ISCTE Business School
Instituto Universitário de Lisboa

EQUITY RESEARCH: NOS, SGPS

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Project submitted as partial requirement for the conferral of

Master in Finance

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September 2018

Abstract

The objective of this dissertation is the definition of a target price for NOS SGPS and providing to the investors a recommendation of either buying, selling or holding the stock of that company. NOS, previously denominated ZON OPTIMUS is a Portuguese communication and entertainment company that resulted from the merger in 2013 between two of the biggest communications companies in Portugal: ZON Multimédia and OPTIMUS Telecomunicações.

Nowadays, NOS is one of the market leaders in the communication and entertainment sector, offering fixed and mobile solutions, TV, internet, mobile data and cinema to its customers.

Regarding the models employed in the valuation of NOS, the choice, taking into account the literature review carried out in the thesis, was to use the DCF - FCFF and Comparable's Method (Multiples), since both provide different perspectives while complementing each other.

Taking into consideration the results from the models presented above and the NOS market price on 2nd of august of 2018, it is possible to conclude that NOS share price is undervalued.

Therefore, the recommendation is to buy or hold NOS shares, since with all the models applied the value obtained for NOS share is always higher than the market value.

Keywords: NOS, SGPS; Company Valuation; Free Cash Flow to the Firm; Multiples

JEL Classification: G30 – Corporate Finance; G32 – Value of Firms

Resumo

A presente dissertação tem como intuito desenvolver um modelo de avaliação que permita alcançar o justo valor da ação da NOS,SGPS, bem como, o de efectuar uma recomendação sobre a decisão de compra ou venda das suas ações.

A NOS, anteriormente denominada ZON OPTIMUS, é uma empresa portuguesa de comunicação e entretenimento que, em 2013, resultou da fusão entre duas das maiores empresas de comunicações em Portugal: a ZON Multimédia e a OPTIMUS Telecomunicações.

Atualmente, a NOS é uma das empresas líderes de mercado no setor das telecomunicações e oferece aos seus clientes soluções de redes fixas e móveis, TV, internet, dados móveis e cinema.

Neste sentido e tendo por base a revisão de literatura desenvolvida ao longo desta dissertação, os modelos de avaliação escolhidos foram o DCF - FCFF e os Múltiplos, uma vez que ambos permitem desenvolver perspetivas diferentes sobre a realidade da empresa, complementando-se mutuamente.

Tendo em consideração os resultados obtidos através dos modelos apresentados acima e o preço de mercado da ação do Grupo, a 2 de agosto de 2018, é possível concluir que o preço da ação se encontra subavaliado.

Por esse motivo, a recomendação efectuada na presente dissertação é a de comprar ou manter as ações da NOS, uma vez que através de todos os modelos de avaliação desenvolvidos e analisados, o valor obtido para a ação da NOS é sempre superior ao valor de mercado.

Palavras-chave: NOS, SGPS; Avaliação de Empresas; Free Cash Flow to the Firm; Múltiplos

JEL Classification: G30 – Corporate Finance; G32 – Value of Firms

Agradecimentos

Aproveito para agradecer a todos os que me acompanharam ao longo deste ano lectivo, que se mostrou cheio de desafios, aventuras e conquistas, tanto a nível académico, profissional e pessoal.

Sem dúvida que o desenvolvimento deste projecto primou sobretudo pela orientação e sugestões que fui recebendo do meu Orientador, o Professor António Gomes Mota, e pelo carinho e motivação que recebi tanto dos meus pais, Cândida e António José, como dos meus amigos, onde destaco o Francisco, a Margarida e a Catarina.

Um muito obrigada a todos pelo vosso apoio, amizade, paciência e dedicação!

Por fim, não posso deixar de agradecer a todo o corpo docente, que fez parte do meu percurso académico no ISCTE e que tanto impacto teve na minha formação.

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Glossary

ANACOM: Autoridade Nacional de Comunicações

BBVA: Banco Bilbao Vizcaya Argentaria

BLF: Fixed broadband

BLM: Mobile broadband

CAPEX: Capital Expenditure

CAPM: Capital Asset Pricing Model

COGS: Cost of goods sold

DCF: Discounted Cash Flow

DCF: Discounted Cash-Flow

DDM: Dividend Discount Model

DDM: Dividend Discount Model

DPS: Dividends per share

EBIT: Earnings Before Interest and Taxes

EBITDA: Earnings Before Interest, Taxes, Depreciation and Amortization

EC: European Commission

EPS: Earnings per share

EQV: Equity Value

EU: European Union

EV: Enterprise Value

FCFE: Free cash flow to equity

FCFF: Free Cash Flow to the Firm

FY: Fiscal year

INE: National Statistics Institute

KPI: Key performance Indicator

MRP: Market Risk Premium

NOPLAT: Net Operating Profit Less Adjusted Taxes

NRA: Autoridade Reguladora Nacional

PER: Price Earnings Ratio

PT: Portugal Telecom

ROA: Return on Assets

ROE: Return on Equity

ROIC: Return on Invested Capital

SAI: Internet access service

STF: Telephone service at a fixed location

STM: Mobile telephone service

TMT: Technology, media, and telecom

TVS or STVS: Subscription of the TV distribution signal

VAT: Value-Added Tax

WACC: Weighted Average Cost of Capital

WC: Working Capital

Introduction

A firm's value is positively correlated with its capacity to generate profit, to motivate and increase the connection with its employees, to make an impact in the society in which it operates and to overcome the conditions of a very demanding market where competition is fierce.

However, for all the companies in the stock market, not only the above mentioned characteristics impact its valuation, but also the future expectations that investors and financial analysts have regarding its future performance.

NOS, previously denominated ZON OPTIMUS is a Portuguese communication and entertainment company that resulted from the merger between two of the biggest communications companies in Portugal: ZON Multimédia and OPTIMUS Telecomunicações. This merger occurred in 2013 and, nowadays, NOS is the market leader in the communication and entertainment sector, offering fixed and mobile solutions, TV, internet, mobile data and cinema to its customers.

Through the years, NOS was capable to build a remarkable position as well as to consolidate its leadership in the communication and entertainment sector. In 2017, NOS had an operating revenue of 1.6 billion euros, an EBITDA of 581 million euros and a Net income of 124 million euros. These indicators attest for the size of the group in Portugal.

Therefore, the main goal of this dissertation is to establish a target for the share price of NOS and give a recommendation to the investors of either buying, selling or holding the stock.

The following sections include the literature review, which explains the valuation models that will be used, a description of NOS business in Portugal and, finally, the recommendation made to the investors, taking into consideration the valuation models, as well as the assumptions and the available market information.

1. Literature Review

The global economy created the need to develop global valuation techniques in order to evaluate and compare company prices and to identify sources of economic value creation or destruction.

According to Fernandez (2017a), these valuation techniques can be used for a wide range of purposes, such as company transactions, valuation of stock prices, public offerings and strategical planning.

When applying the valuation models to a potential transaction of ownership it is also important to take into consideration that the value of a given company will be different from the point of view of the buyer and the seller, since there are different variables to take into consideration.

The first model to be discussed is the Discounted Cash-Flow (DCF), followed by the Dividend Discount Model (DDM) and, finally, the Comparable's Method (Multiples).

1.1. Discounted Cash-flow Models

The Discounted Cash-Flow models are the only conceptually correct valuation methods (Fernandez, 2017a), since the firm assumes itself as the cash flow generator and the future expectations of the firm are also considered. Additionally, by not considering the past performance of the company, the Discounted Cash-Flow models have a significantly lower degree of dependence from organizations' past operations and results.

There are two different Discounted Cash-Flows models: the Free Cash-flow to the firm and the Free Cash-flow to equity, which according to Fernandez (2017a) aim to determine the company's value by estimating the cash-flows they will generate in the future and then discounting them at a discount rate matched to the flow's risk.

1.1.1. FCFF – Free Cash Flow to the Firm

The FCFF can be described as the cash-flow generated by the operations after deducting the required investment in fixed assets and working capital to sustain them. The formula of the FCFF is the following:

$$FCFF = EBIT\,(1-t) + Depreciations - Cap.Expenditures\;(CAPEX) - Changes\ in\ working\ capital \quad (1)$$

In this model, the FCFF needs to be discounted at the Weighted Average Cost of Capital (WACC), since it is a measure that takes into consideration the cost of the two sources of funds (equity and debt) each reflecting the risks that might affect the remuneration of these two stakeholders of the company.

The WACC needs to include three very important elements: the capital structure of the company, the required return on equity by investors (r_E) and the cost of debt (r_D). The WACC formula is as follows:

$$WACC = \frac{E}{E+D} \times rE + \frac{D}{E+D} \times rD \times (1-t) \quad (2)$$

In this formula, E corresponds to the market value of Equity of the firm while D represents the market value of Debt (interest-bearing).

1.1.1.1. Required Return on Equity

One of the key indicators needed to compute the WACC is the required rate of return of investors. According to the Capital Asset Pricing Model (CAPM), the required rate of return is computed by applying the following formula:

$$rE = rf + BL \times (E(rm) - rf) \quad (3)$$

Where the *E(rm)* it is the expected market return, the *rf* it is the risk-free rate and the *BL* is the levered beta, the firm's beta.

Beta's definition is of crucial importance, for the computation of the required rate of return and there are two ways to do it: assuming that the valuation is for a non-listed company, either by using the beta of a similar company to the one under analysis or using a beta which represents an average of a selected peer group of the companies in the same industry. It is worth to highlight that the second option is the most used by financial analysts due to the difficulty in finding a listed company identical enough to be comparable with the one under analysis. However, if the company is listed on the stock market, the company's own beta must be used.

1.1.1.2. Cost of Debt

Following the same line of reasoning, the cost of debt is also required to calculate the WACC. The cost of debt represents the effective rate a company pays on its current debt, and can be computed as the weighted average of the different sources of debt.

1.1.1.3. Interest tax shields

Companies have many ways to finance their projects and one of them is by contracting more debt. By having a higher amount of debt in its capital structure, companies will benefit from deducting the interests paid in that Debt, meaning these firms will be able to reduce their taxable income.

1.1.1.4. Enterprise Value

The Enterprise Value (EV) corresponds to the actual value of the business of the firm. It can be computed by discounting the present value of the Free Cash-Flow to the Firm (FCFF) with the WACC, as it is possible to see in the following formula:

$$EV = \sum \frac{FCFF_t}{(1 + WACC)^t} \quad (4)$$

1.1.1.5. Equity Value

In order to find out the firm´s value for its shareholders, it is necessary to compute the Equity Value (EQV) of the firm. This value corresponds to the sum of the Enterprise Value with the non-operating assets (assets that are not essential to the on-going operations of the business), decreased by the financial debt and non-operating liabilities (obligations assumed by the company, which are not part of the debt used to finance operations), as the following formula suggests:

$$EQV = EV + Non\ operating\ assets - Financial\ debt - Non\ operating\ liabilities \quad (5)$$

Finally, the firm's share price will be equal to the Equity Value of the firm divided by its total number of outstanding shares.

1.1.2 FCFE - Free Cash Flow to Equity

The Free cash flow to equity (FCFE) measures how much cash can be paid to equity shareholders, usually in the form of dividends, after paying all the capital expenses, reinvestment and debt obligations. The FCFE is computed using the following formula:

$$FCFE = Net\ income - Net\ capital\ expenditures - Changes\ in\ working\ capital + New\ debt - Debt\ repayment \quad (6)$$

The FCFE method is sometimes used as an alternative to the dividend discount model, particularly in cases where firms do not distribute dividends.

Therefore, the firm's equity value can be computed by applying the following formula:

$$Equity\ Value = \sum_{t=1}^{n} \frac{FCFE}{(1 + r_E)^t} \qquad (7)$$

Where the FCFE is the expected future cash flows to Equity, and the r_E is the "cost of equity", the rate of return required by equity investors in the firm (Damodaran, 2012).

1.2. Dividend Discount Model

Stock market investors can have, typically, two possible sources of income: in the first place the possibility to sell their shares at a higher price than the one at which they bought and in second place by receiving dividends paid by the shares.

The Dividend Discount Model (DDM) associates the value of a given company based on its future distributions of dividends. According to the DDM, the price of any stock corresponds to the present value of the perpetual stream of future dividends per share, discounted at the Return on Equity, as the following formula presents:

$$Share\ Value = \sum_{t=1}^{\infty} \frac{DPS}{(1 + r)^t} \qquad (8)$$

To get to the final overall value of the company, it is necessary to multiply the share value of the company by the total amount of its outstanding shares.

In the case of companies that currently are not distributing dividends, the model implies an estimation of their future distribution of dividends, which is one of the limitations of the model.

If companies are expected to grow in perpetuity at a constant rate, the DDM can be computed using simplified formula, where g represents an annual constant growth rate, as depicted in the following formula:

$$Share\ value = \frac{DPS_1}{r - g} \qquad (9)$$

In order to overcome the idea of a company growing at the same rate forever, a multistage dividend discount model (two-stage model and three-stage model) was developed. These models are a more accurate solution to value a company, since they consider different growth rates throughout the life of a company. For instance, the three-stage model is applied by assuming an initial phase of stable high growth, then decreasing marginally the growth rate until it reaches the final stage growth rate. Its main advantages are the fact that it does not rely on the pay-out ratio of the company and the above average applicability, since it can be applied to nearly all firms.

1.3. Multiples

This method compares a firm's value with that of its competitors and assumes itself as an alternative to absolute value models. Among its several advantages, we may point out the small number of assumptions needed and its simplicity.

There are three main categories of multiples (Fernandez, 2017b) and each category is based on a relevant indicator of the firm's financials:

- Multiples based on Capitalization: Price Earnings Ratio (PER), Price to Cash Earnings (P/CE), Price to Sales (P/S), Price to Book Value (P/BV);
- Multiples based on the company's value: Enterprise Value to EBITDA (EV/EBITDA), Enterprise Value to Sales (EV/Sales);
- Growth-Referenced Multiples: PER to EPS growth (PEG), Enterprise value to EBITDA growth (EV/EG).

To apply the Multiples Model, firstly it is necessary to choose the multiples that will be used and then to identify the peer group, a group of companies that somewhat have a certain level of affinity to the one under analysis. Firms belonging to the peer group should operate in the same industry, and ideally should have a similar growth pattern, a similar risk profile and use the same accounting standards.

Secondly, it is necessary to compute the multiples for the peer group. The PER – Price Earnings Ratio and the EV/EBITDA are the most used in this kind of valuations.

The final step concerns the average computation of the multiples and consequently the valuation of the company under analysis. However, the differences between firms might require some statistical action, such as the elimination of some outliers that might be present in the peer group.

The multiples approach has some limitations. Firstly, as it is based on market values, if the market is valuing an industry or a group of companies wrongly, the whole valuation will be misleading. Secondly, we may argue that it does not exist a true comparable for a company rather than itself. Finally, the lack of transparency that often is associated with the choice of the indicators that we will be used is also a concern.

Therefore, the relative valuation should be used as a complement to the methods previously described, to a certain extent a way of making more robust the valuation exercise.

1.4. Best model to use

The valuation method used will depend on the nature of the company, for instance, according to Fernandez (2017a), once the growth of utility companies is relatively stable is easy to extrapolate their operating statement and then discount the cash flow. On the other hand, in case of banks, where the focus is on the operating profit, valuations such as the PER or net worth method are the most used. Finally, on industrial and commercial companies, the commonly used methods are the financial ratios.

Therefore, while the conceptually "correct" model is the Discount Cash-Flow Model, where the firm's value is computed by discounting the expected future cash flows, the best model to use will depend on the nature and the growth stage of the company.

In conclusion, the best thing to do, is to combine the results of the different valuation models, since they all complement themselves.

2. Telecommunications Sector

The Telecommunications Sector in Portugal has been constantly evolving through the years, suffering multiple changes associated with the main players in the market and their product portfolio.

In the recent years, this was a sector very active in terms of mergers and acquisitions, both between national and international players. Additionally, with the constant technology evolution, the main players of the market managed to keep on launching new products and services, promoting a very high level of competition for market share.

2.1. Telecommunication Products

The Telecommunications sector offers to its customers a wide range of products, namely:

- Telephone service at a fixed location (STF);
- Mobile telephone service (STM);
- Subscription of the TV distribution signal (TVS or STVS);
- Internet access service (SAI) which integrates both the fixed broadband (BLF) and the mobile broadband (BLM).

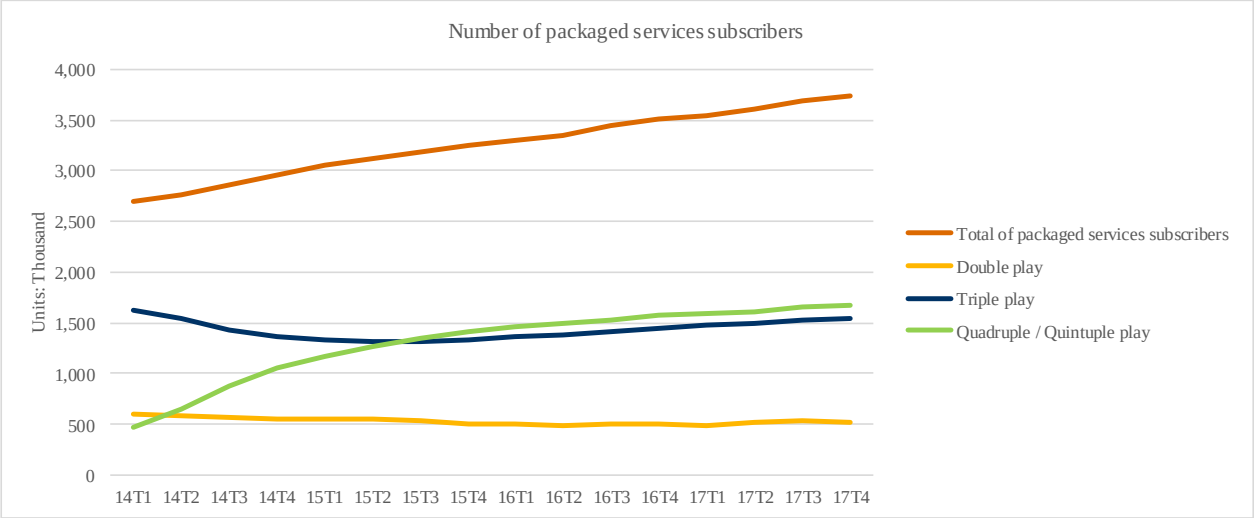
These products can be marketed either in a separated way (*single play* or *stand-alone*) or in an aggregated form (*multiple play* or *multi-play*), where the client can choose the services to include (*double play*, *triple play*, *quadruple play* or *quintuple play* or 2P, 3P, 4P e 5P).

According to *ANACOM* data, the Portuguese regulator for the Telecommunications sector, by the end of 2016 there were approximately 1074 (671 in 2015) commercial offers for the residential segment. This increase was essentially driven by the introduction of new packages of products with different loyalty periods.

In 2017, the penetration of packaged services continued to increase and consequently, the number of service pack subscribers increased approximately 6.3% when compared with the year before. Moreover, the subscriptions of 4P and 5P (BLF + STF + TVS + STM + BLM) packages were clearly the preferred ones by the Portuguese customers (45% of the Subscribers in

FY17), followed by the 3P package (BLF + STF + TVS) with circa 41% of the subscribers. The graph presented below illustrates this situation.

Figure 1 - Number of packaged services subscribers (in thousand of subscribers)



Source: Anacom – "factosnumeros 2017" (2018)

Regarding the price of Portuguese Telecommunications, as of December 2017 the prices decreased marginally, approximately 0.15%, when compared to the same period in 2016. Despite this decrease, the scenario is a little bit different if we analyze the evolution of prices in average annual terms, since according to the National Statistics Institute (INE), the price variation in 2017 was equal to 2.35% (0.98 percentage points above the inflation rate of 1.37%) compared with 2.61% in 2016 (2.01 p.p above the inflation rate of 0.61%).

In December 2017, Portugal was ranked as the second country in the E.U. with the highest price increase, significantly higher than the average of the E.U. (0.9%)

2.2. Main Players

In the Portuguese Telecommunications sector there are four Groups that stand out in terms of size and market share.

The first one is Altice, previously named Portugal Telecom (PT) which joined the Altice Group in 2015 and, consequently, changed its name to Altice Portugal in 2018, but maintained its individual

brands: MEO, PT Empresas, SAPO, MOCHE and UZO. Altice is a Dutch multinational telecommunications, media, entertainment and advertising company and its net sales are distributed geographically as follows: France (43.6%), United States (33%), Portugal (9%), Israel (4.1%), Dominican Republic (7.5%). The most representative shareholders of the group are: Patrick Drahi (60,85%), Europacific Growth Fund (5.17%) and Autodetenção (5%).

Regarding the Altice financial results, in the 4th Quarter of 2017 the total revenue in Portugal decreased by 1.8% compared to the same period of the previous year to € 536 million. Moreover, Altice Portugal's adjusted EBITDA decreased by 6.7% in the 4th Quarter of 2017 to € 245 million, with a margin reduction of 2.4 pp to 45.8%, comparing to the previous year.

In terms of operational results, the growth trend of the postpaid mobile customers in the B2C segment improved again in the 4th Quarter of 2017 with net additions of 33 thousand customers. In the business segment, the mobile customer base increased 2% compared to the previous year, with net additions of 13 thousand customers in the 4th Quarter of 2017, despite a higher competitive environment.

The second one is NOS, which resulted from a merger between Optimus and ZON in 2013 and will be presented with more detail in the next section.

The third one is Vodafone, which initially was denominated Telecel, a Portuguese local operator (2001). Vodafone is a British multinational mobile operator based in the United Kingdom, which has several subsidiaries, one of them in Portugal. Vodafone's currently network covers more than 67 countries worldwide.

Regarding the Vodafone financial results, at the end of March 2017 in Portugal, Vodafone reached a volume of sales and services of € 985.7 million, which represents an increase of 1.2% over the previous exercise. The EBITDA was € 248.2 million in FY17 compared with € 279.3 million in FY16. This reduction reflects the increase in the weight of the fixed business in total EBITDA. Vodafone has an operating profitability of 27.2% in the fiscal year 2016-2017, a decrease of 3.9 pp compared to the homologous period.

The business segment presents an increase in the revenues of 0.1% comparing to the previous year. On the other hand, the consumption segment revenues had also increased by 1.1%. Vodafone has

an operating profitability of 27.2% in the fiscal year 2016-2017, a decrease of 3.9 pp compared to the homologous period.

Finally, the Grupo Apax, which includes ONI and Cabovisão / NOWO and is the Group with the lowest maket share.

According to *ANACOM* data, these four Groups concentrate approximately 99.7% of the market share of the Portuguese TMT sector between themselves. The table below has information regarding the player's market shares and their product portfolio with reference to 2017.

Table 1 - Player's Market share: Portuguese TMT Sector (values in %)

Players	STF (%)	BLF (%)	STVS (%)	STM (%)	BLM (%)	Multiple play (%)	Double play (%)	Triple play (%)	Quadruple/Quintuple play (%)
Altice	44.8	39.5	38.3	43.7	38.3	40.1	43.8	33.2	45.4
NOS Group	35.2	37.3	42.6	24.3	31.3	38	31.5	35.5	42.4
NOS	33.4	34.9	39.8	24.3	31.3	35.5	29.7	32.9	39.8
NOS Açores	0.6	0.8	0.9	0	0	0.8	0.6	0.8	0.9
NOS Madeira	1.3	1.6	1.8	0	0	1.7	1.3	1.8	1.7
Vodafone	15.9	18.6	14.3	29.8	29	17	17	25.9	8.8
Grupo APAX	3.8	4.3	4.7	0.8	1.2	4.8	7.5	5.5	3.4
Cabovisão/Nowo	3.5	4.2	4.7	0.8	1.2	4.8	7.5	5.5	3.4
Onitelecom	0.3	0.1	0	0	0	0	0	0	0
Others	0.3	0.2	0.1	1.3	0.2	0	0.2	0	0

Source: Anacom – "factosnumeros 2017" (2018)

The analysis of the table clearly identifies Altice and NOS as the biggest players in the market, with the highest number of subscribers in both categories, followed by Vodafone and the Apax Group.

As of December 2017, Altice was the player with the highest share of subscribers in the following categories: STF (44.8%), BLF (39.5%), STM (43.7%) and BLM (38.3%). On the other hand, NOS was considered the main provider of TV signal (STVS) with approximately 42.6% of the Portuguese subscribers.

In terms of package offerings, Altice had the largest number of subscribers (41%), followed by NOS (37%), Vodafone (17%) and Grupo APAX(5%).

Finally, it is also important to highlight the existence of several smaller entities (Others) which aim to operate in specific geographic areas or target specific customers, but do not have a relevant presence in the market.

2.3. Telecommunications consumer Trends

According to the *Barómetro de Telecomunicações* of Marktest, the subscribers of packaged services are the ones with the highest propensity to change providers (7.7%). On the contrary, the subscribers of the mobile telephone service (STM) are the ones with highest levels of loyalty towards their telecommunications operators.

According to the E-Communications and Telecom Single Market Household Survey, promoted by the European Commission (EC), in October 2015 the propensity levels of change of provider in Portugal were 10% lower than the average in the EU28 (-4 percentage points). However, this seems to be a recent phenomenon, since in previous years, Portugal was regularly one of the European Union (EU) countries with higher propensity levels of change of suppliers.

In what concerns to the satisfaction levels of residential users of electronic communications services, on a scale from 1 to 10 the Portuguese users ranked the available services at an average rate of 7.94 points, with the Telephone and TV services being the ones with highest levels of satisfaction:

- Telephone service at a fixed location (STF), mobile telephone service (STM), subscription of TV signal distribution service (TVS or STVS) - between 8.4 and 8.3 points;
- Fixed broadband user and packet service users – 7.8 and 7.7 points;
- Mobile broadband (PC / tablet) – 7.5 points.

In conclusion, users of electronic communications services are very satisfied with the services provided.

Finally, it is important to refer that the consumers with a higher educational level, aged between 35 and 44 years and belonging to the working class and higher social classes tend to represent the core of the consumers, according to *ANACOM*.

2.4. Regulator

The National Communications Authority (*ANACOM)* is the national regulatory authority (NRA) in the field of communications in Portugal.

The role of *ANACOM* is to regulate the communications sector, including electronic and postal communications and to provide technical advice to the Government in these areas.

3. Company Overview

3.1 NOS Group

As mentioned above, NOS was created after the merger between two Portuguese telecommunications companies in 2013: Optimus and ZON.

NOS offers its clients several packages that include mobile and fixed telephone service, television and mobile network. Additionally, NOS is the main sponsor of two of the biggest musical festivals in Portugal, such as NOS Primavera Sound and NOS Alive, and has the largest network of cinemas in Portugal, Cinemas NOS.

At the summer festivals level, NOS main competitors are also very strong, working on the increase of their brand awareness and recognition, with Altice sponsoring the MEO Sudoeste and the MEO Marés Vivas and Vodafone sponsoring the Vodafone Paredes de Coura, the Vodafone Mexe Fest and being the main sponsor of the Rock in Rio, in Portugal.

The NOS Group is constituted by 9 companies: NOS Technology, S.A.; NOS Towering, S.A.; NOS Sistemas; NOS Inovação; NOS Açores Comunicações, S.A. (84%); NOS Madeira Comunicações, S.A. (78%); DREAMIA, S.A. (50%); ZAP (30%) and SPORT TV, S.A. (25%).

NOS is a recognized brand in the telecommunications sector in Portugal and it has won several awards over the last few years. In 2018 NOS won for the fourth consecutive year the Choice of Consumer and the Product of the Year award and in 2016 and 2017 was chosen as the Trust Brand in the category Telecommunications and Multimedia.

According to NOS website, the Group is entirely committed on the development and improvement of both customer satisfaction and innovation, being those the main strategic points for the Group in 2018:

1 - "Increase market share in all segments";

2- "Consolidate the position of the best communications and entertainment group in the country"; and

3- "Grow out there and add value anywhere in the world".

In what regards to the Group's financial results in FY17, NOS had €1,562M in operating revenues, €581M in EBITDA, €124M in Net Income, €381M in CAPEX, €2,967M in Total Assets and €1,085M in Net Financial Debt.

Table 2 - KPI's of NOS Group (values in Millions of euros)

KPI's	NOS Group		
	2015	2016	2017
Operating Revenues	1,444	1,515	1,562
EBITDA	533	557	581
Net Income	83	90	124
CAPEX	408	393	381
Total Assets	2,976	2,983	2,967
Net Financial Debt	1,048	1,112	1,085

Source: NOS Website – "NOS HISTORIC KPIs - FY17" (2018)

Through the analysis of the KPI's table above, NOS was able to generate profits and increase its performance over the years. An increase in both Operating Revenues and Net Income is visible over the 3 years presented, with the Operating Revenues increasing 3% and the Net Income increasing 27% compared with 2016.

In the other hand, the total value of Assets has remained relatively constant (-1%), and both CAPEX and Net Financial Debt showed a slight decrease in relation to 2016, 3% and 2% respectively.

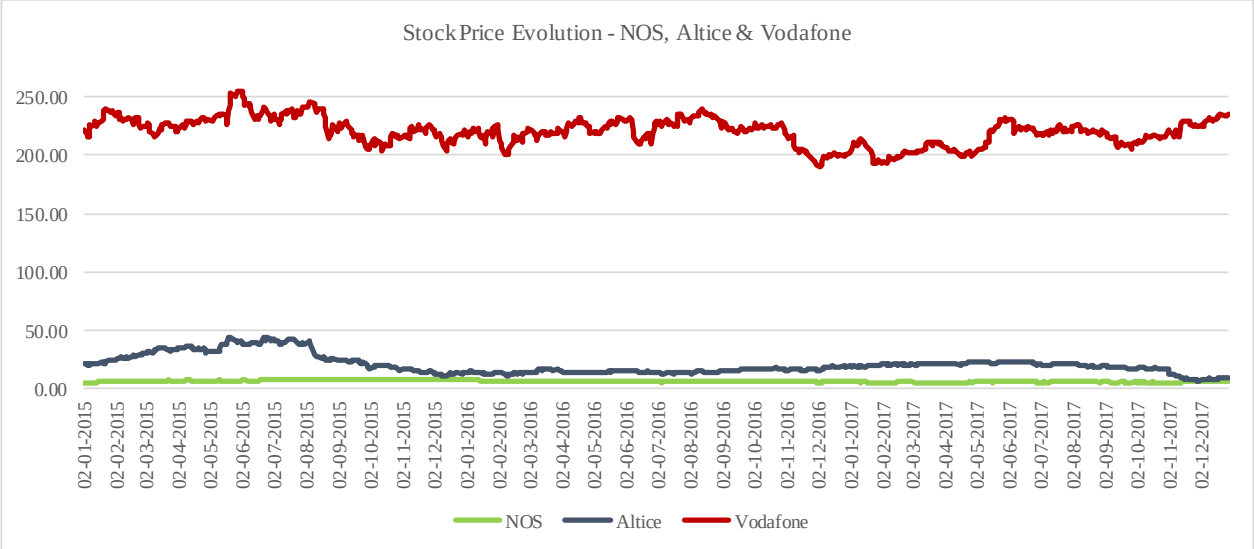
Concerning the Group's share price, by the end of 2017 (29th of December of 2017) the price of the share in the EURONEXT LISBON market was €5.48, lower than the previous year (€5.64 at 30th of December of 2016).

In the other hand, by the end of 2017, Altice (MEO) stock price registered a huge volatility during the year, since the highest valuation of the year was €23.26 and the lowest was €6.63.

Regarding Vodafone, its stock price by the end of 2017 was €235, its highest value was €235.90 and the lowest was 192.45€.

In the chart below, it is possible to analyze the evolution of the stock price of the three main players of the Portuguese Telecommunications sector from 2015 to 2017.

Figure 2 - Stock price evolution: NOS Group, Altice, Vodafone (value in euros)



Source: NOS Website (2017)

The analysis of the chart above, allows investor to take main conclusions:

- Vodafone stock price is the one with the highest volatility;
- Altice stock price presents a decreasing pattern in the last quarter of 2017, with a significant decrease of approximately 45%.
- NOS Group was the one with the lowest volatility (constant values) in the analysed period.

However, it is important to notice that the stock performance of the three companies is not directly comparable, since Altice (MEO) and Vodafone are both multinational firms with exposure to different countries, while NOS Group only have exposure to the Portuguese national market.

In terms of dividends, NOS has increased its dividends distribution significantly in the recent years, since that from 2013 to 2014 the dividends paid had increased by about 14%, while from 2016 to 2017 dividends have increased by about 50%. This situation is representative of the evolution of the Group's capacity of generating profits for its investors while solidifying its position in the market.

In the following table, one can observe the evolution of NOS dividends as well as its pay-out ratio.

It is also important to note that since 2016 the Payout ratio of NOS was higher than 100% (114% and 125% in 2016 and 2017, respectively), meaning this that in addition to distributing all the profits, it still distributed some available reserves as dividends, reducing thought the book value of equity.

Table 3 - Dividends per share and Pay-out-Ratio of NOS Group

Date	Dividend per share	Pay-out-Ratio
2013	0.12 €	97%
2014	0.14 €	97%
2015	0.16 €	100%
2016	0.20 €	114%
2017	0.30 €	125%

Source: NOS Website (2018)

In what concerns to the Group's shareholder structure, the next table identifies the most representative shareholders of the Group, being ZOPT,SGPS, S.A. the most representative shareholder with 52.15% of the share capital, followed by the Harris Associates, L.P. with 2.26% of the Group's capital. ZOPT is a joint venture between Group Sonae (50%) and the Angola entrepreneur Isabel dos Santos (50%).

Table 4 - NOS Group shareholder structure

Shareholders	Number of shares (in euros)	% of share capital
ZOPT, SGPS, S.A.	268,644,537.00	52.15%
Harris Associates, L.P.	11,643,300.00	2.26%
Blackrock, Inc	11,562,497	2.24%
MFS Investment Management	11,049,477.00	2.14%
Norges Bank	10,891,068.00	2.11%
Total	**313,790,879.00**	**60.90%**

Source: NOS Website (2018)

Finally, in order to understand the value creation to NOS shareholders, the historical total stock return (2017, 2016 and 2015) was computed and then compared with the total return of PSI-20 for

the same periods. PSI-20 is a benchmark stock market index of companies that trade on Euronext Lisbon and it is the main reference index of the Portuguese capital market.

The variation computed in order to get the total shareholder return took into consideration the value of the shares at the end and at the beginning of the years, for both NOS and PSI – 20 (Appendix 1). Additionally, the dividends of NOS paid during these years were also taken into account.

In the following table it is possible to conclude that the NOS share price, besides the dividends paid, during 2017 was not able to create value to its shareholders. On the contrary, the PSI-20 was able to generate in 2017 a positive return:

Table 5 – Historical Annual Shareholder Return for NOS and PSI-20

	NOS	PSI-20
2017	-0.87%	13.82%
2016	-19.20%	-10.55%
2015	41.06%	9.44%

In conclusion, through this analysis, it is possible to understand that *NOS*, since entering in the telecommunications market in 2013, has been gaining a solid position in the market and has shown positive results for its shareholders. In addition to this, the Group is totally committed with a future-oriented vision, focused on both clients and employees satisfaction and ready to embrace the challenges ahead. Nowadays, *NOS* is one of the strongest brands in the Portuguese market, and definitely one of the strongest players in Portuguese TMT sector.

3.2 Financial Analysis

Before starting to present NOS valuation that is computed based on historical data and some projections, it is important to take a brief look over some indicators that support the data that will be used in the valuation. An analysis of three profitability ratios of the Group is performed over the next few paragraphs.

Firstly, the Return of Assets (ROA) is a measure of profitability of the business. In 2017, according to Bloomberg, NOS had a ROA equal to 4.28% compared to a significantly lower value of its average peer group (2.43%).

From the analysis of the table below, one can easily conclude that NOS produced a much higher return on assets than its peer group.
Secondly, the Return on Invested Capital (ROIC) is also a measure of profitability of the business. Based on the values presented, NOS has a very similar performance in what concerns to the ROIC with its peer group, since both present the same value in 2017 (6.80%).

Finally, the third and last profitability ratio considered in this analysis is the Return on Equity (ROE), which represents the return of the money invested by the shareholders in the firm.

Once again, NOS SGPS over performed the results of its comparable companies, meaning that NOS shareholders earned a higher return than the shareholders of the companies in the peer group did.

Table 6 - NOS Group Financial Indicators

	ROA	ROIC	ROE
NOS Group	4.28%	6.80%	11.47%
Peer Group	2.43%	6.80%	11.33%

Source: Bloomberg (2018)

In conclusion, once comparing NOS SGPS with other similar companies form the same industry in Western Europe, it is clear that on average NOS over performs the expectations, getting a higher profit both on operational level and in terms of returns. This is a very good indicator for the financial sustainability of the Group and critical for the ambitious growth goals set by the Management of the Group.

3.3 Overview of 2018

In terms of Key Performance Indicators (KPIs), it is possible to conclude that in the first quarter of 2018 NOS Group presented both an increase of approximately 1% in the Operating Revenues and an increase of 4% in the EBITDA when compared with the results of the first quarter of 2017.

Moreover, the Group had also increased its CAPEX (1.5%) and the Total Assets (0.6%).

Finally, both the Net Financial Debt and the Net income decreased 0.3% in comparison with the values of the 1st quarter of 2017.

Table 7 - KPI's of NOS Group 1Q 2018 (values in Millions of euros)

KPI's	1Q 2017	1Q 2018
Operating Revenues	380.3	382.9
EBITDA	142.4	148.1
Net Income	32.8	32.7
CAPEX	86.4	87.7
Total Assets	2,970.80	2,989.50
Net Financial Debt	1,053.30	1,050.40

Source: NOS Website – "NOS HISTORIC KPIs - FY18" (2018)

4. NOS Group Valuation

4.1 Assumptions for the Valuation

As presented in the previous chapter, in 2018 NOS Group intended to maintain its strategy focus on the growth of the Group, increasing its market share, making new investments, both in new products and in the its own retail network, and consolidating its position on the communications and entertainment sector.

According to NOS growth strategy and macroeconomic data, it is important to define some assumptions in order to be possible to compute a DCF-FCFF closer to the reality and to the expectations of the Group and the investors.

Firstly, regarding the growth rate of sales for the next 4 years, the assumption taken into consideration is that Group's sales will accompany the growth of both the forecasted inflation rate and the percentage increase in the private consumption rate defined by the *Banco de Portugal* (Appendix 2). Therefore, the sales will grow on average 3% in each year, percentage that is similar to the percentage verified in 2017, according to the following table:

Table 8 - NOS Group Sales growth projection

	2018	2019	2020	2021
Sales Growth	3.30%	3.30%	3.20%	3.01%

Source: Banco de Portugal (2018)

Secondly, regarding the costs of NOS, it is expected that in the next 4 years the costs will continue to represent approximately 63% of the Group's sales, following the trend already verified in the past years. Taking this into consideration, both COGS and Purchases will also increase at the same growth pattern of the sales.

Thirdly, in terms of Depreciation & Amortization the assumption made is that they will correspond to 71% of the EBITDA. This value was defined by applying the average weight of Depreciation & Amortization in NOS EBITDA in the last 3 years.

On the other hand, the VAT rate corresponds to the average between the normal VAT rate in Portuguese territory, which includes both the country itself as well as the islands, Madeira and Azores, (23%, 22%, 19%, respectively).

Regarding the CAPEX, the values that will have an impact in the computation of the FCFF were defined by some entities like Barclays Capital, BBVA Research, Berenberg Bank, and other ones, based on the 2016 results of NOS. Therefore, the CAPEX on this valuation will assume the following values:

Table 9 - NOS Group CAPEX projection (in millions of euros)

	2018	2019	2020	2021
CAPEX	373,000	363,000	361,000	355,168

Source: NOS Website (2018)

Finally, the growth rate defined for the NOS Group to be considered in the Terminal Value, corresponds to the sum between the Portuguese inflation rate of 2017 (1.60%) and the expected growth rate in earnings per share (0.47%). It is worth to mention that the expected growth rate in earnings per share was computed by Damodaran for the Telecom Services Industry in Western Europe with reference to January 2018. Therefore, the define growth rate for the NOS Group is 2.07%.

4.2 DCF-FCFF of NOS

4.2.1 WACC

The FCFF must be discounted at the Weighted Average Cost of Capital. To compute the WACC we need to identify the cost of debt and the cost of equity. To define the latter we also need to compute the Beta of Debt. This Beta will be computed through the CAPM.. The cost of debt of NOS was computed taking into consideration the Financial Debt of NOS (Appendix 3) and its Financial Expenses, as the following formula presents:

$$Rd = \frac{Financial\ Expenses\ of\ 2017}{Average\ Financial\ Debt\ of\ 2017} = 2.18\% \qquad (10)$$

Then to compute the Beta Debt (Bd) it is also necessary to define the Risk Free Rate (Rf), which in this case was the average of the 10-Year Portuguese Government Bond of December of 2017

(Appendix 4), and the Market Risk Premium (MRP), which was the average between the Market Risk Premium for January of 2017 and January of 2018 given by the Damodaran (Appendix 5).

The following formula represents the application of the CAPM, having the cost of debt to get the implicit value of the beta of debt.

$$Bd = \frac{(Rd - Rf)}{MRP} = 0.04 \quad (11)$$

In order to compute the cost of equity is also necessary to compute the Beta Levered (Bl) and in order to do that it is necessary to define the following variables:

1) Beta Unlevered (Bu) – corresponds to the Bu defined by the Damodaran for the Telecom Services in the Europe, for January of 2018;
2) D/E Ratio – where the D correspond to the Financial Debt at the end of 2017 and the E is NOS share value at 29-12-2017 multiplied by the total number of the outstanding shares; and
3) Taxes Rate (T) – the average of the last 3 years of the Income Taxes paid by the Group divided by the Income Before Taxes of NOS.

Therefore, the Bl of NOS is given by:

$$Bl = Bu + (Bu - Bd) * \frac{D}{E} * (1 - T) = 0.88 \quad (12)$$

Once the Bl is computed it is possible to define the required return on equity by investors (Re) of NOS using the CAPM:

$$Re = Rf + Bl * MRP = 9.37\% \quad (13)$$

Finally, the table below summarizes all the inputs needed to compute the WACC and presents, in the end, the value of WACC, 7.25%.

Table 10 - NOS Group WACC

NOS WACC	
Equity	2,823,084,362
Financial Debt	1,088,460,524
Bu	0.68
Taxes Rate	20.06%
Rd	2.18%
Rf (10 years Portuguese Government Bonds)	1.83%
Risk Premium (Rm - Rf)	8.60%
Bd	0.04
Bl	0.88
Re	9.37%
WACC	**7.25%**

Source: NOS Website (2018) & Damodaran (2018)

4.2.2 FCFF

Having into consideration the assumptions presented before, and the predicted values for the EBITDA (Appendix 6) and the Working Capital (Appendix 7), the forecasted FCFF of NOS for the next 4 years is presented below:

Table 11 - NOS Group FCFF (in millions of euros)

	2017	2018	2019	2020	2021
EBITDA	580,637	599,798	619,591	639,418	658,665
DEPRECIATION	-422,211	-423,412	-437,384	-451,380	-464,967
EBIT	**158,426**	**176,387**	**182,207**	**188,038**	**193,698**
TAXES	31,779	35,382	36,550	37,719	38,854
NOPLAT	**126,647**	**141,005**	**145,658**	**150,319**	**154,843**
DEPRECIATION	422,211	423,412	437,384	451,380	464,967
OPERATIONAL CASH FLOW	**548,858**	**564,416**	**583,042**	**601,699**	**619,810**
CAPEX	-380,567	-373,000	-363,000	-361,000	-355,168
CHANGES IN WC		-12,571	-12,986	-13,008	-12,627
FCFF	**168,291**	**178,845**	**207,056**	**227,691**	**252,015**

Source: NOS Website (2018)

4.2.3 Enterprise Value

The computation of the Enterprise Value is carried out by discounting the FCFF with the WACC and considering that at in fourth year the FCFF will grow in perpetuity at a constant rate of 2.07%:

Table 12 - NOS Group Enterprise Value (in millions of euros)

	1	2	3	4	5
FCFF	178,845	207,056	227,691	252,015	Terminal Value
DCF	166,761	180,021	184,587	190,503	4,868,847
EV	**5,590,719**				

4.2.4 Equity Value and Share Value

In order to get the Group's Equity value it is necessary to add to the Enterprise Value the Non-operating Assets and deduct the Financial Debt and the Non-operating liabilities.

Therefore, to achieve the share value of NOS it is only necessary to divide the Equity Value by the total number of the outstanding shares, as the following table shows:

Table 13 – DCF - FCFF: NOS Group Share value (in euros)

NOS Group Share value	
EV	5,590,719,495
Non operating assets	37,990,000
Financial debt	1,088,460,524
Non operating liabilities	135,757,000
Equity Value	**4,404,491,971**
Number of Shares	515,161,380
Share value	**8.55**

With the DCF - FCFF Model and the all the assumption presented above, the NOS share price equals a value of 8.55 euros.

4.2.4 Sensitivity Analysis

As the DCF - FCFF model is very sensitive to small changes in the growth rate (g) of the future Cash Flows and in the discount rate (WACC), a sensitivity analysis will be conducted, in order to understand how these variables influence the share value of NOS.

The sensitivity analysis was computed with the following variations:

- WACC – This variable will change 0.05% above and below of the WACC considered in this valuation (7.25%);
- g – This variable will change 0.03% above and below of the growth rate considered in this valuation (2.07%).

Table 14 presents the results obtained in the computation of the sensitivity analysis:

Table 14 – Sensitivity Analysis

		WACC				
		7.15%	7.20%	7.25%	7.30%	7.35%
g	2.03%	8.66	8.56	8.48	8.38	8.29
	2.05%	8.69	8.60	8.51	8.41	8.33
	2.07%	8.73	8.64	8.55	8.45	8.36
	2.09%	8.77	8.67	8.59	8.49	8.40
	2.11%	8.81	8.71	8.62	8.52	8.43

In conclusion, by making the growth rate and the discount rate vary in small amounts and considering that all the remaining assumptions remain constant, the lowest result for the NOS share is 8.29 euros while the highest is 8.81 euros.

4.3 Multiples

In order to complement and check the result achieved using the DCF-FCFF Model and in order to get a valuation based on NOS similar companies, the share price of NOS was also computed using the Multiples approach.

In the analysis three multiples were chosen, one based on capitalization (PER), and the other two based on company's value (EV/EBITDA and EV/SALES). Then, the peer group was set up using the group of Western Europe Telcom companies defined by Bloomberg.

In table 15 are presented the values for the three multiples for each company in the peer group:

Table 15 - Peer Group

	PER	EV/EBITDA	EV/SALES
Com Hem	56.37	11.81	4.93
Liberty Global	40.04	8.96	4.17
Sky plc	31.94	14.68	2.51
Tele Columbus	15.77	8.44	4.17
Altice Europe	29.06	7.5	2.8
Modern Times	45.9	14.93	1.51

Source: Bloomberg (2018)

In the table 16 and using the values of NOS Financial Debt and Non-operating Assets, the NOS share price is computed:

Table 16 - Multiples: NOS Share value (in value)

	PER	EV/EBITDA	EV/SALES
Average	36.51	11.05	3.35
Enterprise Value	-	6,417,985	5,229,367
Non operating assets		37,990	
Financial debt		1,088,461	
Non operating liabilities		135,757	
Equity Value	4,535,723	5,231,758	4,043,139
Number of Shares		515,161	
NOS Share value	**8.80**	**10.16**	**7.85**

5. NOS share price through the valuation models

Table 17 summarize the results obtained through the different valuation methodologies:

Table 17 – NOS Share Price

NOS Share Price	
DCF - FCFF	8.55 €
PER	8.80 €
EV/EBITDA	10.16 €
EV/SALES	7.85 €
Market price (02-08-2018)	4.98 €

Taking into consideration that NOS market price on 2nd of august of 2018 is equal to 4.98 euros, the valuation carried out clearly shows that NOS share price is undervalued, which means that:

(1) The market is not considering similar growth perspectives for the company as the ones used in the project; or

(2) It considers a higher level of risk for the company reflected in a higher cost of equity (and consequently in a higher WACC).

In conclusion, the recommendation is to buy or hold NOS shares, since with all the methods applied, the value obtained for NOS share is always considerably higher than the market value. Additionally, even the lower boundaries of the sensitivity analysis performed in the DCF model produces significantly higher values of the share comparing with the current market price.

NOS Group is continuously launching new products, for instance GIGA which is a faster internet solution, as well as it is increasing its market share throughout the recent years, it is considered a stable company with positive results and very good growth perspectives, which all contribute to reinforce the recommendation made.

Conclusion

The main goal of this dissertation was to develop a valuation framework that could generate a target price for NOS Company, listed in the stock market, as well as to give a recommendation to the investors regarding the decision of buy, sell or hold the stock of this company.

The company chosen for this dissertation is one of the biggest Portuguese Telecommunication companies: NOS, SGPS.

The valuation methodologies chosen were the DCF (using the FCFF approach) and Relative Valuation, since both provide different perspectives and complement each other. The DCF - FCFF is based on future cash flow generation while the second one focuses in the comparison of the company with other listed companies with similar characteristics, which also operate in the same industry.

To execute the valuation process of NOS share price, through the valuation methods selected, it was necessary to define several assumptions, detailed and explained in the previous chapter, which inevitably introduces a certain degree of subjectivity to this valuation. In any case, the assumptions made were reasonably conservative and supported by the company´s historical data.

After the computation of both valuation methods and the comparison of results with the Group market price on 2nd of august of 2018, the recommendation is to buy or hold NOS shares, since with all the models applied the value obtained for NOS share is always higher than the market value.

NOS Group is considered a stable company with positive results and a diversified product portfolio, which invests both in the telecommunication and entertainment industry, and has very good growth perspectives. This reasons all contribute to reinforce the recommendation made.

The results obtained in this valuation should be analyzed carefully, since it is important to consider that in the financial world small changes can lead to major impacts in the organization’s structures and its financial performances.

Nowadays, the competition between companies, the customer’s knowledge about its services and products and the technological advances are variables that once combined have a high degree of complexity and make company’s values far from simple and predictable.

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Appendixes

Appendix 1 - Stock price: NOS & PSI-20 (in euros)

	NOS	PSI-20
2017-12-29	5.48	5388.33
2017-01-02	5.73	4734.06
2016-12-30	5.64	4679.20
2016-01-04	7.18	5231.14
2015-12-31	7.25	5313.17
2015-01-02	5.24	4855.04

Source: NOS Website (2018)

Appendix 2 - NOS Sales growth projection

	2018	2019	2020	2021
Inflation Rate	1.20%	1.40%	1.50%	1.47%
Private Consumption	2.10%	1.90%	1.70%	1.54%
Sales Growth	3.30%	3.30%	3.20%	3.01%

Source: Banco de Portugal (2018)

Appendix 3 - Short, Medium and Long Term Debt of NOS

	2015	2016	2017
Short Term	**160.00**	**213.91**	**197.28**
Bank and Other Loans	141.71	196.42	183.57
Financial Leases	18.29	17.49	13.71
Medium and Long Term	**898.32**	**900.72**	**891.18**
Bank and Other Loans	862.56	871.78	870.34
Financial Leases	35.76	28.94	20.84
Total Debt	**1,058.32**	**1,114.62**	**1,088.46**
Cash and Short Term Investments	9.95	2.31	2.98
Net Financial Debt	1,048.37	1,112.31	1,085.48
Net Financial Gearing	0.50	0.51	0.50
Net Financial Debt / EBITDA	1.97	2.00	1.87

Source: NOS Website (2018)

Appendix 4 - Portugal 10 Year Bond Yield Historical Data (01-12-2017 to 31-12-2017)

Date	Price	Open	High	Low	Average
Dec 01, 2017	1.865	1.877	1.912	1.858	1.89
Dec 02, 2017	1.888	1.871	1.888	1.871	1.88
Dec 04, 2017	1.891	1.884	1.895	1.867	1.88
Dec 05, 2017	1.877	1.884	1.888	1.856	1.87
Dec 06, 2017	1.859	1.863	1.868	1.838	1.85
Dec 07, 2017	1.811	1.863	1.865	1.808	1.84
Dec 08, 2017	1.787	1.816	1.825	1.777	1.80
Dec 11, 2017	1.781	1.789	1.791	1.756	1.77
Dec 12, 2017	1.826	1.775	1.837	1.77	1.80
Dec 13, 2017	1.863	1.821	1.875	1.82	1.85
Dec 14, 2017	1.818	1.85	1.891	1.818	1.85
Dec 15, 2017	1.819	1.812	1.812	1.745	1.78
Dec 16, 2017	1.822	1.822	1.822	1.822	1.82
Dec 18, 2017	1.77	1.717	1.782	1.717	1.75
Dec 19, 2017	1.784	1.775	1.802	1.725	1.76
Dec 20, 2017	1.782	1.806	1.82	1.741	1.78
Dec 21, 2017	1.764	1.785	1.81	1.746	1.78
Dec 22, 2017	1.834	1.787	1.866	1.781	1.82
Dec 25, 2017	1.83	1.826	1.83	1.826	1.83
Dec 26, 2017	1.834	1.83	1.834	1.826	1.83
Dec 27, 2017	1.824	1.81	1.847	1.803	1.83
Dec 28, 2017	1.862	1.831	1.863	1.812	1.84
Dec 29, 2017	1.932	1.891	1.934	1.877	1.91

Source: www.investng.com (2018)

Appendix 5 - Risk Premium: Portugal

	Risk Premium Portugal
jan-18	7.96%
jan-17	9.24%
Average	8.60%

Source: Damodaran (2018)

Appendix 6 - NOS EBITDA projection

	31-12-2015	31-12-2016	31-12-2017	31-12-2018	31-12-2019	31-12-2020	31-12-2021
Revenues							
Provision of services	1,362,988	1,425,163	1,480,102	1,528,945	1,579,401	1,629,941	1,679,003
Sales	66,880	71,609	68,833	71,104	73,451	75,801	78,083
Other revenue	14,437	18,197	12,847	13,271	13,709	14,148	14,573
Total	**1,444,305**	**1,514,969**	**1,561,782**	**1,613,321**	**1,666,560**	**1,719,890**	**1,771,659**
Growth rate	**4%**	**5%**	**3%**	**3%**	**3%**	**3%**	**3%**
Gains, losses and costs							
Staff Cost	89,103	93,092	89,201				
Direct Cost	436,705	457,774	492,701				
Cost of goods solds	53,398	56,883	51,111				
Marketing and advertising	29,128	36,269	36,415				
Support services	93,721	91,445	92,920				
Supply and services cost	183,719	184,416	180,110				
Other Operating Costs/Gains	780	831	605				
Indirect taxes	26,202	29,466	32,455				
Provisions and adjustments	-1,550	8,058	5,627				
Losses /gains on participated companies	-	-	-				
Total	**911,206**	**958,234**	**981,145**	**1,013,523**	**1,046,969**	**1,080,472**	**1,112,994**
% of Costs in relation to Revenues	63%	63%	**63%**				
EBITDA	**533,099**	**556,735**	**580,637**	**599,798**	**619,591**	**639,418**	**658,665**
Depreciation, amortization and impairment losses	366,406	391,555	422,211	423,412	437,384	451,380	464,967
Depreciation/EBITDA	69%	70%	73%	**71%**			

Source: NOS Website (2018)

Appendix 7 - NOS Working Capital projection

Variables		
VAT		21%
Average Collection Period	(Clients/(Sales * (1+VAT))*365	79 days
Inventory Turnover	(Inventory/COGS)*365	229 days
Average Pay Period	(Suppliers/((COGS+SESs)*(1+VAT)))*365	293 days
VAT - Months of credit		1 moth

		2017	2018	2019	2020	2021
Accounts Receivable						
	Sales	1,561,782	1,613,321	1,666,560	1,719,890	1,771,659
	VAT	327,974	338,797	349,978	361,177	372,048
	Average Collection Period	79	79	79	79	79
	Accounts Receivable	406,904	420,332	434,203	448,097	461,585
Inventory						
	COGS	51,111	52,798	54,540	56,285	57,979
	Inventory Turnover	229	229	229	229	229
	Inventory	32,044	33,101	34,194	35,288	36,350
Accounts Payable						
	Purchases	32,112	33,172	34,266	35,363	36,427
	Final Inventory	32,044				
	Initial Inventory	51,043				
	VAT	6,744	6,966	7,196	7,426	7,650
	Average Pay Period	293	293	293	293	293
	Accounts Payable	31,229	32,260	33,324	34,391	35,426
State						
	Sales VAT	327,974	338,797	349,978	361,177	372,048
	Costs VAT	6,744	6,966	7,196	7,426	7,650
	Months of credit	1	1	1	1	1
	State	26,769	27,653	28,565	29,479	30,367
WC		**380,949**	**393,521**	**406,507**	**419,515**	**432,143**
ΔWC		**-**	**12,571**	**12,986**	**13,008**	**12,627**

Appendix 8 - NOS Historical Balance Sheet

	31-12-2014	31-12-2015	31-12-2016	31-12-2017
ATIVO				
ATIVO NÃO CORRENTE:				
Ativos fixos tangíveis	1,141,770	1,167,538	1,158,181	1,137,209
Propriedades de investimento	708	698	663	661
Ativos intangíveis	1,164,207	1,178,559	1,158,779	1,141,104
Investimentos em empreendimentos conjuntos e associadas	31,544	29,922	7,888	37,130
Contas a receber - outros	4,311	7,182	6,489	6,185
Impostos a recuperar	4,232	3,617	3,617	149
Ativos financeiros disponíveis para venda	77	77	77	180
Ativos por impostos diferidos	141,115	122,539	117,302	99,538
Instrumentos financeiros derivados	-	-	6	-
TOTAL DO ATIVO NÃO CORRENTE	**2,487,964**	**2,510,132**	**2,453,002**	**2,422,156**
ATIVO CORRENTE:				
Inventários	33,013	30,540	51,043	32,044
Contas a receber - clientes	331,527	347,837	348,926	406,904
Contas a receber - outros	27,652	11,135	15,814	10,366
Impostos a recuperar	5,022	2,242	2,861	14,945
Custos diferidos	47,742	64,660	84,391	77,657
Ativos não correntes detidos para venda	1,574	-	24,237	-
Instrumentos financeiros derivados	368	-	54	19
Caixa e equivalentes de caixa	21,070	9,948	2,313	2,977
TOTAL DO ATIVO CORRENTE	**467,968**	**466,362**	**529,639**	**544,911**
TOTAL DO ATIVO	**2,955,931**	**2,976,494**	**2,982,641**	**2,967,067**
CAPITAL PRÓPRIO				
Capital social	5,152	5,152	5,152	5,152
Prémio de emissão de ações	854,219	854,219	854,219	854,219
Ações próprias	-11,791	-10,559	(18,756)	(12,681)
Reserva Legal	3,556	3,556	1,030	1,030
Outras reservas e resultados acumulados	124,464	119,004	112,031	105,489
Resultado líquido	74,711	82,720	90,381	124,094
CAPITAL PRÓPRIO EXCLUINDO INTERESSES QUE NÃO CONTROLAM	**1,050,311**	**1,054,092**	**1,044,057**	**1,077,301**
Interesses que não controlam	9,818	9,430	9,041	9,067
TOTAL DO CAPITAL PRÓPRIO	**1,060,129**	**1,063,522**	**1,053,098**	**1,086,368**
PASSIVO				
PASSIVO NÃO CORRENTE:				
Empréstimos obtidos	616,526	979,422	972,003	954,658
Provisões	127,221	139,484	146,287	133,262
Contas a pagar - outros	-	-	21,551	17,615
Impostos a pagar	-	-	1,298	-
Acréscimos de custos	24,954	9,470	9,185	8,767
Proveitos diferidos	5,984	5,259	4,138	3,773
Instrumentos financeiros derivados	1,899	3,369	4,027	2,462
Passivos por impostos diferidos	17,237	13,739	10,206	7,140
TOTAL DO PASSIVO NÃO CORRENTE	**793,821**	**1,150,743**	**1,168,696**	**1,127,678**
PASSIVO CORRENTE:				
Empréstimos obtidos	503,508	178,022	224,692	210,136
Contas a pagar - fornecedores	340,721	327,485	238,828	224,864
Contas a pagar - outros	50,934	28,706	68,733	58,155
Impostos a pagar	14,576	23,296	23,957	19,222
Acréscimos de custos	163,165	175,871	174,514	213,564
Proveitos diferidos	29,076	28,802	30,123	27,047
Instrumentos financeiros derivados	-	47	-	33
TOTAL DO PASSIVO CORRENTE	**1,101,980**	**762,229**	**760,847**	**753,021**
TOTAL DO PASSIVO	**1,895,801**	**1,912,972**	**1,929,543**	**1,880,699**
TOTAL DO CAPITAL PRÓPRIO E PASSIVO	**2,955,931**	**2,976,494**	**2,982,641**	**2,967,067**

Source: NOS Website (2018)

Appendix 9 - NOS Historical Income Statement

	31-12-2014	31-12-2015	31-12-2016	31-12-2017
RÉDITOS:				
Prestação de serviços	1,311,031	1,362,988	1,425,163	1,480,102
Vendas	57,653	66,880	71,609	68,833
Outras receitas	15,250	14,437	18,197	12,847
	1,383,934	**1,444,305**	**1,514,969**	**1,561,783**
CUSTOS, PERDAS E GANHOS:				
Custos com o pessoal	85,264	89,103	93,092	89,201
Custos diretos	407,571	436,705	457,774	492,701
Custo das mercadorias vendidas	53,115	53,398	56,883	51,111
Marketing e publicidade	30,761	29,128	36,269	36,415
Serviços de suporte	89,604	93,721	91,445	92,920
Fornecimentos e serviços externos	187,987	183,719	184,416	180,110
Outros custos / (ganhos) operacionais	1,049	780	831	605
Impostos indiretos	23,824	26,202	29,466	32,455
Provisões e ajustamentos	-5,707	-1,550	8,058	5,627
Perdas / (ganhos) em empresas participadas, líquidas	-13,935			
EBITDA	**524,401**	**533,099**	**556,735**	**580,638**
Depreciações, amortizações e perdas por imparidade	339,294	366,406	391,555	422,211
Custos de integração	31,051	15,805	14,084	8,260
Perdas / (ganhos) com a alienação de ativos, líquidas	-1,258	-572	(9)	56
Outros custos / (ganhos) não recorrentes	7,913	4,685	8,333	7,349
RESULTADOS ANTES DE PERDAS / (GANHOS) EM EMPRESAS PARTICIPADAS,	**147,401**	**146,775**	**142,772**	**142,762**
Perdas / (ganhos) em empresas participadas, líquidas	-	-3,584	5,948	(22,933)
Custos de financiamento	36,299	24,057	16,844	20,135
Perdas / (ganhos) em variações cambiais, líquidas	-218	794	480	57
Perdas / (ganhos) em ativos financeiros, líquidas	541	249	-	2
Outros custos / (proveitos) financeiros, líquidos	18,520	10,629	7,277	3,800
	55,142	**32,145**	**30,549**	**1,061**
RESULTADO ANTES DE IMPOSTOS	**92,259**	**114,630**	**112,223**	**141,701**
Imposto sobre o rendimento	17,179	32,138	22,226	17,480
RESULTADO CONSOLIDADO LÍQUIDO	**75,080**	**82,492**	**89,996**	**124,221**

Source: NOS Website (2018)