditure is spread over 21 years, and much of the cost is back-ended (the first five years sees only £0.9 billion expenditure), the anticipated revenue assumptions do not allow debt to be repaid as there is insufficient income to cover the interest on the debt. This is after assuming revenues are indexed at 2.5%. Further, at over 10 times the current RAB value, it is unlikely the RAB-backed financing would be viable for this option. Some alternative form of financing would need to be considered.

In order to repay total debt by 2050 aero revenue charges would need to increase by 181% and rise by 2.5% inflation year on year from 2019 and that would give rise to peak borrowing of £15.9 billion. Alternatively an initial rise of 348% with no further inflationary rise would also see a reduced debt of £11 billion fully repaid by 2050.

However, that analysis assumes that the airport pays for 100% of the off-airport capital expenditure. Assuming that it makes no contribution to those off-airport costs, the revenue is still insufficient to meet interest costs but the increase required to repay the on-airport related debt is a 171% increase in aero revenues from 2019 and indexed at 2.5% thereafter. In that case peak borrowing would be £15.5 billion which could be reduced to £10.5 billion if the initial rise in aero revenues were 335% with no inflationary rise thereafter. Any increase in revenue above that would theoretically allow a contribution to the off-airport capital expenditure.

Whilst the cost of this scheme is low in comparison to the brand new hub options, it is still too large under the revenue assumptions provided to repay the capital cost and would therefore need some form of revenue increase, subsidy or grant from Government. Without a clear economic rationale, it seems unlikely that the remainder of the funding would be attractive to external investors or third party debt providers, so the extent of the Government subsidy needed may be sizeable. It is noteworthy that the cost of the scheme is of a similar order of magnitude to Crossrail, which has some private sector contribution at the margins but is in essence wholly funded by Government.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £17.3 billion, the scheme is viable in the base case and this £17.3 billion is therefore an approximation of the level of Government support that might be required. The additional borrowing requirement is a more manageable £0.8 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	0.9	10.5	19.1	32.6	51.4	75.3	110	128
No surface access capex	0.9	9.9	18.0	31.1	49.1	72.0	105	122
No indexation	1.0	10.9	20.2	35.3	57.2	86.8	131	154
No surface capex or indexation	1.0	10.3	19.1	33.7	54.9	83.4	126	149

3.10.1 Assessment using promoter data

The promoter's capital cost estimate is £4.4 billion (£3.8 billion on-Airport costs plus £0.6 billion off-Airport surface access costs). Here again, the divergence in estimated costs from Jacobs' view is significant. Even assuming this lower estimate, preliminary analysis suggests that revenues would need to increase by 58% and be indexed at 2.5% thereafter to see the associated peak borrowing of £5.4 billion fully repaid by 2050.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	0.4	4.1	7.5	11.4	17.0	24.8	35.7	41.3

3.11 AC option 67: Isle of Grain

The capital cost of developing the scheme is estimated at £115.5 billion (comprising £46.7 billion of on-Airport costs, £60.8 billion for non-airport surface access improvements, an additional £7 billion assumed for the acquisition of Heathrow Airport and a further £1 billion for a compensation payment to London City airport). Some of the non-airport surface access improvements could theoretically be self-financing through a PPP-style transaction. It is also understood that revenue assumptions are based on replicating the current numbers at Heathrow but with a sustained increase assumed for the opening of the new Terminal and a 15% saving in operating expenditure from new efficiencies versus Heathrow. Based on these assumptions and indexing revenue at 2.5%, the cashflows are unable to repay the debt required as there is not enough income to cover interest.

In order to breakeven the aero revenue would need to increase by in excess of 105% and continue to inflate at 2.5% throughout. Peak borrowing would be approximately £109.2 billion, way in excess of market capacity for any form of private capital market or bank finance solution and therefore would fall wholly or almost entirely on Government. Furthermore, the scale of capital investment for this option means that some form of significant government subsidy is likely to be required even once the airport is established and operating. This may not be consistent with a RAB based model.

The above assumes that the airport would be responsible for the entirety of the surface access costs outlined. If that assumption is removed the revenues would need to increase by 6% at the outset (and indexed at 2.5% thereafter) to see peak borrowing of £53.1 billion fully repaid before 2050. Alternatively a rise of 75% in aero revenues at the outset with no subsequent indexation sees peak borrowing of £41.7 billion fully repaid in the period. Rises above these figures would allow a

contribution to surface access costs. NB these breakeven calculations are based on the data supplied which assumes that a revenue stream is earned from the operation of Heathrow Airport from acquisition to its closure and not only from the start of operation of the new airport. Furthermore, we understand that on-going capital investment at Heathrow Airport through that period is reduced to the minimum considered necessary to maintain the asset, but without major investment in additional capacity in view of the anticipated closure. The breakeven revenue increases would be higher if that was not the case.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £64.7 billion, the scheme is viable in the base case and this £64.7 billion is thus an approximation of the level of Government support that might be required. In addition the borrowing requirement is still very large at £49.3 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	-	26.0	117	175	233	309	416	471
No surface access capex	-	11.2	40.2	55.0	56.2	50.1	35.9	26.9
No indexation	-	28.1	124	194	275	391	561	649
No surface capex or indexation	-	13.3	47.5	74.1	98.6	132	180	205

3.11.1 Assessment using promoter data

The promoter's estimated capital cost is £23.2 billion (£19.8 billion on-Airport costs plus £3.5 billion off-Airport surface access costs). This is a markedly lower estimate than that of Jacobs. Applying the promoter's estimates and assuming replication of Heathrow revenue numbers indexed at 2.5 % from 2019, the peak borrowing of £23.9 billion could be repaid by 2038.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	-	7.6	21.2	17.2	-	-	-	-

3.12 AC Option 69: Stansted Five Runway New Hub

The capital cost of developing the scheme is estimated at £94.7 billion (comprising £46.8 billion of on-Airport costs, £40.4 billion for non-airport surface access improvements, and an additional £7 billion assumed for the acquisition of Heathrow Airport and a further £0.5 billion for a compensation payment to London Luton). Some of the non-airport surface access improvements could theoretically be self-financing through a PPP-style transaction. It is also understood that revenue assumptions are based on replicating the current numbers at Heathrow but with a sustained increase assumed for the opening of the new Terminal and a 15% saving in operating expenditure from new efficiencies versus Heathrow. Based on these assumptions, and indexing revenue at 2.5%, the cashflows are unable to repay the debt required as there is not enough income to cover interest.

In order to breakeven the aero revenue would need to increase by in excess of 42% and continue to inflate at 2.5% throughout. Peak borrowing would be approximately £84.2 billion, considerably in excess of market capacity for any form of private capital market or bank finance solution and therefore would fall wholly or almost entirely on Government. There is no modern day precedent for undertaking a project of this scale and cost in the UK. The alternative of increasing revenue at the

outset by 138% without subsequent indexation would reduce the borrowing requirement to £66.9 billion but this is still without precedent.

Stripping out the non-airport surface access costs creates a lower peak borrowing requirement of £19.3 billion arising in 2029 and indexing revenues at 2.5% the debt is repaid by 2034 i.e. no additional increase in revenue is required to see the indicative borrowing repaid. Removing the indexation altogether means peak borrowing of £31.6 billion in 2029 and debt is repaid by 2047. NB these calculations are based on data supplied which assumes that a revenue stream is earned from the operation of Heathrow Airport from acquisition to its closure in addition to the income from Stansted Airport. Furthermore, we understand that on-going capital investment at Heathrow Airport through that period is reduced to the minimum considered necessary to maintain the asset, but without major investment in additional capacity in view of the anticipated closure. If that was not the case in these scenarios the debt would not necessarily still be repaid without an increase in revenue.

To derive a proxy figure for potential Government subsidy to support the schemes (as an alternative to simply raising revenue) a breakeven analysis on the capital expenditure costs has been approximated. Reducing capital expenditure by £27.9 billion, the scheme is viable in the base case and this £27.9 billion is thus an approximation of the level of Government support that might be required. In addition the borrowing requirement is still very large at £58.2 billion.

The indicative five-yearly debt profile of the various options is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
All capex with indexed revenues	0.5	17.0	67.7	84.2	121	147	137	175
No surface access capex	0.5	5.7	19.0	0.0	-	-	-	-
No indexation	0.5	19.3	65.7	106	169	241	337	387
No surface capex or indexation	0.5	8.5	29.2	27.0	28.2	16.6	-	-

3.12.1 Assessment using promoter data

The promoter's estimated capital cost is £67.2 billion (£44.6 billion on-Airport costs plus £22.5 billion off-Airport surface access costs). Even assuming this lower value, preliminary assessment suggests that revenues would need to increase by 10% and be indexed at 2.5% thereafter to see the associated peak borrowing of £65 billion fully repaid by 2050.

The indicative five-yearly debt profile using promoter data is shown below:

£ billions	2018	2023	2028	2033	2038	2043	2048	2050
Promoter data	0.5	14.8	56.1	66.6	83.9	89.1	82.1	76.1

4 Glossary of Terms

Aeronautical (Aero) Revenue	That part of an airport's revenue derived from a number of charges levied on airlines using the airport. In this analysis, this revenue may be subject to regulation
Bank Finance	Provision of senior debt capital (typically a loan or mortgage) by a Bank
Bond Finance	Provision of senior debt capital through non-bank sources sometimes referred to as the Capital Markets. Whilst Bond Finance is in essence providing the same as Bank debt i.e. the provision of money for the payment of interest, there are a number of practical differences in characteristics
Breakeven Analysis	In this case this means a calculation of the increase in revenues required to repay debt fully by 2050 with no cash left over
Capex	Capital Expenditure, amount of money spent to upgrade, acquire or maintain depreciable and tangible long-term physical assets
Equity Capital	Invested money that, in contrast to debt capital, is not repaid to the investors in the normal course of business. It represents the risk capital staked by the owners through purchase of a company's common stock (ordinary share capital)
Indexation	Technique to adjust revenue and cost by means of a price index to keep up the purchasing power of the public after inflation. RPI is commonly used as the price index reference
Non Aeronautical (Non-Aero) Revenue	That part of an airport's revenue derived from passengers and other users of the airport other than charges levied on airlines using the airport, for example from retail within the passenger terminal, car parking or the lease of land and property to third parties
Opex	Operating Expenditure, amount of money spent on an ongoing, day-to-day basis in order to run a business
PPP	Public Private Partnership. Involvement of private enterprise (in the form of management expertise and/or monetary contributions) in government projects
Revenue Profiling	Profiling of regulated income in advance of creation of the regulated asset (e.g. a new airport or expanded facilities as at existing airport) in order to provide the necessary cashflow to the regulated entity to allow it to finance construction and other costs.
RAB	Regulated Asset Base (RAB) is the historic efficient investment in regulated assets by the company, against which the company is allowed to earn a return.
Senior Debt Capital	That part of a firm's total capital which commonly comprises loans. Called Senior because the debt ranks ahead of other forms of capital in terms of apportionment of cash for interest and repayment and in the event of insolvency

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