Master's Thesis

CORPORATE ANALYSIS ON THE CONSEQUENCES DERIVED FROM THE COLLAPSE OF THE GENOA BRIDGE. FOCUS ON ASPI´S VALUATION

Thesis that,

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Executive Summary

The purpose of this thesis is to perform a case study on the consequences that the collapse of the Polcevera viaduct, on the 14th of August of 2018 has had on Autostrade per l'Italia, the concessionaire of the A10 highway, and its parent company, Atlantia. In addition, the authors sought how such an event impacted the takeover bid of Abertis Infraestructuras by Hochtief, ACS and Atlantia, announced on March 2018. The execution of the transaction was being conducted at the same time when the tragedy occurred.

The research has been centered in three main points:

First, context on the list of events and the chronological order that followed has been conducted.

In a second stage, an analysis of the impacts from those events is presented. Special emphasis has been given in the financial implications that the collapse of the Morandi bridge caused to Atlantia, understanding the market crash on the stock and how it was later recovered. Additionally, the implications that the collapse had on the acquisition of Abertis were determined.

In a third stage, the thesis took advantage of the uniqueness of situation to provide an answer to one of the greatest challenges faced on understanding valuation changes. The study was focused in determining how much the changes in the enterprise value of Atlantia right after the event and, later in the midterm, were explained by changes attributable to lower cash flows of Autostrade and, how much were due to the higher market risk perception reflected on the WACC.

The main conclusions derived are that the market crash was mainly provoked by the over-reaction that the government of Italy had, as the termination of the concession was seen a very likely outcome. From a valuation perspective, the influence on cash flows has been much higher rather than the influence derived from the WACC, in a c.75%/25% ratio when looking at the market crash. Such a difference has been reduced when moving from the short term to the medium term, and the ratio ended at c.66%/33%. Uncertainty on the final costs that Atlantia will incur have not been released yet and it explains such a trend. Regarding Abertis, the impact of the collapse had been minor if not inexistent in completing the transaction.

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Glossary

6M / 1H	First six months of the year.
9M	First nine months of the year.
A10	Referring to Autostrada A10 or Fiori Autostrade; Italian motorway connecting Genoa with Ventimiglia; part of the European route E80; It has 158.7 kilometers length.
Abertis Holdco	Refers to the special purpose vehicle created for the acquisition of Abertis Infraestructuras S.A.
Abertis Participaciones	Refers to the entity where the 98.7% share capital of Abertis Infraestructuras acquired by Hochtief was transferred upon acquisition.
Abertis/ Abertis Infraestructuras	Refers to Abertis Infraestructuras S.A., Spanish corporation.
ACS	Refers to Actividades de Construcción y Servicios S.A., Spanish corporation.
AENA	Refers to Aena SME, S.A., subsidiary of ENAIRE and state-owned company managing airports and heliports in Spain.
ANAS	Refers to Azienda Nazionale Autonoma delle Strade; Italian state-owned company devoted to the construction and maintenance of the Italian road network.
Atlantia / ATL	Refers to Atlantia SpA, Italian holding company.
ATVD	Aggregate Theoretical Vehicles per Day; equal to number of kilometers travelling/journey length/number of days.
Autostrade / ASPI	Refers to Autostrade per l'Italia SpA, Italian corporation.
b_a	Beta of the assets of a firm.
Base Case	Refers to the valuation of Autostrade per l'Italia based on the business plan pre-collapse of the Morandi bridge.
BBVA	Refers to the Spanish bank Banco Bilbao Vizcaya Argentaria.
b_d	Beta of the long-term debt of a firm.
b_e	Equity beta or exposure of the company group of assets to the market risk.
Benetton Group	Refers to Benetton Group S.r.l; Italian corporation and well known fashion brand.
bn	Abbreviation used for billion.
BoD / Board	Board of Directors of a company.
BP	Refers to British Petroleum plc, or Business Plan.
bps	Basic points: 1/100 of 1%.
b_{TS}	Beta of the Tax-shield of a firm.
b_u	Unlevered beta of a firm.
CAGR	Compounded Annual Growth Rate.
CAPEX	Capital Expenditures.
CAPM	Capital Asset Pricing Model.
CAS	Consorzio per le Autostrade Siciliane.
CC	Cost of Capital or return required by investors in a given group of assets.

Cellnex	Refers to Cellnex Telecom; Spanish corporation.
CEO	Chief Executive Officer.
CFO	Chief Financial Officer.
CIF	Refers to Código de Identificación Fiscal; number used for identification of enterprises in Spain.
Citi	Refers to the US bank entity CitiGroup.
CNMV	Comisión Nacional del Mercado de Valores.
ConnecT	Refers to the subsidiary of the holding Edizione; Italian corporation.
CPI	Consumer Price Index.
Criteria	Refers to Criteria CaixaHolding; Spanish corporation.
CSR	Corporate Social Responsibility.
D	Market value of long-term debt.
D&A	Depreciation and Amortization.
DCF	Discounted Cash Flow valuation method.
E / EqV	Market value of equity.
EBIT	Earnings Before Interest and Tax.
EBITDA	Earnings Before Interest Tax Depreciation and Amortization.
EBITDA margin	EBITDA over Gross Sales.
ECB	European Central Bank; central banking system of the European Union.
Edizione	Refers to the financial holding of the Benetton family.
EMEA	Europe Middle East and Africa.
Empa	Refers to the Swiss Federal Laboratories for Materials Science and Technology.
EMTN	Euro Medium Term Notes.
ENAIRE	Refers to the Spanish public enterprise responsible for air navigation management in Spain, attached to the Ministry of Public Works.
EU	European Union.
EURIBOR	Basic rate of interest used in lending between banks on the European Union interbank market, also used as a reference for setting the interest rate on other loans.
Euro/€	Currency type: Euro.
EV	Enterprise Value, understood as market value of equity plus net debt.
FCF	Operating Free Cash Flows to the firm available to all investors, before interest payment and after reinvestment needs.
FED	Federal Reserve System; central banking system of the United States of America.
FFO	Adjusted Funds from Operations.
Fitch	Refers to the credit rating agency Fitch Group, Inc.
Five Star Movement/M5S	Refers to the Italian political party: Movimento 5 Stelle.
FX	Refers to Forex or the market in which currencies are traded.
FY	Refers to Financial Year.
g	projected constant growth rate of the cash flows of a firm to infinity.
G&A costs	General and Administrative expenditures.
GDP	Gross Domestic Product.
Genoa Bypass /Bypass/ Gronda di Genova	Genoa Bypass project which includes 72 kilometers of a new motorway connecting the junctions bordering the city area of Genoa; See: https://www;grondadigenova;it/.

GIC	Refers to the Singapore Investment Corporation.
GBP/£	Currency type: Great Britain Pound (United Kingdom).
Hisdesat	Refers to the public enterprise Hisdesat Servicios Estratégicos S.A.; Spanish entity.
Hispasat	Refers to Hispasat; the Spanish satellite communications operator.
Hochtief	Refers to Hochtief Aktiengesellschaft , German limited company.
Ibex 35	Índice Bursátil Español; Benchmark stock market index of Spain.
IMF	International Monetary Fund.
IRR	Internal Rate of Return.
km	Kilometer.
LTM	Refers to: Last Twelve Months.
m	Abbreviation used for million.
M&A	Refers to: Mergers and Acquisitions.
Medium-term Case	It refers to the valuation of Autostrade per l'Italia based on the business plan 6 months after the collapse of the Morandi bridge.
MM	Modigliani and Miller.
Moody's	Refers to the credit rating agency Moody's CreditView.
NPV	Net Present Value.
OECD	Organization for Economic Co-operation and Development.
OPEX	Operational Expenditures.
PE ratio	Price to Earnings ratio.
Pillar 9	Refers to the pillar of the Morandi bridge that collapsed on the 14th of August 2018.
PP	Refers to the Spanish political party: Partido Popular.
PPPs	Refers to Public-Private Partnerships; type of contract involved in infrastructure provision.
PSOE	Refers to the Spanish political party: Partido Socialista Obrero Español.
r_d	Pre-tax market expected yield to maturity of long-term debt.
r_e	Market value of expected return on equity.
REE	Refers to Red Eléctrica de España; Spanish corporation.
r_f	Risk free rate.
r_m-r_f	Market risk premium.
S&P	Refers to the credit rating agency Standard & Poor's.
Short-term Case	It refers to the valuation of Autostrade per l'Italia based on the business plan two days after the collapse of the Morandi bridge.
SPV	Special Purpose Vehicle.
t_c	corporate marginal tax rate.
The League	Refers to the Italian political party: Lega Nord per l'Independenza della Padania.
TV	Terminal Value.
V_U	Value of an unlevered firm.
WACC	Weighted Average Cost of Capital used as a Cost of Capital attributable to a corporation.
WC	Working Capital.
y-o-y	Year on Year.
σ_m	Variance of the market returns representing volatility of the market.

Chapter 1. Introduction

The largest M&A deal on the management of infrastructure business took place on May 2018, when Abertis was acquired by a consortium formed by ACS, Atlantia and Hochtief for an enterprise value of €32.1bn.

The deal took two years before completion due to the competing bids of the buyers and the strategic character of Abertis' assets for the Spanish Government, among other issues.

Briefly, Atlantia announced its intention to buy Abertis in May 2017 but a competing bid by ACS emerged some months later, locking the two companies in a bid war. An agreement sealed one year later between both companies created the basis for a joint bid.

The process ended with a 20.1% premium pre-rumor price paid to Abertis shareholders fully in cash, for a total equity value of €16,519.6m, equivalent to 18.36 €/share. As a result, the new consortium created a special purpose vehicle in October 2018, named Abertis Holdco, which was registered into the Mercantile Registry of Madrid, to control the new entity.

The rationale of the deal was to develop a new project in the long-term view, based on the experience that Hochtief and ACS have on the construction sector together with the expertise of Atlantia as a global operator of transportation infrastructure. Such strength, to be merged with the attractive and extensive assets that Abertis held, would allow to gain competitiveness of the businesses to all of them.

The new Abertis Holdco was funded with an equity contribution, totaling €6,909.3m and a debt contribution, primarily constituted of several bank loans, of €9,823.9m. The split of ownership agreed corresponded to 50% + 1 share for Atlantia, 30% for ACS, and 20% - 1 share for Hochtief. As a result, Atlantia is from year ended 2018 integrating Abertis on its consolidated accounts.

The disbursement effort that ACS, Atlantia and Hochtief committed was of considerable importance and, in 2019, refinancing operations to allocate it on the capital structure of each, to benefit as much as possible from the synergies derived had become a strategic priority for the corporates.

The resulting group, has linked two of the main construction entities in a global scale (ACS and Hochtief) with one of the major transportation infrastructure management portfolio of assets worldwide (Atlantia and Abertis), which will allow to diversify its risk, enhancing its global exposure and being able to compete for larger projects in consolidated and emerging markets where Public Private Partnerships to fund new infrastructure are gaining importance.

Apart from the challenges that the integration of Abertis would suppose for the entities, another event of significance took place on the 14th of August 2018.

That day, a section of the Polcevera road bridge, on the A10 Genoa-Ventimiglia motorway, collapsed under a heavy rain, leaving behind 43 deaths and more than 80 injured people which were travelling across the bridge in the city of Genoa.

The A10 motorway, is part of the infrastructure network managed by the concessionaire Autostrade per l'Italia, which since its privatization in 1999, is controlled by Atlantia. The concession is constituted of 3,020km of highways in Italy, almost half of the network of the country. Additionally, Autostrade represented for Atlantia c.65% of the EBITDA of the group, being then, one of its major assets.

Due to the collapse of the bridge, society was in shock, and the Italian government immediate reactions were to threaten with the revocation of the concession of Autostrade to Atlantia in a very short time. Consequently, the stock price of Atlantia suffered a great crash, and the group lost c.30% of its market capitalization in 2 days.

Six months after the event, investigations behind the collapse are being conducted by the government. The initial tempers have calmed down and a judiciary process has begun trying to determine who was the main responsible and how much should he pay for it. Further, the Italian government showed its predisposition in revising the current contractual agreements under all the concessions held and will decide whether they need to be modified or even revoked, which would suppose the nationalization of the assets.

On the other hand, Atlantia has shown its commitment with a collaborative spirit. The company assumed the costs related to the demolition and reconstruction of the new bridge, as well as the compensations payable to all the people which was directly affected by the collapse and estimated that it will be c.€509m. Also, they are convinced that there is no culpability from their side, as they complied with all the requirements established by contract, and thus, did not assume any prejudicing liability to be derived from the case in the future.

After the collapse, the threat of punishments to Atlantia raised the concerns, not only for the company itself, but for the implications that it could have on the acquisition of Abertis, limiting the viability of the refinancing needed and endangering the agreement reached among the parties. Emphasis was given on the lowering of the credit rating that the agencies did on Atlantia and Autostrade post-event. In particular, the investment community tried to assess how much would

be the added cost for the group to be supported, in a context where a high increase on leverage would take place upon consolidating Abertis debt.

Fortunately, Abertis was acquired as planned, and today, is seen as an asset of even more strategic importance for Atlantia, enabling the diversification of its business not only regionally but also in reputational terms.

The refinancing of Abertis acquisition was completed, and the effects for all involved entities from the Abertis contribution, as well as the collapse of the bridge are coming to light.

Finally, to mention that, for a more detailed view on the presented entities above, in the Appendix 1 a description of each entity and its main activities can be found.

1.1 Description and goals of the Thesis

Under the exceptional situation that the presented corporates are facing as a result of the sequence of events that took place in the last 2 years, being of major importance, the collapse of the bridge soon after announcement of the acquisition of Abertis, the authors will focus on the following points:

1- What has been the impact of this event on the acquisition of Abertis for all the involved parties?

The fact that the event took place soon after one of the most complex M&A transactions in the recent history (the biggest one in the management of infrastructure business) was finally accomplished a few months before, allows us to study how such an accident has impacted the materialization of the transaction and its involved entities as of today.

The operation, which involved the creation of a new shared SPV to gain control of Abertis, as well as the high leverage provided by banks to pay for the operation, are an area of interest to understand the mechanics of M&A financing.

In particular, the changes on corporate governance, shareholding structure, debt rating perceptions and acquisition finance conditions for Abertis will be analyzed for each of the participants.

2- How was the market reaction post-collapse and its evolution in time?

More specifically, it will be looked in detail the impact on the valuation of Atlantia since that day.

In order to do that, we will link the market information available at the time just right after the stock of Atlantia collapsed, to build a DCF. This new model will consider the potential losses of Autostrade's cash flows that the removal of the concession would bring to Atlantia and also the changes on WACC. The WACC, being the risk perception that the market had immediately post-collapse, and estimated by means of consensus of the market as well.

In a second stage, the impact of time is presented. A new model, considering the information available 6 months post event is built and the outcome is compared with the value right after the event.

Finally, the authors will seek to provide an analysis of the results and set up some empirical evidence and pragmatic relationships to assess the impacts of shocks in the enterprise value of firms. Emphasis will be put on the relationships between cash flows an WACC, and its evolution on time.

1.2 Structure of the Thesis

The thesis is structured in a way such that the answers to the 2 questions presented above are given, ensuring the reader gathers gradually the necessary context to understand the content presented.

The content has been split between 5 chapters plus additional information found in 7 Appendixes. For ease of clarity, a Glossary of Terms has also been provided and all the References used were listed.

Additionally, for having a comprehensive view of the work done, the thesis is accompanied with the valuation of Autostrade per l'Italia. The models developed were done in Microsoft Excel and have been a key element to conduct the analysis. Therefore, it is recommended for the reader to validate the outputs himself following the guidance given on the Appendixes 6 and 7.

In order to provide to the reader with a guide on what to expect on the following pages, as well as the possibility to filter the topics that could be of interest to him, in the following paragraphs the content on each chapter is explained.

Chapter 1 is the Introduction. The purpose of it is to present to the reader the list of events that justify the interest and uniqueness of this case study. Primarily, a summary of the events for the Abertis takeover, starting on April 2017, and the posterior collapse of the Morandi bridge, which took place on August 2018, are given. Some primary insights on the market shock following the disaster are stated and the situation as of 6 months post-collapse is outlined. Secondly, the financial and corporate valuation aspects of interest that aroused the curiosity of the authors, as well as the intentions that they pursue on this investigation, are explained, separated mainly in 2 questions, which are:

1. *What has been the impact of this event on the acquisition of Abertis for all the involved parties?*
2. *How was the market reaction post-collapse and its evolution in time?*

Chapter 2, the Historical Review of the Main Events, has the objective to provide to the reader a complete view on all what happened between April 2017 and end of February 2019. How such events affected the main corporates as well as all its stakeholders. The stakeholders include the main corporations, the respective governments of Spain and Italy and ultimately, the society. The chapter took the form of a journalistic reportage, and, for keeping the logic, it has been split in two parts:

1. In the first part, there is the review on how the acquisition of Abertis was conducted. Also, details about the conflicts of interests derived and the involvement on the Spanish government are given.

2. In the second part, the collapse of the bridge in Genoa is described. From the day that occurred, insight is given on the immediate reactions and on the social impact that it had. The evolution of the situation is presented. The reader can understand how the transition from the primary strong threats of the Italian government, claiming termination of the concession would occur immediately, towards the current status, with on-going investigations expected to last until Q3 2019, took place.

Chapter 3 main content and objectives are well summarized by the title "Analysis of the consequences of the collapse of the Polcevera viaduct". It has been divided in 2 main sub-chapters:

1. The first one is centered on the impacts that the collapse had for the owners of the concessionaire of the A10, Autostrade per l'Italia, and its parent company, Atlantia. To provide an answer to question 2 above, three main fields are studied on these corporates. Primarily, to observe what corporate governance changes took place. Secondly, how did shareholders react on the event and during the subsequent months. Finally, a detailed review on the financial impacts that the event supposed for the corporates and its shareholders is given. Emphasis is put at the beginning with the market crash, two days after the collapse. Next, credit rating agencies lowered the profile of the corporates on the view of probable future attributable costs in several forms of punishments. It is worth to mention that a detailed description of the implications of termination of the concession for all parties is detailed. Remember that, government reactions were the main fears that investors had at that time and the outcomes are still not clear, which increased the risk perception of the market towards the company's assets.
2. The second half aimed to determine which financial impacts were derived from the collapse towards the proper completion of the Abertis acquisition, and thus, to provide an answer to question 1. The primary financing terms and conditions that Hochtief agreed with the bank guarantors are presented. In a second stage, such conditions are benchmarked with the new refinancing packages used for the new Abertis Holdco. Note that, due to the delisting of Abertis from the Spanish stocks market upon acquisition, not all detailed information has been released. Therefore, the authors were limited to use public press releases from the corporates and the media at that time, which, in our opinion, were enough to conduct a proper study. Similarly, as in the first part, the impact on the shareholders for ACS and Hochtief was studied in detail. Finally, a review of the contribution that Abertis brought to ACS, Hochtief and Atlantia as of end of 2018 is given, extracted from the financial results presented by the entities at that time.

Chapter 4 is the most analytical part of the thesis. It is based on the results from the model build to value Autostrade and its purposes were mainly two. The first one, to conduct an independent assessment by means of the outputs of a DCF model on the valuation changes suffered by Atlantia due to the risks of losing Autostrade concession rights. The second one, was to study the market shock reaction from a technical point of view.

The chapter has been divided into 6 sub-chapters detailed below:

1. In the first part there is a review on valuation topics of interests and corporate valuation theory. This seeks to provide to the reader with the basics on how the DCF model was built. In addition, the main problem the authors aim to solve for valuation practitioners is presented. In short, the question to be answered is how under such an event, the valuation changes are explained by changes in cash flows vs changes in WACC.
2. The second presents the logic followed to conduct the study. Three different valuations of Autostrade were done. One before the collapse, which is known as the Base Case. A second one just right after the collapse, which considers the views that created the shock. Finally, a third one, as of 6 months from the event, considering the information available by end of February 2019.
3. Sub-chapters 3, 4 and 5 present the results obtained from the valuations. Business plans of Autostrade in each case were updated according to the information available, which modified the cash flows of Autostrade. The WACC attributable to Autostrade was computed proportionally to the Equity Value that the interest in Autostrade represented in Atlantia's market capitalization, according to the consensus from the Broker Reports.
4. The last point studies the outputs found from the analysis, with emphasis on cash flows and WACC changes in time. An indication of a new metric, $\frac{\Delta FCF(\%)}{\Delta WACC}$ is presented. The authors propose it as a way to assess, from a pragmatic point of view for practitioners, changes in enterprise value derived from events of similar nature.

Finally, Chapter 5 outlines the main conclusions derived from the case study. The authors also present additional research of interest that could be conducted on the topic and that fell outside the scope of the presented work.

Chapter 2. Analysis of ASPI's valuation: impact derived from the collapse

The aim of this chapter is to study how the valuation fundamentals change when valuing a company under such an event like the collapse of the Genoa Bridge. At the same time, to remark the distribution of risk through the FCF and the WACC as well as to develop a first multiple for future assessments of the impact in comparable disasters.

The chapter is divided in 6 parts. In the first part, the authors present a brief theoretical review about changes in valuation fundamentals. In the second part, the authors explain the process used in order to assess Autostrade per l'Italia changes. In the third, fourth and fifth part, the authors explain the results obtained in each of the three cases under study. Finally, in the sixth and last part, the reader can find a discussion of the results obtained.

2.1 Corporate valuation review and topics of interest derived from the collapse of the Morandi Bridge

The determination of the value of a company is a challenge being faced by many working in the finance industry.

Although applied in different contexts, bankers, asset managers, research analysts and investors, all need at some point to figure out what is the value of the assets hold by an enterprise to make rational decisions. The common way by which the enterprise value is defined is given by the following expression:

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Market Value of Debt} \quad (1)$$

Where,

$$\text{Market Value of Net Debt} = \text{Market Value of Gross Debt} - \text{Cash \& Market Securities} \quad (2)$$

Despite the definition being clear, the word "Market" makes it difficult many times to estimate straightforward both parts, either because not all enterprises are public, or because of inefficiencies on the market which could conduct to wrong valuations.

Two main approaches are currently being used by practitioners when trying to find the "true" value of the assets behind any company:

1. *Relative Valuation:* which compares the asset valuation based on multiples of relevant metrics (i.e. PE ratio or EV/EBITDA) with those of other comparable company's or versus the own historical valuation levels.
2. *Intrinsic Valuation:* based on the economics of the company itself and not on its current price. In that case, the value of any asset, is defined as a function of the cash flows that it generates, the expected growth of those cash flows, the useful life, and its risk.

This thesis is focused on Intrinsic Valuation methods, and, particularly, on the Discounted Cash Flow (DCF) method, being the one most commonly used in practice. According to the DCF, the Enterprise Value (EV) of a firm is defined as:

$$\text{EV}=\sum_{t=1}^{\infty}\frac{FCF_t}{(1+CC)^t}=\sum_{t=1}^{T}\frac{FCF_t}{(1+CC)^t}+TV \tag{3}$$

Where,

- FCF are operating Free Cash Flows to the firm available to all investors, prior to payments to bondholders but after reinvestment needs, and computed as:

$$\text{FCF}=\text{EBIT}\cdot(1\text{-Tax Rate})+\text{D\&A}-\Delta\text{WC}-\text{Capex} \tag{4}$$

- CC is the expected Cost of Capital (CC) or return required by the investors, which reflects the firm's business risk, in the sense that it is the cost of opportunity than an investor has by investing in the firm's assets and not doing it in another group of assets equally risky.
- Terminal Value (TV) is the later set of cash flows (CF), assuming an infinite life.

When building a DCF, the cash projections are estimated for a period in which the visibility of the Business Plan (BP) is realistic. Depending on the industry and type of firm, this period is going to vary largely, being the range typically between 5 to 10 years. For the remaining of the life, commonly projected to infinity, a Terminal Value (TV) is estimated.

Such a TV, following the same logic as before, can be determined using Relative Valuation or Intrinsic Valuation methods.

In Intrinsic Valuation, it is modeled as a perpetuity, using the last FCF_T projected and assuming a constant growth rate g, estimated under certain assumptions, which many times need to be adjusted and tested due to the large impact that it has on the outcome.

$$\text{TV}=\frac{FCF_t\cdot(1+g)}{(CC-g)}\cdot\frac{1}{(1+CC)^T} \tag{5}$$

In the case of a concessionaire business, applicable to this thesis, where the conditions are generally well specified by contract, (i.e. tariffs and timings set up a clear base to estimate revenues and to project its end), the TV is not used and FCF are projected until the expiration date.

On the FCF part of the equation, assumptions on the business plan projections of the firm must be done. Either insiders of the company and or research analysts from the financing sector will estimate what will be the key drivers of the business according to its strategy and market available information. Such assumptions are going to largely impact the results, and several scenarios and sensitivities on this, should be conducted. As an example, in the case of a toll road, traffic projections will be key to determine the volumes that will flow. From the number of users, we will find how much revenues the concession will be able to generate, based on the tariffs agreed.

Regarding the Cost of Capital to be used as a discounting rate, its determination has been linked commonly with the basis of modern financial theory. The 2 main ones used in a DCF are the Modigliani and Miller (MM) theory (1963) and the Capital Asset Pricing Model (CAPM - 1959).

On one hand, MM were awarded a Nobel Prize in Economics for pointing out that capital structure does not affect the value of the firm in perfect market conditions. On the other, Sharpe, Markowitz and Merton Miller jointly received a Nobel Memorial Price in Economics as well, for building a model which could describe the relationship between systematic risk (i.e. the uncertainties inherent to the entire market) and expected return for assets, particularly stocks.

A lot of research and effort in trying to proof and empirically test both theories have been conducted since its inception.

Commonly, proofs were based on the impossibility of arbitration and, thus, assuming perfect financial markets, being always right, which do not include the costs of bankruptcy (going-on concern) either the impact on taxes. However, the limitations on the real practice of such assumptions are evident and cast doubt on its applicability in corporate valuation techniques.

As a response, models which aim to be an evolution off the abomination original investigations had been developed and empirically validated. As an example, the empirical check for trade-off (the benefits derived from the tax-shield on debt) and the pecking order theory (how the cost of financing increases with asymmetric information) in the view of capital structure done by Fama and French (2002), or the stochastic modeling proposed by Strebulaev (2007), based on modelling a random change of the enterprise value and then changing capital structure for better.

Overall, consensus has not been reached, and the reality is that in common practice, many times sensitivities on the results play a much important role rather than the validity of the theory sustaining the methods used. In part, because the assumptions taken when building financial models are already more significant rather than the degree of validity of the theory itself.

As of today, and using the original MM and CAPM framework, the CC can be estimated by means of the Weighed Average Cost of Capital or WACC , defined as:

$$\mathrm{WACC} = \mathrm{r}_D \cdot (1 - t_C) \cdot \frac{D}{D+E} + r_E \cdot \frac{E}{D+E} \tag{6}$$

Where:

- r_D is the pre-tax market expected yield to maturity on long-term debt.
- t_C is the corporate marginal tax rate.
- D is the market value of long-term debt.
- E is the market value of equity.
- r_E is the market expected return on equity.

Following the MM theory, in perfect financial markets, if the capital structure of a firm does not have an impact on its future cash flows, then, both sides of the balance sheet should reflect the same and:

$$\text{Risk of Business Assets} = \text{Risk of Liabilities \& SHL's Equity} \quad (7)$$

Which justifies the use of the rates of return required by equity holders and debt holders as the same risks associated with the FCF that the firm can generate, i.e. the business risk.

Despite the formula being explicit, the word "Market" makes difficult the estimation of the parameters that should determine the value of WACC.

There are 3 main things that need to be estimated/adjusted which are discussed below:

1. Target Capital Structure (E and D)

The long-term capital structure target of the company should be the reference to be used as weights for the split among debtholders and shareholders' claims.

To do that, it is necessary to estimate the current capital structure based on market values of equity and debt and adjust it for any expected changes on management's financing philosophy in the future.

Market values will be easy to find in the case of securities marked to market (i.e. common stock, bonds etc..), but will require adjustments for items which are not, such as operating leases, minority interests and other book value assets not updated to the present conditions.

Additionally, benchmarking with other comparable companies will allow to understand better the results obtained. And, to check if the capital structure of today is something temporary due to ongoing changes or if there is any permanent difference with the peers.

The benchmark on comparable listed entities is key when we need to value private corporates. Market values on the equity and debt are not straightforward and using comparables is the best alternative used by practitioners.

2. Market Cost of Debt (r_D)

The approach to estimate the cost of debt consist in 3 steps:

- Firstly, to determine the bond rating of the debt. If the entity has bonds on the market, credit rating agencies will most probably provide this information. Otherwise, to benchmark with bonds and leverage ratios from comparable entities is the best alternative to use.

- Next, to find what is the yield spread that the market requires for corporate bonds of entities which have the same credit rating as the one of the corporate. Finally, add to it the 30-year government bond yield asked by the market.
- Thirdly, because interest payments provide tax deductions, it is necessary to convert the bond yields to an after-tax yield. Not doing it, considering the definition of FCF given in equation 4, would represent an underestimation of the FCF.

3. Market Cost of Equity (r_E)

The determination of the cost of equity takes as a reference the CAPM, and is defined as:

$$\mathrm{r}_E = r_f + \beta_E \cdot (r_m - r_f) \tag{8}$$

Where:

- r_f is the risk-free rate, normally it is taken as the yield on the 10-y or 30-y Treasury bond from the market (i.e. in North America is USA; in Europe is Germany).
- In the case of a concession, when visibility to the end is provided, the best is to match the time of maturity of the security with the date of expiration of the concession.
- $(r_m - r_f)$ is the market Risk Premium, usually taken as the average of excess returns of equity compared to treasury bonds in a reasonable period of time, which will be able to smooth effects of economic cycles. Values between 6-8% are commonly used.
- β_E is the measure of exposure of the company or group of assets to the market risk, and is estimated as a time-series regression of r_E and r_m:

$$\beta_E = \frac{Cov(\tilde{r}_E, \tilde{r}_m)}{\sigma_m^2} \tag{9}$$

Where:

- σ_m^2 is the variance of the market returns (i.e. the volatility of the market)

In order to estimate the β_E of a firm, either listed or not listed, many practitioners do not run the regressions themselves, but look at the consensus of the market provided by analysis of broker reports on the company and among its comparables.

It is common to look for betas of comparable firms in the industry and take the average among them.

However, the riskiness of equity is closely linked with the leverage that a firm has, because of the higher priority that debtholders have over shareholders in the case of bankruptcy (i.e. cash flows generated will first serve debtholders, thus, the higher the leverage, the higher the risks and the higher the beta of the equity).

Leverage is an effect that must be removed from comparable companies to determine the beta of the assets of the firms before averaging them. Finally, the value obtained, must be releveled using the capital structure of the company under study.

Therefore, following the same reasoning presented on equation 6 on the right side of the balance sheet, we could define the β_A of a firm as the sum of the contributions of a β_D on debt and of a β_E on equity as follows:

$$\beta_A = \beta_D \cdot (1-t_C) \cdot \frac{D}{D+E} + \beta_E \cdot \frac{E}{D+E} \tag{10}$$

Which should be equivalent to the beta from the asset side:

$$\beta_A = \beta_U \cdot V_U + \beta_{TS} \cdot D \cdot t_C \tag{11}$$

Considering the value split in the form of an unlevered firm V_U, plus an additional contribution attributable to the tax-shield effects on debt, that have a value of $D \cdot t_C$.

To determine the β_U as a combination of equation 10 and 11, assumptions are taken.

If it is assumed that a firm targets or has a fixed leverage ratio, and that debt is riskless, it can be proved that the $\beta_{TS} = \beta_U$ and the $\beta_D = 0$.

In that case, the level of debt will fluctuate with the value of the firm, and, consequently, the value of the tax shield will move as well to consider the debt adjustments which leads to:

$$\beta_U = \beta_E \cdot \frac{1}{1+\frac{D}{E}} \tag{12}$$

On the other hand, if it is assumed that a firm will aim to keep a constant level of debt, then $\beta_{TS} = \beta_D$ and:

$$\beta_U = \beta_E \cdot \frac{1}{1+(1-t_C) \cdot \frac{D}{E}} \tag{13}$$

Experience says that the differences observed in using one or other method are not significant, nevertheless, equation 13, known as Hamada's Equation (Robert Hamada, 1972) has imposed its dominance on finance practitioners worldwide.

The objective of this subchapter 4.1 aims to show that the theory behind building a DCF is not an exact science, and it involves many assumptions derived from the limitations of the models developed in financial theory, and, particularly, on the estimations of WACC.

This brings uncertainty with regards the validity of the EV derived from financial models, but, as of today, and from a pragmatic perspective, there is no better alternative, and the DCF is used and trusted by many practitioners in finance.

Remembering the case of the collapse of the bridge, it created a market shock for Atlantia that has its interest to be studied further.

The Equity Value (and so the EV) was severely affected in a very short period due to the uncertainties of the consequences with regards to Autostrade per l'Italia's future hands.

Thus, the main goal, will be to empirically study this event, putting emphasis on how the market reaction took place, applying the DCF methodology, and developing some metrics that could be of usefulness in assessing the impacts of potential future shocks in corporations when modeling scenarios.

To develop further on the mentioned above, after the shock of the collapse of the bridge, the EV of Atlantia, computed by means of a DCF, was lowered by the two main components presented in equation 3:

1. The FCF contribution of Autostrade to Atlantia became not clear anymore.
2. The risk of the business assets increased. Primarily, the cost of debt was expected to be higher due to a lower on the credit rating, next, the beta was also affected because of the higher volatility that the shock brought to the market.

Understanding how those two factors impacted the EV changes in the shock, based on market information at a given time, is of usefulness for practitioners to be able to simulate future crashes in a very pragmatic way, as will be presented on the following chapter.

Particularly, the event sets up an ideal framework to know how much weight FCF had on valuation changes compared with the changes attributable to the WACC just right after the event, and how did evolved later in time, as more information was made available.

In fact, previous research, conducted by Cochrane (2011) proved that price volatility was largely depending on discount rates volatility rather than on the volatility of cash flows. However, the results were determined for stock exchange indexes and over long periods of time, which cast doubt on the general applicability. The collapse of the Morandi Bridge is a good example to test whether such a theory can be extended further to extreme events as well.

2.2 Description of the methodology

As described previously, this chapter is centered in the impact that the collapse of the Genoa bridge has had in Autostrade per l'Italia valuation fundamentals. These valuation fundamentals can be classified primarily in (i) the Free Cash Flows (FCF) and (ii) the WACC of the company which in aggregate give place to the valuation of Autostrade.

In order to capture how both the FCF and the WACC have changed due to the collapse, the authors have first considered a Base Case which reflects the value of Autostrade before the collapse.

In this way, the authors have been able to calibrate the intrinsic valuation of the company as well as to obtain values of reference for both, the FCF and the WACC, without the implications that the collapse had.

Once the authors had a first valuation of reference, two more have been calculated: a short-term valuation (Short-term Case) and a medium-term valuation (Medium-term Case).

Both cases are after the collapse of Genoa bridge so, they incorporate the information that the company was publishing at that time, as well as the market beliefs regarding the concession (i.e. the regulatory risk). Note that by having two cases after the collapse the authors are able to study two effects: the effect of time and the effect that the disclosure of information has in the valuation fundamentals.

Once the three business plans are projected, the authors can obtain information regarding the evolution of how valuation fundamentals evolve over time, and more important, an approximation of how changes in valuation are distributed between changes in FCF and changes in WACC.

For ease of clarity, see below a timeline of the different cases vs the performance of both, the volume and the stock price of Atlantia.

Figure 2.1 Stock price volume chart of ATL (ticker: ATL.MI). Source: Atlantia, 2019.

Remember that Autostrade is currently a subsidiary of Atlantia, and a private company, which means that valuation changes in Autostrade are not directly public. But it is done in an indirect way through Atlantia share price. This is an important point since in order to adjust the different valuations the authors needed to calculate through broker consensus the Autostrade's relative weight in the equity value of Atlantia. This point will be covered in more detail in the next subchapters.

2.3 Base Case scenario

The Base Case is dated the day before the collapse, so, August 13th, 2018. Thus, the case does not incorporate any of the impacts or potential impacts that the event caused. What incorporates is the latest financials that Autostrade disclosed before the event, which are the ones concerning 6M 2018 (period end June 30, 2018).

The authors valued Autostrade projecting in a very detailed way the different sub-concessions of the company.

In order to do so, it has been used Broker Reports[1], Sector Reports, Autostrade's concession agreements and its variations, news, disclosed financials and data bases, among others. A detailed guide on how the authors projected Autostrade can be found on Appendix 6.

Once Autostrade per l'Italia is projected, which implies that the distribution of the FCF is obtained, the authors calculated the WACC at that moment by adjusting the DCF according with the proportion of Equity Value that the interest in Autostrade represents in Atlantia Market Value, according to Broker Reports. Under the Base Case, the Equity Value (EqV) of Autostrade represents 66.3% of the total Market Value of Equity of Atlantia at that date (see Table 4.1).

Broker	Date	Broker estimates
		% EqV ASPI/ATL
Base Case		
RBC Capital Markets	23/05/2018	80.3%
Societe Generale	24/05/2018	64.2%
J.P. Morgan	06/06/2018	N/A
UBS	08/06/2018	65.0%
Macquarie Research	13/07/2018	N/A
Banco Santander	24/07/2018	59.2%
Equita	06/08/2018	62.9%
Average Base Case		**66.3%**

Table 2.1 Proportion of Equity Value that represents ASPI over the market value of ATL as of August 13th, 2018. Source: Broker Reports.

With this proportion and the projections in mind, the authors obtained a WACC as of August 13th, 2018 of 5.9%. However, this WACC is not Atlantia's WACC, but the WACC of Autostrade per l'Italia since the valuation is done in a standalone way.

This also implies that from now onwards, changes in the Market Value of Equity represent direct changes in the valuation of Autostrade since the other Atlantia's divisions are considered to not have a considerable impact during the period in study. This is a strong assumption taken under this study.

See below Autostrade's valuation what does this WACC under the Base Case scenario imply:

[1] Brokers Reports used: RBC Capital Markets, Equita, Banco Santander, Société Générale, J.P. Morgan Cazenove, UBS, Macquarie Research, Kepleur Cheuvreux and Morgan Stanley. Period of covering: 11/09/2017 – 28/02/2018

Valuation	
Enterprise Value	**29,589**
EV/EBITDA 19E	*11.2x*
Net Debt	9,176
Investments accounted for at cost or fair value	44
Investments accounted for using the equity method	26
Equity attributable to non-controlling interests	346
Non-current portion of provisions for construction services required by contract	2,531
Non-current provisions	1,269
Current portion of provisions for construction services required by contract	641
Current provisions	217
Equity Value (100%)	**15,478**
% stake	88.1%
Equity Value associated to ATL	**13,630**
Number of shares in issue (m)	826
Price per share associated to ATL (€/share)	**16.5**
Price per share ATL 13/08/18	24.9
% ASPI/ATL	*66.3%*

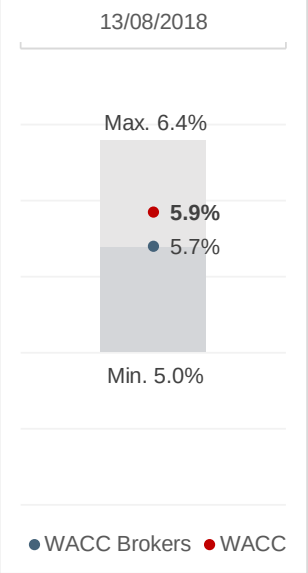

Figure 2.2 Valuation of ASPI under the Business Plan of the Base Case. Source: own source.

Note that both, the valuation as well as the WACC obtained in this case are in line with market beliefs which under such a private company, could be considered to be the aggregate of the Broker Reports' opinion.

Since in the next scenarios (short and medium-term), the model will be modified in order to incorporate the impact of the fall of Genoa Bridge, the authors considered of interest to run sensitivities in the model.

For your reference, see below a figure which provides information regarding the main sensitivities of the Business Plan. Note that since it is a toll road operator, the item that has more impact on the valuation is the GDP growth because all the traffic growth is linked to GDP, using traffic multipliers (econometric model of 1 independent variable).

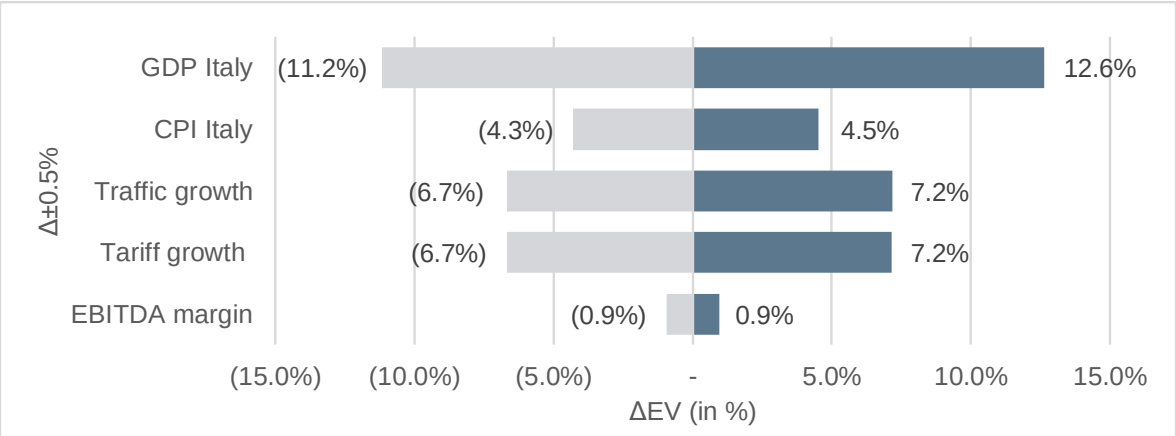

Figure 2.3 Valuation sensitivities. Source: own source.

You can find a summary of the Business Plan of the Base Case in the Appendix 7.

2.4 Short-term reaction after the collapse

The Short-term Case tries to include all the market beliefs that investors had due to the collapse of the bridge and to calculate how fundamentals changed. These reactions have already been covered in previous chapters of this thesis but, in order to summarize them in a more practical way, the authors aggregated how Brokers updated their Autostrade per l'italia models (as an immediate reaction to the fall).

These reactions could be considered as the reactions under a market efficient environment since they reflect news, press releases and other ways of information from both, the company (Atlantia or Autostrade per l'Italia) and the Government.

See below the short-term reactions to the fall of the Genoa Bridge, both the facts from Atlantia (that by that time it did not disclosed anything) and the market beliefs represented by the Brokers' opinion:

Updates regarding the FCF of ASPI	Facts from ATL	Market beliefs		
		Minimum	Average	Maximum
Post-event (short-term reaction)				
Total provisions (including Genoa bridge provision)	N/A	€500m	€750m	€1bn
Time for reconstruction of Genoa bridge	N/A	8 months	2 years	3 years
ASPI's maintenance opex	N/A	c.30% increase until 2025	c.40% increase until 2025	c.50% increase until 2025
Traffic impact	N/A	2% downside forecasts for the period 2018-21		
Tariff impact	N/A	N/A		
ASPI's extension due to the Bypass project	N/A	ASPI extension seems more difficult		

Table 2.2 Impacts due to the collapse of Genoa Bridge: facts from ATL vs Market beliefs (short-term reaction from Broker Reports). Source: Broker Reports, News and Financial Reports.

As you can see in the above table, the main market beliefs were:

- Provisions: estimated to be in average €750m. According to Atlantia at that time, it was insured against such events. However, according to Broker Reports it was ultimately responsible for maintenance and any negligence could avoid this insurance. The total €750m value is composed of the fine suggested by Danilo Toninelli, Minister of Infrastructure, the estimated cost to rebuild the bridge and additional compensatory damages.
- Time for reconstruction of the Genoa Bridge.
- Increase in Autostrade's maintenance OPEX since the beliefs were that all bridges in Italy may be subject to immediate inspection and maintenance.
- Traffic impact: the general belief was that the traffic would be impacted because the A10 was a feeder road for several other motorways and the rebuild would take an average of 2 years. In addition, additional inspections could decrease the traffic in Italy.
- Tariff impact: no comments regarding impact on tariff increases was mentioned at that time.

- Autostrade's extension due to the Bypass project: according to Broker Reports, the aggregate opinion was that due to the conflict with the Government, the extension could be delayed further or even canceled.

The Short-term Case has been constructed from the Base-Case by applying these modifications in the Business Plan.

Once the new FCF were projected, and similarly as it was done in the Base Case, the WACC has been obtained by adjusting the DCF with the proportion of Equity Value that the interest in Autostrade per l'Italia represents in Atlantia Market Value.

Under the Short-term Case, the Equity Value (EqV) of Autostrade per l'Italia represents 53.6% of the total Market Value of Equity of Atlantia at that date (see Table 4.3). Note that, obviously the proportion at this time is lower than the one obtained in the Base Case.

Broker	Date	Broker estimates
		% EqV ASPI/ATL
Short-term Case		
RBC Capital Markets	14/08/2018	N/A
Equita	16/08/2018	54.9%
Macquarie Research	16/08/2018	52.0%
J.P. Morgan	21/08/2018	N/A
UBS	29/08/2018	58.0%
Banco Santander	05/09/2018	49.4%
Average Short-term Case		**53.6%**

Table 2.3 Proportion of Equity Value that represents ASPI over the market value of ATL as of August 16th, 2018. Source: Broker Reports.

With this proportion and the projections in mind, the authors obtained an Autostrade's WACC as of August 16th, 2018 (the next day were markets were open after the fall of the bridge) of 6.6% (vs 5.9% in the Base-Case).

See below Autostrade's valuation what this WACC, under the Short-term Case scenario, represents:

Valuation	
Enterprise Value	**24,060**
EV/EBITDA 19E	*9.6x*
Net Debt	9,176
Investments accounted for at cost or fair value	44
Investments accounted for using the equity method	26
Equity attributable to non-controlling interests	346
Non-current portion of provisions for construction services required by contract	2,531
Non-current provisions	1,269
Current portion of provisions for construction services required by contract	641
Current provisions	217
Total provisions (including Genoa bridge)	750
Equity Value (100%)	**9,199**
% stake	88.1%
Equity Value associated to ATL	**8,101**
Number of shares in issue (m)	826
Price per share associated to ATL (€/share)	**9.8**
Price per share ATL 16/08/18	18.3
% ASPI/ATL	*53.6%*

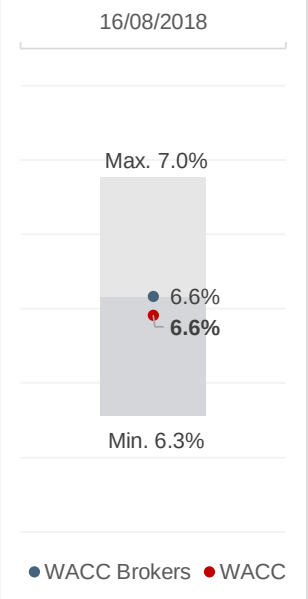

Figure 2.4 Valuation of ASPI under the Business Plan of the Short-term Case. Source: own source.

It is worth to mention that Brokers (and investors) had a lot of difficulty to quantify the future Equity Value impact. Most of them changed its previous DCF or DDM valuations of Autostrade per l'Italia for scenarios analysis. However, the most common choice was to increase Autostrade's WACC which now discounts an increased regulatory risk as well as all the uncertainties that are not incorporated in the FCF. That's the reason why it increased by 0.7%.

Autostrade's valuation after the collapse was impacted mainly by the market beliefs of traffic decrease, since the model is highly sensible to this item. In the side of the FCF, it is also worth to estate the impact of the Autostrade's extension due to the Bypass as well as the provisions.

For more detail about how the different market beliefs regarding the FCF/WACC impacted the valuation of Autostrade's attributable price per share, see Figure 4.5.

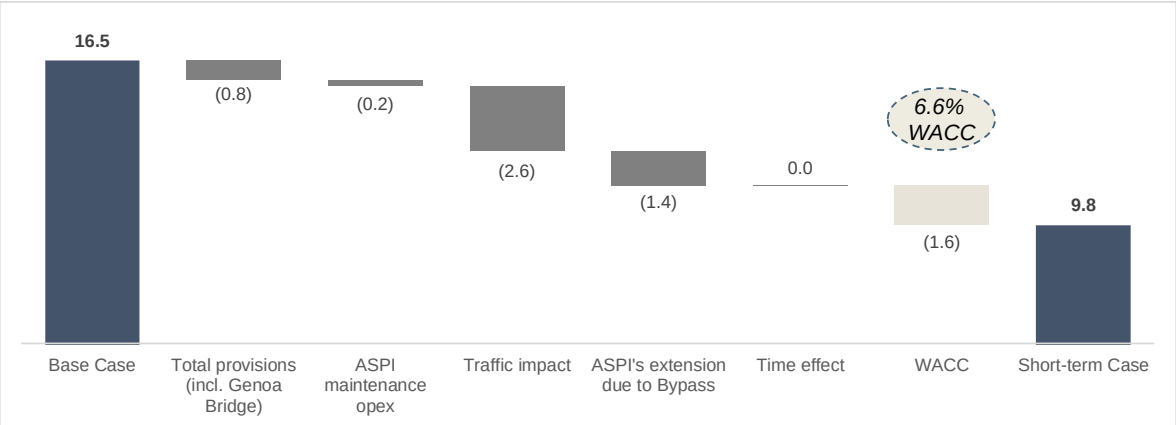

Figure 2.5 Bridge of ASPI's price per share associated to ATL (€/share): Base Case vs Short-term Case. Source: own source.

You can find a summary of the Business Plan of the Short-term Case in the Appendix 7.

2.5 Medium-term reaction after the collapse

The Medium-term Case includes not only the market beliefs from investors (medium-term reaction) but also the facts from the company (and government) incorporated in both press releases as well as the financials of 9M 2018 (period end September 30, 2018). So, it could be seen as a way to study how the impact of reliable information during the process and time affected the valuation fundamentals of Autostrade per l'Italia.

The reactions have already been covered in previous chapters of this thesis but, in order to summarize them in a more practical way, the authors aggregated how Broker updated their Autostrade's models (as a medium-term reaction).

These reactions could be considered as the reactions under a market efficient environment since they reflect news, press releases and other ways of information from both the company (Atlantia or Autostrade) and the Government.

See below the medium-term reactions to the fall of the Genoa Bridge, both the facts from Atlantia and the market beliefs represented by the Brokers' opinion:

Updates regarding the FCF of ASPI	Facts from ATL	Market beliefs		
		Minimum	Average	Maximum
Post-event (long-term reaction)				
Genoa bridge provision	€350m			
Time for reconstruction of Genoa bridge	1 year			
Extra provisions (fines and others)	N/A	€150m	€200m	€250m
ASPI's maintenance opex	N/A	c.15% increase until 2025	c.22.5% increase until 2025	c.30% increase until 2025
Traffic impact	N/A	2% downside forecasts for the period 2018-21		
Tariff impact	Freezing of ASPI's tariffs for 6 months (1H19)			
ASPI's extension due to the Bypass project	N/A	Expected delays in the approval to lead to capex postponement (stand-by situation). More visibility in capex rather than tariffs scheme		

Table 2.4 Impacts due to the collapse of Genoa Bridge: facts from ATL vs Market beliefs (medium-term reaction from Broker Reports). Source: Broker Reports, News and Financial Reports.

As you can see in the above table, the main facts and market beliefs were:

- Genoa Bridge provision: Atlantia published 9M results, announcing it had booked a €350m provision associated with the potential reconstruction of the Polcevera Bridge and help the affected families in Genoa.
- Time for reconstruction of Genoa Bridge: despite Brokers' opinion that the timetable for the reconstruction of the bridge is ambitious, this is contractually a fact from Atlantia (announced late December 2018).
- Extra provisions of Genoa Bridge: according to Brokers, the provision is exceptionally modest. That's the reason why they included extra provisions in order to cover fines and other damages, among others.
- Increase in Autostrade's maintenance OPEX: estimates have been decreased with the new information provided.
- Traffic impact: without changes.

- Tariff impact: Autostrade per l'Italia tariffs freeze for 1H19 which was announced on January 1, 2019.
- Autostrade's extension due to the Bypass project: after the collapse, the Italian Government received more pressure to approve the Genoa Bypass project. Since it has several budget constraints, which could make it difficult to manage this in case of a revocation of the concession, Brokers belief that this plan will be approved by the regulator next year as expected before the collapse.

The Medium-term Case has been constructed from the Base-Case by applying these modifications in the Business Plan. Once projected the new FCF, and similarly as it was done in the Base Case, the WACC has been obtained by adjusting the DCF with the proportion of Equity Value that the interest in Autostrade represents in Atlantia Market Value.

Under the Medium-term Case, the Equity Value (EqV) of Autostrade represents 58.7% of the total Market Value of Equity of Atlantia at that date (see Table 4.5). Note that, the proportion at this time is still lower than the one obtained in the Base Case.

Broker	Date	Broker estimates
		% EqV ASPI/ATL
Medium-term Case		
Kepleur Cheuvreux	27/09/2018	N/A
Macquarie Research	12/11/2018	N/A
Banco Santander	21/01/2019	56.5%
Equita	07/02/2019	61.7%
Societe Generale	08/02/2019	60.6%
RBC Capital Markets	28/02/2019	56.0%
Average Medium-term Case		**58.7%**

Table 2.5 Proportion of Equity Value that represents ASPI over the market value of ATL as of February 28th, 2019. Source: Broker Reports.

With this proportion and the projections in mind, the authors obtained an Autostrade's WACC as of February 28th, 2019 of 6.3% (vs 5.9% in the Base-Case). See below Autostrade's valuation what this WACC, under the Medium-term Case scenario, imply:

Valuation	
Enterprise Value	**25,791**
EV/EBITDA 19E	*10.3x*
Net Debt	8,789
Total Investments	83
Equity attributable to non-controlling interests	353
Non-current portion of provisions for construction services required by contract	2,338
Non-current provisions	1,269
Current portion of provisions for construction services required by contract	709
Current provisions	564
Extra provisions	200
Equity Value (100%)	**11,652**
% stake	88.1%
Equity Value associated to ATL	**10,261**
Number of shares in issue (m)	826
Price per share associated to ATL (€/share)	**12.4**
Price per share ATL 28/02/19	21.2
% ASPI/ATL	*58.7%*

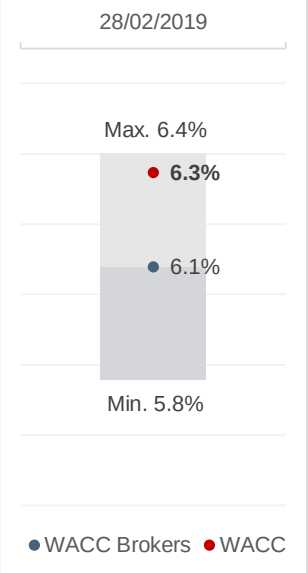

Figure 2.6 Valuation of ASPI under the Business Plan of the Medium-term Case. Source: own source.

Despite the new financials, it is worth to mention that Brokers (and investors) still have a lot of difficulty to quantify the future Equity Value impact. However, it decreased 0.3% vs the Short-term Case which means that certainty about the impact has improved.

Autostrade's medium-term valuation after the collapse was impacted mainly by the market beliefs of traffic too. In the side of the FCF it is also worth to mention the impact of the Autostrade's tariffs freeze for 1H19.

For more details about how the different market beliefs regarding the FCF/WACC impacted the valuation of Autostrade's attributable price per share, see Figure 4.7.

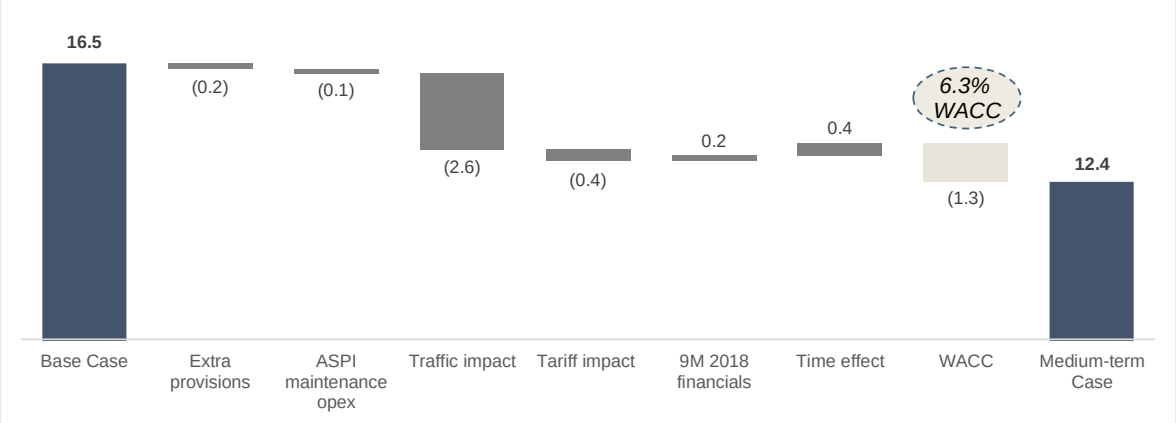

Figure 2.7 Bridge of ASPI's price per share associated to ATL (€/share): Base Case vs Medium-term Case. Source: own source.

You can find a summary of the Business Plan of the Medium-term Case in the Appendix 7.

2.6 Discussion about the results

As discussed in the introduction of this chapter, understanding how the valuation fundamentals impacted the valuation in the shock, based on market information at a given time, is of usefulness for practitioners to be able to simulate future crashes in a very pragmatic way.

Particularly, the event sets up an ideal framework to know how much weight FCF had on valuation changes compared with the changes attributable to the WACC just right after the event, and how did evolved later in time, as more information was made available.

Using a multiple like:

$$Multiple = \frac{\Delta FCF(\%)}{\Delta WACC} \tag{14}$$

We are able to compare how percentual changes in FCF (relative to a base case), i.e. linked to a disaster, is able to explain changes in WACC.

The results obtained in both, the Short-term Case and the Medium-term Case (showed in Figure 4.8) demonstrate that in the case of Autostrade per l'Italia its valuation change tends to be more guided by FCF changes. It is normal since the impact of disasters like the fall of the Genoa Bridge are well known by investors since the costs of damages as well as externalities are commonly well projected.

The results also show how the impact of time and disclosure of more information affects this multiple. The multiple in the Medium-term Case compared with the Short one is lower since the FCF projections, estimated in the Short-term Case, were largely exaggerated by investors. However, the impact on WACC was also exaggerated but it has recovered less compared with the FCF due to the still uncertainty regarding Autostrade's concession.

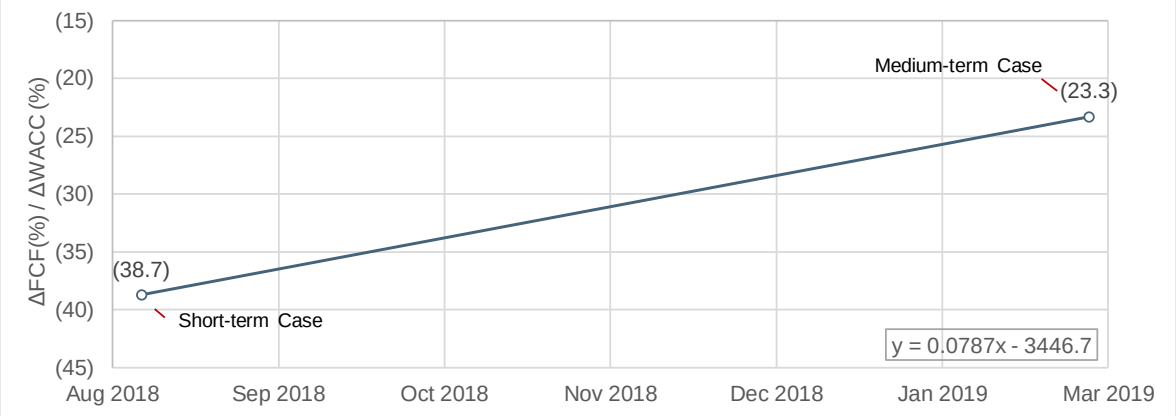

Figure 2.8 Relationship between the variation of FCF and WACC after the collapse of the Genoa Bridge. Source: own source.

The authors included the Figures 4.9 and 4.10, in which the reader can see how the impact on FCF and WACC changed over time. It is of relevance to see how uncertainty regarding valuation fundamentals affects more the WACC that the FCF.

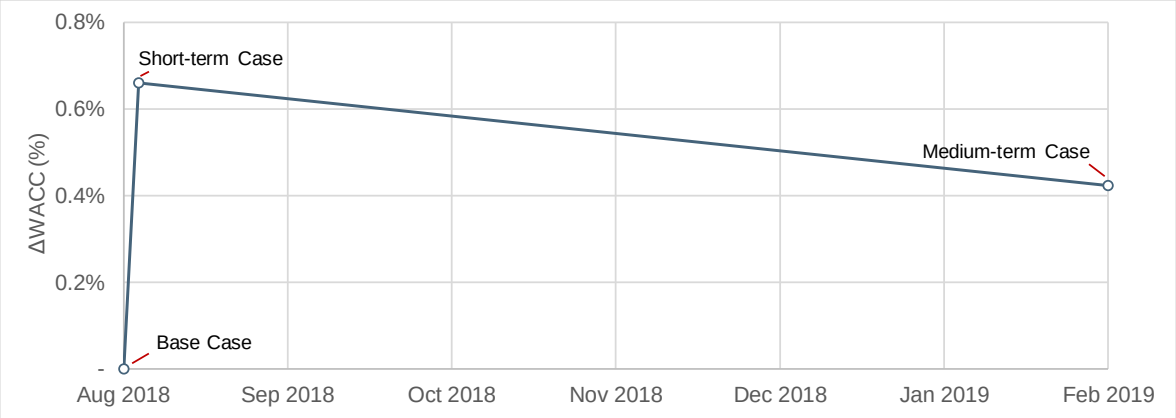

Figure 2.9 Evolution of WACC vs time after the collapse of the Genoa Bridge. Source: own source.

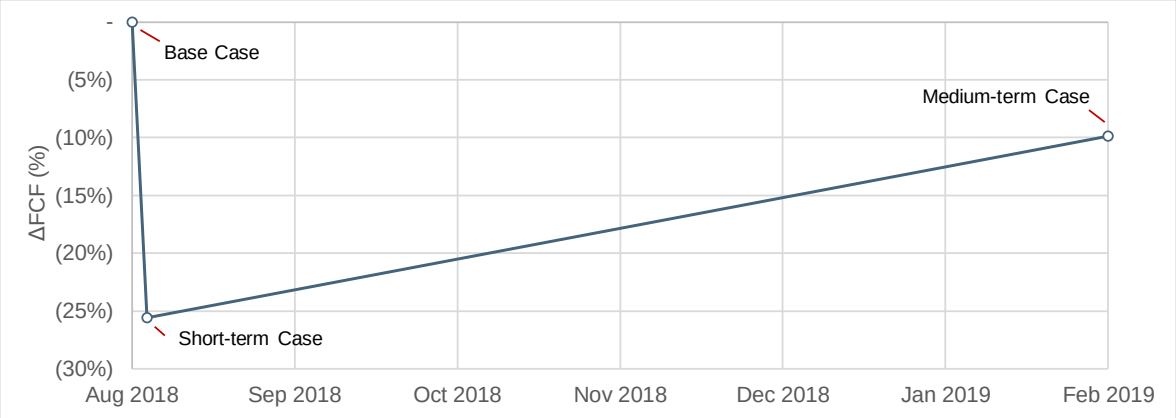

Figure 2.10 Evolution of FCF vs time after the collapse of the Genoa Bridge. Source: own source.

The authors want to remark that the results regarding the calculation of multiples should be seen in a critic way. These results are for Autostrade's concession and the authors understand that the distribution of FCF, the sector of the company, as well as the specificity of infrastructure assets ruled by agreements, among other things, can have an impact on them.

Further research about the impact on this kind of events is necessary in order to prove its applicability but, as a first and quick reference, these multiples could be used for assessing events comparable in nature with the fall of the Genoa Bridge.

Chapter 3. Conclusions and further research

This thesis presented a case study on the valuation changes and implications derived from the collapse of the Morandi bridge in Genoa that took place on the 14th of August 2018. Additionally, it provided a review on the takeover bid of Abertis leaded by Hochtief, ACS and Atlantia, and how the disaster impacted the M&A transaction which was not finalized by that time.

The authors have worked to provide an answer to two questions and the main conclusions extracted from the research for each of them are presented below:

1- What has been the impact of this event on the acquisition of Abertis for all the involved parties?

The authors conclude that the impact on the M&A transaction that the collapse of the Morandi bridge has had as of end of March 2019 are very limited or even inexistent.

The main points which supports this statement are outlined below:

1. Abertis was acquired as it was primarily intended, the new Abertis Holdco was able to get appropriate financing, which took place in October 2018, post-collapse.
2. The information facilitated by credit agencies, keeping the "BBB" level and improving the outlook, and the results reported by Atlantia, ACS and Hochtief, all indicate that the endurance of the conditions in debt terms from bank loans established to constitute the new Abertis Holdco was minor.
3. Despite the crash that the accident supposed for Atlantia, the market reaction for ACS and Hochtief was not very strong. Moreover, stocks performed differently from Atlantia post-collapse. This indicates that there is a low correlation between the entities and that Abertis is seen as independent entity by the investor community.
4. The refinancing operations conducted during the years 2018 and 2019 in Abertis Infraestructuras and in Abertis Holdco, considering the c.€3bn in notes placed in March 2019, improved the cost of debt profile of Abertis and its owners, despite having a higher leverage and commitments upfront.

Nevertheless, time will tell if the outcomes of the investigations, and potential punishments in Atlantia, will change the conditions for getting future financing, despite the efforts made in presenting Abertis as an independent entity that have worked successfully to complete the transaction.

2- How was the market reaction post-collapse and its evolution in time?

The main conclusions extracted from the analysis on valuation changes of Atlantia's market crash derived from the collapse of the Morandi bridge are:

1. The market over-reacted immediately after the shock. Investors were afraid of the removal of the concession of Autostrade that the government strongly reiterated in the first days, which explains the 30% stock price drop that occur immediately after the event.
2. The government of Italy was the main driver of the over-reaction. Its statements were done without enough information regarding the viability of terminating the concession of Autostrade. Either legally, nor the economic impacts for the country were considered when the leaders of the political parties primarily commented on the issue, in an aim to calm down society. A good proof of that is how the situation has evolved as of March 2019. On-going investigations to determine the degree of real culpability attributable to all parties, as well as the best way to proceed in order to minimize the costs derived for all are being studied.
3. The stock price of Atlantia is still depressed, with additional risk attributed to it due to no visibility on what the final consequences will represent for them. Costs incurred as of end of March 2019 have been limited and provisioned by the company at c.€500m. Atlantia and Autostrade, both performed changes on its management structure aiming to bring confidence to the investment community and to its shareholders. Shareholders that reacted in an accordion mode, divesting at the time of the event and coming back to its original position 6 months later.
4. The impact on enterprise value changes seen in Atlantia just right after the event (short-term) was mainly attributable to the cash flows endangered from Autostrade. Cash flows explained 76% of the drop in the attributable share price of Atlantia, being traffic and penalties the two main contributors. WACC and risk perception, according to Broker consensus, represented 24% of the drop in the share price. When looking at the numbers, the FCF decreased by +25% and the WACC increased from 5.9% to 6.6%, which is a +11.9% in percentage terms.
5. The impact on enterprise value seen in Atlantia 6-months post event (medium-term) is still mainly explained by the potential decrease on cash flows attributable to Autostrade. However, there has been a reduction on the weights. Cash flows explained the change in valuation by 67% while WACC has a weight of 33%. The WACC has been reduced slightly, from 6.6% to 6.3%. This proofs that, in the medium term, uncertainty on the outcome is valued more by the market as cash flow visibility impacts have improved considerably and are more tangible.
6. A new multiple establishing the relationship between cash flows and WACC has been determined for the event in 2 sequences of time. The multiple is expressed as:

$\frac{\Delta FCF(\%)}{\Delta WACC}$. The authors propose this multiple as a source to predict future disasters of similar nature.

To finalize, the authors would like to propose further research from the study that would be of interest for the academics and later directly applicable on the day to day of practitioners.

From a corporate finance and valuation perspective, the authors suggest conducting empirical validation of the presented ratios $\frac{\Delta FCF(\%)}{\Delta WACC}$. Primarily, using data on similar events that occurred in the past, and filtering according to the industry.

It is of logic to believe that the particularities of the concession terms governing Autostrade make cash flow projections rather straight forward while, in some other cases, risk perception could be higher and thus, the ratios applicability could be limited.

In a second phase, it would be useful to determine in which specific areas practitioners could find such ratios an interesting tool to incorporate on its sensitivity analysis. The authors thoughts go towards project finance, for the infrastructure, energy and mining sectors.

On the other hand, a benchmark on the financial implications observed in the thesis, versus the loss of welfare to society that the collapse of the Morandi bridge had could also be conducted.

More specifically, the degree of fairness of the financial and reputational costs payed by Atlantia and the Italian political class, with the real impact that it had for society in an event which involved multiple deaths and damage to property and businesses from the city of Genoa should be determined.

Also, this is linked with the complexities behind PPPs. The authors propose to put emphasis on the responsibility sharing clauses from the contracts established to determine certain recommendations on improving its effectiveness as a tool to finance infrastructure. This is of high importance in a moment where PPPs popularity is increasing in a global scale.

Appendix 1. Presentation of the main corporates

A1.1 Abertis Infraestructuras

Abertis Infraestructuras, S.A. (Abertis) is a Spanish Company, registered in Madird. The 98.7% of company shares are hold by Abertis Holdco, entity constituted the 29th of October 2018 on purpose and in a conjoint agreement for the voluntary takeover bid presented by Hochtief that took place in May 15th 2018. Their main shareholders are Atlantia (50% + 1 share), ACS (30%) and Hochtief (20% - 1 share), which reached an agreement on the control of the company in April 2018, ending with a complicated transaction which commenced in May 2017.

Abertis main activity is in the toll road concession business. They build, maintain and operate highways in Europe, America and Asia, managing 8,648 km of roads with various concessions. They also provide electronic tolling, free-flow tolling and smart motility solutions from its subsidiaries, Emovis and Eurotoll.

A1.2 Actividades de Construcción y Servicios

Actividades de Construcción y Serivicios S.A. (ACS) is a Spanish limited entity. It is listed on the Spanish Stock Exchange, being part of the Ibex 35 index, and registered in Madrid Its main shareholder is the Chairman of the group, Mr. Florentino Pérez Rodríguez, whose ownership amounts to 12.7%.

The company offers a diversified amount of services within the infrastructure space, which can be divided in 3 segments. Primary, they carry infrastructure development and residential construction works, building of new projects and construction of new mines. Secondly, they provide engineering, installation and maintenance services for industrial infrastructure in energy plants and communication installations. Finally, on the transportation side, the company offers traffic management services, concession services and management of public facilities. They operate in EMEA, Asia Pacific and America.

A1.3 Atlantia

Atlantia SpA (Atlantia) is an Italian holding company headquartered in Roma. Its shares trade publicly in the Milan stock exchange (MTA) under the name of ATL and are part of the FTSE MIB Index. Atlantia main shareholders are the Benetton family, with around 30% stake.

Atlantia is a provider of infrastructure and construction services for motorways and airports with operations worldwide. The business can be segmented in 5 as follows:

1- Italian motorways, focused on the construction and management of motorways operated under PPP in Italy, being its main subsidiary Autostrade per l'Italia SpA.
2- International motorways, holding concessions in India, Poland, Brazil and Chile.
3- Italian Airports, responsible of managing the two main airports of the country, Rome Fiumicino and Rome Ciampino.

4- International Airports, operating some other airport facilities such as Aeroports de la Cote d'Azur, in Nice (France).
5- Other engineering, construction and traffic management solutions and services within the civil infrastructure field.

A1.4 Autostrade per l'Italia

Autostrade per l'Italia SpA (ASPI or Autostrade) is an Italian Company, with its operational headquarters registered in Roma. The company is managed and coordinated by Atlantia (88.06% ownership) and was established in 2003.

The company main activities are the construction and management of toll highways in Italy, with a network of around 3,020 km across the country and 217 Service Areas. The main concessionaries of the group are Autostrade per l'Italia, Società Italiana per Azioni for the Mont Blanc Tunnel, Raccordo Autostradale Valle d'Aosta, Tangenziale di Napoli, Società Autostrade Meridionali and Autostrada Tierrenica SpA.

Additionally, the group has some other entities offering additional services to the core business. Those include the management of service areas, payroll and general services for toll billing and cleaning services in outdoor areas and green areas. Overall, it is the main private investor of the country, providing service to 15 regions and connecting 60 provinces. Under its investment scheme, there are 1,066 km of highways to develop and improve until the end of its concessions.

A1.5 Hochtief Aktiengesellschaft

Hochtief Aktiengesellschaft (Hochtief) is a German limited company registered in the commercial register of the local court of Essen. Its corporate headquarters are in Germany.

Currently, it is a subsidiary of ACS, which owns 50.15% (reduced from 71.72% after the acquisition of Abertis in October 2018).

Hochtief is a building and infrastructure construction company involved in infrastructure projects, real estate and commercial facilities. They also provide concessions and operation services for infrastructure and renewable energy. The company operates in various countries in EMEA, Asia Pacific and the Americas.

Appendix 2. Autostrade per l'Italia concession legal framework and other information of interest

In the following pages, an extraction of the terms and conditions governing Autostrade per l'Italia SpA concession, which are relevant for the financial impacts of the firm, are given.

This information has been retrieved literally from the Offering Circular for the EMTN Program of Autostrade entered the 27th of October 2017. The specific pages were the text is found in each section will be given for ease of clarity.

Business Description of the Group – Introduction- page 33

*"Autostrade Italia holds the Group's primary concession (the "**Autostrade Italia Concession**"), which is governed by the concession agreement entered into on 12 October 2007 (the "**Single Concession Contract**").*

The Single Concession Contract replaced a series of earlier agreements and implemented the regulatory provisions set out in Law Decree 262/2006, converted into Law 286/2006.

*The Autostrade Italia Concession and the other concessions for motorways in Italy (each, "**Concession**" and, collectively, the "**Concessions**") held by subsidiaries of the Group (together with Autostrade Italia, the "**Motorway Companies**") are granted by the Ministry of Infrastructure and Transport (the "**Concession Grantor**") as of 1 October 2012 pursuant to Law Decree 98 of 6 July 2011. Such concessions were previously granted by ANAS, a joint stock company owned by the Italian Ministry of Economics and Finance.*

*Each Concession gives the relevant Motorway Company the right to finance, construct, operate and maintain its networks of motorways in Italy (the "**Italian Group Network**") during the term of the Concessions. The Italian Group Network comprises 3,019 kilometres2 of motorways in Italy, of which the Autostrade Italia Concession (the "**Autostrade Italia Network**") accounts for 2,855 kilometres or 95.0% of the Italian Group Network.*

Although the principal activities of the Group have always remained focused on the operation and maintenance of the Italian Group Network, in recent years the Group has diversified its business operations, both geographically and through expansion into other businesses related to the operation and management of motorways."

Concessionaires	% of issued capital	km of network	Concession expiry
Autostrade per l'Italia	100.0%	2,855	2038/2042
Società Italiana per il Traforo del Monte Bianco	51.0%	6	2050
Autostrada Tirrenica	100.0%	55	2038
Tangenziale di Napoli	100.0%	20	2037
Raccordo Autostradale Valle d'Aosta	24.5%	32	2032
Autostrade Meridionali	59.0%	52	2012
Total		**3,020**	

Table A2.1 Concessions held by ASPI's Group as of December 31, 2017. Source: ASPI, 2017.

Business Description of the Group – Regulatory - pages 66-67

"The Italian motorway sector is governed by a series of laws, ministerial decrees and resolutions by CIPE (Comitato Interministeriale per la Programmazione Economica), which have been issued and amended over time, as well as generally applicable laws and special legislation, such as the road traffic code. Motorway concessionaires must operate pursuant to this regulatory framework, as well as pursuant to the concession agreements entered into by the concessionaires and the Concession Grantor.

The Italian Group Network is operated under five motorway Concessions granted by the MIT. As a result of Law Decree 98 of 6 July 2011, converted with amendments into Law 111/2011, certain policymaking, supervision and oversight functions previously exercised by ANAS, a joint-stock company owned by the Italian Ministry of Economics and Finance, which acted as Concession Grantor for Autostrade Italia until the effective date of such Law Decree n. 98/2011, were supposed to be transferred to a newly-established Roads and Highways Agency within the Ministry of Infrastructure and Transport which would have assumed certain policymaking, supervision and oversight functions previously exercised by ANAS, as well as the role of grantor for existing motorway concessions, and administrator and grantor for any subsequent concessions put to public tender. However, since the required corporate documents were not approved by 30 September 2012, the Roads and Highways Agency was abolished and the responsibilities allocated to it were transferred to the Ministry of Infrastructure and Transport as of 1 October 2012 as Concession Grantor.

ANAS will continue to: (i) build and operate toll public roads and motorways, including those reverted to State control as a result of the expiry or revocation of a relevant concession; (ii) perform upgrades and improvements of public roads and motorways and the road signs system; (iii) acquire, maintain and improve the tangible and intangible assets of the road and motorway network; (iv) provide traffic police services along the motorway network; and (v) approve projects relating to works on the non-toll road and motorway network which are of public interest.

*Law Decree 201/2011 (the so-called Salva-Italia, or "**Save Italy**", legislation), converted, with amendments, into Law 214/2011, has set up the Transport Regulation Authority to oversee conditions of access and prices for rail, airport and port infrastructure and the related urban transport links to stations, airports and ports. This legislation was subsequently amended by article 36 of Law Decree 1/2012 (the so-called Liberalizzazioni, or "**Deregulation**", legislation), extending the scope of the new regulator's responsibilities to include the motorway sector. The new authority is, among other things, responsible for (i) determining tariff mechanisms based on the "price cap" mechanism for new concessions; (ii) deciding the concession schemes to be included in tenders for management and construction; (iii) defining the arrangements of tenders intended for motorway companies for new concessions; and (iv) determining the ideal management areas of motorway sections in order to promote a plural management of the sections and to enhance competition.*

Law Decree 1/2012, converted into Law 27/2012 (as amended by Law Decree 83/2012 converted into law, with amendments, by Law 134/2012), contains a range of provisions impacting, among other things, on motorway concessions, including (i) article 51, which, from 1 January 2014, has raised the minimum percentage of works to be contracted out to third-party contractors by the providers of construction services under concession to 60%; and (ii) article 17, which has introduced a new regime for the holders of fuel service licences, who may now offer other goods and services for sale at their service stations.

Article 177 of Legislative Decree no. 50 of 18 April 2016, concerning "concessionaire awarding", has introduced the obligation to award to a third party 80% of the works, services and supply contracts for €150,000 or more, via public and open tender procedure for state or private entities which do not operate in the so called "excluded sectors" and which have been granted concessions as of the entry into force of the aforementioned Legislative Decree,

and which have not been subject to project financing or awarded through a public tender procedure in accordance with the European framework of rules. Furthermore, the above Legislative Decree provides that the remaining part (equal to 20%), in particular for private entities, can be carried out through companies directly or indirectly controlled or connected.

Article 178 of Legislative Decree no. 50 of 18 April 2016, concerning motorway concessions and the interim regime, provides that the grantor of a motorway concession that has expired as of 19 April 2016, shall, within 6 months from the date thereof, call a tender offer to award the concession. However, article 178 also provides that the grantor may operate the motorway in-house. In addition, article 178 (i) prohibits the extension of the term of concessions, (ii) provides that the operational risk set forth in article 3, paragraph.1, lett. zz), shall also include the "traffic risk" and (iii) provides that the former concessionaire will be entitled to receive from the new concessionaire an indemnity for investment made and not yet amortized, net of amortizations and certain assets.

The new legislation, which repealed Legislative Decree no. 163 of 2006, entered into force on 20 April 2016 and concessionaries shall implement the new provision within a transitional period (i.e. a period of 24 months from the date of entry into force).

With regard to motorway service areas, the terms and conditions of sub-concession arrangements in force at 31 January 2012 are unaffected, as are the restrictions linked to competitive tenders for motorway areas under concession, conducted in accordance with the format required by the Transport Regulation Authority."

Business Description of the Group – Important developments in the regulatory history of concessions- pages 69-71

"Motorway concessions were historically granted by the State. In 1992, Law No. 498/92 granted CIPE the authority to issue directives in relation to the revision of existing motorway concessions and toll rates. CIPE, by a resolution dated 21 September 1993, established the criteria for the review and renewal of motorway concessions. Pursuant to such criteria, any bid must:

- *(i) contain an investment plan (which provides estimates of the economic and financial performance of the concessionaire and includes the expected works to be performed by the concessionaire during the concession, the estimated cost of such works and expected State subsidies, if any) which is complying with a standard model approved by the Ministry of Infrastructure and Transport and the Ministry of Economics and Finance;*
- *(ii) (ii) set out rules for the allocation of works according to applicable law in force, including EU environmental legislation;*
- *(iii) (iii) broaden the concessionaire's scope of activity, with the aim of improving its management and diversifying services offered to customers; and*
- *(iv) eliminate restrictions on the shareholding structure of the concessionaire companies.*

*Since 1993, CIPE has issued several directives regarding the relationship between ANAS and the individual concessionaires, which form the basis for a standard concession agreement prepared by the Ministry of Infrastructure and Transport (the "**Standard Concession Agreement**"). The Standard Concession Agreement provided the general terms which were expected to govern subsequent concession agreements with the concessionaires.*

Regulatory changes were also introduced in the legal framework governing motorway concessions to delineate the roles of the State vis-à-vis the Italian regions. Italy's regions, of which there are twenty, have administrative, legislative and executive powers at the local level, and can act in matters specifically under their domain or in areas

which are not specifically reserved for the State. Regions are responsible for managing the network of roads and motorways which do not have a national interest and may grant concessions for the construction and management of regional toll motorways.

*Law Decree No. 262 of 3 October 2006, which was enacted into law on 24 November 2006 as Law No. 286/2006 (as subsequently amended, "**Law 286/06**") and subsequently amended by Law No. 296/2006 ("**Law 296/06**") and by Law No. 101/2008, established a new regime for motorway concessions primarily through the requirement that concessionaires enter into a comprehensive new concession agreement following specific binding guidelines. All concessionaires are required to enter into such new concession agreement upon the earlier to occur of an update to the relevant concession's financial plan (the "**Concession's Financial Plan**") or revision of the relevant concession agreement following the effectiveness of the new legislation.*

Law 286/06 provides, among other things, for:

(i) the rate to be used in calculating annual tariff adjustments based on traffic and cost trends and the concessionaire's efficiency and service quality;

(ii) the terms for the allocation of additional profits generated by the commercial use of motorway areas;

(iii) the terms for the recovery of toll revenues related to commitments under investment plans;

(iv) the recognition of tariff adjustments in return for investments included in the investment plan only after the related investments have been verified by the grantor of the concession to have been effectively carried out;

(v) the documentation to be provided to the Concession Grantor; and

(vi) a system of sanctions and penalties in the event of a breach of the concession.

*New concession agreements are subject to the technical review by the Consulting Unit for the implementation and regulation of public utility services (Nucleo di consulenza per l'attuazione delle linee guida sulla regolazione dei servizi di pubblica utilità or "**NARS**") as well as the CIPE, followed by a review by the relevant Parliamentary Commissions. New concession agreements are approved by interministerial decree from the Ministry of Infrastructure and Transport and the Ministry of Economy and Finance, subject to a preliminary review of legitimacy by the Corte dei Conti, the independent institute responsible for supervising public finances, among others.*

Law 286/06 and Law Decree 69/13, converted into Law 98/13, made substantial changes in the tariff adjustment procedure. In particular, Law 98/13, amending Law 286/06, provides that the concessionaire notifies the grantor, within 15 October of each year, a proposal containing the variations to the tariffs that it intends to apply, further to the investment item of parameters X and K regarding new additional works.

By 15 December of each year, the Ministry of Infrastucture and Transport, in agreement with the Ministry of Economy and Finance, should enact a decree, approving or rejecting the proposed variations. The decree may concern exclusively the verifications regarding the accuracy of the values inserted in the revisioning formula and related calculations or the occurrence of severe violations of the provisions set forth in the concession and that have already been formally notified to the concessionaire by 30 June.

*In accordance with Law 286/06, CIPE issued a new directive in June 2007 ("**Directive 39/07**") that introduced criteria and parameters for determining motorway tariffs. Directive 39/07 is applicable to all new*

concessions and existing concessions where the concessionaire requests a re-alignment of the Concession's Financial Plan, as well as to new investments under existing concessions which were not yet approved at 3 October 2006, or which were approved but not included in the investment plan at such date. Directive 39/07 introduced a new tariff formula which provides for a re-alignment of tariffs every five years to reflect traffic and cost trends and investment costs in an effort to provide the concessionaire with an agreed rate of return. Supplementing Directive 39/07, CIPE Directive 27/2013 established criteria and methods for the updating of economic and financial plans at the expiry of the regulatory period.

Law Decree 59/2008, converted into law by Law 101/2008, as amended, approved all concessions entered into with ANAS as of 31 July 2010 and enabled motorway concessionaires to agree to a simplified formula for the annual tariff rate adjustment calculation based, for the entire term of the concession, on a fixed percentage of real inflation, as well as terms for the return of invested capital.

*Law Decree 201/2011 (the so-called Salva-Italia or "**Save Italy**" legislation) also introduced a simplified approval procedure for amendments to existing concessions, which shall be approved by decree by the Ministry of Infrastructure and Transport, together with the Ministry of Economy and Finance. Updates or amendments to existing concessions which result in amendments to the investment plans or regulatory aspects relating to public finance, shall be reviewed by CIPE, following consultation with NARS which shall provide any comments within 30 days."*

Business Description of the Group – The Autostrade Italia Concession- pages 71-76

"Legal Framework

*On 6 June 2008 the Italian Parliament passed Law No. 101/2008 which approved all the draft concession agreements with ANAS already executed by motorways concessionaires and, consequently, the Single Concession Contract entered into by Autostrade Italia and ANAS as Concession Grantor on 12 October 2007 in accordance with Law 286/06. The Single Concession Contract replaced the previous agreements between the parties relating to the Autostrade Italia Concession. Prior to the enactment of the Single Concession Contract, the Autostrade Italia Concession was governed by a concession agreement entered into with ANAS in 1997 (as subsequently amended, "**Single Concession Contract**") and a series of supplementary addenda, the most significant of which was entered into in 2002 (the "**2002 Supplementary Agreement**").*

The 2002 Supplementary Agreement approved a new investment plan at that time and introduced new criteria for determining some of the elements of the price-cap mechanism previously instituted to regulate tariff increases in order to compensate Autostrade Italia for the additional capital expenditure commitments undertaken at that time.

Key Concession Terms

The Single Concession Contract grants Autostrade Italia the right to continue to operate and manage the motorways and related infrastructure granted under the concession until 31 December 2038.

The Single Concession Contract implemented (i) a new formula for tariff adjustments; (ii) new detailed rules on Autostrade Italia's rights and obligations; and (iii) a revised investment plan. The investment plan and tariff formula are set forth in more detail below.

Autostrade Italia's Obligations

In particular, Autostrade Italia's main obligations include the duty:

(i) to manage and maintain the motorway infrastructure;

(ii) to organise, maintain and promote motorist assistance services;

(iii) to design and execute works specified in the Single Concession Contract, such as the construction of additional lanes and motorway sections and junctions;

(iv) to keep detailed financial accounts, including traffic data, for each section of motorway;

(v) include a clause in the by-laws of Autostrade Italia requiring that its Board of Statutory Auditors include an officer of the Concession Grantor;

*(vi) to maintain a debt service coverage ratio ("**DSCR**") throughout the period of the applicable concession;*

(vii) for activities directly connected to the construction and maintenance of highways (not including activities already specified in the Single Concession Contract), to grant works, services and supplies in accordance with existing laws and regulations;

(viii) to reserve, on an annual basis, a portion of shareholders' equity in an amount equal to the net benefits it has received from delays in investments that are not compensated through tariffs (such as those under the Single Concession Contract), until such time as the originally planned investment amounts have been made;

(ix) to have available irrevocable financing or cash or cash equivalents committed to investment funding in an amount equal to the investment gap (the difference between planned and realised investments) with respect to a particular investment plan;

(x) not to provide financing to or guarantees for entities that are controlling, controlled by, otherwise under common control or affiliated with Autostrade Italia pursuant to Article 2359 of the Italian Civil Code, except for subsidiaries of affiliated companies operating in roadway infrastructure or in order to enable larger capital raising at more favourable terms; and

(xi) to establish and maintain procedures to prevent conflicts of interests and independence requirements for the members of its board of directors.

In addition, the entity controlling Autostrade Italia shall be required, for the duration of the Single Concession Contract, to maintain a net worth of at least €10 million for every percentage point of share capital of Autostrade Italia held by it, and shall maintain its registered office in a white-list country and ensure that the offices and management of Autostrade Italia are located in Italy.

The Single Concession Contract sets forth the sanctions and penalties applicable in the event of violations of the obligations set forth above. Penalties vary from €10,000 to €2 million. Sanctions vary from €25,000 to €5 million. The highest fine is imposed in connection with a failure to obtain prior authorisation by the Concession Grantor of extraordinary transaction. The maximum aggregate annual amount of such sanctions may not exceed 10% of total annual revenue of Autostrade Italia, and in any case may not exceed €150 million per year. In the event that such amount is exceeded for two consecutive years, the Concession Grantor may propose the termination of the concession to the relevant Ministries.

Concession Payments

Under the Single Concession Contract, in accordance with Law 296/06, Autostrade Italia is required to pay an annual fee equal to 2.4% of net toll revenue (net of VAT and the Additional Concession Fees) and 5.0% of the revenues derived from any subconcessions or subcontracts, including fees related to the commercial use of the telecommunications networks, which annual fee on subconcessions or subcontracts increases to 20.0% for new services coming into existence after 8 June 2008 or which relate to services in new service areas.

Expiry or Termination of Concession

Upon the expiry of the Single Concession Contract, Autostrade Italia is required to transfer to the Concession Grantor the motorways and related infrastructure without compensation and in a good state of repair.

The Single Concession Contract sets out procedures for early termination of the concession in the event of material and continuing non-performance by Autostrade Italia of the material terms of the concession.

Similarly, the concession is subject to early termination by Autostrade Italia in the event of non-performance by the Concession Grantor or material changes in the legal framework of the concession. In the event of early termination of the Autostrade Italia Concession, the Concession Grantor would step into the shoes of Autostrade Italia, assuming all its obligations and receiving all of its benefits under the Autostrade Italia Concession.

In return, Autostrade Italia is entitled to receive a cash payment based on the net present value, discounted at market rate, of revenues from operation until the end of the term of the concession, net of projected costs, liabilities, investments and projected taxes for such period, plus taxes due payable by the concessionaire following receipt of such indemnification amount by the Concession Grantor, less (i) the outstanding financial debt assumed by the Concession Grantor at the date of transfer from Autostrade Italia, (ii) and projected cash flows from ordinary business until the end of the term of the concession.

In the event that the early termination is due to Autostrade Italia's failure to meet its obligations, such payment is reduced by 10.0% plus any damages. In the event of termination of the Single Concession Contract for reasons other than the failure by Autostrade Italia to fulfil its obligations, such penalty shall not apply.

In the event that the Concession Grantor finds material and continuing non-performance by Autostrade Italia of material terms of the concession, it must issue a notice to Autostrade Italia requiring it to rectify such non-performance within a specified and reasonable timeframe or provide the reasons for the non-performance.

If the reasons provided are not acceptable or the non-performance is not rectified within the specified timeframe, then the Concession Grantor may, following confirmation of the continuing material breach, commence proceedings to terminate the concession. Such proceedings are a preliminary phase in which Autostrade Italia is given notice of the breach and formally requested to cure the breach within a set time period, which cannot be less than 90 days. During this time, Autostrade Italia can present its position and objections. At the end of such time period, if the breach continues or in the event that the Concession Grantor rejects the concessionaire's objections, the Concession Grantor is required to set out another time period of not less than 60 days within which the concessionaire must cure the breach. If Autostrade Italia does not cure the breach within this 60 day period, the Concession Grantor may, jointly with the Ministry of Economy and Finance, issue a decree declaring the termination of the concession. In such an event, the concessionaire is obliged to continue managing the concession until management of the concession is transferred.

Investments and Cost Overruns

For project investments of the other Motorway Companies, the relevant Motorway Subsidiary assumes the obligation to pay cost overruns necessary to complete the committed investments.

Pursuant to Law 286/06 and Directive 39/07, the other Motorway Companies (except for Società Italiana per Azioni per il Traforo del Monte Bianco) have entered into "realignment/rebalancing" concession, which provides for a realignment of tariffs every five years to reflect investment costs. Such Motorway Companies have therefore assumed the obligation to finance cost overruns only in excess of the Approved Investment Amount, with the exception of cost overruns due to force majeure or resulting from acts by third parties."

Terms and Conditions of the Notes – Redemption, Purchase and Options- page 105-106

"(e) Redemption at the Option of Noteholders on the Occurrence of a Put Event

If, at any time while any of the Notes remains outstanding (as defined in the Trust Deed), a Put Event (as defined below) occurs, then, unless at any time the Issuer shall have given a notice under Condition 6(d) in respect of the Notes, in each case expiring prior to the Put Date (as defined below), each Noteholder will, upon the giving of a Put Event Notice (as defined below), have the option to require the Issuer to redeem any Notes it holds on the Put Date at their principal amount, together with interest accrued up to, but excluding, the Put Date.

For the purposes of this Condition 6(e):

*A "**Put Event**" occurs if:*

(i) the Autostrade Italia Concession or the Single Concession Contract is terminated or revoked in accordance with its terms or for public interest reasons; or

(ii) a ministerial decree has been enacted granting to another person the Autostrade Italia Concession; or

(iii) it becomes unlawful for Autostrade Italia to perform any of the material terms of the Autostrade Italia Concession; or

(iv) the Autostrade Italia Concession is declared by the competent authority to cease before the Maturity Date (as defined in the applicable Final Terms); or

(v) the Autostrade Italia Concession ceases to be held by Autostrade Italia or any successor resulting from a Permitted Reorganisation; or

(vi) the Autostrade Italia Concession is amended in a way which has a Material Adverse Effect (as defined in Condition 10 below).

*Promptly upon becoming aware that a Put Event has occurred, and in any event not later than 21 days after the occurrence of the Put Event, the Issuer shall give notice (a "**Put Event Notice**") to the Noteholders in accordance with Condition 17, specifying the nature of the Put Event and the procedure for exercising the option contained in this Condition 6(e).*

*To exercise the option to require the Issuer to redeem a Note under this Condition 6(e), the Noteholder must deliver such Note at the specified office of any Paying Agent, on any day which is a day on which banks are open for business in London and in the place of the specified office falling within the period (the "**Put Period**") of 45 days after the date on which a Put Event Notice is given, accompanied by a duly signed and completed Exercise Notice in the form available from each office of the Paying Agents (the "**Exercise Notice**").*

*The Note must be delivered to the Paying Agent together with all Coupons, if any, appertaining thereto maturing after the date (the "**Put Date**") being the seventh day after the date of expiry of the Put Period, failing which deduction in respect of such missing unmatured Coupons shall be made in accordance with Condition 7(e). The Paying Agent to which such Note and Exercise Notice are delivered will issue to the Noteholder concerned a non-transferable receipt (a "**Put Option Receipt**") in respect of the Note so delivered.*

Payment by the Issuer in respect of any Note so delivered shall be made, if the holder duly specified in the Exercise Notice a bank account to which payment is to be made, by transfer to that bank account on the Put Date, and in every other case, on or after the Put Date against presentation and surrender of such Put Option Receipt at the specified office of any Paying Agent. An Exercise Notice, once given, shall be irrevocable. For the purposes of these Conditions and the Trust Deed, Put Option Receipts issued pursuant to this Condition 6(e) shall be treated as if they were Notes.

In the event that the Trustee has been notified by the Issuer that no further notes are outstanding under the Euro Medium Term Note Programme of Atlantia S.p.A., this Condition 6(e) shall be deemed to no longer be effective."

Appendix 3. Assumptions and construction of the Business Plan

The aim of this Appendix is to describe the main assumptions used in order to project the Business Plan of ASPI.

The main sources of information in order to project it, were: Broker Reports[2], Sector Reports, ASPI's concession agreements and its variations, news, disclosed financials and data bases (IMF and Eikon Thomson Reuters mainly), among others.

A3.1 Economics

Economic projections have been taken from the IMF:

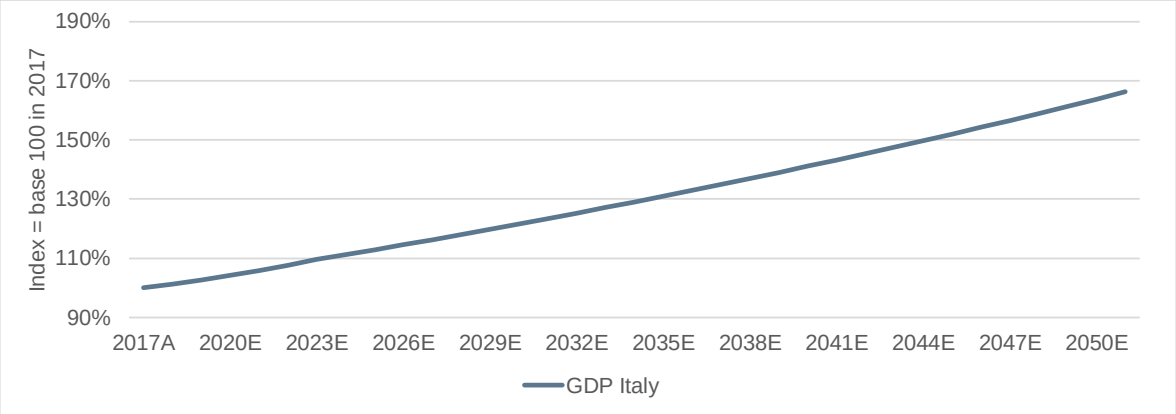

Figure A3.1 GDP projections. Source: IMF, February 2018.

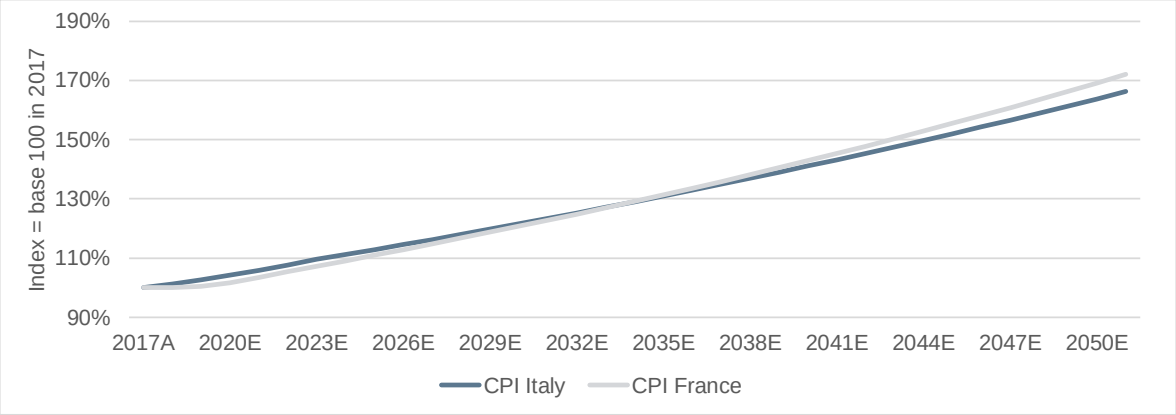

Figure A3.2 CPI projections. Source: IMF, February 2018.

[2] Brokers Reports used: RBC Capital Markets, Equita, Banco Santander, Société Générale, J.P. Morgan Cazenove, UBS, Macquarie Research, Kepleur Cheuvreux and Morgan Stanley. Period of covering: 11/09/2017 – 28/02/2018

A3.2 Traffic

Using proprietary econometric analysis, the authors have been able to model historical ASPI traffic volumes[3] (available data for the period 2012-17 in the annual reports). Based on regression analysis with fixed intercept at 0, the authors found that c.55% of the variation in annually ASPI traffic volumes can be explained by the annual evolution of Italian GDP (c.56% in ASPI's subsidiaries), illustrating the importance of this variable for forecasting future traffic. In the case of regression analysis with variable intercept, the authors found that c.92% of the variation in annually ASPI traffic volumes can be explained by the annual evolution of Italian GDP (c.92% in ASPI's subsidiaries).

Note that, in the Base Case the projections were made with the results of the regressions with fixed intercept in order to avoid traffic growth with null GDP growth.

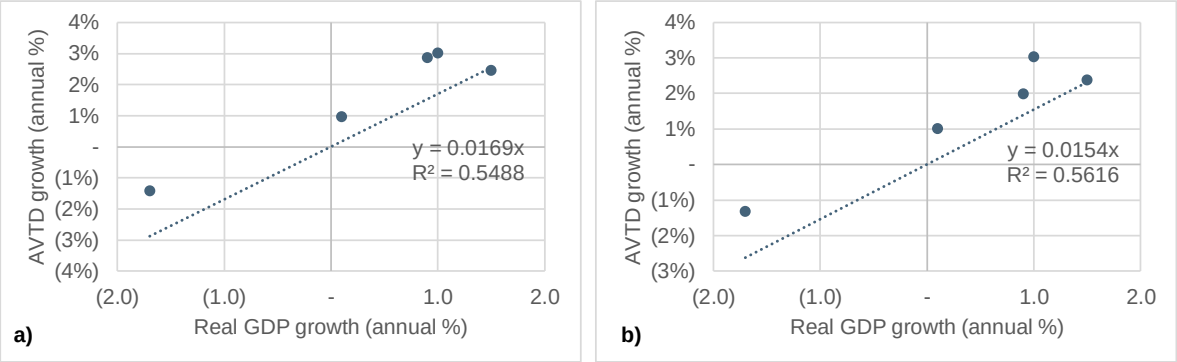

Figure A3.3 a) ASPI regression analysis with fixed intercept b) ASPI's subsidiaries regression analysis with fixed intercept. Source: ASPI's annual reports, IMF.

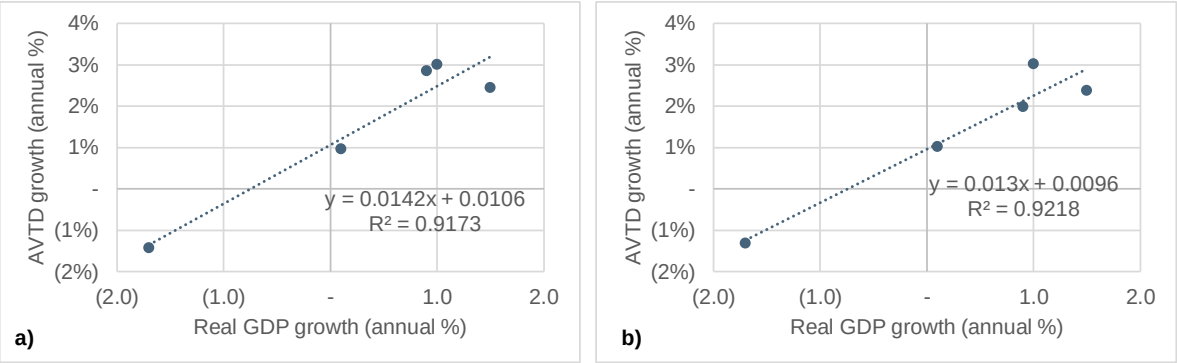

Figure A3.4 a) ASPI regression analysis without fixed intercept b) ASPI's subsidiaries regression analysis without fixed intercept. Source: ASPI's annual reports, IMF.

A3.2 Tariffs

Tariffs in the past have been typically by determined using the formula:

[3] Traffic volumes in ATVD: aggregate theoretical vehicles per day, equal to number of kilometers travelling/journey length/number of days.

$$\Delta T = 70\% \cdot CPI + X + K \tag{15}$$

The X factor recognized a tariff increase using a 7.2% real post-tax IRR capex under the 2002 plan. The X factor lags investment by a year, and lasts for the duration of the concession. It will cease to contribute to tariffs once the investment is over (end of 2029).

The factor K was based on a RAB-based system $((RAB \cdot WACC) + D\&A) / traffic)$, i.e. a system which provides a return on investment equivalent to the WACC (pre-tax before additional leverage) and is used for ASPI's 2007 capex plan. The system remunerates capital employed at a fixed specific return. The regulatory periods run for five years. The current regulatory period runs until 2023, with a WACC 5.5% nominal post-tax.

The old tariffs schemes are being replaced which should be NPV neutral. The old tariff formula is being replaced by:

$$\Delta T = 100\% \cdot CPI + 50bps \tag{16}$$

The concession will be extended by four years to 2042 (from 2038) and a terminal value equivalent to 1-1.5% of the final EBITDA will be payable to the company at expiry. Since the overall project remuneration should remain unchanged, and since the final conditions regarding the new tariff formula have not been approved, the authors considered to keep using the old tariff formula for the projections.

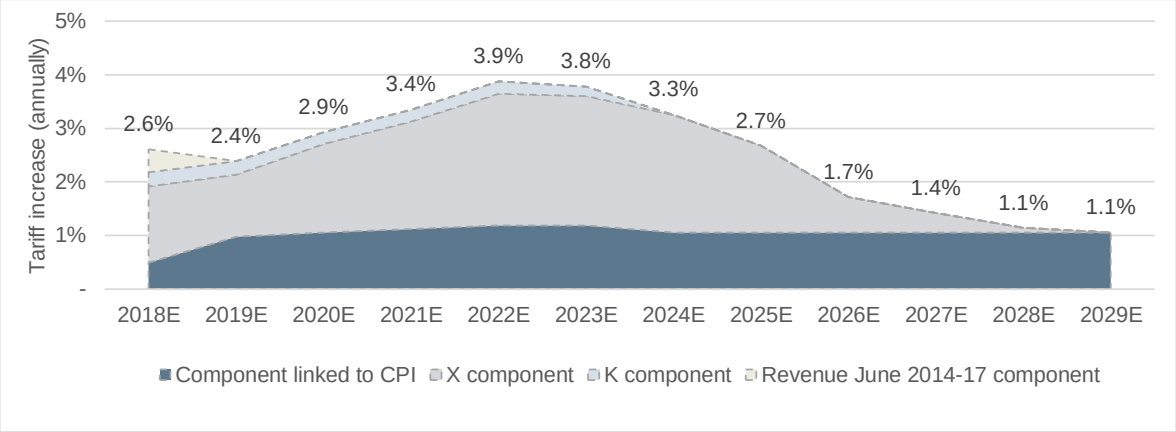

Figure A3.5 Tariff increase projection segmented by components - ASPI. Source: ASPI concession agreement.

Note that the subsidiary called Società Italiana per il Traforo del Monte Bianco has a difference tariff scheme ruled by the following formula:

$$\Delta T = 50\% \cdot CPI_{Italy} + 50\% \cdot CPI_{France} \tag{17}$$

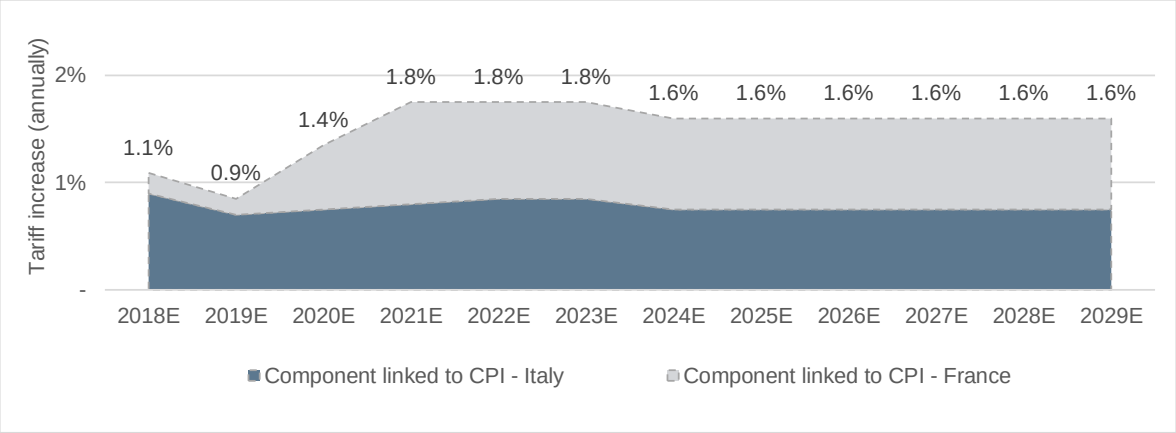

Figure A3.6 Tariff increase projection segmented by components – Società Italiana per il traforo del Monte Bianco. Source: ASPI annual reports.

A3.3 Revenues and EBITDA

The authors estimate that ASPI revenues will have a long-term growth of 2.5% 2018-42E, i.e. tariffs will be the main driver of top-line growth as highlighted in Figure A6.7.

The authors forecast EBITDA will rise from €2,568m in 2018E to €4,791m in 2042E, a CAGR of 2.6% - a forecast that hardly appears aggressive based on CPI projections.

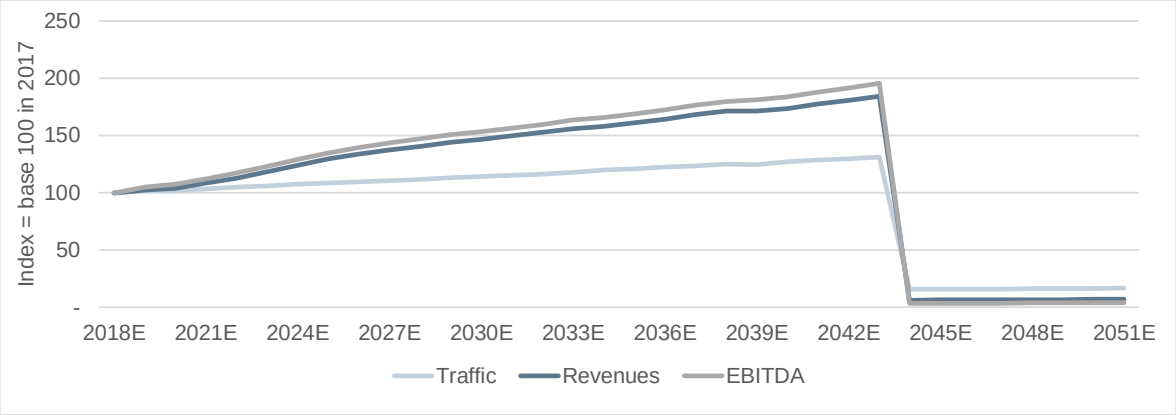

Figure A3.7 Drivers of growth in ASPI's EBITDA. Source: own source.

A3.4 Capex and D&A

ASPI is in the process of implementing a programme of investment in major infrastructure projects under the original Agreement of 1997 and the IV Addendum of 2002, totaling €15.6bn. Projects with a value of €9.7bn have been completed as at 31 December 2017.

The purpose of the investments are to increase the capacity of the existing motorway network on the country's principal arteries, in order to improve traffic flow, road safety and service quality.

In addition to the above programme, SPI new Single Concession Arrangement of 2007 also envisages further investments, totaling €7bn, via:

- Extensions to projects already included in the Agreement of 1997, involving new specific network upgrades worth approximately €2bn.
- A commitment to develop preliminary designs for the upgrade of certain sections of motorway operated under concession, totaling around 325km, at a cost of approximately €5bn.

Autostrade Meridionali and Raccordo Autostradale Valle d'Aosta have completed their planned investment in major works under their respective concession arrangements.

Autostrada Tirrenica opened the new section of motorway between Civitavecchia and Tarquinia to traffic in 2016. Completion of the remaining section from Tarquinia to Livorno is still at the planning stage and, at the end of 2017, a related financial plan was sent to the Grantor for initial examination. This only envisages construction of the section from Tarquinia to Ansedonia, plus an extra-urban link road between Ansedonia and Orbetello Scalo (amounting to a total estimated investment of approximately €0.6bn).

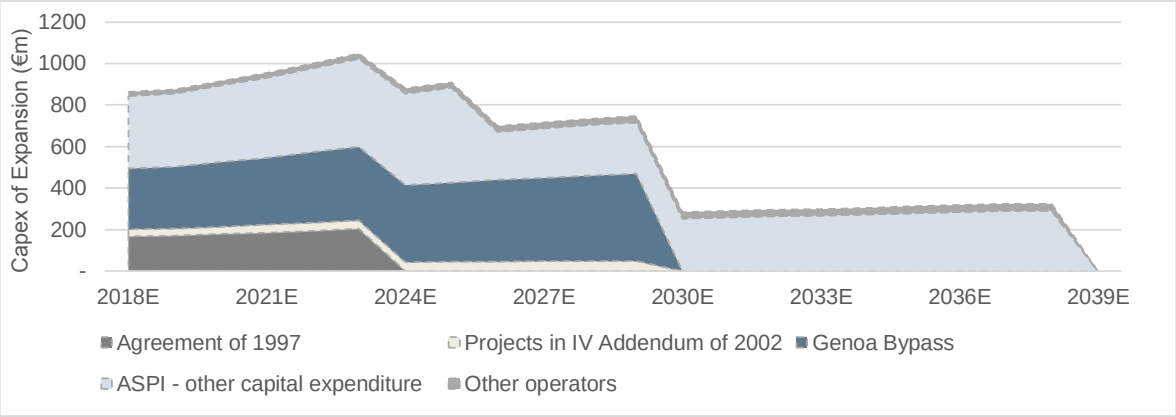

Figure A3.8 ASPI capex plans. Source: ASPI Annual Reports.

A3.5 Working Capital

The operating working capital has been projected using the average of the last 3 years days of inventories, days of receivables and days of payables.

A3.6 Other assumptions about the DCF

The main assumptions regarding the DCF are:

- Mid-year convention.
- Statutory tax rate of 24.0% in Italy according to KPMG Corporate Tax Rates Table.
- No Terminal Value.

For more information regarding the assumptions of the Business Plan, please see the Model (in Microsoft Excel format) presented with the Thesis.

Appendix 4. Summary of the BP: Base Case, Short-term Case and Medium-term Case

(€m)	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2042E	2043E	2050E	CAGR	CAGR
Period End	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	Dec-24	Dec-25	Dec-26	Dec-27	Dec-28	Dec-29	Dec-30	Dec-31	Dec-32	Dec-33	Dec-34	Dec-35	Dec-36	Dec-37	Dec-38	Dec-42	Dec-43	Dec-50	18-23	18-38
Base Case																										
Total traffic	**47,254**	**47,253**	**47,970**	**48,617**	**49,190**	**49,771**	**50,274**	**50,783**	**51,296**	**51,815**	**52,339**	**52,868**	**53,403**	**53,943**	**54,489**	**55,510**	**56,072**	**56,639**	**57,212**	**57,791**	**57,701**	**60,769**	**7,250**	**7,732**	**1%**	**1%**
% growth	*2%*	*(0%)*	*2%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*2%*	*1%*	*1%*	*1%*	*1%*	*(0%)*	*1%*	*(88%)*	*1%*		
o/w ASPI concession	46,920	47,713	48,438	49,093	49,674	50,262	50,771	51,286	51,806	52,331	52,862	53,398	53,940	54,486	55,039	55,597	56,161	56,730	57,306	57,887	58,474	60,882	-	-	1%	1%
Revenues	**4,149**	**4,204**	**4,394**	**4,578**	**4,798**	**5,030**	**5,247**	**5,421**	**5,567**	**5,700**	**5,837**	**5,941**	**6,062**	**6,186**	**6,330**	**6,400**	**6,531**	**6,664**	**6,819**	**6,941**	**6,954**	**7,474**	**256**	**285**	**4%**	**3%**
% growth	*2%*	*1%*	*5%*	*4%*	*5%*	*5%*	*4%*	*3%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*2%*	*0%*	*2%*	*(97%)*	*2%*		
o/w ASPI concession	3,750	3,905	4,091	4,274	4,492	4,717	4,934	5,103	5,243	5,371	5,503	5,602	5,718	5,836	5,974	6,081	6,207	6,336	6,485	6,602	6,739	7,315	-	-	5%	3%
EBITDA	**2,568**	**2,633**	**2,756**	**2,877**	**3,021**	**3,170**	**3,312**	**3,424**	**3,518**	**3,604**	**3,692**	**3,758**	**3,836**	**3,916**	**4,008**	**4,061**	**4,145**	**4,231**	**4,331**	**4,409**	**4,448**	**4,791**	**85**	**100**	**4%**	**3%**
% margin	*62%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*64%*	*64%*	*64%*	*64%*	*33%*	*35%*		
o/w ASPI concession	2,411	2,510	2,631	2,748	2,888	3,033	3,172	3,281	3,371	3,453	3,538	3,601	3,676	3,752	3,841	3,910	3,991	4,074	4,170	4,244	4,332	4,703	-	-	5%	3%
EBIT	**2,198**	**2,224**	**2,292**	**2,351**	**2,421**	**2,485**	**2,546**	**2,573**	**2,593**	**2,600**	**2,600**	**2,575**	**2,595**	**2,611**	**2,627**	**2,612**	**2,600**	**2,571**	**2,518**	**2,390**	**2,086**	**2,247**	**56**	**59**	**2%**	**(0%)**
% margin	*53%*	*53%*	*52%*	*51%*	*50%*	*49%*	*49%*	*47%*	*47%*	*46%*	*45%*	*43%*	*43%*	*42%*	*42%*	*41%*	*40%*	*39%*	*37%*	*34%*	*30%*	*30%*	*22%*	*21%*		
Capex	909	921	962	1,003	1,051	1,102	936	968	758	776	795	809	347	354	363	367	374	382	391	398	398	79	3	3	4%	(4%)
Change in WC	(335)	(16)	16	18	20	23	18	19	14	13	12	12	12	12	12	2	13	13	13	14	(21)	14	(660)	1	(158%)	(13%)
D&A	370	409	465	526	600	685	767	851	925	1,003	1,092	1,183	1,241	1,305	1,381	1,449	1,545	1,660	1,813	2,019	2,361	2,544	29	41	13%	10%
Taxes on EBIT	(528)	(534)	(550)	(564)	(581)	(596)	(611)	(618)	(622)	(624)	(624)	(618)	(623)	(627)	(631)	(627)	(624)	(617)	(604)	(574)	(501)	(539)	(13)	(14)	2%	(0%)
FCF	**796**	**1,162**	**1,260**	**1,328**	**1,409**	**1,495**	**1,783**	**1,858**	**2,152**	**2,217**	**2,285**	**2,343**	**2,879**	**2,947**	**3,027**	**3,070**	**3,160**	**3,246**	**3,349**	**3,452**	**3,527**	**4,188**	**(591)**	**84**	**13%**	**8%**
% FCF conversion	*31%*	*44%*	*46%*	*46%*	*47%*	*47%*	*54%*	*54%*	*61%*	*62%*	*62%*	*62%*	*75%*	*75%*	*76%*	*76%*	*76%*	*77%*	*77%*	*78%*	*79%*	*87%*	*(694%)*	*84%*		

Valuation date	13/08/2018
WACC	**5.9%**
Benchmark WACC brokers	*5.7%*
EV	**29,589**
Equity Value	15,478
Equity Value associated to ATL	*13,630*
# of shares in issue (m)	826
Price per share associated to ATL (€/share)	**16.5**
% ASPI/ATL	*66.3%*

Figure A.4.1 Summary of the Business Plan under the Base Case. Source: own source.

(€m)	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2042E	2043E	2050E	CAGR	CAGR
Period End	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	Dec-24	Dec-25	Dec-26	Dec-27	Dec-28	Dec-29	Dec-30	Dec-31	Dec-32	Dec-33	Dec-34	Dec-35	Dec-36	Dec-37	Dec-38	Dec-42	Dec-43	Dec-50	18-23	18-38
Short-term Case																										
Total traffic	**46,367**	**45,435**	**45,230**	**44,950**	**45,481**	**46,017**	**46,483**	**46,953**	**47,427**	**47,907**	**48,392**	**48,881**	**49,375**	**49,874**	**50,379**	**51,313**	**51,832**	**52,356**	**52,886**	**53,421**	**53,257**	**7,183**	**7,250**	**7,732**	**(0%)**	**1%**
% growth	*0%*	*(2%)*	*(0%)*	*(1%)*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*2%*	*1%*	*1%*	*1%*	*1%*	*(0%)*	*1%*	*1%*	*1%*		
o/w ASPI concession	45,981	45,823	45,590	45,282	45,818	46,360	46,830	47,305	47,784	48,269	48,758	49,253	49,752	50,257	50,766	51,281	51,801	52,326	52,857	53,393	53,934	56,155	56,725	60,876	0%	1%
Revenues	**4,074**	**4,051**	**4,155**	**4,250**	**4,454**	**4,668**	**4,869**	**5,030**	**5,165**	**5,288**	**5,416**	**5,511**	**5,624**	**5,739**	**5,872**	**5,933**	**6,055**	**6,179**	**6,322**	**6,435**	**6,437**	**253**	**256**	**285**	**3%**	**2%**
% growth	*0%*	*(1%)*	*3%*	*2%*	*5%*	*5%*	*4%*	*3%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*2%*	*0%*	*1%*	*1%*	*2%*		
o/w ASPI concession	3,675	3,750	3,851	3,942	4,144	4,351	4,551	4,706	4,836	4,954	5,076	5,167	5,274	5,383	5,510	5,609	5,725	5,844	5,982	6,089	6,215	-	-	-	3%	3%
EBITDA	**2,520**	**2,519**	**2,573**	**2,620**	**2,739**	**2,863**	**2,980**	**3,069**	**3,256**	**3,335**	**3,417**	**3,478**	**3,551**	**3,624**	**3,710**	**3,757**	**3,835**	**3,915**	**4,007**	**4,079**	**4,111**	**83**	**85**	**100**	**3%**	**2%**
% margin	*62%*	*62%*	*62%*	*62%*	*62%*	*61%*	*61%*	*61%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*64%*	*33%*	*33%*	*35%*		
o/w ASPI concession	2,363	2,411	2,476	2,535	2,664	2,797	2,926	3,026	3,109	3,185	3,263	3,322	3,391	3,461	3,543	3,606	3,681	3,757	3,846	3,915	3,996	-	-	-	3%	3%
EBIT	**2,059**	**2,035**	**2,051**	**2,058**	**2,117**	**2,173**	**2,230**	**2,259**	**2,399**	**2,431**	**2,460**	**2,469**	**2,486**	**2,497**	**2,509**	**2,487**	**2,470**	**2,432**	**2,366**	**2,220**	**1,883**	**47**	**49**	**52**	**1%**	**(0%)**
% margin	*51%*	*50%*	*49%*	*48%*	*48%*	*47%*	*46%*	*45%*	*46%*	*46%*	*45%*	*45%*	*44%*	*44%*	*43%*	*42%*	*41%*	*39%*	*37%*	*35%*	*29%*	*19%*	*19%*	*18%*		
Capex	642	638	654	669	701	735	557	576	359	368	377	383	341	349	357	360	368	375	384	391	391	3	3	3	3%	(2%)
Change in WC	(342)	(13)	19	20	29	32	27	28	(61)	12	11	11	11	11	12	2	12	12	12	13	(22)	1	1	1	(162%)	(13%)
D&A	461	484	522	562	622	689	751	811	857	905	957	1,009	1,065	1,127	1,201	1,270	1,366	1,483	1,641	1,859	2,228	36	37	48	8%	8%
Taxes on EBIT	(494)	(488)	(492)	(494)	(508)	(522)	(535)	(542)	(576)	(583)	(590)	(593)	(597)	(599)	(602)	(597)	(593)	(584)	(568)	(533)	(452)	(11)	(12)	(12)	1%	(0%)
FCF	**1,042**	**1,380**	**1,445**	**1,478**	**1,559**	**1,638**	**1,915**	**1,979**	**2,261**	**2,397**	**2,461**	**2,514**	**2,624**	**2,688**	**2,762**	**2,801**	**2,887**	**2,968**	**3,068**	**3,168**	**3,246**	**70**	**72**	**86**	**9%**	**6%**
% FCF conversion	*41%*	*55%*	*56%*	*56%*	*57%*	*57%*	*64%*	*64%*	*69%*	*72%*	*72%*	*72%*	*74%*	*74%*	*74%*	*75%*	*75%*	*76%*	*77%*	*78%*	*79%*	*84%*	*84%*	*85%*		

Valuation date	16/08/2018
WACC	**6.6%**
Benchmark WACC brokers	*6.6%*
EV	**24,060**
Equity Value	9,199
Equity Value associated to ATL	*8,101*
# of shares in issue (m)	826
Price per share associated to ATL (€/share)	**9.8**
% ASPI/ATL	*53.6%*

Figure A.4.2 Summary of the Business Plan under the Short-term Case. Source: own source.

(€m)	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2042E	2043E	2050E	CAGR	CAGR
Period End	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	Dec-24	Dec-25	Dec-26	Dec-27	Dec-28	Dec-29	Dec-30	Dec-31	Dec-32	Dec-33	Dec-34	Dec-35	Dec-36	Dec-37	Dec-38	Dec-42	Dec-43	Dec-50	18-23	18-38
Medium-term Case																										
Total traffic	**46,367**	**45,435**	**45,230**	**44,950**	**45,481**	**46,017**	**46,483**	**46,953**	**47,427**	**47,907**	**48,392**	**48,881**	**49,375**	**49,874**	**50,379**	**51,313**	**51,832**	**52,356**	**52,886**	**53,421**	**53,257**	**56,053**	**7,250**	**7,732**	**(0%)**	**1%**
% growth	*0%*	*(2%)*	*(0%)*	*(1%)*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*2%*	*1%*	*1%*	*1%*	*1%*	*(0%)*	*1%*	*(87%)*	*1%*		
o/w ASPI concession	45,981	45,823	45,590	45,282	45,818	46,360	46,830	47,305	47,784	48,269	48,758	49,253	49,752	50,257	50,766	51,281	51,801	52,326	52,857	53,393	53,934	56,155	-	-	0%	1%
Revenues	**4,074**	**4,007**	**4,111**	**4,204**	**4,406**	**4,618**	**4,816**	**4,976**	**5,109**	**5,231**	**5,357**	**5,452**	**5,563**	**5,677**	**5,809**	**5,869**	**5,989**	**6,112**	**6,254**	**6,364**	**6,365**	**6,836**	**256**	**285**	**3%**	**2%**
% growth	*0%*	*(2%)*	*3%*	*2%*	*5%*	*5%*	*4%*	*3%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*2%*	*0%*	*2%*	*(96%)*	*2%*		
o/w ASPI concession	3,675	3,706	3,806	3,896	4,095	4,300	4,497	4,652	4,780	4,897	5,016	5,106	5,212	5,320	5,446	5,543	5,659	5,776	5,912	6,018	6,143	6,669	-	-	3%	3%
EBITDA	**2,520**	**2,497**	**2,556**	**2,610**	**2,733**	**2,861**	**2,984**	**3,078**	**3,220**	**3,298**	**3,379**	**3,440**	**3,511**	**3,584**	**3,668**	**3,715**	**3,792**	**3,871**	**3,962**	**4,033**	**4,064**	**4,375**	**85**	**100**	**3%**	**2%**
% margin	*62%*	*62%*	*62%*	*62%*	*62%*	*62%*	*62%*	*62%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*63%*	*64%*	*64%*	*33%*	*35%*		
o/w ASPI concession	2,363	2,383	2,447	2,505	2,633	2,765	2,892	2,991	3,073	3,148	3,225	3,283	3,351	3,421	3,501	3,564	3,638	3,714	3,801	3,869	3,949	4,288	-	-	3%	3%
EBIT	**2,124**	**2,071**	**2,082**	**2,082**	**2,133**	**2,176**	**2,218**	**2,228**	**2,298**	**2,298**	**2,291**	**2,261**	**2,276**	**2,285**	**2,294**	**2,274**	**2,257**	**2,221**	**2,161**	**2,029**	**1,724**	**1,868**	**54**	**57**	**0%**	**(1%)**
% margin	*52%*	*52%*	*51%*	*50%*	*48%*	*47%*	*46%*	*45%*	*45%*	*44%*	*43%*	*41%*	*41%*	*40%*	*39%*	*39%*	*38%*	*36%*	*35%*	*32%*	*27%*	*27%*	*21%*	*20%*		
Capex	959	942	967	989	1,036	1,086	924	955	748	766	785	798	340	348	356	360	367	374	383	390	390	72	3	3	3%	(4%)
Change in WC	(342)	(21)	14	16	24	27	22	23	(29)	12	11	11	11	11	11	2	12	12	12	13	(22)	13	(602)	1	(160%)	(13%)
D&A	396	426	475	527	601	685	766	850	922	1,000	1,088	1,178	1,235	1,299	1,374	1,441	1,535	1,650	1,801	2,005	2,340	2,507	31	43	12%	9%
Taxes on EBIT	(510)	(497)	(500)	(500)	(512)	(522)	(532)	(535)	(551)	(552)	(550)	(543)	(546)	(548)	(551)	(546)	(542)	(533)	(519)	(487)	(414)	(448)	(13)	(14)	0%	(1%)
FCF	**709**	**1,036**	**1,104**	**1,137**	**1,209**	**1,280**	**1,549**	**1,611**	**1,892**	**1,993**	**2,055**	**2,110**	**2,636**	**2,699**	**2,773**	**2,811**	**2,895**	**2,975**	**3,073**	**3,169**	**3,238**	**3,868**	**(532)**	**84**	**13%**	**8%**
% FCF conversion	*28%*	*41%*	*43%*	*44%*	*44%*	*45%*	*52%*	*52%*	*59%*	*60%*	*61%*	*61%*	*75%*	*75%*	*76%*	*76%*	*76%*	*77%*	*78%*	*79%*	*80%*	*88%*	*(625%)*	*84%*		

Valuation date	28/02/2019
WACC	**6.3%**
Benchmark WACC brokers	*6.1%*
EV	**25,791**
Equity Value	11,652
Equity Value associated to ATL	*10,261*
# of shares in issue (m)	826
Price per share associated to ATL (€/share)	**12.4**
% ASPI/ATL	*58.7%*

Figure A.4.3 Summary of the Business Plan under the Medium-term Case. Source: own source.

References

1. "2018 - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/bilanci/2018.
2. "2018 Informe Anual Integrado." Financial Accounts. Madrid: Abertis Infraestructuras S.A., March 2019. https://www.abertis.com/media/annual_reports/2018/ABERTIS%20ESP%20Navegable%20%2B%20Web.pdf.
3. "2018 Results Atlantia." Financial Update presented at the Financial Results presentation 2018, Rome, March 7, 2019. https://www.atlantia.it/documents/20184/509291/2019-03-07_Atlantia_FY18_Results.pdf/f48ba2a7-4d30-4fc7-9c25-46f930adebf7.
4. "2018 Review: Genoa Still Suffering from Morandi Bridge Tragedy | Euronews." Accessed between January and March 2019. https://www.euronews.com/2018/12/26/2018-review-genoa-still-suffering-from-morandi-bridge-tragedy.
5. "2019, a Year of Reconstruction," 2019, 13.
6. "A Review of Empirical Capital Structure Research and Directions for the Future | Annual Review of Financial Economics." Accessed between January and March 2019. https://www.annualreviews.org/doi/10.1146/annurev-financial-102710-144821.
7. Abertis. Press Release. "Emisión de Deuda EMTN Programme." Press Release, March 18, 2019. https://www.abertis.com/media/relevants_facts/2019/03/18/20190318%20HR%20fin%20emisi%C3%B3n%20EMTN.pdf.
8. ———. Press Release. "Venta de Hispasat." Press Release, February 19, 2019. https://www.abertis.com/media/relevants_facts/2019/02/12/HR%20Venta%20Hispasat.pdf.
9. "Abertis da garantías a los bonistas frente a la venta de activos o al excesivo dividendo." Expansión, March 9, 2019. http://www.expansion.com/empresas/inmobiliario/2019/03/09/5c83e900468aebd6678b460d.html.
10. "Abertis, excluida definitivamente en Bolsa." EXPANSION, August 3, 2018. http://www.expansion.com/mercados/2018/08/03/5b644717e2704e3aa78b45fb.html.
11. "Abertis pide a la junta vender Hispasat a REE por 1.149 millones." Expansión.com, February 8, 2018. http://www.expansion.com/empresas/transporte/2018/02/08/5a7bfa86e2704ec51f8b4645.html.
12. "Abertis Takeover Grand Finale, Atlantia to OP," 2018, 31.
13. "Abertis vende un 4,1% de Cellnex con un descuento del 0,7%." EXPANSION, June

4, 2018. http://www.expansion.com/empresas/tecnologia/2018/06/04/5b1548a5468aebd2678b462a.html.

14. Acitores, Victor, and Manish Beria. "Atlantia: Intrinsic Value Is Penalised by Regulatory Uncertainties. Hold Reiterated." Société Générale, February 8, 2019.

15. ———. "Atlantia: Time for a Pause." Société Générale, May 24, 2018.

16. "ACS ofrece 18.600 millones de euros por Abertis." Expansión.com, October 18, 2017. http://www.expansion.com/empresas/transporte/2017/10/18/59e70780e5fdea96738b4663.html.

17. "ACS ofrece 18.600 millones de euros por Abertis." Expansión.com, October 18, 2017. http://www.expansion.com/empresas/transporte/2017/10/18/59e70780e5fdea96738b4663.html.

18. "ACS ofrece 18.600 millones de euros por Abertis." Expansión.com, October 18, 2017. http://www.expansion.com/empresas/transporte/2017/10/18/59e70780e5fdea96738b4663.html.

19. "ACS pagará un dividendo a cuenta de 0,449 euros en febrero." Expansión, January 9, 2019. http://www.expansion.com/mercados/2019/01/09/5c363c21468aeb7b2e8b4589.html.

20. "ACS y Atlantia culminan la toma de Abertis." EXPANSION, October 29, 2018. http://www.expansion.com/empresas/2018/10/29/5bd6e92b22601d75238b45eb.html.

21. "ACS y Atlantia han pedido ya los permisos referidos a Hispasat que les faltaban." EXPANSION, May 8, 2018. http://www.expansion.com/empresas/industria/2018/05/08/5af171fae2704ef9048b463d.html.

22. "ACS y Atlantia pactan el reparto de poder para la compra de Abertis." EXPANSION, March 13, 2018. http://www.expansion.com/empresas/energia/2018/03/13/5aa824e546163f7e048b460e.html.

23. "ACS y Atlantia piden más de 1.300 millones por Hispasat." EXPANSION, June 7, 2018. http://www.expansion.com/empresas/inmobiliario/2018/06/08/5b198e84e5fdea53528b461a.html.

24. "ACS y Atlantia podrán emprender la toma conjunta de Abertis esta misma semana." EXPANSION, March 18, 2018. http://www.expansion.com/empresas/inmobiliario/2018/03/18/5aae3e6a22601d5a3f8b45a5.html.

25. "ACS y Atlantia sondean repartirse Abertis y evitar la guerra de opas." EXPANSION,

March 8, 2018. http://www.expansion.com/empresas/transporte/2018/03/08/5aa0da48e2704e83758b4617.html.

26. "ACS-Atlantia pagarán 18,36 euros por acción en efectivo por Abertis y se excluirá de Bolsa." EXPANSION, March 14, 2018. http://www.expansion.com/empresas/transporte/2018/03/14/5aa8f7e0468aeb7f248b4667.html.

27. "Advanced Issues in Valuing Free Cash Flows," n.d.

28. "Analyst Coverage - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/analyst-coverage.

29. "Annual Report 2017." Financial Accounts. Rome: Atlantia, 2017. https://www.atlantia.it/documents/20184/27156/Atlantia_RFA_2017_+Inglese.pdf/81e1ddbc-e8df-406a-9352-30d42cf83184.

30. "Annual_Report_2016_ASPI_Final.Pdf." Financial Accounts. Rome: Autostrade per l'Italia, 2016. http://www.autostrade.it/documents/10279/4408513/Annual_Report_2016_ASPI_Final.pdf.

31. "Annual_Report_ASPI_2017_Eng.Pdf." Financial Accounts. Rome: Autostrade per l'Italia, 2017. http://www.autostrade.it/documents/10279/4408513/Annual_Report_ASPI_2017_Eng.pdf.

32. Press Release. "Anuncio de Fusión por Absorción Abertis Participaciones y Abertis Infraestructuras." Press Release, February 12, 2019. https://www.abertis.com/media/relevants_facts/2019/02/12/20190212%20HR%20fusi%C3%B3n%20publicaci%C3%B3n%20anuncios.pdf.

33. "Archive - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/bilanci/archivio.

34. "As It Happened: Genoa Motorway Bridge Disaster - BBC News." Accessed between January and March 2019. https://www.bbc.com/news/live/world-europe-45182675.

35. "ASPI 2016 Offering Circular." Autostrade per l'Italia, October 27, 2016. http://www.autostrade.it/en/investor-relations/obbligazionisti-emtn.

36. "ATLANTIA GROUP'S RESULTS ANNOUNCEMENT FOR NINE MONTHS ENDED 30 SEPTEMBER 2018." Atlantia, October 9, 2018. https://www.atlantia.it/documents/20184/195126/2018-11-09_Atlantia_9M2018_Results_ENG.pdf/0e76511d-01c4-4f7c-8d04-d3f5d134a452.

37. "Atlantia Baja Un 5,4% En Bolsa: Su Filial Autostrade Trabajaba En El Mantenimiento Del Puente de Génova | EXPANSION." Accessed between January and March 2019. http://www.expansion.com/mercados/2018/08/14/5b72eea122601d05348b45a3.html.

38. "Atlantia CEO Considering Resigning as Autostrade Head - Source." *Reuters*, November 28, 2018. https://uk.reuters.com/article/uk-atlantia-castellucci-idUKKCN1NX1X4.

39. "Atlantia formaliza esta semana su opa sobre Abertis ante la CNMV." Expansión.com, June 11, 2017. http://www.expansion.com/empresas/inmobiliario/2017/06/11/593d0981268e3e164c8b45fe.html.

40. "Atlantia formaliza esta semana su opa sobre Abertis ante la CNMV." Expansión.com, June 11, 2017. http://www.expansion.com/empresas/inmobiliario/2017/06/11/593d0981268e3e164c8b45fe.html.

41. "Atlantia, Mediobanca avverte: il debito di Abertis va monitorato - MilanoFinanza.it." Accessed between January and March 2019. https://www.milanofinanza.it/news/atlantia-mediobanca-avverte-il-debito-di-abertis-va-monitorato-201902201147513100.

42. "Atlantia/Genoa Bridge: Setting a Penalty." Financial Times, August 21, 2018. https://www.ft.com/content/33189816-a549-11e8-8ecf-a7ae1beff35b.

43. "Audited Financial Statements & Interim Financial Statements - Historical Financial Data - Shareholders & Investors - Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/shareholders-investors/historical-financial-data/audited-financial-statements-interim-financial-sta/.

44. Aust, Christian. "Abertis, Atlantia." UniCredit, March 14, 2018.

45. "Autoroutes: Abertis/Atlantia envisagent l'OPA." FIGARO, April 19, 2017. http://www.lefigaro.fr/flash-eco/2017/04/19/97002-20170419FILWWW00130-autoroutes-abertisatlantia-envisagent-l-opa.php.

46. "Autostrade Executives Guilty of Manslaughter in 2013 Motorway Accident, CEO Acquitted | Reuters." Accessed between January and March 2019. https://uk.reuters.com/article/us-autostrade-ceo-trial/autostrade-executives-guilty-of-manslaughter-in-2013-motorway-accident-ceo-acquitted-idUKKCN1P5198.

47. "AUTOSTRADE PER L'ITALIA GROUP'S RESULTS ANNOUNCEMENT FOR NINE MONTHS ENDED 30 SEPTEMBER." Autostrade per l'Italia, October 9, 2018. http://www.autostrade.it/documents/10279/4408513/2018-11-09_ASPI_Group_9M2018_Results_-_ENG.pdf.

48. Bellis, Luigi de, Stefano Gamberini, Domenico Ghiliotti, and Roberto Letizia. "Infrastructure Conference: Conference Feedback and Quick Credit Snapshot." Equita, January 25, 2019.

49. "Benettons Confront Italy's Populists Over Bridge Disaster," August 16, 2018. https://www.bloomberg.com/news/articles/2018-08-16/atlantia-shares-poised-to-lose-4-6-billion-euros-in-market-value.

50. Bentley, Zak. "Atlantia Director Resigns over 'Inappropriate' Bonus Pay-Outs."

Content. *Infrastructure Investor* (blog), November 22, 2018. https://www.infrastructureinvestor.com/atlantia-director-resigns-inappropriate-bonus-pay-outs/.

51. "Bondholders." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/obbligazionisti-emtn.

52. "Bondholders - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/bondholders.

53. "Cable-Stayed Bridge." *Wikipedia*, March 14, 2019. https://en.wikipedia.org/w/index.php?title=Cable-stayed_bridge&oldid=887694364.

54. "Calendar of Corporate Events - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/financial-calendar.

55. "Cambio de Control Abertis." Abertis Infraestructuras S.A., October 29, 2018. https://www.abertis.com/media/relevants_facts/2018/10/29/20181029%20Cambio%20control%20Abertis.pdf.

56. "Capital Asset Pricing Model." *Wikipedia*, February 13, 2019. https://en.wikipedia.org/w/index.php?title=Capital_asset_pricing_model&oldid=883053788.

57. Carelli, Vittorio. "Atlantia." Banco Santander, August 14, 2018.

58. ———. "Atlantia: 1H18 Earnings in Line, Better CFs." Banco Santander, August 3, 2018.

59. ———. "Atlantia: De-Risking the ABE Deal's Execution." Banco Santander, July 5, 2018.

60. ———. "Atlantia: Knowing the Unknowns." Banco Santander, July 24, 2018.

61. ———. "Atlantia: Nothing Ventured, Nothing Gained." Banco Santander, May 23, 2018.

62. "Castellucci Doesn't Answer Prosecutors - English - ANSA.It." Accessed between January and March 2019. http://www.ansa.it/english/news/general_news/2018/11/28/castellucci-doesnt-answer-prosecutors_011f6436-fc8f-4586-97cc-987fa33e5dd5.html.

63. Castellucci, Mr. "The New Atlantia: Complex but Still a Quality Asset," 2018, 11.

64. "CCAA Consolidadas Abertis 2018." Abertis Infraestructuras S.A., February 19, 2019. https://www.abertis.com/media/annual_reports/2018/CCAA%20Consolidadas%20Abertis%202018%20ESP%20web.pdf.

65. Press Release. "Cese y nombramientos nuevos Directores." Press Release, December 10, 2018. https://www.abertis.com/media/relevants_facts/2018/12/10/20181210%20HR%20Cese%20y%20nombramientos%20Consejeros.pdf.

66. "CNMV - OPAS." Accessed between January and March 2019.

https://www.cnmv.es/Portal/Consultas/Folletos/OPA.aspx?numreg=388.

67. "CNMV Links - Relevant Events (CNMV) - Shareholders & Investors - Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/shareholders-investors/relevant-events-cnmv/cnmv-links/.

68. Cochrane, John H. "Presidential Address: Discount Rates." *The Journal of Finance* 66, no. 4 (2011): 1047–1108. https://doi.org/10.1111/j.1540-6261.2011.01671.x.

69. "Company Profile: Abertis Infraestructuras S.A." Company Profile. London: John Carpenter House, July 5, 2018. www.marketline.com.

70. "Condensed Consolidated FInancial Statement for the year ended 31 December 2018." ACS and Subsidiaries, 2018. https://www.grupoacs.com/ficheros_editor/File/03_accionistas_inversores/02_info_financiera_historica/2018/EEFF%20Sem%20Resumidos%20Dic-18%20-%20EN.pdf.

71. Press Release. "Convocatoria Junta General de Accionistas 2019." Press Release, February 19, 2019. https://www.abertis.com/media/relevants_facts/2019/02/19/20190219%20HR%20Convocatoria%20JGO%20marzo.pdf.

72. "Convocatoria Junta General Extraordinaria de Accionistas." Abertis Infraestructuras S.A., November 7, 2018. https://www.abertis.com/media/relevants_facts/2018/11/07/20181107%20HR%20Convocatoria%20JGE%20dic%20combinado.pdf.

73. "Corporate Presentations - Shareholders & Investors - Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/shareholders-investors/corporate-presentations/.

74. "Cuentas Anuales del ejercicio terminado el 31 de Diciembre de 2018 e Informe de Gestión, junto con el Informe de AUditoría Independiente." Abertis Infraestructuras S.A., February 19, 2019. https://www.abertis.com/media/annual_reports/2018/Abertis%20Infraestructuras%202018%20ESP%20web.pdf.

75. D'Ath, Stephanie. "ABE Joint Bid from ATL & ACS/HOT Saves Times but Creates More Execution Risk." RBC Capital Markets, March 12, 2019.

76. ———. "ATL - Surprise on Dividend... and GET Stake Acquisition," n.d., 2.

77. ———. "ATL IM - 1Q18 EBITDA in Line, Net Income Beat, Good Cash Generation...but Traffic Momentum below Peers," n.d., 1.

78. ———. "ATL IM - 1Q18 EBITDA in Line, Net Income Beat, Good Cash Generation...but Traffic Momentum below Peers," n.d., 1.

79. ———. "ATL IM - 2Q18 Small Miss on EBITDA, Bigger on NI Due to Financial Expenses Related to ABE, Good Cash Generation," n.d., 1.

80. ———. "ATL IM - Bridge Collapse Results in Market Overreaction," n.d., 1.

81. ———. "European Infrastructure: Abertis Suitors Step up Their Game .. Together," n.d., 2.

82. ———. "European Infrastructure: ATL, ACS/HOT: From Competitors to Allies, Combining Forces to Acquire ABE," n.d., 2.

83. ———. "European Infrastructure: Hunting for Scarce Assets, While Making the Most of Low Funding Interest," n.d., 2.

84. ———. "European Infrastructure: The Nitty-Gritty on the ATL-ABE-HOT-ACS Saga," n.d., 3.

85. "DATI E FATTI SULLA NOSTRA ATTIVITÀ." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/autostrade-per-genova/vero-falso.

86. "De la Serna: es 'de sentido común' que el Gobierno se pronuncie sobre la opa de Atlantia a Abertis." Expansión.com, December 12, 2017. http://www.expansion.com/empresas/inmobiliario/2017/12/12/5a2fa3c1ca4741d3138b460d.html.

87. "Documentación OPA Hochtief." Accessed between January and March 2019. https://www.abertis.com/es/opa-2018.

88. "Dozens Feared Dead in Italy Bridge Collapse," August 14, 2018, sec. Europe. https://www.bbc.com/news/world-europe-45183624.

89. "El CEO de Atlantia rechaza una posible nacionalización de Autostrade." EXPANSION, August 29, 2018. http://www.expansion.com/empresas/inmobiliario/2018/08/29/5b86ab0b22601dec088b461e.html.

90. "El CEO de Atlantia rechaza una posible nacionalización de Autostrade." EXPANSION, August 29, 2018. http://www.expansion.com/empresas/inmobiliario/2018/08/29/5b86ab0b22601dec088b461e.html.

91. "El consejo de Abertis ve positiva la opa de ACS y Atlantia." EXPANSION, April 17, 2018. http://www.expansion.com/empresas/transporte/2018/04/17/5ad597a5ca474147638b45cf.html.

92. "El Gobierno fuerza a REE a comprar Hispasat por 950 millones." Expansión, February 12, 2019. http://www.expansion.com/empresas/inmobiliario/2019/02/12/5c62fe33468aeb873f8b4621.html.

93. "El grupo italiano Atlantia plantea una opa sobre Abertis." Expansión.com, April 18, 2017. http://www.expansion.com/empresas/inmobiliario/2017/04/18/58f629a4e2704e2f268b45a6.html.

94. "Estimating the WACC." HEC Paris MSc International Finance, n.d.

95. European Union Road Federation. "Road Statitics Yearbook 2016." Brussels Belgium: European Road Federation, December 1, 2016. www.erf.be.

96. "Éxito rotundo de Abertis en su mayor emisión de la historia." Expansión, March 16, 2019. http://www.expansion.com/empresas/inmobiliario/2019/03/16/5c8d2158e5fdea1d7c8b45c6.html.

97. Fernandez Verdes, Marcelino. Press Release. "Hecho Relevante: Orden sostenida de compra de acciones de Abertis." Press Release, June 20, 2018. https://www.abertis.com/media/relevants_facts/2018/06/20/Orden%20sostenida%20HOT.pdf.

98. ———. "Oferta Pública Voluntaria de Adquisición de Acciones de Abertis Infraestructuras S.A. Formulada Por HOCHTIEF Aktiengescellschaft." HOCHTIEF Aktiengesellschaft, April 10, 2018. https://www.cnmv.es/Portal/verDoc.axd?t={c7cc8684-a46c-485f-bbf3-cbd638161578}.

99. "Final Terms nº 2 Notes due November 2027." Abertis Infraestructuras S.A., November 23, 2017. https://www.abertis.com/media/uploads/2017/12/14/final-terms-2027.pdf.

100. "Final Terms Series nº 1 Notes due March 2023." Abertis Infraestructuras S.A., November 23, 2017. https://www.abertis.com/media/uploads/2017/12/14/final-terms-2023.pdf.

101. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1410.

102. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1405.

103. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1399.

104. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1395.

105. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1382.

106. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-

ir/1368?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

107. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1364?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

108. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1358?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

109. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1346?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

110. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1344?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

111. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1336?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

112. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1332?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

113. "Financial Press Releases." Autostrade per l'Italia. Accessed between January and March 2019. http://www.autostrade.it/en/investor-relations/comunicati-stampa-finanziari/-/detail-ir/1330?controlPanelCategory=portlet_comunicatiinvestor_WAR_comunicatiportlet.

114. "Fitch Keeps Negative Outlook on Italy Citing High Debt Level," February 22, 2019. https://www.bloomberg.com/news/articles/2019-02-22/fitch-maintains-negative-outlook-on-italy-citing-high-debt-level.

115. "Fitch Keeps Negative Outlook on Italy Citing High Debt Level - Bloomberg." Accessed between January and March 2019. https://www.bloomberg.com/news/articles/2019-02-22/fitch-maintains-negative-outlook-on-italy-citing-high-debt-level.

116. "Fixed Income Issues - Shareholders & Investors - Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/shareholders-investors/fixed-income-issues/.

117. Frank, Murray Z., and Vidhan K. Goyal. "Chapter 12 - Trade-Off and Pecking Order

Theories of Debt**We Thank Long Chen, Sudipto Dasgupta, Espen Eckbo, Chris Hennessy, Jay Ritter, Michael Roberts, Tan Wang, and Jaime Zender for Comments and Helpful Discussions. Murray Frank Thanks Piper Jaffray for Financial Support. Vidhan Goyal Thanks the Research Grants Council of the Hong Kong Special Administrative Region for Financial Support (Project No. 6489/06H). The Literature on Capital Structure Is Vast, Containing Hundreds of Papers, and so We Cannot Hope to Cover It All. Inevitably, We Have Left out a Great Deal, Much of It Very Important. As Such, We Apologize in Advance for Our Inevitable Oversights. Even More than Usual, It Must Be Stressed That This Survey Reflects Only Our Views." In *Handbook of Empirical Corporate Finance*, edited by B. Espen Eckbo, 135–202. Handbooks in Finance. San Diego: Elsevier, 2008. https://doi.org/10.1016/B978-0-444-53265-7.50004-4.

118. "Free Cash Flows and Valuation." HEC Paris MSc International Finance, n.d.

119. Press Release. "Fusión Abertis Participaciones y Abertis Infraestructuras." Press Release, December 12, 2018. https://www.abertis.com/media/relevants_facts/2018/12/12/HR%20Fusi%C3%B3n.pdf.

120. Gamberini, Stefano. "Atlantia." Equita, 05/14/20182018.

121. ———. "Atlantia." Equita, November 13, 2017.

122. ———. "Atlantia." Equita, March 5, 2018.

123. ———. "Atlantia." Equita, August 6, 2018.

124. ———. "Atlantia." Equita, February 7, 2019.

125. ———. "Atlantia." Equita, December 14, 2019.

126. Garola Crespo, Alvaro. "Infraestructures i Creixement Econòmic." Universitat Politècnica de Catalunya, December 1, 2011.

127. "Genoa Bridge Collapse Shows What's Wrong with Modern Italy - CNN." Accessed between January and March 2019. https://edition.cnn.com/2018/08/15/opinions/delay-infrastructure-upgrade-disaster-opinion-intl/index.html.

128. "Genoa Bridge Collapse: The Road to Tragedy - The New York Times." Accessed between January and March 2019. https://www.nytimes.com/interactive/2018/09/06/world/europe/genoa-italy-bridge.html.

129. "Genoa Disaster Shines Light on Italy's Perceived Inequalities | Financial Times." Accessed between January and March 2019. https://www.ft.com/content/80862dd6-a227-11e8-85da-eeb7a9ce36e4.

130. Ghiglione, Davide. "Autostrade under Fire after Italian Motorway Bridge Collapse." Financial Times, August 15, 2018. https://www.ft.com/content/82bd3c92-a052-11e8-85da-eeb7a9ce36e4.

131. Ghiglione, Davide, and Mark Odell. "At Least 35 Killed as Motorway Bridge Collapses in Italy." Financial Times, August 14, 2018. https://www.ft.com/content/60fd2694-9fb7-11e8-85da-eeb7a9ce36e4.

132. "Group Report 2016 - Reader." Accessed between January and March 2019. https://reports.hochtief.com/gr16/0.jhtml.

133. "Group Report 2017 - Reader." Accessed between January and March 2019. https://reports.hochtief.com/gr17/0.jhtml.

134. "Group Report 2018 - Reader." Accessed between January and March 2019. https://reports.hochtief.com/gr18/0.jhtml.

135. "Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/home/.

136. Hansen, Lars Peter. "Large Sample Properties of Generalized Method of Moments Estimators." *Econometrica* 50, no. 4 (1982): 1029–54. https://doi.org/10.2307/1912775.

137. "Harry Markowitz." *Wikipedia*, January 23, 2019. https://en.wikipedia.org/w/index.php?title=Harry_Markowitz&oldid=879801666.

138. "HOCHTIEF." Accessed between January and March 2019. https://www.hochtief.com/hochtief_en/0.jhtml.

139. "HOCHTIEF Investor Relations." Accessed between January and March 2019. https://www.hochtief.com/hochtief_en/5.jhtml.

140. "HOCHTIEF Investor Relations > Financial Calendar." Accessed between January and March 2019. https://www.hochtief.com/hochtief_en/6024.jhtml.

141. "HOCHTIEF Investor Relations > HOCHTIEF Bonds / Ratings." Accessed between January and March 2019. https://www.hochtief.com/hochtief_en/737.jhtml.

142. "Hochtief toma hoy el control del consejo de Abertis." EXPANSION, May 17, 2018. http://www.expansion.com/empresas/inmobiliario/2018/05/18/5afdfdd446163f74708b4573.html.

143. "Hotchief (ACS) compra otro 3,06% de Abertis por 556,9 millones." EXPANSION, July 27, 2018. http://www.expansion.com/empresas/inmobiliario/2018/07/27/5b5b4d57e5fdea126a8b4590.html.

144. "Ignored University Reports about Morandi Bridge: 'Deformed Pylons and Oxidized Cables' - La Stampa." Accessed between January and March 2019. https://www.lastampa.it/2018/08/17/esteri/ignored-university-reports-about-morandi-bridge-deformed-pylons-and-oxidized-cables-4WzupknoVJEH655DDwXn3O/pagina.html.

145. "Informe 2015 sobre el sector de autopistas de peaje en España." Ministerio de Fomento, Secretería de Estado de Infraestructuras, Transporte y Vivienda, Secretería General de Infraestructuras, December 1, 2016. http://publicacionesoficiales.boe.es.

146. "Informe Anual | Informe Anual 2017 Grupo ACS." Accessed between January and March 2019. http://informe-anual.grupoacs.com/?lang=en.

147. "Informe Anual | Informe Anual 2017 Grupo ACS." Accessed between January and March 2019. http://informe-anual.grupoacs.com/?lang=en.

148. "Informe Anual Integrado 2017 – Abertis – Informe Anual Integrado 2017." Accessed between January and March 2019. https://www.abertis.com/informeanual2017/.

149. "Interim Report ASPI June 2018." Financial Accounts. Rome: Autostrade per l'Italia, June 2018. http://www.autostrade.it/documents/10279/4408513/Interim_Report_ASPI_June_2018.pdf.

150. "Interim Report January to September 2018 - Reader." Accessed between January and March 2019. https://reports.hochtief.com/ir18/1.jhtml.

151. "Italia amenaza con retirar a Atlantia la concesión tras el desplome del puente de Génova." EXPANSION, August 14, 2018. http://www.expansion.com/sociedad/2018/08/14/5b72b42f22601dc41d8b4589.html.

152. "Italia revisará el sistema de concesiones y valorará si 'es de interés público' nacionalizarlo." EXPANSION, August 27, 2018. http://www.expansion.com/empresas/2018/08/27/5b841a59e2704e50458b463e.html.

153. "Italy Magistrates Investigate 20 after Genoa Bridge Collapse | Financial Times." Accessed between January and March 2019. https://www.ft.com/content/5f074b46-b1f3-11e8-8d14-6f049d06439c.

154. Kenton, Will. "Capital Asset Pricing Model - CAPM." Investopedia. Accessed between January and March 2019. https://www.investopedia.com/terms/c/capm.asp.

155. Klepper, William. "Governance and Managing Change in the Company of the 21st Century." OpenMind. Accessed between January and March 2019. https://www.bbvaopenmind.com/en/articles/governance-and-managing-change-in-the-company-of-the-21-st-century/.

156. Klepper, William M. "Governance and Managing Change in the Company of the 21st Century," n.d., 31.

157. "La CNMV aprueba la opa de Atlantia sobre Abertis y fuerza a ACS a mover ficha." Expansión.com, October 9, 2017. http://www.expansion.com/empresas/transporte/2017/10/09/59db4899468aebdb7a8b45ce.html.

158. "La CNMV aún debe responder a los requerimientos del Gobierno sobre la OPA de Atlantia." Expansión.com, December 22, 2017. http://www.expansion.com/empresas/inmobiliario/2017/12/22/5a3ce87e468aeb5e748b4633.html.

159. "La Crisis de Atlantia Puede Alterar La Financiación de Abertis | EXPANSION." Accessed between January and March 2019. http://www.expansion.com/empresas/distribucion/2018/08/17/5b768ea322601dc7138b45e4.html.

160. "Los accionistas de Abertis aprueban la exclusión de los títulos de la compañía de Bolsa." EXPANSION, July 24, 2018. http://www.expansion.com/empresas/inmobiliario/2018/07/24/5b56f00e22601db4138b45d3.html.

161. "Los Benetton concluyen la entrada de socios en Cellnex con la venta de un 20% de Connect a GIC." EXPANSION, October 9, 2018. http://www.expansion.com/empresas/tecnologia/2018/10/09/5bbcedade2704e405b8b45f4.html.

162. "Macroemisión de Abertis: Coloca 3.000 Millones En Deuda Con Vencimientos de Entre 5 y 12 Años | Mercados | Cinco Días." Accessed between January and March 2019. https://cincodias.elpais.com/cincodias/2019/03/18/mercados/1552903228_494534.html.

163. "Masterminding the ABE Acquisition," 2018, 25.

164. "Monica Mondardini si è dimessa dal cda di Atlantia." Lettera43, February 19, 2019. https://www.lettera43.it/it/articoli/economia/2019/02/19/monica-mondardini-atlantia/229351/.

165. "More than the Standalone Priced In," 2017, 31.

166. Myers, Stewart C. "Capital Structure." *Journal of Economic Perspectives* 15, no. 2 (June 2001): 81–102. https://doi.org/10.1257/jep.15.2.81.

167. "Nadal: a ACS y Atlantia todavía les faltan tres permisos relacionados con Hispasat." EXPANSION, April 16, 2018. http://www.expansion.com/empresas/tecnologia/2018/04/16/5ad4a2f422601d3a0c8b463b.html.

168. Ojeda, Bosco. "ACS." UBS, March 8, 2018.

169. ———. "Atlantia." UBS, March 2, 2018.

170. ———. "Atlantia." UBS, May 11, 2018.

171. ———. "Atlantia." UBS, March 18, 2019.

172. ———. "Atlantia." UBS, October 16, 2019.

173. ———. "Atlantia: Exposure to Italian Rates...so Far It's Affordable." UBS, June 8, 2018.

174. "Operator of Collapsed Italian Bridge Criticised in Ministry Report | Financial Times." Accessed between January and March 2019. https://www.ft.com/content/73ad8dbc-c0e4-11e8-8d55-54197280d3f7.

175. O'Riordan, David. "Genoa Bridge Collapse: Seven Experts Offer Initial Thoughts."

Engineers Journal (blog), September 4, 2018. http://www.engineersjournal.ie/2018/09/04/genoa-bridge-collapse-seven-experts-offer-initial-thoughts/.

176. Peters, Olivia. "Atlantia: Bridge Collapse in Italy, We See 9% Downside." Macquarie Research, August 14, 2019.

177. ———. "Atlantia: Size Matters." Macquarie Research, July 13, 2018.

178. ———. "Atlantia: Steady She Goes." Macquarie Research, August 6, 2018.

179. "Ponte Morandi." *Wikipedia*, March 16, 2019. https://en.wikipedia.org/w/index.php?title=Ponte_Morandi&oldid=887972125.

180. "Presentations - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/presentations.

181. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa.

182. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Member_of_Board_of_Directors_resigns.html?id=1420&lang=en&year=2019.

183. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Guidance_for_Shareholders_on_re_election_of_Board_of_Directors_for_the_three_year_period_2019_2021.html?id=1418&lang=en&year=2019.

184. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Committees_and_Independence_of_director_assessed_.html?id=1416&lang=en&year=2019.

185. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Abertis_reaches_agreement_with_Red_El_ctrica_on_the_sale_of_its_stake_in_Hispasat.html?id=1414&lang=en&year=2019.

186. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Moody_s_concludes__review_for_downgrade__and_confirms_ratings_for_Atlantia__ASPI_and_ADR.html?id=1407&lang=en&year=2019.

187. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-New_Chairperson_and_CEO_for_Autostrade_per_l_Italia_.html?id=1397&lang=en&year=2019.

188. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Nominations_Committee_established__replacement_of_members_of_the_Committee

_of_Independent_Directors_with_responsibility_for_Related_Party_Transactions_and_Corporate_Governance_Code_revised_.html?id=1401&lang=en&year=2019.

189. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Letter_from_the_Ministry_of_Infrastructure_and_Transport.html?id=1392&lang=en&year=2018.

190. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Replacement_of_members_of_the_Human_Resources_and_Remuneration_Committee_and_the_Committee_of_Independent_Directors_with_Responsibility_for_Related_Party_Transactions_.html?id=1388&lang=en&year=2018.

191. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Member_of_Board_of_Directors_resigns.html?id=1379&lang=en&year=2018.

192. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Atlantia_Group_s_results_announcement_for_nine_months_ended_30_September_2018_.html?id=1371&lang=en&year=2018.

193. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Standard___Poor_s_downgrades_Atlantia__group__ratings.html?id=1366&lang=en&year=2018.

194. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Fitch_downgrades_Atlantia_Group__ratings.html?id=1362&lang=en&year=2018.

195. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Closing_of_joint_investment_in_Abertis.html?id=1360&lang=en&year=2018.

196. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Moody_s_lowers_Group_s_ratings_after_downgrade_of_Italy_.html?id=1356&lang=en&year=2018.

197. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Atlantia_signing_of_a_new_revolving_credit_facility.html?id=1352&lang=en&year=2018.

198. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Board_of_Directors__meeting__update_on_the_Genoa_plan_and_letter_of_reply_to_the_Ministry_of_Infrastructure.html?id=1348&lang=en&year=2018.

199. "Press Releases - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/area-stampa/-/page/-/page/content-Board_of_Directors__meeting__condolences_for_victims__families_and_plan_for_Genoa.html?id=1340&lang=en&year=2018.

200. Rall, Elodie, Emily Biddulph, Rajesh Patki, and Isabella Antollini. "Atlantia." J.P. Morgan Cazenove, April 27, 2018.

201. ———. "Atlantia." J.P. Morgan Cazenove, June 6, 2018.

202. ———. "Which Would Likely Lead to an Increase in Our WACC Assumption That Would Alter Our Valuation of Atlantia; and (4)Worse or Better Economic Forecasts for Italy, Spain, France and LATAM Would Impact Traffic Negatively or Positively.," n.d., 6.

203. Rall, Elodie, Emily Biddulph, Rajesh Patki, and David Min. "Refreshing Abertis Takeover Model and Assessing Risk Rewards Following Strong Performance." J.P. Morgan Cazenove, September 11, 2017.

204. Rall, Elodie, Rajesh Patki, Emily Biddulph, and Isabella Antollini. "Atlantia." J.P. Morgan Cazenove, August 3, 2018.

205. Ralph, Alex. "Genoa Bridge Firm Director Quits over Bosses' Payout." *The Times*, November 22, 2018, sec. Business. https://www.thetimes.co.uk/article/genoa-bridge-firm-director-quits-over-bosses-payout-x6tflc8ql.

206. "Rating - Atlantia." Accessed between January and March 2019. https://www.atlantia.it/en/investors/rating-investor-kit.

207. "Rating - Shareholders & Investors - Grupo ACS." Accessed between January and March 2019. https://www.grupoacs.com/shareholders-investors/rating/.

208. "REE aparca la compra de Hispasat y se centra en inversiones de 7.000 millones para redes en España." EXPANSION, October 2, 2018. http://www.expansion.com/empresas/energia/2018/10/02/5bb33e50468aebbf4e8b4687.html.

209. "REE dice que la compra de Hispasat no obedece a ninguna indicación del Gobierno." Expansión.com, January 11, 2018. http://www.expansion.com/empresas/energia/2018/01/11/5a5743c122601d351a8b460b.html.

210. "REPORT BY THE BOARD OF DIRECTORS OF ABERTIS INFRAESTRUCTURAS, S.A. ON THE TAKEOVER BID BY HOCHTIEF AKTIENGESELLSCHAFT AUTHORISED BY THE NATIONAL SECURITIES MARKET COMMISSION (CNMV) ON 12 APRIL 2018." Abertis Infraestructuras S.A., April 17, 2018. https://www.cnmv.es/Portal/verDoc.axd?t={403901ae-9d9f-4514-b657-d69bd7f3fc4b}.

211. Ridolfi, Daniele. "Atlantia." Kepler Cheuvreux, October 10, 2017.

212. ———. "Atlantia." Kepler Cheuvreux, January 2, 2018.

213. Roberts, Hannah. "Italian Coalition Shows Splits in Handling of Bridge Collapse." Financial Times, August 17, 2018. https://www.ft.com/content/230ec6a8-a200-11e8-85da-eeb7a9ce36e4.

214. ———. "Italy's Bridge Disaster: An Inquest into Privatisation." Financial Times, September 4, 2018. https://www.ft.com/content/874b7e4c-ac3f-11e8-94bd-cba20d67390c.

215. ———. "Italy's Transport Officials Were Warned over Genoa Bridge 6 Months Ago." Financial Times, August 20, 2018. https://www.ft.com/content/b547bbe6-a472-11e8-926a-7342fe5e173f.

216. ———. "Rome Dismisses Operator's €500m Genoa Bridge Recovery Offer." Financial Times, August 19, 2018. https://www.ft.com/content/49d0b62c-a39d-11e8-926a-7342fe5e173f.

217. Simón, Gema Escribano, Pablo Martín. "Macroemisión de Abertis: coloca 3.000 millones en deuda con vencimientos de entre 5 y 12 años." Cinco Días, March 18, 2019. https://cincodias.elpais.com/cincodias/2019/03/18/mercados/1552903228_494534.html.

218. Squires, Nick, and Andrea Vogt. "Genoa Collapse: Hundreds More Bridges 'at Risk' across Italy as Ministers Blast Highways Firm." *The Telegraph*, August 16, 2018. https://www.telegraph.co.uk/news/2018/08/16/genoa-collapse-hundreds-bridges-risk-across-italy-ministers/.

219. "Thomson Reuters Eikon." Accessed between January and March 2019. https://eikon.thomsonreuters.com/index.html.

220. "Transferring Research Coverage," 2017, 6.

221. Tsoneva, Tania. "Infrastructure Finance Outlook." S&P Global Ratings, Q3 2018.

222. "Understanding Morandi - Part 1 - The Post-Stressed Conrete Cable Stays." Accessed between January and March 2019. http://www.retrofutur.org/retrofutur/app/main?DOCID=1000116030.

223. Vickars, Paul. "Atlantia: Abertis Deal Creates Long and Short Bond Opportunities." Société Générale, June 13, 2018.

224. "Watch: Demolition of Genoa's Collapsed Morandi Bridge Begins | Euronews." Accessed between January and March 2019. https://www.euronews.com/2019/02/08/watch-demolition-of-genoa-s-collapsed-morandi-bridge-begins.

225. Wibowo, Andreas. "Valuing Guarantees in a BOT Infrastructure Project." *Engineering, Construction and Architectural Management* 11, no. 6 (December 2004): 395–403. https://doi.org/10.1108/09699980410571543.

226. Zhukov, Pavel. "The Impact of Cash Flows and Weighted Average Cost of Capital to Enterprise Value in the Oil and Gas Sector." *Journal of Reviews on Global Economics* 7 (March 9, 2018): 138–45. https://doi.org/10.6000/1929-7092.2018.07.11.