

# **Valuation of Companies in Financial Troubles: The Case of Eurotunnel**

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Key Words : Project Finance, Valuation, Eurotunnel

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## **Abstract**

The standard approach to DCF valuation assumes that the company to be valued is profitable and solvent. That usually implies positive taxable income, no major obstacles to obtain external financing and no financial distress. This paper discusses DCF valuation for firms in need for financial restructuring by using Eurotunnel as an example. The Eurotunnel is the rail tunnel system which links the European Continent with the United Kingdom. It was built during 1987 to 1994 for over £10 billion, of which roughly 80% were financed by debt and 20% by equity. No public funds were used. For both shareholders and lenders the project has been depressing so far: No dividends were paid, the share price is low, the scheduled interest payments and debt repayments could not be met and had to be restructured and postponed several times. The company acts at the edge of bankruptcy as forecasted revenues and the expected operational efficiency were not achieved. Recently, shareholders and management are asking lenders to write off about 60% of their claims. Lenders could demand early repayment, sell their claims to other investors, use their collaterals or use their right to substitute the existing Eurotunnel group by a new operator. They could also send the company into a formal insolvency proceeding. This case illustrates the issues raised when valuing distressed firms as to choose between different DCF approaches, to determine the present value of uncertain tax shields, to measure overindebtedness and to provide a basis for identifying the consequences of different restructuring packages.

## **I. Introduction**

The British Prime Minister Margaret Thatcher and the French President François Mitterand announced in January 1986 that a fixed link between the United Kingdom and France will be built following the proposal submitted by France Manche S.A. and the Channel Tunnel Group Limited, together the later Eurotunnel Group. The system comprises of two single-track rail tunnels for train and shuttle services and one service tunnel. The Treaty between both governments stressed the point that the project was to be financed by private funds only (see Exhibit 1a). Nobody foresaw that it would become one of the most challenging project finance deals ever. The initial public offering of Eurotunnel in November 1987 was followed by unplanned seasoned equity offers in November 1990, May 1994 and October 1999. The initial debt financing had to be increased in 1990, completely restructured in 1997, when the project faced insolvency the first time, and revised again in 2002.

Since 2005, Eurotunnel's management has to negotiate with its lenders again: Operating cash flows are not even covering interest payable according to the last published accounts for fiscal year 2004 (see Exhibit 5). The company faces insolvency again. Its shareholders are holding shares worth around

40 cents a piece, which were priced at £3.5 at the IPO and were quoted at about £11 in 1989.<sup>1</sup> They have never received any dividends. Although the Eurotunnel is a highly frequented way to cross the Channel and also led to positive infrastructure effects especially in Northern France, which is now even attracting commuters from London, the project has been a nightmare for lenders and shareholders (see for example Exhibit 6). What options do investors have? For answering that question, firstly, one needs to know how much operating cash flow (after taxes and capital expenditures) could be generated in the future. This requires a cash flow forecast and a DCF valuation of Eurotunnel. Secondly, one has to think about how to distribute those cash flows. Will lenders approve the proposal made by shareholders and management to write off around 60% of loans outstanding, which currently amount to £6,354 million? Will lenders accept a debt-equity-swap as they did in 1997? A DCF valuation is necessary also in order to answer these questions. As the Eurotunnel project can be described – at least under the assumptions made later in the paper – as financially distressed, the analyst is required to develop a consistent valuation scheme. We will start off with the APV(Adjusted Present Value) approach, since it enables us to differentiate between the present value of operating cash flows after capital expenditures and taxes, the value of tax shields caused by debt financing and the expected loss of creditors' claims. It will be shown also how the WACC (weighted average cost of capital), FTE (Flow to Equity) and CCF (Capital Cash Flow) approach can be used for the case.

Section II will introduce the project's history, technical description and operating performance thus far. Section III will then discuss DCF valuation for financially troubled firms based upon the related literature,<sup>2</sup> before those techniques are applied to the case in Section IV.

The case has been chosen for illustrating the use of DCF valuation for financially troubled firms. That implies that we are not discussing other interesting aspects of the case like conflicts of interest in the founding group of investors and constructions companies, hold-up problems during the negotiations, the reliability of the cash flow forecasts published.

It is important to note the following disclaimer: The conclusions drawn depend heavily upon the assumptions chosen. We do not claim to value Eurotunnel properly; our valuation is based upon estimates.

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<sup>1</sup> Currently, the share has been suspended from trading at the stock exchanges in Paris and London.

<sup>2</sup> See Section III.

## II. Case Background<sup>3</sup>

### 1. Technical Description

The construction of the Eurotunnel began in December 1987. On May 6<sup>th</sup> 1994 most of the construction was completed and the tunnel was officially inaugurated by Queen Elizabeth II and François Mitterand.

The tunnel links the terminals in Folkstone/Britain and Coquelles/France. Its approximate length is 31 miles. The two rail tunnels are single-track rails and are used for trains running in one direction only. The maintenance tunnel is connected to each of the rail-tunnels and serves as a safe haven in case of accidents. In addition, there are four crossover points where trains can switch between the two rail tunnels while maintenance work is being carried out. On both sides of the channel, the terminals have direct access to motorways in order to ensure a fast travel experience.

The capacity of the tunnel is measured in standard paths per hour in each direction. The signalling system currently allows for 20 standard paths per hour in each direction. Eurotunnel uses 50% of the capacity, the remainder is used by other train operators (Eurostar and railfreight services by railway operators). Management believes that it can increase capacity to 24 paths per hour in each direction, although utilization of all 24 paths will require improving traction power supply.

The operations of the Eurotunnel Group include shuttle business, railway business and ancillary business. The latter does not account for more than 5% of total revenues.

Firstly, Eurotunnel is a transportation service provider for freight and passengers. It can provide that service all year long, i.e. 24 hours on 365 days a year.

- Currently 9 passenger shuttles carry cars, caravans, trailers and coaches from one side of the Channel to the other. They can carry either 180 cars or 120 cars and 12 coaches. Passengers remain within their vehicles throughout the journey, which takes approximately 35 minutes. In peak times the system can ensure 4 departures per hour in each direction. Prices range from £39 per one way trip during off peak times for frequent travellers to £279 one way from Calais to Folkestone with a flexible ticket. The number of departures per year is 39,342 for 2001.<sup>4</sup>
- 16 freight shuttles carry on average 20 trucks (heavy goods vehicles, HGV). The drivers travel separately from their vehicles in 'Club cars' in order to enhance their safety. In peak times the system can handle 7 departures per hour in each direction. Tariffs are negotiated annually with freight customers on an individual basis. The number of departures is just over 60,000 per year.<sup>5</sup>

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<sup>3</sup> The information presented in this section is taken from the prospectus published for the IPO 1987, the SEO 1990 and 1994, the financial restructuring 1997 and the annual reports of the company from 1987 to 2004; see the references for details.

<sup>4</sup> See Eurotunnel, Redemption of Equity Notes Prospectus, 2002, p. 14.

<sup>5</sup> See Eurotunnel, Summary Annual Report 2004, p. 5.

Secondly, the group manages the capacity not used for shuttle services and the infrastructure of the tunnel.

- It provides capacity for the Eurostar train and the Through Railfreight Services. Eurostar offers transportation for passengers between London and Paris as well as between London and Brussels. Some other connections, e.g. London to Avignon in Southern France, are served as well. Railway companies use three different types of trains for freight services through the tunnel. There are intermodal trains, consisting of wagons carrying containers, conventional trains carrying palletised wrapped goods and automotive trains for the transport of cars. The annual fees consist of a fixed annual charge and a variable charge. The latter depends on the number of passengers respectively tons of freight passing the tunnel. A toll formula is used which also refers to inflation and volume thresholds. In addition, until November 2006 the railways are obliged to make payments to Eurotunnel, if usage is below a minimum level.
- Eurotunnel leases space to retailers in the terminals on either side of the channel. The tenants have to pay a fixed amount and/or a variable fee as a percentage of revenues.
- It provides infrastructure for commercial telecommunications business. This activity consists of laying and maintaining fibre optic cables in the tunnel.

## **2. Competitors**

Generally speaking, Eurotunnel operates in the market for Channel crossings. Its core focus lies on the market for the so called Short Straits. This market segment includes routes between Dover, Folkestone or Ramsgate in the United Kingdom and Calais, Zeebrugge or Dunkerque on the European continent. Truck traffic concentrates on these Short Straits because of a fast Channel crossing and the variety of alternative carriers. Eurotunnel's main competitors are ferry operators like P&O Ferries, SeaFrance, Hoverspeed, Norfolkline and SpeedFerries. Competition in the passenger shuttle business between Britain and France arises also from low cost airlines offering another fast means of transportation and serving a variety of destinations.

Nevertheless, Eurotunnel is convinced to have three competitive advantages (at least compared to the ferries):

- Speed: Travelling time between autoroutes in France and motorways in Britain is shorter than for competing services.
- Frequency of departures: None of its rivals can match its frequency of departures.
- Dependability: The operating of the tunnel is not affected by adverse weather conditions.

Customer research has shown that passenger shuttle services are considered to be very good and customer loyalty has proven to be very high.

### 3. History

The following time line gives an overview of the history of Eurotunnel from the project proposal to the present.

#### a) *Project Launch*

<b>1985</b>	March	Initiation of the project by the British and French governments
<b>1986</b>	January	Proposal of a rail tunnel system is chosen by the governments
	February	Franco-British Channel Tunnel Treaty is signed
	March	Signing of the Concession Agreement by the French and British governments, Channel Tunnel Group Ltd. and France Manche S.A.: BOOT-Project, <sup>6</sup> concession period until July 2042
	August	Eurotunnel group is founded Construction Contract is signed (commissioning date scheduled for May 1993)
	Sep./Oct.	First tranche of equity: £46 million provided by the founding consortium Second tranche of equity: £206 million provided by institutional investors
<b>1987</b>	July	Ratification of the Treaty; Railway Usage Contract signed with British Rail and SNCF <sup>7</sup>
	November	Credit Agreement: £5 billion; over 200 participating banks IPO: £770 million

#### b) *Construction*

<b>1987</b>	December	Start of tunnelling
<b>1989</b>	July	First violation of covenants of the Credit Agreement
<b>1990</b>	October	Additional £1.8 billion bank loan, £300 million European Investment Bank (EIB) facility
	November	Seasoned equity offering (SEO): £568 million
	December	Breakthrough in the service tunnel In exchange for waiving Eurotunnel's claims against the governments the concession period is extended to July 2052
<b>1991</b>	November	Additional loan facility of £200 million by European Coal and Steel Community (ECSC)
<b>1992</b>	March	Violation of covenants
<b>1993 / 1994</b>	Dec. - May	Completion of the tunnel, fitting out, testing

#### c) *Operation*

<b>1994</b>	May	Official inauguration Additional credit facility £647 million SEO £858 million
	July	First rail freight trains, truck shuttles
	November	First Eurostar service
	December	First passenger shuttle
<b>1995</b>	June	First coach shuttle
	September	Standstill: Eurotunnel stops interest payments on junior debt
<b>1996</b>	October	Eurotunnel and banks outline financial restructuring
	November	Fire in the tunnel caused by a truck on a freight shuttle
<b>1997</b>	July	Shareholders agree with financial restructuring in extraordinary general meeting Governments grant extension of the concession period until 2086 against 59% (incl. taxes) of pre-tax income starting 2052
	November	Lenders agree with financial restructuring plan

<sup>6</sup> BOOT: Build, Own, Operate and Transfer.

<sup>7</sup> SNCF: Société Nationale des Chemins de Fer

<b>1999</b>	November	SEO for funding debt repurchases
<b>2002</b>	May	Restructuring claims of creditors: Buy back of subordinated debt below face value in exchange for new bonds
<b>2003</b>	September	Opening of the first part of the high speed line between Folkestone and London (UK terminal to Fawkham Junction, North Kent)
<b>2004</b>	February Spring	Eurotunnel subsidiary is granted a rail operator's licence in France Revolt of shareholders leading to a change in management and demanding (in vain) financial support by the governments
<b>2005 until present</b>	April	Eurotunnel obtains the waiver to the Credit Agreement required and starts the renegotiation of its capital structure

#### **4. Construction**

Due to the delays and technical difficulties during construction and also due to the unexpectedly high costs for the so called procurement items, mainly the specially designed shuttles, the financial capacity provided by the initial equity contributions (Equity 1 financed by the founding consortium, Equity 2 provided by institutional investors), by the IPO and the initial debt contracts was already stretched beyond budget in 1989. Before granting more loans, the banks required Eurotunnel to raise additional equity. This was achieved by the successful equity offering in November 1990, which resulted in an increase in equity of £568 million. Total loan facilities were increased from about £5,000 million to £7,300 million after that. Exhibit 3b summarizes those financial transactions and the next seasoned equity offer in 1994 as well as the additional senior debt financing of £647 million in 1994. Exhibit 3a shows how the construction costs estimated initially more than doubled till 1994 when the system was expected to operate fully. The cost overruns led to intense discussions between the Eurotunnel group and the construction consortium Trans Manche Link (TML) and also between the Eurotunnel group and the governments represented by the Intergovernmental Commission. One might note that during the start up phase the construction companies arguably faced a considerable conflict of interests: they were sitting on both sides of the table while negotiating the construction contract, since they were both founding shareholders (see Exhibit 2), i.e. principals, as well as agents, who had to design and build the tunnel and order shuttles etc. It also became clear that not all of the system's design had been specified clearly enough in advance. Safety prescriptions imposed by the IGC led to changes in the design of the tunnel and the shuttles leading to compensatory claims on behalf of Eurotunnel for the increased costs. Eurotunnel and the IGC settled their disputes on those issues in December 1993 as Eurotunnel waived its claims in exchange for a prolongation of the concession period from July 2042 to July 2052.

The total cost until opening increased also because of the delayed opening. Instead of an opening in May 1993, the system was fully operational only by the end of 1994. The cash inflows were therefore postponed by one and a half years.

Besides that, management's cash flow forecast became less optimistic over time. Exhibit 4a summarizes the forecasts published for the various seasoned equity offerings. Based upon the cash

flow forecasts and the price per unit, the implied internal rate of returns before income taxes for equity investors can be calculated. Cash flow were forecasted in the respective prospectus for the next ten years explicitly and for a 10year-interval afterwards. Therefore, we apply linear interpolations to fill the gaps. We derive the interest payments and repayments from the credit agreements published in the respective prospectus. Table 1 shows the results. The IRR serve only as an illustration for the decreasing optimism about the performance of the project. When we estimate the current value of Eurotunnel in Section IV, we will be far more specific on the valuation technique applied.

	Unit price in £	IRR in %
IPO 1987	3.5	15.2
SEO 1990	Average unit price during subscription period (November 12 <sup>th</sup> – December 3 <sup>rd</sup> ): 3.62	11.8
SEO 1994	Average unit price during subscription period (June 2 <sup>nd</sup> – June 22 <sup>th</sup> ): 3.17	9.8

Table 1: Internal Rate of Returns

Both SEO were rights issues, i.e. the subscription price and subscription rights have to be paid. The IRR are based upon the average unit price during each subscription period for the sake of simplicity. It becomes evident that the rate of return decreases significantly due to the revised cash flow forecasts. Not surprisingly, the share price decreased considerably after the announcement of the rights issue 1994 and the publication of the cash flow forecast:



Figure 1: Share Price around SEO 1994

## 5. Operations from Opening to Present

After Eurotunnel became fully operational at the end of 1994, it seized a large market share fairly quickly. However, it did not meet the forecasted cash flows also because of lower than expected revenues. Those were due to price wars with its direct competitors, the ferry companies. Eurotunnel competes also with discount airlines like RyanAir which are serving flights between London and other European cities. Unfortunately, not only prices but volumes also failed to meet expectations. Table 2 shows how many vehicles, passengers and tons of freight have been transported over the last 10 years by shuttle and train.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Truck Vehicles (000)	65	391	519	267	705	839	1,133	1,198	1,231	1,285	1,281
Car Vehicles (000)	82	1,224	2,097	2,340	3,351	3,260	2,784	2,530	2,336	2,279	2,101
Coach Vehicles (000)	0	24	58	65	96	82	79	75	72	72	63
Eurostar Passengers (million)	0.16	2.92	4.87	6	6.3	6.6	7.1	6.9	6.6	6.32	7.28
Freight (million metric tons)	1.1	1.9	2.4	2.8	3.1	2.9	2.9	2.4	1.5	1.7	1.9
Market Shares (Short-Straits) (%)											
Truck	8	36	41	14	33	35	43	42	41	43	n.a.
Car	3	30	41	37	49	51	51	50	47	47	n.a.
Coach	0	13	27	28	39	34	35	35	33	36	n.a.

Table 2: Eurotunnel Traffic Volumes<sup>8</sup>

1995 was the first year of full operations. The fire at the end of 1996 had a negative effect on tunnel traffic in 1997 because of repairment works. The system was shut down for almost 6 months. Table 3 compares the forecasts for 2003 with the actual figures. The number of passengers per car and coaches and the tons per HGV (heavy goods vehicle) are estimated in analogy to the IPO prospectus of Eurotunnel. It becomes evident that especially the number of passengers transported was heavily overestimated.

		Passengers (millions)	Freight (million tons)
Actual	Cars · 2.55	5.81	
	Coaches · 25	1.80	
	Eurostar	6.32	
	Sum	13.93	
Actual	HGV · 11.7		15.03
	Rail Freight		1.70
	Sum		16.73
Forecast	ET 1987	39.5	21.1
	ET 1990	44.6	26.8
	ET 1994	35.8	25.3

Table 3: Traffic Volumes 2003: Forecast vs. Actual Figures

<sup>8</sup> Source: Eurotunnel; Fitch Rating.

The increase in the number of passengers travelling with Eurostar increased from 2003 to 2004, because of the opening of the first part of the high speed line between the UK terminal and London. Thanks to the completion of the second half by 2007, the time for a train journey from London to Paris will be further reduced by 15 minutes to 2 hours and 25 minutes. Nevertheless, this high speed link comes late compared to the French side where the high speed link has already been provided for. However, not only the expectations concerning prices and traffic volumes but also concerning operational efficiency were not met. Operating costs in percent of revenues were expected to be 19% (IPO 1987), 25% (SEO 1990) and 27% (SEO 1994) respectively. In fact, they were 53% from 1995 to 2004 on average. Exhibit 4b summarizes additional key figures for that period.

In accordance with Clause 34 of the Concession Agreement (see Exhibit 1b), Eurotunnel submitted a feasibility study on a drive through tunnel to the British and French governments at the end of 1999. In doing so, Eurotunnel preserves an exclusive option to construct a second fixed link without any need to take a decision until 2010.<sup>9</sup> If no agreement is reached between the governments and Eurotunnel, the governments are entitled to grant a concession to another company. In that case, the second link is not allowed to be opened before 2020.

As is also shown in Exhibit 4b, ancillary revenues decreased considerably from 1999 to 2000 due to the abolition of duty free sales in July 1999. The ancillary business nowadays comprises of minor activities in retail outlets at the terminals, development activities at both ends of the tunnel and telecommunications as Eurotunnel continues the development of its fibre optic cable activity. It ceased its telecommunications operator business in 2000.

In 2001, major disturbances to the train schedules were caused by asylum seekers. In order to reach the United Kingdom, they were trying to gain illegal access to the tunnel system and freight trains. That year alone, 50,000 interceptions were made by the officials. The problem has now been solved by better surveillance. In addition, a nearby camp for asylum seekers in France, which served as a starting point, has been closed down.

Rail business has been subsidized by the rail usage contract for years, since revenues were protected by the minimum usage charge. That charge has been paid by the railways, as rail traffic has been far below expectations. In 2004, this protection amounted to £67 million out of total rail revenues of £234 million. By the end of November 2006 this provision expires, endangering even the current level of rail revenues. A crucial issue for improving rail capacity utilization is the pricing policy. According to Eurotunnel, due to its heavy debt burden it cannot risk to offer lower usage charges to railway operators.

Europorte 2, an Eurotunnel's railway operating subsidiary, has obtained a Rail Operators Licence from the French authorities. That licence is valid for the international transportation of goods on the tracks belonging to the Trans-European Rail freight network.

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<sup>9</sup> Considering the troubles Eurotunnel is facing already, the value of that option is questionable. We do not try to price it, when we value the company in Section IV.

Eurotunnel currently tries to improve its cash flow by the project DARE (Deliver Actions to Revitalise Eurotunnel). Steps to be taken within that project are for example reshaping the agreements with HGV hauliers, adjusting the capacity for freight shuttles accordingly, reducing the capacity for car shuttles and reviewing sub-contractor and supplier contracts.

## **6. Financing from Opening to Present**

Failure to deliver forecasted results imposed financial constraints on Eurotunnel, for it was not able to meet the contractual interest and repayment schedule. Eurotunnel's Board decided to suspend interest payments on junior (subordinated) debt in September 1995 in order to renegotiate the capital structure under a standstill provision. The standstill, due to expire in May 1997, was extended by the lenders till December 1997. A restructuring plan was developed with the lenders leading for example to a major debt-equity-swap, reduction in interest rate risk exposure, postponement of interest payments and repayments. The extraordinary shareholder meeting in July 1997 approved the restructuring plan. The restructuring agreement was signed by the banks and Eurotunnel in January 1998. The main features of the debt-equity-swap were:

- Decrease of the amount of junior debt by exchanging part of it for new shares (£908 million).
- Exchange of junior debt partially for equity notes (£906 million), participating loan notes (£1,092 million) and a resettable facility (£1,366 million). Meanwhile, the equity notes have been exchanged into new units until the end of 2003. That – together with the debt-equity-swap – led to a dilution of the equity held by prior unitholders to 39.4%. The participating loan notes and the resettable facility postponed the repayment to 2040 and 2050 respectively (see Exhibit 9 for details).

Not as a part of the restructuring agreement, however linked to the critical financial condition of the project, the French and British government approved an extension of the concession period to 2086 in July 1997. That prolongation is to be paid for by a total annual sum, including corporate taxes, equal to 59% of the Group's pre-tax profits from 2052 on.<sup>10</sup>

After the completion of the financial restructuring Eurotunnel's debt has been trading in the secondary debt market at considerable discounts to its face value. As Eurotunnel's management puts it:

'Purchasing debt at such discounts continues to present an attractive opportunity to reduce the Group's indebtedness and interest obligations and to accelerate its financial recovery'.<sup>11</sup> Thus, Eurotunnel bought back debt with a face value of around £360 million in 1999. In order to finance further repurchases of about £150 million, the group issued new shares in October 1999. The repurchases were made at prices ranging from 26% to 52% of face value.

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<sup>10</sup> See Eurotunnel, Annual Report 1997, p. 60.

<sup>11</sup> See Eurotunnel, Rights Issue Prospectus 1999, p. 1.

In 2000 and 2001 minor amounts of debt were repurchased at the market and so called stabilisation advances and deferred interest accounts were built up for interest which was not covered by cash generated. Postponement of interest payments amounted to £83 million in 2001.

A large portion of the equity notes mentioned above were converted into shares (units) in 2002. With the proceeds from an issue of £740 million of bonds (called Tier 1A), Eurotunnel bought back £840 million of debt at an average price of 43% of face value and refinanced £343 million of its junior debt. The last equity notes were converted into units in 2003. Additionally, £155 million of debt were settled at a discount of about 58% of face value.

The company experienced a shareholder revolt which led to a change in management during spring 2004. The mainly french shareholders (see Exhibit 6) urged the governments to provide financial support for Eurotunnel. The governments declined that request referring to Article 1 of the Treaty between France and the UK and Clause 2 of the Concession Agreement (see Exhibit 1a and 1b). And finally, it became obvious during 2004 that the beginning of repayments in 2006/2007 will become a major problem for Eurotunnel as its operating cash flows are still not covering its interest obligations. This problem will become even more severe from 2006 onwards, when the stabilisation period ends and interest which cannot be paid in cash cannot be settled by using stabilisation advances anymore. Exhibit 7 and 8 summarize the development of the capital structure. At the end of 2004 total loans outstanding amounted to £6.354 billion. Total financial charges of £331 million exceeded the net operating cash flow of £283 million (see Exhibit 5). A major restructuring effort is necessary again.

## **7. Current Financial Status**

On 5 April 2005, Eurotunnel requested an exemption of the covenants in the Credit Agreement from its creditors. Two weeks later, senior debt holders and co-financiers gave Eurotunnel the waiver to the Credit Agreement enabling it to start renegotiations. This waiver has been extended recently till 12<sup>th</sup> July 2006.<sup>12</sup> During the presentation of the preliminary results for 2004 Eurotunnel estimated that the maximum amount the group could bear was somewhere between £2.3 billion to £2.7 billion.<sup>13</sup> They expect the lenders to write off the remainder. A representative of the Ad hoc Credit Committee (see below), responded that 'Eurotunnel's suggestion will not be acceptable to the majority of debtholders, whose support is necessary for any capital restructuring. We look forward to starting negotiations within the framework of Eurotunnel's existing obligations and in the spirit of economic realism'. The annual general meetings in France and the UK once again confirmed that shareholders and management, represented by the chairman of the joint board, Jacques Gournon, favour a write-off. In February 2006 Eurotunnel announced the validation of a Memorandum of Agreement with the

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<sup>12</sup> See Eurotunnel, Press Release 26<sup>th</sup> April 2006.

<sup>13</sup> See Fitch Ratings, Eurotunnel and Related FLF1 & FLF2 Debt Vehicles – How Far Underwater Are They?, May 2005.

Committee concerning the (strictly confidential) outline of the restructuring of its debt.<sup>14</sup> Currently, the company is trying to get a restructuring package approved by all lenders.

The Ad hoc Credit Committee consists of MBIA (an US credit insurer), the European Investment Bank, Franklin Mutual Advisers LLC. and Oaktree Capital Management. It represents 21% of senior debt and 73% of Junior debt, the 4<sup>th</sup> Tranche Debt and the Tier 1A Debt.<sup>15</sup> Looking back to the restructuring in 1997, one possible option from the lenders' point of view is a debt-equity-swap, which will lead to further dilution for the existing shareholders and would have to be approved by an extraordinary general meeting. The Concession Agreement also grants the right of substitution to the lenders (see Exhibit 1b). That right allows the lenders to substitute the current concessionaires, the Eurotunnel group, with new concessionaires, if Eurotunnel fails to make the payments required by the financing agreements for example. Assets owned by the Eurotunnel group are used as collaterals for different tiers of its debt. The Credit Agreement defines events of default which allow the lenders to demand early repayment (see Exhibit 9). Thus, lenders could send Eurotunnel into bankruptcy, sell their claims to other investors,<sup>16</sup> use their right of substitution or use their collaterals.

One could argue that either the outcome of a legal bankruptcy procedure or using the right of substitution would not alter much of the core business of a fixed link operator. Crucial questions remain to be answered: Can Eurotunnel be seen as a going concern company?<sup>17</sup> How much cash flow can be generated by Eurotunnel in the future?

### **III. Valuation of Financially Troubled Companies**

#### **1. APV Approach**

The APV approach is used to start the valuation of Eurotunnel since its main idea is to evaluate a company step by step. That is particularly useful for companies with several business units, heavy debt burden and financial distress. We start with describing its standard procedure: Firstly, the unlevered value of the company ( $V_U$ ) is derived by discounting unlevered cash flows ( $C_U$ ; operating cash flows after capital expenditures and taxes) with the unlevered cost of equity ( $r_U$ ):<sup>18</sup>

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<sup>14</sup> See Eurotunnel, Press Release 2<sup>nd</sup> February 2006.

<sup>15</sup> See Eurotunnel, Press Release 2<sup>nd</sup> February 2006.

<sup>16</sup> Goldman Sachs and Macaquire have been mentioned in that context recently; see Fincancial Times Deutschland, 16<sup>th</sup> May 2006, p. 7; Eurotunnel, Press Release 15<sup>th</sup> May 2006.

<sup>17</sup> That question is also being asked by the auditors in the preliminary annual report for 2004. Their answer is: yes, if financial restructuring is successful. Currently, the continuation of the project depends upon the approval of a financial restructuring package; see Eurotunnel, Share Price Review: April 2006.

<sup>18</sup> See e.g. Modigliani/Miller (1958, 1963); Myers (1974); Inselbag/Kaufold (1997); Luehrmann (1997).  $r_U$  is assumed to be constant.

$$V_{U,0} = \sum_{t=1}^n E[\bar{C}_{U,t}] (1+r_U)^{-t} \quad (1)$$

If there is information available for estimating cash flows for different lines of business – as it is for Eurotunnel – unlevered company value can be derived as the sum of the unlevered values of the business units. Secondly, debt financing is taken into account by discounting the tax shields caused by interest expenses in order to come up with the present value of the tax shields ( $V_{TS}$ ). We are assuming a tax regime where only corporate earnings are taxed with the corporate tax rate  $\tau$ . The interest expenses are the contractual cost of debt ( $r_{D,FV}$ ) multiplied with the face value of debt ( $D_{FV}$ ). The discount rate has to be equivalent to the risk of the periodic tax shields ( $r_{TS}$ ). Thus, for a constant  $r_{TS}$ , we get:

$$V_{TS,0} = \sum_{t=1}^n E[\bar{C}_{TS,t}] (1+r_{TS})^{-t} \quad (2)$$

If tax shields can be used without restrictions, it follows:

$$C_{TS,t} = \tau r_{D,FV} D_{FV,t-1} \quad (3)$$

The levered company value ( $V_L$ ) is the sum of the unlevered firm value and the value of the tax shields:

$$V_{L,0} = V_{U,0} + V_{TS,0} \quad (4)$$

Finally, after subtracting the value of debt ( $D$ ), i.e. the present value of expected interest payments and repayments ( $C_D$ ),

$$D_0 = \sum_{t=1}^n E[\bar{C}_{D,t}] \prod_{j=1}^t (1+r_{D,j})^{-1} \quad (5)$$

we obtain the value of equity ( $E$ ):

$$E_0 = V_{L,0} - D_0 \quad (6)$$

As there is always the alternative to liquidate the company, the levered value of the company under the going concern assumption ( $V_L$ ) has to be compared with its liquidation value ( $V_{Liq}$ ) and any capital contribution necessary to finance the restructuring effort ( $I_{Restr}$ ). Going concern is to be assumed, if

$$V_L > V_{Liq} + I_{Restr} \quad (7)$$

leaving cost of financial distress (direct and indirect cost of insolvency) aside.<sup>19</sup> If we are dealing with a company which is in financial distress, defined as the inability to satisfy all claims of creditors if not measures for financial restructuring are imposed, the only step which is not modified compared to the standard case is the derivation of the unlevered company value. The present value of tax shields is influenced by financial distress in several ways:

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<sup>19</sup> For a valuation model with cost of financial distress, which additionally refers to option pricing, see Brennan/Schwartz (1978),

- Taxable income might not suffice for generating a tax shield on interest expenses in the period they occur. Depending upon future prospects it might also be impossible to use the tax shields in later periods.
- The interest rate might be affected by the financial troubles, if e.g. it increases with deteriorating profitability and liquidity ratios.
- If one or both of these conditions are fulfilled the rate for discounting the periodic tax shields is not equal to the risk free rate anymore. Other authors, as Laitenberger/Lodowicks (2005), Kruschwitz/Lodowicks/Loeffler (2005) and Drukarczyk/Schueler (2006) are using the risk free rate also for financially distressed firms, assuming that tax shields can be used with certainty. The question arises which discount rate has to be applied instead of the risk free rate. Looking through the literature one has to conclude currently that this issue is addressed in a few contributions based upon examples but has not been resolved analytically yet. Ruback (2002) suggests to use the unlevered cost of equity.<sup>20</sup> There might be cases for which  $r_U$  is the risk equivalent  $r_{TS}$ . However, it is not compelling, that periodic tax shields, which are limited to the tax rate multiplied with interest expenses in scenarios without default and which might be zero although unlevered cash flow is still positive in scenarios with default, are as risky as unlevered cash flows.

Finally, it has to be considered that for computing the value of equity one has to subtract the present value of expected payments to the lenders ( $D$ ) from levered firm value and not the face value of debt ( $D_{FV}$ ). If the risk of default is not compensated ex ante by imposing a sufficiently high contractual cost of debt for example, we will observe  $D < D_{FV}$ .<sup>21</sup>

## 2. WACC Approach

For the WACC approach the expected unlevered cash flows are to be discounted with the weighted average cost of capital. If the ratio between value of equity (or debt) to levered company value is not constant over time (see (9)), WACC will vary periodically and levered company value is defined by:

$$V_{L,0} = \sum_{t=1}^n E[\bar{C}_{U,t}] \prod_{j=1}^t (1 + WACC_j)^{-1} \quad (8)$$

The standard definition of WACC, assuming risk free debt at first, is:

$$WACC_t = r_{L,t} \frac{E_{t-1}}{V_{L,t-1}} + r_{F,t} (1 - \tau) \frac{D_{t-1}}{V_{L,t-1}} \quad (9)$$

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<sup>20</sup> Note that this reasoning for using  $r_U$  is not based upon the reasoning of Miles/Ezzell (1980) who use  $r_U$  if debt employed follows levered firm value according to a target leverage ratio. They do not focus upon financial distress.

<sup>21</sup> Following Stiglitz (1969) we are assuming limited liability on both the corporate and the investor's level; see Stiglitz (1969), p. 788.

Following Inselbag/Kaufold (1997) the levered cost of equity ( $r_L$ ) can be derived periodically with:

$$r_{L,t} = r_U + (r_U - r_{F,t}) \frac{D_{t-1} - V_{TS,t-1}}{E_{t-1}} \quad (10)$$

Substituting the levered cost of equity according to (10) in (9) we get:

$$WACC_t = r_U \left( 1 - \frac{V_{TS,t-1}}{V_{L,t-1}} \right) + r_F \frac{V_{TS,t-1} - \tau D_{t-1}}{V_{L,t-1}} \quad (11)$$

For preparing a valuation in case of financial distress we have to adjust those definitions for an uncompensated risk of default and risky tax shields. Again following Inselbag/Kaufold (1997) we can derive the levered cost of equity, assuming constant unlevered cost of equity:<sup>22</sup>

$$\begin{aligned} r_U V_{U,t-1} + r_{TS,t} V_{TS,t-1} &= r_{L,t} E_{t-1} + r_{D,t} D_{t-1} \\ r_{L,t} &= r_U \frac{V_{U,t-1}}{E_{t-1}} + r_{TS,t} \frac{V_{TS,t-1}}{E_{t-1}} - r_{D,t} \frac{D_{t-1}}{E_{t-1}} \\ r_{L,t} &= r_U + r_U \frac{(D_{t-1} - V_{TS,t-1})}{E_{t-1}} + r_{TS,t} \frac{V_{TS,t-1}}{E_{t-1}} - r_{D,t} \frac{D_{t-1}}{E_{t-1}} \\ r_{L,t} &= r_U + (r_U - r_{D,t}) \frac{D_{t-1}}{E_{t-1}} + (r_U - r_{TS,t}) \frac{-V_{TS,t-1}}{E_{t-1}} \end{aligned} \quad (12)$$

We can get the definition of WACC analogously. It has to be taken into account that the rate of return required by creditors ( $r_D$ ) does not coincide with the contractual cost of debt necessarily:

$$\begin{aligned} WACC_t \cdot V_{L,t-1} &= r_{L,t} E_{t-1} + r_{D,t} D_{t-1} - \tau r_{D,FV,t} D_{FV,t-1} \\ WACC_t &= r_{L,t} \frac{E_{t-1}}{V_{L,t-1}} + r_{D,t} \frac{D_{t-1}}{V_{L,t-1}} - \tau r_{D,FV,t} \frac{D_{FV,t-1}}{V_{L,t-1}} \end{aligned} \quad (13)$$

Since the last term in (13) implies the standard tax shield we need to reformulate it in a more flexible way:

$$WACC_t = r_{L,t} \frac{E_{t-1}}{V_{L,t-1}} + r_{D,t} \frac{D_{t-1}}{V_{L,t-1}} - \frac{C_{TS,t}}{V_{L,t-1}} \quad (14)$$

Substituting  $r_L$  by (12), we get:

$$\begin{aligned} WACC_t &= \left[ r_U + (r_U - r_{D,t}) \frac{D_{t-1}}{E_{t-1}} + (r_U - r_{TS,t}) \frac{-V_{TS,t-1}}{E_{t-1}} \right] \frac{E_{t-1}}{V_{L,t-1}} \\ &\quad + r_{D,t} \frac{D_{t-1}}{V_{L,t-1}} - \frac{C_{TS,t}}{V_{L,t-1}} \\ &= r_U + (r_U - r_{TS,t}) \frac{-V_{TS,t-1}}{V_{L,t-1}} - \frac{C_{TS,t}}{V_{L,t-1}} \\ &= r_U \left( 1 - \frac{V_{TS,t-1}}{V_{L,t-1}} \right) + r_{TS,t} \frac{V_{TS,t-1}}{V_{L,t-1}} - \frac{C_{TS,t}}{V_{L,t-1}} \end{aligned} \quad (15)$$

<sup>22</sup> See also Tham/Wonder (2002), p. 10.

After subtracting  $D$  from  $V_L$  we end up again with  $E$ .

### 3. CCF Approach

Within the CCF approach the expected unlevered cash flows and the expected tax shields are discounted by the CCF:

$$V_{L,0} = \sum_{t=1}^n \left\{ E[\bar{C}_{U,t}] + E[\bar{C}_{TS,t}] \right\} \prod_{j=1}^t (1 + CCF_j)^{-1} \quad (16)$$

The discount rate CCF is defined as the average between the levered cost of equity according to (12) and the cost of debt without a reduction caused by tax shields, since they are already part of the cash flow. Thus, the CCF equals the WACC without a tax reduction:

$$\begin{aligned} CCF_t \cdot V_{L,t-1} &= r_{L,t} E_{t-1} + r_{D,t} D_{t-1} \\ CCF_t &= r_{L,t} \frac{E_{t-1}}{V_{L,t-1}} + r_{D,t} \frac{D_{t-1}}{V_{L,t-1}} \end{aligned} \quad (17)$$

(17) can be rearranged by using (12):

$$\begin{aligned} CCF_t &= \left[ r_U + (r_U - r_{D,t}) \frac{D_{t-1}}{E_{t-1}} + (r_U - r_{TS,t}) \frac{-V_{TS,t-1}}{E_{t-1}} \right] \frac{E_{t-1}}{V_{L,t-1}} + r_{D,t} \frac{D_{t-1}}{V_{L,t-1}} \\ &= r_U + (r_U - r_{TS,t}) \frac{-V_{TS,t-1}}{V_{L,t-1}} \\ &= r_U \left( 1 - \frac{V_{TS,t-1}}{V_{L,t-1}} \right) + r_{TS,t} \frac{V_{TS,t-1}}{V_{L,t-1}} \end{aligned} \quad (18)$$

Or:

$$CCF_t = r_U \frac{V_{U,t-1}}{V_{L,t-1}} + r_{TS,t} \frac{V_{TS,t-1}}{V_{L,t-1}} \quad (19)$$

(19) makes clear why using  $r_U$  for  $r_{TS}$  might be perceived attractive for valuation purposes as Ruback (2002) suggests, as we then get  $CCF = r_U$  immediately. However, both (18) and (19) show, that the inclusion of the tax shields in the cash flows to be discounted does not relieve the CCF approach of calculating the tax shields before discounting.

### 4. Flow to Equity Approach

If the FTE approach is applied, the expected levered cash flows are discounted with the levered cost of equity defined by (12):

$$E_0 = \sum_{t=1}^n E[\bar{C}_{L,t}] \prod_{j=1}^t (1 + r_{L,j})^{-1} \quad (20)$$

With:

$$\begin{aligned}
C_{L,t} &= C_{U,t} - (r_{D,FV,t} D_{FV,t-1} - \Delta D_{FV,t}) + \tau \cdot r_{D,FV,t} \cdot D_{FV,t-1} \\
&= C_{U,t} - C_{D,t} + \tau \cdot r_{D,FV,t} D_{FV,t-1}
\end{aligned}
\tag{21}$$

Again, the levered cost of equity cannot be calculated ex ante, because they are based upon the valuation results. As with the WACC approach we are facing a circular argument.

If WACC, CCF or FTE approach are to be used and the respective discount rates vary periodically, the valuation has to be done in a roll back procedure, starting in the last period  $t=T$ .

## 5. Preliminary Conclusions

We conclude to use the APV approach since it allows us to derive the unlevered firm value without any capital structure influences. We can then deal with tax shields and the difference between debt at present value and at face value. Unlevered firm value is a proxy for the debt capacity of the firm. It is not identical with debt capacity as the tax shields on interest expenses, which increase the debt capacity, are not included. We will address that problem of interdependency later on and we will solve it by using iterations. WACC and FTE approach are not appropriate here because the argument in favour of those methods, i.e. constant discount rates when the target leverage ratio is followed by management, does not fit into the context of valuing firms in financial distress: Those companies are not able to repay debt, when their company value deteriorates.<sup>23</sup> They are not able to maintain their target capital structure.

If the assumption is set that the discount rate CCF equals the unlevered cost of equity, CCF approach and APV approach work almost identically:

$$V_{L,0} = \underbrace{\sum_{t=1}^n E[\mathcal{E}_{U,t}]}_{V_{U,0}} (1+r_U)^{-t} + \underbrace{\sum_{t=1}^n E[\mathcal{E}_{TS,t}]}_{V_{TS,0}} (1+r_U)^{-t} = \sum_{t=1}^n \underbrace{\{E[\mathcal{E}_{U,t}] + E[\mathcal{E}_{TS,t}]\}}_{\text{CCF approach}} (1+r_U)^{-t} \tag{22}$$

However, in all other cases – as Equations (17) through (19) make clear – we need to know the value of tax shields or the levered cost of equity before applying the CCF.

Thus, we will apply the APV approach first and then use the results to illustrate the WACC, CCF and FTE approach.<sup>24</sup>

<sup>23</sup> The model developed by Homburg/Stephan/Weiß (2004) combines target leverage ratios and risk of default by referring to Miles/Ezzell (1980); see Homburg/Stephan/Weiß (2004), e.g. pp. 280-283. This combination can be criticised, see Kruschwitz/Lodowicks/Loeffler (2005), p. 228, 234.

<sup>24</sup> For the use of the APV approach for financial restructurings see also Gilson (2001), pp. 491-495.

## IV. Application to Eurotunnel

### 1. APV Approach

#### a) *Unlevered Value of Eurotunnel ( $V_U$ )*

A valuation of Eurotunnel is necessary in order to estimate how much of its debt can be repaid by the company *ceteris paribus*. The estimated debt capacity is crucial for developing a financial restructuring package. The valuation is currently done confidentially within the company and the Ad hoc Credit Committee, but we will try to do it from an external perspective. For an external DCF valuation key value drivers have to be estimated, as cash flow forecasts have not been published by the company for years.<sup>25</sup> The main drivers for Eurotunnel's cash flows are the growth rates for its existing shuttle, rail and ancillary revenues and operational efficiency. For doing a valuation one might use past growth rates of Eurotunnel, the ratio of operating costs to revenues and the relation of capital expenditures to revenues. One could use other growth assumptions related to the growth of the GDP of Europe or its inflation rates or traffic projections. Due to its currently minor relevance, it is doubtful that ancillary revenues will cover much of the debt employed.

Following the APV approach we start with estimating future operating cash flows after taxes and capital expenditures as their present value ( $V_U$ ) is a crucial ingredient for valuing the position of owners and lenders.

As there has not been published a cash flow forecast recently one has to make some simplifying assumptions. We start with historic growth rates of revenues for the three lines of business: shuttles, rail and ancillary. Exhibit 4b provides the data for calculating the most recent growth rate, average growth rates or cumulative average growth rates. The estimation presented in Exhibit 10 is based upon the CAGR for shuttle (0.011) and rail (0.0167) for the years 1999 to 2004. Since 1995 has been the first year of full operations and revenues in 1996 and 1997 have been adversely affected by the fire, the growth rate from 1998 to 1999 is used as the first data point. For ancillary business we assume a growth rate of zero. Since the annual reports for 2005 have not been published yet, we value Eurotunnel as of the end of 2004.

Other growth rates could be assumed like the average inflation rates or the average growth rates of GDP. Exhibit 13 shows the results of those scenarios. One could also come up with explicit forecasts for volumes and prices for the different services. However, Eurotunnel's pricing policy is highly differentiated for passenger shuttles (from £39 to £279 per one way trip). As far as the rail or freight shuttle businesses are concerned, there is not much public information available: a toll formula is used for rail services and the tariffs for freight shuttle services are negotiated individually.

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<sup>25</sup> Due to the unique character of the Eurotunnel project, it is probably impossible to find peer companies for using comparable financial figures (multiples) to evaluate Eurotunnel.

A restriction to be considered is capacity available. Since the rates of growth in revenues are going to be applied for a time span of about 80 years (2005 to 2086), volumes increase considerably and it is questionable whether existing capacity can cope with them. The current maximum capacity follows from data presented in Section II.1:

Passenger shuttles: 4 departures per hour, in both directions, 24 hours a day, 365 days per year equals 70,080 departures a year. Comparing that to the actual number of departures of around 40,000 a year, it becomes evident that capacity is used up to 57% only (in reference to the entire year).

Freight shuttles: 7 departures per hour, in both directions, 24 hours a day, 365 days per year equals a maximum capacity of 122,640 departures a year. Since the number of actual departures is 60,000, 49% of capacity is used currently.

Thus, there is unused capacity. This is also true for the rail business. By investing into shuttles, which can carry more vehicles or by increasing the speed of the shuttles, capacity might be increased as well. As it might be hard to predict, at what point of time major capital expenditures are necessary, it can be assumed that capital expenditures occur permanently as a percentage of revenues. The data in Exhibit 4b reveals that capital expenditures have been 8.7% of revenues between 1998 and 2004. This number is used for the DCF valuations. Capital expenditures lead to tax deductible depreciations. Total tangible fixed assets are £6,934 million at the end of 2004. That amount and capital expenditures occurring during the concession period are to be depreciated. We apply a straight line depreciation which leads to fixed assets at the end of the concession period equal to zero.<sup>26</sup> Changes in net working capital are not considered for the sake of simplification.<sup>27</sup>

As we have mentioned earlier, on average 53% of revenues are needed for operating costs. This is far from the ratios the company forecasted by Eurotunnel at several occasions. Sensitivity analysis might illustrate the impact of other assumptions.

The corporate tax rate was set at 33%, which is the average of the French and British corporate tax rate. Only corporate taxes are considered here, since it is quite complicated to build in the French and the British income tax code. In addition it would be necessary to consider double taxation agreements. According to the latest annual report, tax loss carry forwards (LCF) are £3,081 million.<sup>28</sup> That number is based upon the given capital structure. Therefore, it is not the loss carry forward, which would result if the company was financed by equity only. That number would be needed for a APV valuation. In order to avoid going back to 1987 for elimination of all contributions to LCF caused by interest expenses, the LCF of £3,081 million is used for deriving unlevered company value. It has to be considered that 59% of profits before taxes have to be paid to the governments after 2052 which includes corporate taxes.

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<sup>26</sup> One could argue that there might be some impairment losses like in 2003 and 2004 also for later years.

<sup>27</sup> Besides of creditors other components of net working capital like inventories or debtors are not of high relevance for Eurotunnel.

<sup>28</sup> See Eurotunnel, Annual Accounts 2004, p. 46.

The company has used 7.2% as a (unlevered) cost of equity for accounting impairment tests fairly recently.<sup>29</sup> One might tend to argue at first sight, that using a  $r_U$  at 7.2% is low for a company in need for a major financial restructuring. However, it should be become clear in the following that the underlying business produces operating cash flows which are easily covering future capital expenditures. The risk of default is not to be considered at this point, since it is assumed first that the company is financed by equity solely, and the volatility of operating cash flows has not been high during the last years (see Exhibit 4b). Insolvency risk enters the scene, when we consider debt employed later on.

After setting all assumptions the unlevered free cash flows can be derived. They are shown in Exhibit 10 for several periods.

Discounting them to the beginning of 2005 gives an unlevered firm value ( $V_U$ ) of £3,253 million.

#### *b) Repayment Schedule*

For developing the repayment schedule all different debt instruments have to be included with their individual schedule (Exhibit 8 and 9). We are assuming here that the Stabilisation Notes are not converted into units at the end of 2005. Since no information is available about the yearly repayments, a linear repayment schedule is chosen for each instrument. EDL, Senior and 4<sup>th</sup> Tranche Debt are assumed to be repaid in equal instalments from 2006 to 2019. Exhibit 12 contains the aggregated repayment stream and the corresponding interest expenses.

#### *c) Present Value of the Tax Shields ( $V_{TS}$ )*

Based upon the repayment schedule, interest expenses and taxable income, it is possible to quantify the present value of the tax shields caused by debt financing. Unlike the usual treatment of the APV approach in textbooks on Corporate Finance, it is not enough to simply multiply the corporate tax rate with interest expenses, since Eurotunnel will not have any positive taxable income for years. One might also argue that the company is not even able to fully pay its interest obligations. However, as the financial statements (Exhibit 5) show, interest payable are expensed in the P&L account totally and do not depend upon whether they are really paid in that year. The average interest rate on debt employed has been 4.8% in 2004 (debt employed at the end of 2003: £6,364 million; interest expenses without leasing 2004: £304 million; see Exhibits 8 and 5). As one can see, this is a moderate interest rate compared to the risk of Eurotunnel. The risk of borrowings to Eurotunnel becomes evident, if one considers their market prices trading at large discounts to face value.

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<sup>29</sup> See Eurotunnel, Annual Accounts 2004, p. 31. The company and its auditors also applied the APV approach; see Eurotunnel, Annual Accounts 2004, p. 35.

Working with loss carry forwards within an APV valuation requires to differentiate between tax losses for the unlevered and the levered case. The easiest way to overcome those problems is to compare taxes paid in the unlevered and the levered case explicitly. The difference between those streams of taxes is caused by debt financing, i.e. it equals the tax shields (see Exhibit 11). The first tax shield occurs in 2029. The loss carry forwards, which are assumed to be used without restrictions, have to be defined for the levered and the unlevered case.

The resulting tax differences are discounted to the beginning of 2005. Due to the risky nature of the project and its debt financing, the risk free rate might not be the best choice. We will apply the cost of unlevered equity ( $r_U$ ) following Ruback (2002). In order to be more specific about the riskiness of the tax shield, it would be necessary to model future scenarios and their intertemporal development explicitly. As that overstretches the information available for our external analysis, we use  $r_U$  for simplification purposes. This leads to a present value of £157 million ( $V_{TS}$ ) using 4.8% as the cost of debt for the entire period. It is informative to compare that value with a back of the envelope calculation of a tax shield like corporate tax rate times debt employed: assuming an infinite and constant use of the entire debt employed, one would expect  $\tau \cdot D_{FV} = 0.33 \cdot \text{£}6,354 \text{ million} = \text{£}2,093$ . Due to the fragile financial constitution of Eurotunnel the value of tax shields is only £157 according to our estimation. If income taxes would have been considered, the tax shield would even be lower, since the French and the British tax regime are to a large extent an imputation system giving shareholders credit for (part) of corporate taxes paid.<sup>30</sup>

#### *d) Levered Value of Eurotunnel ( $V_L$ )*

Adding the value of the tax shields ( $V_{TS} = \text{£}157$  million) to the unlevered value of Eurotunnel plus cash ( $\text{£}3,253$  million +  $\text{£}181$  million in cash =  $\text{£}3,434$  million) leads to its levered value ( $V_L = \text{£}3,591$  million). Subtracting debt at face value ( $D_{FV} = \text{£}6,354$  million) gives the ‘value’ of equity ( $E = -\text{£}2,763$  million). That implies that  $V_L = D = \text{£}3,591$  million. Obviously, this is a case of overindebtedness. The cash flows are too low for the amount of debt employed. The negative value of equity could also be interpreted as the difference between market value and face value of debt. It shows a discount of 44% of face value.

The estimated cash flows are not covering repayments or even interest expenses. If we assume that Eurotunnel would have been financed by equity only, the analogous conclusion is that the opportunity cost of capital on invested equity and the invested equity itself are not covered by cash flows.

The gap between total company value and debt employed can also be discussed by comparing the unlevered cash flows with the interest obligations and repayments according to the Credit Agreement.

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<sup>30</sup> It should be mentioned that the 59% to be paid from 2052 onwards substitute the tax rate of 33% for calculating taxes and tax shields from that point of time.

The resulting levered free cash flows are negative for years implying equity contributions for a long period of time. As those contributions are not compensated by later payouts, they are driving the value of equity below zero.

One could use the cash flow forecasts for identifying critical rates of growth in revenues. This can be done by iterative calculations. Leaving all other assumptions unchanged, the critical growth rate for  $D = D_{FV}$  is 4.6%, exceeding the growth in GDP considerably. The growth rate, which ensures that the project is economically feasible, has to consider all capital invested and all cost of capital since the project's start. Thus, the point of reference is  $NPV = 0$  and as such is much higher than  $D = D_{FV}$  (or  $E = 0$ ). One needs to consider a compensation for debt formerly repurchased below face value, too. In that case, the critical growth rate increases to around 10%; the exact number depends upon the cost of equity and debt assumed for previous years. That growth rate exceeds the historic growth rates of revenues reported above considerably. This result signals that the project is not economically feasible by itself. Positive infrastructure effects like lower prices for Channel crossings and decreasing travel times could have justified the use of public funds instead of financing the project by private funds only. Figure 2 summarizes the APV valuation of Eurotunnel.

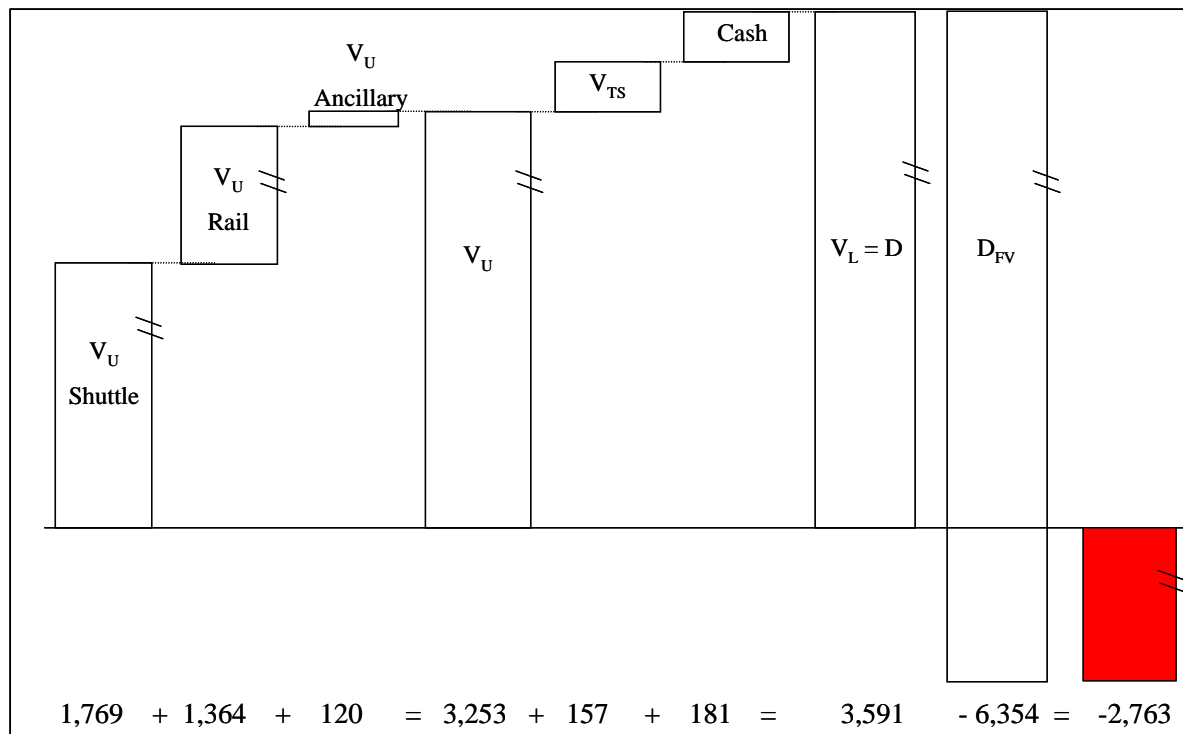


Figure 2: APV valuation Eurotunnel

e) *Estimated Debt Capacity*

Shortly, one could refer to *b)* and conclude that the maximum amount of debt is  $V_L = \text{£}3,591$  million. However, if the focus lies upon a precise DCF valuation, the answer is a bit more demanding, as there is an interdependence between the value of the tax shield and debt capacity. One could solve that problem by doing iterative calculations. Exhibit 12 shows the result. The maximum amount of debt is  $\text{£}3,553$  million under the assumptions made above. It is assumed here that yearly repayments equal the unlevered cash flow available less after tax interest payments. Interestingly, management, acting on behalf the shareholders explicitly, has demanded recently, that the company can only bear debt in the range between  $\text{£}2.3$  and  $\text{£}2.7$  billion. That is clearly below the conclusion drawn from our rather conservative valuation shown above. It could be interpreted as a first move in a bargaining game. In either case it should be emphasized that it is derived under a set of assumptions. Exhibit 13 shows the results while using other growth rates leaving all other parameters unchanged.

## 2. Other DCF Approaches

Table 4 summarizes all four DCF approaches. The cost of capital necessary for the valuations besides APV (i.e.  $r_L$ , WACC, CCF) are based upon the results delivered by APV. Debt is fully repaid according to the Credit Agreement in 2050. As stated earlier, the repayment schedule cannot be met, the value of equity is negative. Negative equity is responsible for the low levered cost of equity which are to be calculated according to (12). WACC and CCF are identical since in the first year there are no periodic tax shields ( $C_{TS} = 0$ ). That follows from a comparison of (15) and (19). Furthermore, TCC equals  $r_U$  as we assume that  $r_{TS} = r_U$ .

	2004	2005	2006	2007	2008	2009	2010	2020	2030	2040	2050	2060	2070	2080	2086
APV approach															
$C_U$		208	211	214	217	219	222	254	228	253	282	220	238	258	272
$V_U$	3253	3279	3304	3328	3351	3373	3394	3492	3345	3353	2998	2764	2350	1258	
$C_{TS}$		0	0	0	0	0	0	0	61	78	97	0	0	0	
$V_{TS}$	157	168	180	193	207	222	238	477	831	701	188	0	0	0	
$V_L$ (without Cash)	3410	3447	3484	3521	3558	3595	3631	3968	4176	4054	3187	2764	2350	1258	
$D_{FV}$	6354	6256	6229	6030	5832	5633	5435	3300	1347	473	0	0	0	0	
E (without Cash)	-2944	-2809	-2745	-2509	-2274	-2038	-1803	669	2829	3581	3187	2764	2350	1258	
WACC approach															
$C_U$		208	211	214	217	219	222	254	228	253	282	220	238	258	272
WACC		7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	5,73%	5,29%	4,27%	7,20%	7,20%	7,20%	7,20%
$V_L$ (without Cash)	3410	3447	3484	3521	3558	3595	3631	3968	4176	4054	3187	2764	2350	1258	
CCF approach															
$C_U + C_{TS}$		208	211	214	217	219	222	254	289	331	379	220	238	258	272
CCF		7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%	7,20%
$V_L$ (without Cash)	3410	3447	3484	3521	3558	3595	3631	3968	4176	4054	3187	2764	2350	1258	
FTE approach															
$C_L$		-195	-116	-284	-271	-259	-247	-147	225	79	214	220	238	258	272
$r_L$		2,02%	1,85%	1,75%	1,43%	1,04%	0,57%	27,9%	8,35%	7,69%	7,32%	7,20%	7,20%	7,20%	7,20%
E (without Cash)	-2944	-2809	-2745	-2509	-2274	-2038	-1803	669	2829	3581	3187	2764	2350	1258	

Table 4: DCF Valuations

## **V. Conclusions**

In the paper we have shown how different DCF approaches have to be adjusted for valuing firms in financial distress. The APV approach can be recommended for valuing companies in financial troubles, as it forces to cope with the implications of a given capital structure step by step. WACC, CCF and FTE approach face circular arguments due to the definitions of the respective cost of capital. Based upon the estimated company value possible strategies for the claimholders involved can be discussed. First of all, it is improbable that lenders will give up anything close to 60% of their claims without compensation. The lenders could sell their claims to other investors, use their right of substitution to implement a new tunnel operating organisation. The governments have to approve a new operator (see Exhibit 1b). In addition, one could ask how a company that went through several restructurings and that has only a limited chance for developing new business opportunities, could be run better by a new management. If lenders choose to trigger a legal bankruptcy/insolvency procedure, (depending upon the question on which national law the procedure will be based upon) an administrator will operate the business which triggers new costs and lengthens the time needed for agreement upon the financial restructuring (see Gilson/John/Lang (1990), Gilson (1995), Tashjian/Lease/McConnell (1996)). Liquidation of the project in the sense of a complete shut down is not a probable outcome, because the proceeds for selling the assets might be lower than the cash flows from further operating the tunnel.

Shareholders do not have many options. They could sell the shares or they could try to prevent any major dilution. However, if they do not agree with a financial restructuring, their position will probably be worthless when the company has to file for bankruptcy. Thus, they are in a weak position. Assuming the going concern case, a financially viable strategy is to swap debt for equity. Existing shareholders will have to endure a dilution of course. That leads to the question of how many shares shall be assigned to lenders. Since the company is over indebted, an extreme position would be to call for (almost) full dilution. That shares are still worth something signals that investors consider the probability of scenarios in which dividends are paid to be positive. To put it differently: at least some shareholders see light at the end of the tunnel.

## **Exhibit 1a: Treaty (Article 1)**

Treaty between the United Kingdom of Great Britain and Northern Ireland and the French Republic concerning the Construction and Operation by Private Concessionaires of a Channel Fixed Link (12 February 1986)

### *Article 1: Object and Definitions*

(1) The High Contracting Parties undertake to permit the construction and operation by private concessionaires (hereinafter referred to as "the Concessionaires") of a Channel fixed link in accordance with the provisions of this Treaty, of its supplementary Protocols and arrangements and of a concession between the two Governments and the Concessionaires (hereinafter referred to as "the Concession"). The Channel fixed link shall be financed without recourse to government funds or to government guarantees of a financial or commercial nature.

## **Exhibit 1b: Concession Agreement (Clause 2, 32, 34)**

### *Clause 2: The Project and the Characteristics of the Fixed Link*

2.1 Subject to an in accordance with the provisions of this Agreement, the Concessionaires shall jointly and severally have the right and the obligation to carry out the development, financing, construction and operation during the Concession Period of a Fixed Link under the English Channel between the Department of the Pas-de-Calais in France and the County of Kent in England. Subject as aforesaid, they shall do this at their own risk, without recourse to government funds or to government guarantees of a financial or commercial nature and regardless of whatever hazards may be encountered. The Principals shall, in a manner which they will endeavour to co-ordinate between them, adopt such legislative and regulatory measures, and take such steps, including approaches to international organisations, as are necessary for the development, financing, construction and operation of the Fixed Link in accordance with this Agreement and ensure that the Concessionaires are free, within the framework of national and Community laws, to determine and carry out their commercial policy.

### *Clause 32: Provisions relating to Lenders*

#### 32.1 Substitution

32.1 (1) The parties to this Agreement agree that new Concessionaires shall be substituted for the initial Concessionaires in the following circumstances:

- (a) following the occurrence of one of the events referred to in Annex IV and so long as its effect shall be continuing or if the Principals take or propose to take any action which could result in the premature termination of the Concession Period, two legal entities, one French and the other English (the "Substituted Entities") controlled by the lenders financing the construction and operation of the Fixed Link (the "Lenders") shall, at the option of the Lenders and on the following terms, be simultaneously substituted by the Principals for the initial Concessionaires; and
- (b) the Substituted Entities will need to provide evidence to the Principals that they have, at the time of substitution, a financial and technical capability sufficient to perform the obligations of the Concessionaires under this Agreement.

32.1(3) As from the actual or deemed confirmation of the substitution by the Principals, the Substituted Entities will benefit from all the rights and will assume all the obligations to the Principals under this Agreement and any leases granted to the initial Concessionaires pursuant to Annex II in place of the initial Concessionaires.

#### 32.2 New Concession:

32.2(2) If the lenders have not exercised the right of substitution referred to in Clause 32.1(1) or, having been offered a new concession pursuant to Clause 32.2(1) (a), have not accepted the same or if the Substituted Entities have failed to fulfil the conditions specified in Clause 32.1(1) (b), if the Principals grant a new concession, the new concession agreement shall provide that the Lenders shall be entitled to receive from the new concessionaires payments out of the net revenues generated from such new concession in or towards repayment of the amounts owed to them on a subordinated basis agreed between the Lenders and such new concessionaires

32.2(3) If the Substituted Entities become the new concessionaires pursuant to Clause 32.2(1) (a), the new concession agreement will contain provisions to the effect that upon the payment of all amounts of principal, interest and other moneys from time to time owed to the Lenders under their financing agreements, it shall terminate without penalty.

### *Clause 34: Exclusivity and Second Link*

34.1 The Concessionaires recognise that, in due course, the construction of a drive through link may become technically and financially viable. They undertake as a result to present to the Principals between now and the year 2000 a proposal for a drive through link which shall be added to the first link when technical and economic

conditions for realisation of such a link shall permit it and the increase of traffic shall justify it without undermining the expected return on the first link.

34.2 The Principals undertake not to facilitate the construction of another fixed link whose operation would commence before the end of 2020. However, after 2010, and in the absence of agreement with the Concessionaires on the implementation of their proposal for the construction of a drive through link and as to its timetable, the Principals shall be free to issue a general invitation for the construction and operation of such a link. This new link shall not enter into operation before the end of 2020.

34.3 The Principals agree that throughout the Concession Period no link shall be financed with the support of public funds, either directly or by the provision of government guarantees of a financial or commercial nature.

#### *Annex IV to the Concession Agreement*

##### Events giving rise to the Right of Substitution

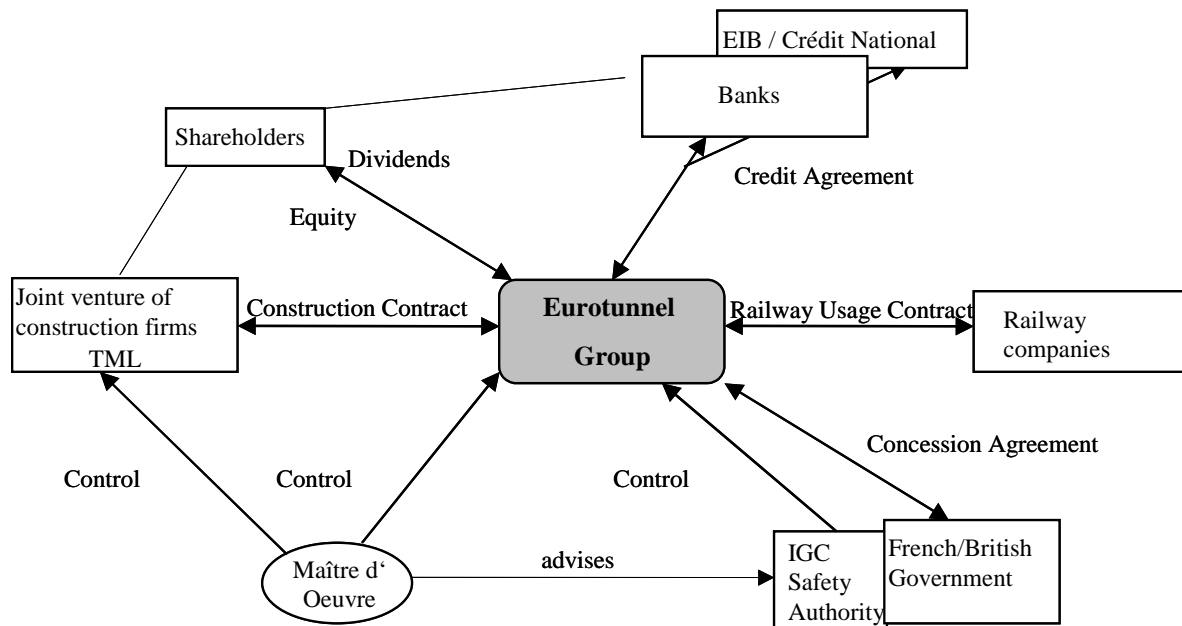
- (1) failure to make any payment required under the financing agreements within a stated grace period;
- (2) it appears, by reference to an objective test, that the Concessionaires do not have available and are not in a position to obtain sufficient funds to meet the estimated cost of construction or operation of the Fixed Link, together with the associated financing costs;
- (3) it appears, by reference to an objective test, that the estimated final maturity date for repayment of the Lenders financing the construction and operation of the Fixed Link will be materially extended; or
- (4) abandonment of the Project, insolvency, liquidation, enforcement of security by other creditors and related events.

## Exhibit 2: Project Structure

### *Eurotunnel: Founding companies*

<i>Banks:</i>	<u>Channel Tunnel Group Limited</u>	<u>France Manche S.A.</u>
	Midland Bank PLC	Banque Indosuez
	National Westminster	Banque Nationale de Paris
		Crédit Lyonnais

<i>Construction companies:</i>	Balfour Beatty Construction Ltd.	Bouygues S.A
	Costain UK Ltd.	Dumez S.A.
	Tarmac Construction Ltd.	Société Auxiliaire d'Entreprises S.A.
	Taylor Woodrow Construction Ltd	Société Générale d'Entreprises S.A.
	George Wimpey International Ltd	Spie Batignolles S.A.



**Maitre d'Oeuvre:** appointed by the concessionaires (if not objected by IGC) to review the work carried out regarding the relevant specifications, regulations, standards, contracts, timetable, and cost projections.

**IGC:** Intergovernmental Commission; supervises, in name and on behalf of the two governments, all matters concerning the construction and operation of the fixed link.

**Safety Authority:** advises and assists the IGC on all matters concerning safety in the construction and operation of the fixed link.

### Exhibit 3a: Cost until Opening

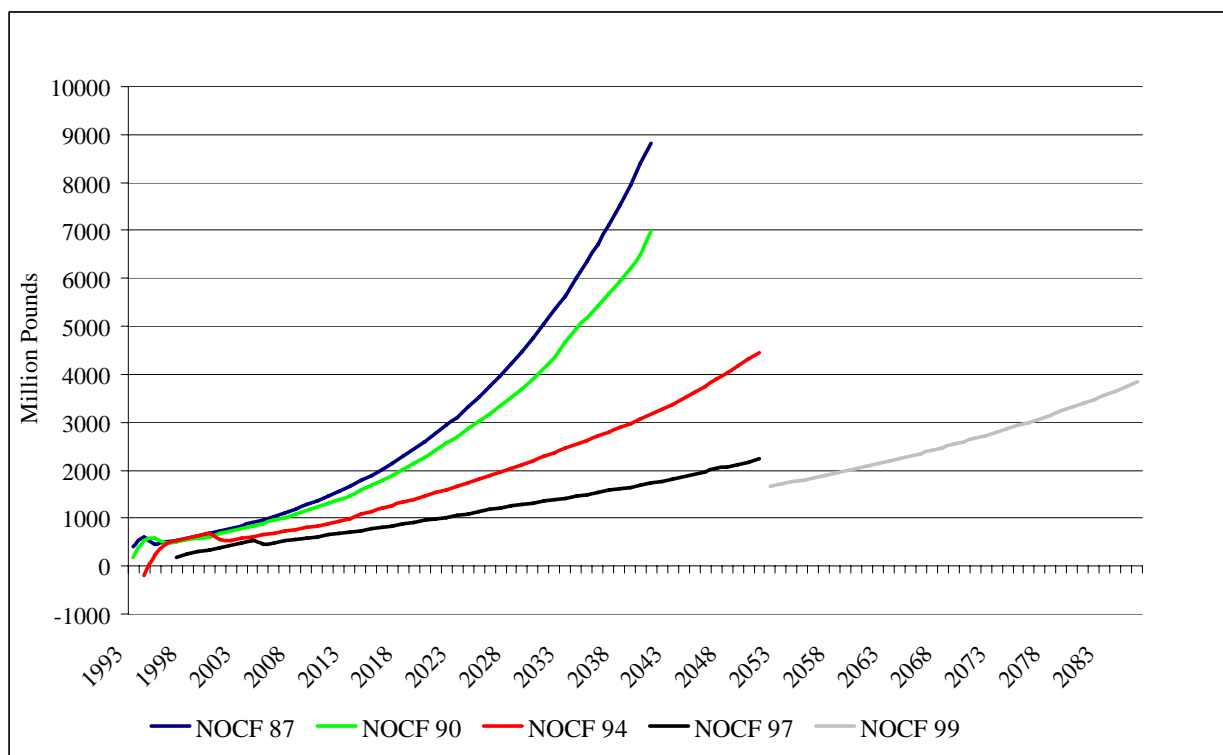
£ million	Nov. 1987	Nov. 1990	Oct. 1991	May 1994
Target works (e.g. tunnels)	1,367	2,009	2,009	2,110
Lump sum works (e.g. buildings)	1,169	1,305	1,305	1,753
Procurement items (e.g. shuttles)	252	583	692	705
Bonus TML		72	72	46
Direct works				36
Project contingency		239	239	
Total construction costs	2,788	4,208	4,317	4,650
Corporate costs	642	787	829	1,128
Provision for inflation	469	1,031	1,031	1,146
Net financing costs	975	1,386	1,534	4,757
Capital Expenditure				222
Transfer to interest reserve				72
Net Cash Out Flow at the Beginning of Operations		196	343	-1,859
Total	4,874	7,608	8,054	10,116

### Exhibit 3b: Financing until Opening

	£ million
Equity 1	46
Equity 2	206
IPO	770
Capital increase Nov. 90	568
Capital increase 1994	858
Warrants*)	approx. 200
Total equity	2,648
Initial Credit Agreement	4,985
Revised Credit Agreement	1,800
EIB Credit Agreement	300
ECSC Credit Agreement	200
Senior debt	647
Interest guarantees	-29
Total debt	7,903
Total funds	10,551

\*) Consists of several issues; the largest of them in terms of funds raised were granted to shareholders at the IPO; however, until the expiration date (November 1992) only 2.7% of those warrants have been exercised.

## Exhibit 4a: Management's Cash Flow Forecast



NOCF: Net Operating Cash Flow = Revenues – Operating Costs – Taxes – Change in Working Capital

Data taken from forecasts published at IPO 1987, SEOs 1990 and 1994, Financial Restructuring 1997.

NOCF 99 is based on the forecasted cash flow published for the financial restructuring 1997, but interpolated for the extended concession period (until 2086). The operating cash flows are decreased by 59% (agreement with the government) from 2052 onwards.

## Exhibit 4b: Actual Key Figures

£ million	1996	1997	1998	1999	2000	2001	2002	2003	2004
Shuttle	145	113	210	270	314	309	333	309	285
Rail	198	212	213	215	208	211	217	232	234
Ancillary	105	132	196	141	57	27	20	25	19
Revenues	448	456	618	627	579	548	570	566	538
Staff	88	86	92	95	95	95	102	105	104
Other operating expenses	265	235	240	207	159	146	144	162	157
Operating Cost	353	321	332	302	254	241	246	267	261
Capex	44	37	57	59	71	82	41	25	19
NOCF	115	201	356	315	328	320	348	314	283

## Exhibit 5: Eurotunnel Group Financial Statements 2003/2004

### Balance sheet

<b>£'000</b>	<b>2004</b>	<b>2003</b>
Tangible fixed assets	6,933,599	7,426,858
Financial fixed assets	18,910	17,205
Total fixed assets	6,952,509	7,444,063
Total current assets*)	423,106	823,022
Prepaid expenses	36,545	52,592
<b>Total assets</b>	<b>7,412,160</b>	<b>8,319,677</b>
Shareholders' funds and liabilities		
Total shareholders' funds	528,241	1,099,187
Provisions	144,752	99,508
Total creditors	6,725,456	7,098,298
Deferred income	13,711	22,684
<b>Total shareholders' funds and liabilities</b>	<b>7,412,160</b>	<b>8,319,677</b>

\*) Including £181 million in cash and cash equivalent investments (2004).

### Profit and loss account

<b>£'000</b>	<b>2004</b>	<b>2003</b>
Total turnover	555,173	583,944
Total operating expenditure	383,883	414,160
<i>Operating profit</i>	171,290	169,784
Total financial income	32,964	43,005
Total financial charges*)	331,158	362,143
<i>Financial result</i>	(298,194)	(319,138)
Exceptional result**)	(442,806)	(1,184,847)
<i>Taxation</i>	23	24
Loss for the year	(569,733)	(1,334,225)

\*) Including interest on leasing operations of £27 million; financial charges after leasing are £304 million

\*\*\*) Including an exceptional impairment of £ 395 million in 2004 (2003: £ 1,300 million).

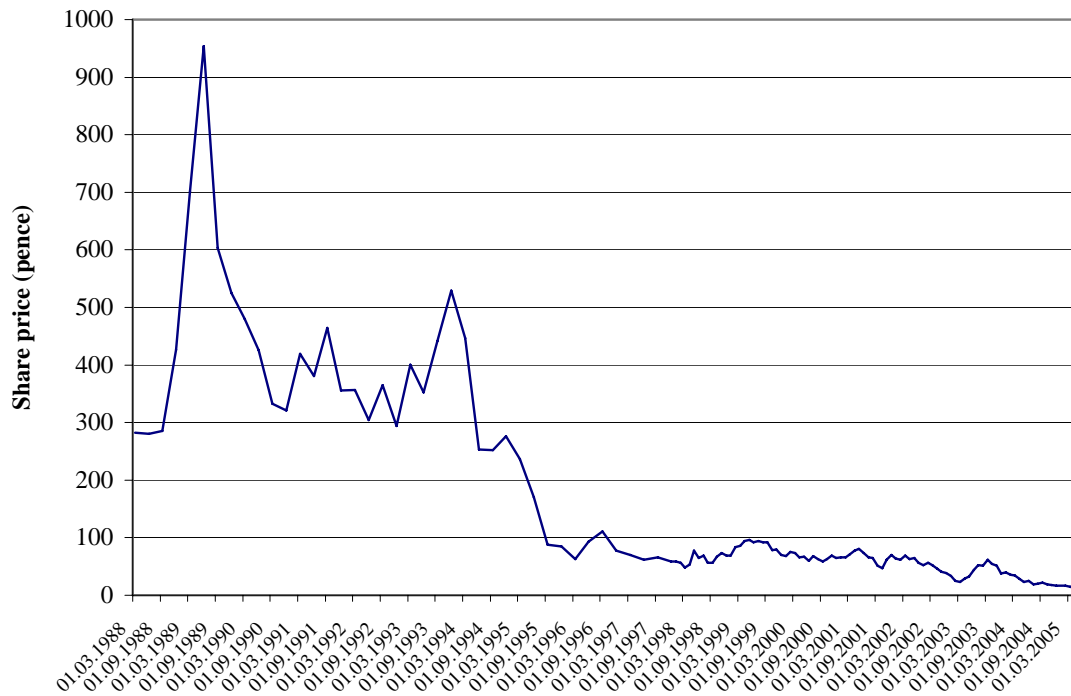
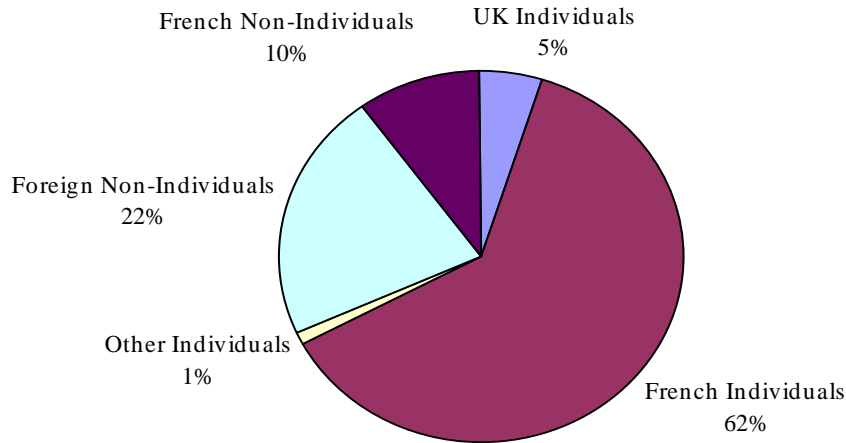
### Cash flow statement

<b>£'000</b>	<b>2004</b>	<b>2003</b>
Net cash inflow from operating activities	283,312	314,304
Returns on investments and servicing of finance	(281,241)	(277,878)
Capital expenditure	(18,934)	(24,717)
Other non-operating cash flows and taxation	(13,859)	20,367
Cash (outflow)/inflow before financing	(30,722)	32,076
Financing	724	(68,100)
Decrease in cash in the period	(31,446)	(36,024)

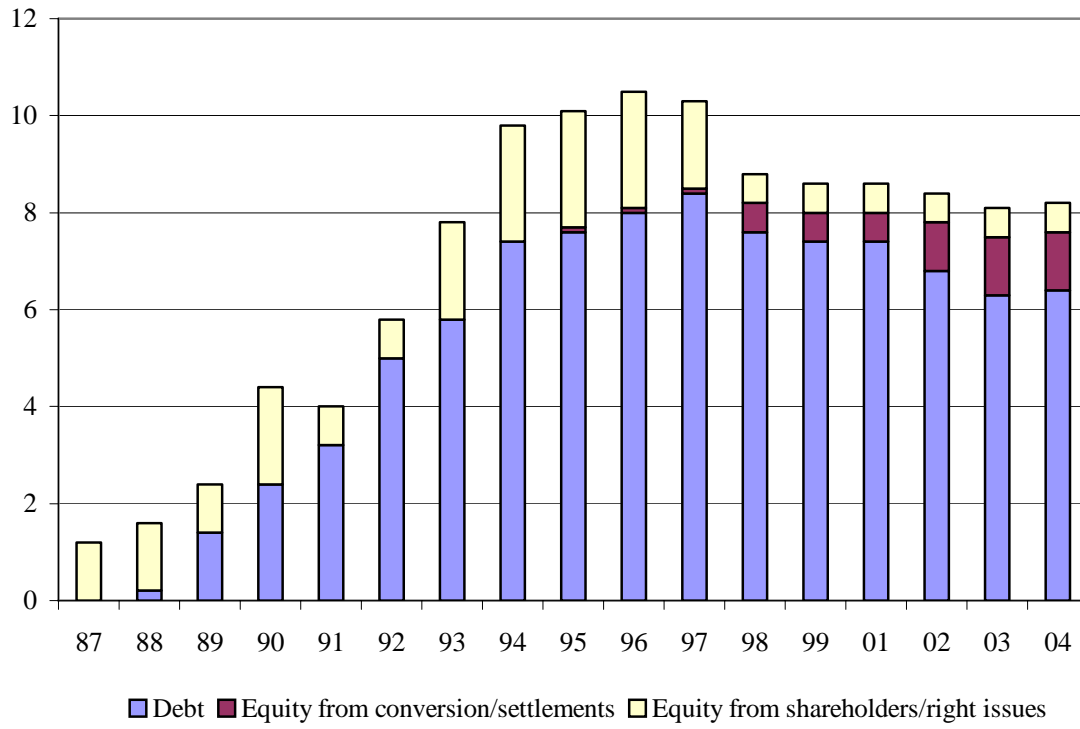
## Exhibit 6: Shareholder Structure & Share Price

Number of Units at December, 31<sup>st</sup> 2004: 2,546,114,213

Share Price at December, 31<sup>st</sup> 2004: 17 Pence



**Exhibit 7: Capital Structure in Book Values**



**Exhibit 8: Debt Employed 1988 – 2004**

£ million	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Loan Notes																	
Equity Notes											935.7	621.9	623.0	615.5	252.4		
Participating loan Notes										8.4	1,127.1	820.8	822.3	812.4	839.2	873.8	874.1
Stabilisation Notes															0.1	76.9	161.4
<b>Total Loan Note Principal</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>8.4</b>	<b>2,062.7</b>	<b>1,442.7</b>	<b>1,445.3</b>	<b>1,427.9</b>	<b>1,091.6</b>	<b>950.6</b>	<b>1,035.5</b>
Bank Loans																	
EDL, Senior and 4 <sup>th</sup> Tranche Debt											374.4	352.3	352.9	348.9	359.8	374.0	374.1
Tier 1A Debt														740.0	740.0	740.0	
Junior Debt											3,639.9	3,397.2	3,404.0	3,352.3	3,126.9	3,264.7	3,264.0
Resettable Advances											1,414.0	1,130.4	1,129.6	1,114.9	550.7	479.1	473.0
<b>Total Bank Loan Principal</b>	<b>174.6</b>	<b>1,061.3</b>	<b>2,339.7</b>	<b>3,487.8</b>	<b>5,387.6</b>	<b>6,936.1</b>	<b>7,857.5</b>	<b>8,579.8</b>	<b>7,915.4</b>	<b>7,544.6</b>	<b>5,428.3</b>	<b>4,879.8</b>	<b>4,886.5</b>	<b>4,816.0</b>	<b>4,777.5</b>	<b>4,857.8</b>	<b>4,851.1</b>
Unpaid interest								307.6	735.1	1,171.7	477.8	508.4	575.4	653.4	495.9	431.5	368.9
Stabilisation Advances											403.8	431.6	470.7	522.5	344.2	352.2	368.9
Deferred interest account											74.0	76.9	104.7	130.9	151.6	79.3	
<b>Total Loans</b>	<b>174.6</b>	<b>1,061.3</b>	<b>2,339.7</b>	<b>3,487.8</b>	<b>5,387.6</b>	<b>6,936.1</b>	<b>7,857.5</b>	<b>8,887.4</b>	<b>8,650.5</b>	<b>8,716.2</b>	<b>5,906.1</b>	<b>5,388.3</b>	<b>5,461.9</b>	<b>5,469.4</b>	<b>5,273.4</b>	<b>5,289.3</b>	<b>5,220.1</b>
Accrued interest	1.8	24.5	54.4	64.0	115.5	125.5	156.0		138.6	157.3	158.7	136.3	138.9	136.3	127.6	124.9	98.1
Loan Notes											20.0	13.4	13.4	13.2	6.3	6.5	1.5
Loans											138.8	122.9	125.4	123.1	121.3	118.4	96.6
Overdrafts	0.4	0.7	1.9	0.7	1.4	2.8	2.2	4.2	2.1	2.3	2.5	1.3	0.6	0.0	0.0		
<b>Total</b>	<b>176.8</b>	<b>1,086.5</b>	<b>2,396.0</b>	<b>3,552.5</b>	<b>5,504.5</b>	<b>7,064.3</b>	<b>8,015.7</b>	<b>8,891.6</b>	<b>8,791.2</b>	<b>8,884.2</b>	<b>8,130.1</b>	<b>6,968.5</b>	<b>7,046.7</b>	<b>7,033.7</b>	<b>6,492.7</b>	<b>6,364.9</b>	<b>6,353.6</b>

## Exhibit 9: Credit Agreement – Repayment, Some Covenants and Events of Default

Debt instrument	Repayment
Participating Loan Notes	2040 at the latest
Stabilisation Notes	Conversion into units or repayment from 2018 till 2026
EDL, Senior and 4 <sup>th</sup> Tranche Debt	Senior Debt: 2009 – 2012; 4 <sup>th</sup> Tranche Debt: 2006 - 2019
Tier 1A Debt	2026: £120 million; 2027-2028: £620 million
Junior Debt	2007 - 2025
Resettable Advances	Until 2050
Stabilisation Advances	Conversion into units or repayment from 2018 till 2026
Accrued Interest	2005

The Credit Agreement contains a number of events of default. The consequences of an event of default are that, unless the event of default is waived and subject to a standstill being triggered under the provisions of the Agreement Among Lenders, the Banks may demand early repayment of their loans, enforce their security or seek to effect substitution.

The events of default include:

- (a) failure to pay amounts due under the Credit Agreement;
- (b) material breaches of other obligations under the Credit Agreement and other relevant documents, which remain unremedied;
- (c) insolvency and related events in respect of members of the Owning Group (including the inability to pay debts as they fall due);
- (d) cross-default with other agreements (subject to a de minimis level);
- (e) the ratio of operating cash flow to debt service costs plus capital expenditure (i) is less than 1.0 for any year in the period from 2006 (or if the Stabilisation Period is ended early, the first calendar year after the end of the Stabilisation Period) to 2011 and (ii) is less than 1.2 for any year in the period from 2012 to 31 December 2025;
- (f) the ratio of turnover plus other operating income less operating expenditure (after depreciation) to total interest service costs in less than 1.0 for any year in the period from January 2008 (or if the Stabilisation Period is ended early, the third calendar year after the end of the Stabilisation Period) to 2011 and 1.5 for any year from 2012 to 2025;
- (g) the Borrowers fail to meet the default repayment schedule in respect of the Junior Debt or fail to meet the repayment schedule in respect of the Stabilisation Advances.

### Dividend constraints

Following implementation of the Transaction the declaration or payment of a dividend by Eurotunnel will constitute an event of default, unless.

- (a) the Stabilisation Period has ended;
- (b) no event of default or potential event of default is subsisting which has not been waived by the Agents;
- (c) in respect of any dividend declared or paid after the end of the Stabilisation Period but before 1 January 2006 (if the Stabilisation Period is ended early), Eurotunnel is on or ahead of the target outstanding profile in respect of the Junior Debt;
- (d) in respect of any dividend declared or paid up to the end of 2006 only, Eurotunnel has made the payment due under the Target Repayment Schedule in January 2006 for any dividend declared or paid in the first half of 2006 and, in addition, the payment due under the Target Repayment Schedule in July 2006 for any dividend declared or paid in the second half of 2006;
- (e) in respect of any dividend declared or paid up to the end of 2009 (or, if earlier, full repayment (including by way of refinancing) of all Junior Debt), Eurotunnel has aggregate cash balances after payment of the dividend and all debt service required to be paid up to the date such dividend is declared or paid, of at least £70 million; and
- (f) in 2010 or any subsequent year, and if at such time FLF still holds any Junior Debt, Eurotunnel has repaid an additional amount of Junior Debt equal to 50 per cent. of the repayment last required under the default repayment schedule.

Sources: Eurotunnel, Annual Report 2004; Redemption of Equity Notes Prospectus, 2002

**Exhibit 10: Unlevered Value of Eurotunnel (31 December 2004)**

GBP million	2004	2005	2006	2007	2008	2009	2010	2020	2030	2040	2050	2060	2070	2080	2086
Shuttle	285	288	292	295	298	301	305	340	379	423	472	526	587	655	699
Rail	234	238	242	246	250	254	258	305	360	425	501	591	698	824	910
Ancillary	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Revenues	538	545	552	560	567	574	582	664	758	866	992	1137	1304	1498	1628
Operating Costs	261	289	293	297	301	305	309	352	402	460	527	604	692	795	864
Depreciation	122	170	170	170	170	170	170	170	170	170	170	170	170	170	170
<i>Net fixed assets</i>	<i>6934</i>	<i>6811</i>	<i>6689</i>	<i>6567</i>	<i>6446</i>	<i>6326</i>	<i>6207</i>	<i>5049</i>	<i>3968</i>	<i>2975</i>	<i>2085</i>	<i>1313</i>	<i>678</i>	<i>201</i>	<i>0</i>
Operating profit	155	85	89	92	96	99	103	141	185	236	295	363	441	532	593
Taxes	0	0	0	0	0	0	0	0	-61	-78	-97	-214	-260	-314	-350
<i>Loss Carry Forward</i>	<i>3081</i>	<i>2996</i>	<i>2907</i>	<i>2815</i>	<i>2719</i>	<i>2620</i>	<i>2517</i>	<i>1284</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
NOPAT	155	85	89	92	96	99	103	141	124	158	198	149	181	218	243
Depreciation	122	170	170	170	170	170	170	170	170	170	170	170	170	170	170
Change NWC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Operating Cash Flow	277	256	259	262	266	269	273	311	294	328	368	319	351	388	414
Capital Expenditures	24	47	48	49	49	50	51	58	66	75	86	99	113	130	142
FCF <sub>U</sub>	253	208	211	214	217	219	222	254	228	253	282	220	238	258	272

V<sub>U</sub> 3253

### Exhibit 11: Value of Tax Shields (31 December 2004)

Mio. GBP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Debt employed	6354	6256	6229	6030	5832	5633	5435	5236	5038	4839	4641	4442	4244	4045	3788	3530	3300	3069	2838	2607	2377	2146	1967	1657	1347	1347
Repayment		98	27	199	199	199	199	199	199	199	199	199	199	199	257	257	231	231	231	231	231	231	179	310	310	0
Interest expenses		305	300	299	289	280	270	261	251	242	232	223	213	204	194	182	169	158	147	136	125	114	103	94	80	65
Operating Profit - Interest expenses		-220	-211	-207	-194	-181	-168	-155	-141	-128	-115	-102	-88	-75	-61	-45	-28	-13	2	17	33	48	64	77	96	116
Taxes (Levered case)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loss Carry Forward (Levered case)	3081	3301	3512	3719	3913	4093	4261	4416	4557	4685	4800	4902	4990	5065	5126	5171	5200	5213	5211	5193	5161	5112	5049	4972	4876	4760
Taxes (Levered case)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxes (Unlevered case)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-59
Periodic tax shield		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
Present Value of Tax Shields (V <sub>TS</sub> )	157																									

Mio. GBP	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Debt employed	1347	1347	1347	1347	1347	1347	1347	1129	910	692	473	473	473	473	473	473	473	473	315	158	0	0	0	0	0
Repayment	0	0	0	0	0	0	0	219	219	219	219	0	0	0	0	0	0	0	158	158	158	0	0	0	0
Interest expenses	65	65	65	65	65	65	65	65	54	44	33	23	23	23	23	23	23	23	23	15	8	0	0	0	0
Operating P. - Interest expenses	121	125	130	135	140	145	150	155	171	187	203	219	225	230	236	242	248	254	260	274	287	301	308	314	321
Taxes (Levered case)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-177	-189
LCF (Levered case)	4639	4514	4384	4249	4109	3964	3813	3658	3487	3300	3097	2878	2654	2423	2187	1946	1698	1444	1185	911	624	322	15	0	0
Taxes (Levered case)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-177	-189
Taxes (Unlevered case)	-61	-63	-64	-66	-68	-69	-71	-73	-74	-76	-78	-80	-82	-83	-85	-87	-89	-91	-93	-95	-97	-99	-102	-185	-189
Periodic tax shield	61	63	64	66	68	69	71	73	74	76	78	80	82	83	85	87	89	91	93	95	97	99	102	9	0

**Exhibit 12: Debt Capacity**

GBP million	2004	2005	2006	2007	2008	2009	2010	2020	2028	2029	2030	2031	2039	2040	2041	2042	2043	2044
Debt employed	3553	3515	3473	3426	3374	3317	3254	2235	708	457	189	0	0	0	0	0	0	0
Repayment		38	42	47	52	57	63	140	237	252	268	189	0	0	0	0	0	0
Interest expenses		171	169	167	164	162	159	114	45	34	22	9	0	0	0	0	0	0
OP-Interest expenses		-85	-80	-75	-69	-63	-57	27	130	146	163	181	231	236	242	247	253	259
Taxes (Levered case)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-58	-85
LCF (Levered case)	3081	3166	3246	3321	3389	3452	3509	3648	2993	2847	2683	2503	803	567	325	78	0	0
Taxes (Levered case)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-58	-85
Taxes (Unlevered case)		0	0	0	0	0	0	0	0	-59	-61	-63	-76	-78	-80	-82	-83	-85
Periodic tax shield		0	0	0	0	0	0	0	0	59	61	63	76	78	80	82	26	0

Exhibit 13: Szenario Analysis

Szenario: Growth rate = Inflation rate = 2.1%	Szenario: Growth rate = Average GDP growth 2004 = 2.75%
<p>3,662    172    181    4,016</p> <p><math>- 6,354 = - 2,338</math></p>	<p>4,101    169    181    4,452</p> <p><math>- 6,354 = - 1,902</math></p>
Debt Capacity: £3,974 million	Debt Capacity: £4,424 million

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