

# Huawei-ZTE

## One feared response to today's Telecommunications Equipment market

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### ***Abstract***

*After the global crisis that started after June 2008, companies have become more wary about maintaining solid financial positions and liquidity. This has made them start to build piles of cash, which are now very large. In addition to this, the recovery of economic growth and the increased global competition created incentives to M&A transactions to happen. Huawei and ZTE are two Chinese Telecom Equipment companies that have comparable background and compete with each other. By engaging on a merger, they would be able to enhance their revenues and cut the costs and be in a better position to face the fiercer than ever competition.*

*Depois da crise global que teve início em Junho de 2008, as empresas passaram a preocupar-se mais com a manutenção de uma posição financeira sólida e líquida. Isto causou uma grande acumulação de meios financeiros líquidos. Além disso, a recuperação económica e o aumento da concorrência a nível global criou incentivos para integração económica. Huawei e ZTE são dois fabricantes chineses de equipamento de telecomunicações, partilhando um passado semelhante. Ao procederem a uma fusão entre as duas, estas empresas poderiam potenciar receitas e reduzir custos, conseguindo colocar-se numa melhor posição para fazer face a uma concorrência mais forte do que nunca.*

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# 1. INTRODUCTION & LITERATURE REVIEW

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## 1.1. INTRODUCTION

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This dissertation consists in the analysis of a potential integration between two Chinese Telecom Equipment companies - Huawei Technologies and ZTE Corporation. Does the current Telecommunications market justify such transaction? Who would profit, who would lose and under which conditions? These and other questions will be given possible answers.

The first section includes a short review over Mergers & Acquisitions: market size, why it happens and determinants of success or failure. In the second section, the existing literature is revisited – the focus is on firm valuation, being the literature on integration discussed further on the dissertation. The third section consists of an industry review, where the Telecommunications industry will be characterised in terms of size, maturity, main players and competitive environment, as well as drivers and trends. After that, the two companies are reviewed in order to detect strengths and vulnerabilities that would influence the integration. On the fifth section, the companies are valued according to three methods: the Weighted-Average Cost of Capital (WACC), the Adjusted-Present Value (APV) and Market Multiples. Firstly, they are valued separately and then together, already considering the potential benefits from the integration, which should add value to the merged entity. On the sixth section, the transaction specifics are detailed, such as the deal type, method of payment, financing of the deal, not forgetting the key risks and also alternatives to this transaction.

At the end of the dissertation there are four annexes that complement the main part. Annex 1 complements the introduction and the review of literature. Annex 2 provides further exploration of themes related to the industry. Annex 3 contains additional information on both companies. Lastly, Annex 4 consists of the forecasts and standalone valuation of both ZTE and Huawei.

The analysis conducted hereafter was made using both companies' financial reports until 2013, once the ones for 2014 were only released in April 2015. By this time, the forecast and valuation had already been concluded.

### 1.1.1. FIRST WORD ON M&A

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Mergers and Acquisitions (M&A) is part of the broader subject of Corporate Restructuring and comprises various types of economic integration, vertical or horizontal, from a simple business agreement to the full integration of one company into another. It is something going on every day, even though we do not realise it. Between 1998 and 2000, the total value of the deals was already greater than the sum of all the transactions that had taken place in the preceding thirty years (Henry, 2002). More recently, in 2013, M&A deals totalled approximately USD 2.3 trillion globally, with some transactions receiving great hype. In fact, in some situations, companies are willing to pay billions of whatever currency to acquire another company. According to (Shimizu, Hitt, Vaidyanath, & Pisano, 2004), technological development and globalisation have created many opportunities for M&A and a consequent increase in its popularity.

Table 1 in Annex 1 shows some of the largest deals of all time, many of them in the Telecommunications industry.

Economic integration may occur when two or more companies are worth more together than in separate. This gain translates into a potential increase in shareholder value and is commonly called synergy. (Anand & Andrew, 2002) believe that technological advantages and R&D intensity motivate acquisitions. According to (Sirower & Sumit, 2006), integrations related to R&D, capacity expansion or marketing, investments that are made within a medium to long time frame, have particular difficulty in performing well, since the initial premium paid puts pressure on performance right in the beginning. The premium represents what companies need to pay in order to have access to synergies. According to (Sirower & Sumit, 2006), it is equivalent to assume that the companies are increasing all the future cash flows by the amount of the premium. Either there is evidence that the synergies are likely to be delivered or the perceived value of the company starts to drop. The simple integration makes investors demand more from the merger and, on top of that, the premium paid puts the expectations even higher. In addition, there is the risk that the benefits from the integration are easily replicable by competitors, while the involved parties are more focussed on integration issues. It is thus very important to clarify the source of the synergy, what is the predictable impact and when it will start affecting cash flows (Damodaran, 2006). When valuing the synergies, one needs to assess the part of the premium that is control premium. Only after subtracting it may we find out the value of the synergies.

Synergies may take various forms and to (Damodaran, 2006) they can be divided into two main categories - operating synergies and financial synergies. Operating synergies affect margins, returns and growth. Financial Synergies, which translate mainly into higher cash flows or lower cost of capital, may take several forms. Examples of both types of synergies can be found on Addendum 1 in Annex 1.

We may also have Growth Synergies but these are more difficult to value. For example: will the combined firm earn higher return on its investments or have access to a higher number of investments, increasing the reinvestment rate? Will it keep growing for a longer period? In this analysis, synergies that are too uncertain or difficult to assess are avoided.

In his article about the meaning and value of synergies, Damodaran disserts about these being many times overstated, leading to high sums of money being spent in the transactions. On Addendum 2 of Annex 1 are some of the causes for failure in M&A.

It is, thus, important to look beyond the increase in revenues enhanced by increased market power and the cost reductions given the existence of economies of scale. There are matters not so straightforward which reveal themselves as vital issues for the success of the transaction, such as the use of different accounting principles or corporate governance, country and culture, factors that may even have a double effect on the merged company: increasing the integration costs and worsening the conditions for the synergies to become effective. Depending on the extent, suddenly, the acquirer has overpaid for the target, making it very difficult to deliver the advantages of the operation to shareholders. Prior experience in M&A of both parties is also relevant to avoid mistakes, as pre- and post-integration phases are dynamic and full of learning in both directions (Shimizu, Hitt, Vaidyanath, & Pisano, 2004).

In one of his studies, (Sirower & Sumit, 2006) provide some empirical evidence regarding deals and post-integration performance: acquirers underperform their industry peers, on average; initial market reactions are persistent over time; pricing matters; cash deals outperform stock deals; sellers have the highest returns among all the participants on the transaction.

(Child, Falkner, & Pitkethly, 2001) state that regardless of the type of transaction, the integration process is critical for the success of the operation, as the sources of conflict are always present.

Addendum 3 of Annex 1 reviews M&A in the Telecom Industry

## 1.2. LITERATURE REVIEW

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### 1.2.1. VALUATION APPROACHES

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In order to assess how much a company is worth, we may use several methods, depending on size, industry, capital structure, dividend policy, life cycle and on whether the company is publicly traded or not. The purpose is to give owners or any other stakeholders an approximation of how much a company is worth. In any of these approaches, we must be very clear with identifying the above stated company characteristics and all the consequences it might have on valuation, which should vary according to the method used. In this analysis, the main focus will be on cash-flow approaches, namely the Discounted Cash Flow (DCF) method, once it is the most widely used method and I agree with the well-known saying that “cash is king”. (Luehrman, 1997) even refers to it as “the heart of most corporate capital-budgeting systems”. The DCF analysis conducted in this dissertation consists of the Weighted-Average Cost of Capital (WACC) and the Adjusted-Present Value (APV) methods. Dividend-Discount models would not make sense in the context of R&D-intensive companies (Damodaran, 2006), who reinvest most of the income back into the company. Moreover, these are still growth companies without much pay-out and with an unstable capital structure. Finally, a Multiples approach on comparable companies will be carried forward to support conclusions.

Despite Huawei being a private-held company, this literature review will be more focused on publicly-held company valuation, with a note on private company valuation at the end of this section, providing the adjustments or proxies more pertinent to use when no market data is available. On the other hand, ZTE is publicly-traded. Therefore, we will make the bridge between both types of companies, as to value both companies in a complete and fair manner.

#### 1.2.1.1. CASH FLOWS

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Company Valuation as we know it is considered a recent practice and has evolved throughout the times. The objective is, (Steiger, 2008) to provide stakeholders and potential investors with an approximation of the worthiness of the firm. Two of the pioneers in valuing companies by discounting future income to the present were Franco Modigliani and Merton Miller. In (Modigliani & Miller, 1958), they argue that an asset has value if it increases the net profit of the owners of the company, i.e. the expected return (the yield on the asset) is greater than the cost.



Due to the two existing ways of financing, equity and debt, one derives the value by adding the value of equity to the value of debt (Bodie, Kane, & Marcus, 2013)

$$(1) \textit{Enterprise Value} = \textit{Equity} + \textit{Net Debt} + \textit{Corporate Adjustments}$$

$$(2) \textit{Net Debt} = \textit{Long term Debt} + \textit{Short term Debt} + \textit{Capitalised leases} + \\ \textit{Other interest carrying liabilities} - \textit{Cash and cashlike investments}$$

$$(3) \textit{Corporate Adjustments} = \textit{Minority Interests} + \textit{PV of pension deficit} + \\ \textit{Off BS obligations} \pm \textit{Associated companies}$$

The Discounted Cash Flow (DCF) analysis is the most common and fundamental approach. The reasons behind the use of this method are explained on Addendum 4 of Annex 1.

If companies have significant leverage or the capital structure changes over time, the Free Cash Flow to the Firm (FCFF) should be more appropriate, as it avoids distortions caused by debt's features, since this cash flow is prior to debt payments. On Addendum 5 of Annex 1 are the main reasons for the use of FCFF instead of dividends or the Free Cash Flow to the Equity.

According to (Kaplan & Ruback, 1995) the FCFF should be computed in the following way:

$$(1) \textit{FCFF} = \textit{EBIT} * (1 - \textit{Tax rate}) + \textit{Depreciation} + \textit{Aftertax asset sales} - \\ \Delta(\textit{Net Working Capital}) - \textit{CAPEX}$$

$$(2) \textit{FCFF} = \textit{FCFE} + \textit{Interest}(1 - \textit{Tax rate}) - \Delta(\textit{Net Debt})$$

Using the FCFE or FCFF should yield the same result when there are no non-operating items that affect the Net Income but not the Operating Income. Also, when the firm has a simple and straightforward debt, i.e. no old debt on its books that makes interest different from pre-tax cost of debt multiplied by the market value of debt. Consequently, the assumptions about leverage must be consistent or the analysis will be distorted, if otherwise.

Both methods presented below (WACC and APV) are a development of the traditional way of valuing a business - discounting the cash flow available to equity at the required return by shareholders and then adding the value of debt, which is, in turn, a development of the Dividend Discount Model (DDM).

In sum, all the models should lead to the same result (Damodaran, 2006), in theory, but some might cause more trouble than others and the outcomes may vary if one is not consistent with the approach.

#### 1.2.1.1.1. COST OF CAPITAL

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The cost of capital, which will be used to discount cash flows, is many times undervalued, as people may understate its importance. In fact, independently of the quality of the forecast, the valuation will be widely affected by the discount rate. Depending on the method we are using, different rates may be suitable, depending which type of investor is sourcing the capital. We may discount cash flows at the required return on equity ( $K_e$ ), the required return on debt ( $K_d$ ), the expected return on assets ( $K_u$  or  $R_A$ ).

#### 1.2.1.1.2. COST OF EQUITY

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For the required return on equity, we may use several models - Capital Asset Pricing Model (CAPM), the Arbitrage Pricing Model, multi-factor models, proxy models, etc. - each of them with clearly different assumptions. We will use the simple, well-known though not perfect Capital Asset Pricing Model (CAPM) (Sharpe, 1964) (Lintner, 1965) to assess  $K_e$ . We may use it to estimate the return investors require for taking the risk on the company's shares (Steiger, 2008). The model states that the expected return on a financial asset should be the risk-free rate of return plus an asset-specific risk premium. This risk premium is affected by the exposure of the individual stock to market movements. In the case of China, there is country-specific risk that should be compensated. The way one includes it in the equation depends on whether it is assumed that the country risk affects all assets of that country equally or not. On this matter, I believe that different companies from different sectors are affected by the country risk differently, as they have more or less exposure to the market. In addition, according to (Damodaran, 2013), it might be a mistake to use a single market risk and country risk premia when the company derives its revenues from different geographies. As such, a weighted-average was used according to the revenue breakdown by geography of each company.

$$(3) K_u = r_f + \beta_L * (MRP + CRP)$$

#### 1.2.1.1.2.1. RISK-FREE RATE

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A common practice is to use the London Interbank Offer Rate (LIBOR) as an approximation for short-term risk-free rates. Despite it would be more correct to use the yield on T-Bills or T-Bonds (Steiger, 2008), these are too low to be used (Hull, 2006). Damodaran, in turn, argues that the risk-free rate depends on the investment horizon. To match the length of the forecasts both for Huawei and ZTE, the 7-year US T-bonds rate was

used, later adding the country-specific spread for China and converting the rate to the local currency by adjusting for the inflation differential.

#### 1.2.1.1.2.2. MARKET RISK PREMIUM (MRP)

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Because investors are risk averse, the higher the risk the higher the required return. According to (Damodaran, 2006), the equity risk premium is the premium the investors demand for investing on the average non-diversifiable risk investment - diversifiable or stock-specific risk should not be compensated since, according to the assumptions of the model, it can be diversified away without significant costs. To (Fernández, 2003), the concept of MRP relates to historical, expected and required market returns, being important to be aware that these represent three different things - the CAPM assumes expected MRP and required MRP are the same, though. The most common approach when computing the equity risk premium is to use past data. (Damodaran, 2013) admits the limitations of using historical returns for US companies and the complete failure when applied to Emerging Markets for not being mature markets. In fact, one should add a country risk premium. Despite its low predictive power, an MRP based on historical returns will be used.

#### 1.2.1.1.2.3. BETA

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Beta is simply the non-diversifiable risk that holding the stock will add to an already diversified portfolio (Rhaiem, Ammou, & Mabrouk, 2007). It can be interpreted as the exposure of the company to market variations, i.e. if the market risk premium increases by 1, the cost of equity of the specific firm will increase by  $\beta$ . Beta is empirically estimated by a regression of the return on the stock on market returns. Because the shareholder's risk varies according to the capital structure, beta should also be adjusted when this changes (Brealey, Myers, & Allen, 2007). There are different ways to make this adjustment, as it is discussed on Addendum 6 in Annex 1. After analysing the various methods, it was decided that Milles & Ezzel's should be used since the companies should have a fixed target capital structure.

For private non-listed companies, there is no information about stock prices performance. Hence, a target capital structure can be estimated by taking the most adequate peer group of similar companies, with similar size, R&D intensity, asset tangibility, taxation and profitability (Hovakimian, Hovakimian, & Tehranian, 2004). For (Shyam-Sunder & Myers, 1999), the historical mean can be used as a proxy for the target capital structure. In

addition, CAPM is a model built on a set of assumptions among which is liquidity, therefore, for less liquid assets, adjustments might be pertinent. Damodaran states there should be an illiquidity discount, which I apply further on the WACC for Huawei, once illiquidity also affects debt.

#### 1.2.1.1.3. COST OF DEBT

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The average interest rate that the company has to pay on its debt is most influenced by the credit rating (Steiger, 2008). This reflects but also determines the credit spread between a company's cost of debt and the risk-free rate. Neither ZTE nor Huawei are rated by any of the three most known rating agencies (Standard & Poor's, Fitch and Moody's). So, in both cases, relevant financial ratios are used to compute a synthetic rating by comparing the average market characteristics for each grade with the two companies in this work. Then, using the credit spread for the synthetic rating estimated by Damodaran, we calculate the cost of debt by adding the spread to the risk-free rate.

#### 1.2.1.2. WACC METHOD

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This method simply consists of discounting the estimated Free-Cash Flows to the Firm FCFF, considering the discount rate as being a weighted-average of the cost of equity and the cost of debt. It all boils down to the way of computing the components of the cost of capital, i.e. the quality and pertinence of the assumptions made and, of course, as in any other DCF method, the accuracy of the forecasts.

(Modigliani & Miller, 1958) is an anchoring article and the authors' findings are described on Addendum 7 of Annex 1

According to (Fernández, 2011), the WACC is neither a cost nor a required return, as it is the average of two different magnitudes. It is the rate at which the FCFF must be discounted, so that  $(E + D) = PV[WACC; FCFF] = PV[Ke; FCFE] + PV[Kd; Interest]$ . "Mixing" both equations, it yields the widely known formula:

$$(4) WACC_t = \frac{D_{t-1} * Kd_t * (1-T) + E_{t-1} * Ke_t}{E_{t-1} + D_{t-1}}$$

On Addendum 8 of Annex 1 we expand further on Fernandez' approach.

### 1.2.1.3. ADJUSTED PRESENT VALUE METHOD (APV)

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APV was first introduced by Stewart Myers as a static valuation tool less prone to errors, given the more relaxed assumptions (Myers S. C., 1974). Moreover, it enables the investor to break down the sources of value to the company and analyse them more closely. Anyway, it is still a DCF method that, according to (Luehrman, 1997), takes better care of the financial side effects, such as interest tax shields, costs of financial distress, subsidies, etc. despite not all of these effects being taken into account, mostly because of the difficulty in assessing its value. Basically, this approach values the company as if it were financed entirely with equity - discounting the FCFF at the unlevered cost of equity. According to Modigliani and Miller, this restricts the formula to projects that do not change the risk level of the company, which Myers considers to be an unnecessary limitative interpretation - thus adding the financing side-effects:

$$(5) \text{ Adjusted Present Value} = V_{unlevered} + PV(\text{Tax Shields}) + (\text{FD Costs})$$

The major discussion point has been about the discount rate to use for the tax shields. It is widely agreed that these cash flows are not certain, although there is no consensus about how risky tax shields are. Hence, there are different suggested ways to compute it as discussed on Addendum 9 in Annex 1. For consistency, Milles & Ezzel's approach to tax shields is used.

### 1.2.1.4. TERMINAL VALUE

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#### *Perpetuity Growth*

Based on Gordon's Growth Model (Gordon & Shapiro, 1956), it assumes that the expected life of the company is perpetual and that the last estimated free cash flow will grow at a constant rate in perpetuity. In addition, the terminal value has to be discounted to the "present". For the case here analysed, given that the Telecom Equipment sector is expected to reach some more mature point from 2017-2020 onwards and also the high global exposure of both ZTE and Huawei, the last forecasted cash flows should grow at the world's GDP growth rate.

$$(6) \text{ Terminal Value} = \frac{FCFF_{n+1}}{(WACC-g)}$$

According to (Fernández, 2007), when computing the residual value, we need a constant capital structure going forward the last year we forecast. To this purpose, we should adjust last year's debt to increase by the growth rate the company did.

### *Exit Multiple*

In this method, widely used among practitioners, the company is assumed to be sold by the end of the forecast period. For that purpose, comparable transactions are picked, from which one draws several operating statistics. The Enterprise Value-to-EBITDA is a commonly used multiple. For EBITDA multiples, we should take the analysed company's EBITDA and multiply it by the market multiple we computed. Much like in the previous method, the outcome must be discounted to year 0.

#### 1.2.1.5. RELATIVE VALUATION

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In addition to a DCF valuation, one can complement the analysis with the Market Multiples approach. The objective is to value a company's assets based on similar assets that are priced in the market. According to (Damodaran, 2006), the most important features of relative valuation are the pertinence of the multiples used and the extent to which comparable assets are, in fact, comparable. Naturally, the use of ratios aims at making the data comparable, which would not happen if one was to compare, for example, raw stock prices. If we succeed in choosing the right multiples and the true peer group, then we are in position to enjoy the advantages of relative valuation. It is much simpler to understand and faster to complete than a DCF approach. Also, it is much more likely that the outcome of the valuation reflects the current market value of the company since it is based on current data and is not trying to find the intrinsic value of the company but rather its worthiness compared to the peers. On the other hand, this time-saving process can also lead to misestimating the value of companies, as it does not take into consideration vital factors like risk, growth or cash flows. In addition to this, industries can be over or undervalued, which will attribute a higher value to the company in analysis. This last drawback is difficult to detect, once the peer group usually lies within the same industry, thus blinding the analyst (Damodaran, 2006).

The choice of which type of multiple to use depends on what we consider to be the source of value: Earnings, Revenues, Cash Flows, hiatus between Market Values and Book Values. According to (Holthausen & Zmijewski, 2002), it is necessary to control for the difference in these value drivers across companies, which affect their comparability. They argue that different multiples have different sensitivities. According to the authors, peer groups can be incorrectly formed if one does not account for differences in the capital structure, in the growth rate, cost structure, capital expenditure and required investment in working capital. Variables like size, for example, are arguably a matter in choosing the comparable companies. This empirical result was already mentioned by (Alford, 1992). (Boatsman &

Baskin, 1981) find that the error in valuation is smaller when the peer group includes companies with similar earnings growth. Furthermore, (Holthausen & Zmijewski, 2002) find that Free Cash Flow and earnings multiples are less affected by the drivers than other multiples

The peer group methodology and ratio selection will be further explored in the “Valuation” section.

## 2. INDUSTRY REVIEW

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In order to further characterise the Telecom Equipment sector, the structure of this chapter will be as follows. Firstly, we will have a description of the industry, focusing on its size, products, geographic concentration and major players. Secondly, a Porter's Five Forces analysis is conducted, in order to understand the competitive framework. Thirdly, we will expose the companies' past strategies and moves, as well as the trends and expected growth of the industry. Lastly, we will identify the key drivers of the industry and the most common valuation approaches.

### 2.1. DESCRIPTION

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The following sub-section focuses on characterising the industry, something that is necessary when one is to value companies and, more importantly, considering the potential change in the structure of the industry about to be proposed.

#### 2.1.1. SIZE, GEOGRAPHIC CONCENTRATION AND PRODUCTS

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Telecommunication consists of any communication over a distance, comprising software producers, service providers and hardware manufacturers. This industry operates in one of the most dynamic markets and is in constant development, with an increasing number of participants.

<b>Telecom Market by Region (Billion €)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>YoY (%)</b>	<b>2016</b>
North America	885	915	939	959	<b>2,0</b>	1028
Europe	860	868	869	878	<b>0,5</b>	941
Asia-Pacific	836	879	913	961	<b>3,5</b>	1127
Latin America	241	259	272	287	<b>4,5</b>	332
Africa/Middle-East	147	162	176	190	<b>6,6</b>	234
Total	2969	3083	3169	3275	<b>2,5</b>	3662

TABLE 1 - TELECOM MARKET BY REGION. SOURCE: IDATE (IN DIGIWORLD YEARBOOK 2013)

From the table above, it is possible to conclude that North America and Europe have been traditionally the biggest markets for telecom but the latter was overtaken by Asia-Pacific. Furthermore, one can notice the expectable convergence between the developed economies and the developing ones, with Africa and Latin America having the highest year-on-year growth rates.



Among several sectors, we find Telecom Equipment, in which a broad set of products is provided, going from fax machines and cell phones to optical fibre and communication satellites. These products are inevitably part of our day-to-day life, as we make constant use of, for example: Mobile phones, Wireless networks (Antennas, Wi-Fi equipment, Mobile RAN), Fixed Access networks (equipment for aggregation of broadband connections), Core Networks (Control and service layers, such as IMS, VoIP, SDP), Transport Networks (optical products, routing, Ethernet switches) and Security (security software, content gateways, intrusion detection systems, DDos). The services provided include managing the switches that control the phoning system, Internet access, creating private networks for companies. They also provide software, which goes from email communication to improving the noise on a simple phone call.

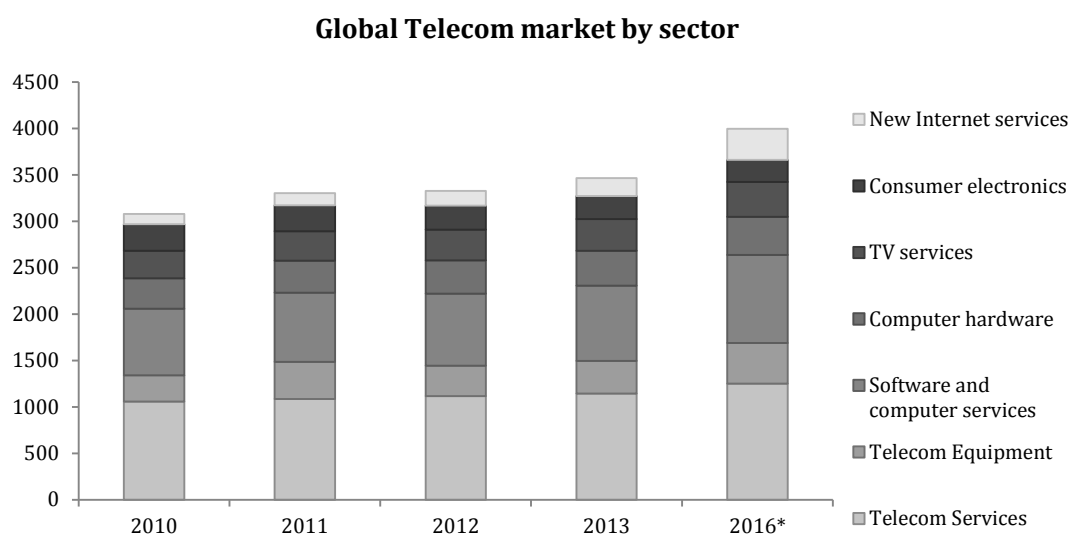


FIGURE 1- GLOBAL TELECOM MARKET BY SECTOR. SOURCE: DIGIWORLD YEARBOOK 2013

Looking at the above graph, we may see that Telecom Equipment represents only a small fraction of the whole industry. However, as technology integrates, it becomes more difficult to clearly distinguish between sectors. In fact, we are seeing a convergence in the Telecom market, as companies look to share resources and broaden the uses of their products or services. Serving as examples, we have Cloud Computing, the Connected TV and Digital Music, which approximate service providers to carriers and equipment companies.

<b>Telecom Equipment Market by region (billion €)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>YoY</b>	<b>2016*</b>
<b>North America</b>	69	72	76	77	2,2%	82
<b>Europe</b>	76	79	84	88	3,0%	105
<b>Asia/Pacific</b>	90	103	111	121	6,1%	168

China	37	45	48	54	7,9%	77
<b>India</b>	15	16	17	18	3,7%	25
<b>Japan</b>	20	21	21	22	1,9%	26
<b>Latin America</b>	29	32	35	38	5,6%	47
<b>Africa/Middle East</b>	18	21	24	27	8,4%	37
World	282	307	330	351	4,5%	439

TABLE 2 - TELECOM EQUIPMENT MARKET BY REGION. SOURCE: IDATE (IN DIGIWORLD YEARBOOK 2013)

The Telecom Equipment market has been growing nonstop for the last twenty years and there is still room for more growth. China, alongside with MEA, has had the greatest year-on-year growth. Nonetheless, it is becoming more mature, with a considerable concentration, i.e. a few players hold the majority of the market. The revenues in 2013 were \$351B<sup>1</sup>, 60% of which belonged to the top-6 players. In addition, over the last years, we have seen a shrink on the number of players, either because they integrated (Alcatel and Lucent, Nokia Siemens) or they exited the market (Nortel, Motorola's sale). The smartphone boom that started in 2007 with Apple's iPhone has made revenues from smartphones account for 50% of the sector's revenue. By coincidence or not, the companies that were not successful in the smartphone market are now struggling.

On Addendum 1 of Annex 2 we expand further on the Industry in China.

Given the globalization and worldwide integration of the telecom industry, the strategy of the two companies and their revenue structures, the focus should not be exclusively on China, except in regulatory matters or questions related to manufacturing.

### 2.1.2. MAJOR PLAYERS

On the table below, we have the positioning of both Huawei and ZTE, according to three different groups: all the equipment except mobile phones, the router and switch business which is some companies' core business and mobile phones which now accounts for the majority of revenues of many equipment manufacturers.

**Worldwide Top-5 Telecommunications vendors by business (2Q2013)**

Position	Telecom Equipment (ex-mobile phones)	Router and Switch	Mobile phones
1.	<b>Huawei</b>	Cisco Systems	Samsung
2.	Ericsson	<b>Huawei</b>	Nokia
3.	Alcatel-Lucent	Alcatel-Lucent	Apple
4.	NSN	Juniper Networks	LG
5.	<b>ZTE</b>	<b>ZTE</b>	<b>ZTE</b>

<sup>1</sup> According to IDATE

6.	-	-	Huawei
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TABLE 3 - WORLDWIDE TOP-5 TELECOMMUNICATIONS VENDORS BY BUSINESS (2Q2013). SOURCE: GARTNER

Huawei and ZTE have different businesses that can be grouped in three categories: Networks, Terminals and Telecom Software & Services. However, in the analysis on Addendum 2 of Annex 2, the categories will be the main two (Networks and Terminals), as the software and services business is not exclusive of Telecom Equipment companies and the market for it is not clearly delimited.

Both Huawei and ZTE have not gained much market share in recent years despite their bits being considerably big. Their potential advantage might well be in R&D, as we may see on Addendum 3 of Annex 3.

## 2.2. PORTER'S FIVE FORCES ANALYSIS

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Seeking a better understanding of the competition in the Telecom Equipment industry, what follows is an analysis to see how companies are influenced by external factors, namely suppliers, customers, substitute products and potential new players. This analysis is on Addendum 4 of Annex 2

## 2.3. INDUSTRY TRENDS & STRATEGY

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Huawei and ZTE have been clear in their low-cost structure and strategy. They first gained market share in China, moving to Southern-Asian countries. After that, they penetrated in the developed countries, with competitive prices. Given their huge and successful investment in the last years, they were able to shift towards high-end hardware to compete with the most technologically advanced products, ruling out some of the big players. Inclusively, Huawei's representatives stated that the company wants to reach the top-3 vendor of smartphones by 2015 and become the highest-quality hardware manufacturer in the world. This way, they would be able to increase margins, boost their reputation and build a strong brand. To complement the expansion strategy, Huawei is looking to do a Corporate Governance reform to enhance transparency and comply with international guidelines and rules for Telco companies.

There are some limitations to strategy, which are exposed on Addendum 5 of Annex 2.

Recent industry reports and news have shown a positive sentiment for the future of Telecom Equipment. This sub-section will be divided by business lines and by type of

countries, given the clear differences in terms of maturity, growth, competition and degree of development.

### 2.3.1. BY BUSINESS LINE

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#### ***Networks & Terminals***

Despite the increased demand for smartphones, faster connection speed and more network equipment for developing countries, telecom equipment companies seem to be reluctant to invest (expansion, R&D, etc.), given this whole global economic environment of the recent years. This is confirmed by the fact that ZTE but mainly Huawei have been accumulating big piles of cash in recent years. It has been a common practice among the competitors as well and another issue arises from that: financially healthy companies integrating “bad” peers. Another explanation for the general revenue decrease was the cut in spending by operators by close to 6% in 2012, given the decrease in communications prices. However, they are expected to increase spending in a near future in order to upgrade from 3G to 4G (LTE) large scale.

Global revenues of Telecom Equipment companies were €351B in 2013 and are expected to reach €439B by 2016<sup>2</sup>, which represents a CAGR of 7.7%. Revenues from handsets are reportedly around 50% of companies like Apple, Samsung and Nokia, which might indicate a growth potential for Huawei (24%) and ZTE (29%) despite these having different businesses, which provide them bigger revenues - networks and infrastructures. Total connected devices are expected to more than double by 2020, while mobile devices are expected to increase 60% until 2020.

Both Huawei and ZTE were the big winners of the 4G tender in China, with a third of the \$36 billion expenditure over the next two years being allocated to each of the companies. This amount accounts for about one half of the global 4G spending.

#### ***IT Software & Services***

This segment is sensitive to the economic environment and has been suffering, mainly because of Europe (Italy, France and Spain). Fortunately, the centre of Huawei’s and ZTE’s operations is not Europe and also they are far from having a leading position in Information Technology (IT) services, which is not their core business. Anyway, corporations are spending less in IT and there are a few reasons for this to be happening:

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<sup>2</sup> According to IDATE

- Migration to cloud-based models, instead of the traditional outsourced and hosted ones; it might be an opportunity for companies already offering those services, as it is the case of both Huawei and ZTE;
- Open source platforms;
- Increased competition, once the solutions are commoditised and standardised.

### 2.3.2. BY TYPE OF COUNTRY

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#### ***Developing Countries***

It is crystal clear that this group of countries represents the biggest opportunity for a telecom company that provides both networks and handsets. There is a need for improvement in every field of telecommunications. It all comes down to who is able to penetrate these markets better, at a public and private level, getting the bigger network contracts and diffusing mobile telecommunications across populations. In Africa, only one in every three people actually holds and uses a mobile phone. Moreover, for every ten households there is only one broadband connection. The pace of growth of ICT expenditure in some of these countries has been growing astonishingly, with Nigeria presenting a 35% growth per year, on average. China and India are still growing greatly but not at double-digit rates anymore. In addition, the gap relatively to Japan in terms of revenue generation still exists but is closing. There are five other Asian countries which are present in OECD's top-20 ICT spending growth list: Indonesia, Sri Lanka, Vietnam, Bangladesh and the Philippines. Latin America is on a more advanced stage of development. With around 50 million users of broadband connections by 2012, it is believed that this number might double in the five coming years.

#### ***Developed Countries***

On this "side" of the world, the situation is very different. ICT spending is large and usage is increasing but the Average Revenue Per User (ARPU) is not improving, given the intense competition and the poor economic environment. It is, therefore, vital that companies find more efficient solutions to improve productivity. In Europe, the situation is not getting better, now representing 27.4% of the global market, a two consecutive year decrease. Demographics are a clear cause for this to be happening. North America represents 30% of the global market and is still on the lead, probably due to the hype and excitement about smartphones, which keeps investment levels high.

### 2.4. KEY INDUSTRY DRIVERS

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In this last sub-section of the Industry Review, several industry drivers are discussed. However, this will not be extensive as it seems more pertinent to expand the analysis later on the forecasts for the valuation. For this reason, this is on Addendum 6 of Annex 2

### 3. COMPANY REVIEW

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After analysing the industry, it is now time to dwell on the two companies that will be part of the proposed deal - Huawei, the acquirer and ZTE, the target. The structure of the analysis will as follows: brief description; range of products; current strategy; shareholding structure; revenue analysis; cost analysis, key financial ratios and market performance. The purpose is to understand the strengths and vulnerabilities both companies have shown in the past and how their financials have been evolving.

#### 3.1. DESCRIPTION & PRODUCT LINE

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Huawei is a multinational telecommunications equipment, services and networking company, originally from and headquartered in Shenzhen, China. Founded in 1987, it experienced fast growth in the last 10 years, given their high competitiveness. Along with ZTE, it has benefited from the support of both the Chinese government and Chinese banks, which fostered a rapid overtaking of the competitors. Currently, it is present in 140 countries and offers a broad range of products and services.

Similarly to Huawei, ZTE is also a telecom equipment company, listed both in the Shenzhen Stock Exchange and Hong Kong Stock Exchange, since the IPO in 1997. It provides the most complete telecom product line in the world, with a broad range of solutions in wireless, switching, access, optical transmission, data, handsets and software. Over the years, ZTE has achieved leading positions in many telecom segments in China by partnering with the main carriers in the country. Besides that, it has been extending its presence, currently providing products and services in more than 160 countries and regions.

Both companies have a very similar product line. Hence, the differences are very specific and not relevant to this dissertation.

#### ***Products & Services***

Huawei and ZTE provide solutions to telecom carriers, enterprises and consumers. The product range can be divided in three categories: infrastructure, cloud and devices.

- Infrastructure: broad range of end-to-end network building solutions. From radio antennas to routers, Ethernet switches and data centres,
- Cloud: includes software (network management) for carriers, data protection and storage solutions (servers)
- Devices: intelligent video surveillance, mobile phones, tablets, video conferencing, home internet

In the last 20 years, the Chinese economy has been growing astonishingly, with its labour-intensive production of low-value-added goods. More recently, the general focus has been on moving up on the value chain, internationalising Chinese firms, making them global brands. In the Technology field, we see companies penetrating the market and challenging huge international companies. The Telecom Equipment sector is no different.

By the time these companies started, China's telecommunication infrastructures were very poor and the government strongly supported the development of research in Telecom. Some of the research was done by the People's Liberation Army and among the engineers in charge was Ren Zhengfei, the founder of Huawei.

### 3.1.1. CURRENT STRATEGY

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The companies' strategy is on Addendum 1 of Annex 3

### 3.1.2. SHAREHOLDING STRUCTURE

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#### ***Huawei***

The ownership structure of Huawei is unique and one of its most kept secrets. Huawei has disclosed little information but the company is held by its employees in full but they must be Chinese citizens. Currently, 80,000 of its 150,000 employees are in the stock ownership plan. In addition, as of the beginning of 2014, the shares were worth around RMB 5.42 each and in 2013 a dividend of RMB 1.41 was paid. Employees may apply to the program and the shares are allocated to them based on their annual performance review (depending on skills and experience). This complex structure makes it difficult for Huawei to go public, which would show transparency and improve market's perception. Nonetheless, the company's strong financing channels and extraordinary growth make the timing for IPO not so important.

#### ***ZTE***

<b>Name</b>	<b>Nature</b>	<b>Percentage</b>
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Shenzhen Zhongxingxin Telecommunication Equipment Co.	State-owned corporation	30,78%
HKSCC Nominees Ltd.	Foreign	18,28%
CITIC Trust Co.	Wealth Management	1,69%
Hunan Nantian Co. Ltd.	State-owned corporation	1,09%
Agricultural Bank of China	Others	0,93%

TABLE 4 - SHAREHOLDERS STRUCTURE ZTE. SOURCE: ZTE ANNUAL REPORT 2013

Since its foundation, ZTE has been held, directly or indirectly, by the Chinese state which has had an important role in ZTE's development through the financial support to foster R&D by subsidising company's projects and lending at more favourable conditions. However, despite being state-owned it is privately managed. Regarding the free-float, i.e. shares held by the public and traded in the market, it must comply with the minimum of the Hong Kong listing requirements. It has been reported to be around 60%<sup>3</sup>.

### 3.1.3. REVENUE ANALYSIS

#### *Huawei*

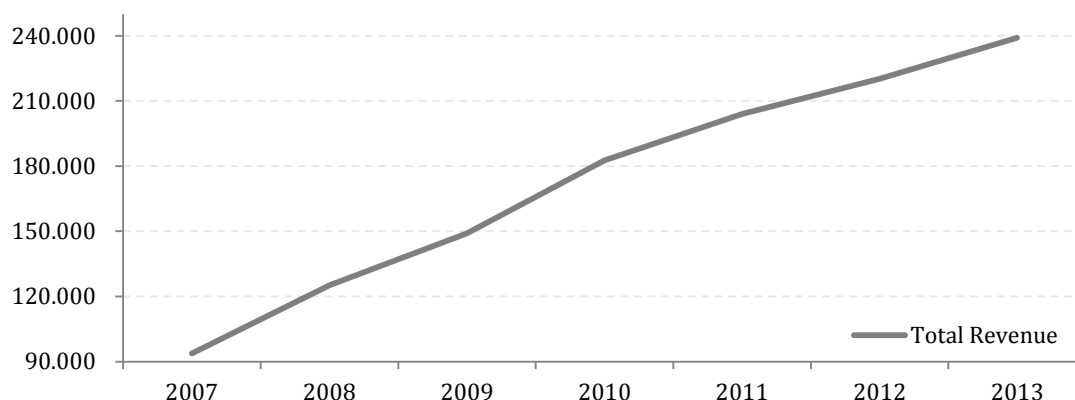


FIGURE 2 - REVENUES HUAWEI. SOURCE: HUAWEI'S ANNUAL REPORT 2013

Huawei's revenues have been growing non-stop since its inception. Between 2007 and 2013 the CAGR was almost 17% despite the pace of growth has been slowing down. The reasons behind this outstanding growth were the company's different approach to the market, its strong focus on R&D and the support from the government on key periods. On Addendum 2 of Annex 3 there is a more historical perspective of Huawei's growth.

<sup>3</sup> According to Financial Times and Yahoo Finance



**Revenue Breakdown by Region - Huawei**

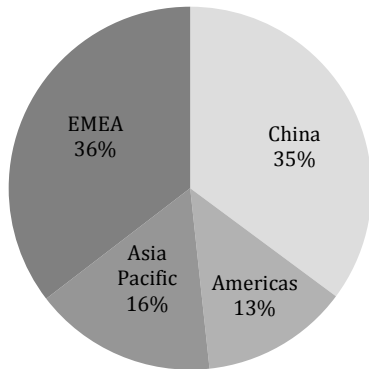


FIGURE 3 - REVENUE BREAKDOWN BY REGION. SOURCE: HUAWEI'S ANNUAL REPORT 2013

**Revenue Breakdown by Activity - Huawei**

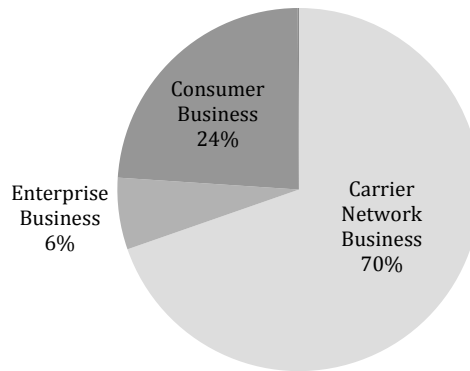


FIGURE 4 - REVENUE BREAKDOWN BY ACTIVITY. SOURCE: HUAWEI'S ANNUAL REPORT 2013

As one can see on the pie chart on the left, Huawei has been successfully diversifying its revenues away from China, which allows them to profit from the deployment of new technologies anywhere in the world. In what regards infrastructure networks, the constant blocks from expanding the business to the United States, made Huawei's administration to shift the focus away from there, and they do not even consider it a strategic market anymore. This is at the network contracts level because as far as handsets are regarded, their view is slightly different.

On Addendum 3 of Annex 3 there is more on Huawei's worldwide expansion.

**ZTE**

**Revenue Breakdown by Region- ZTE**

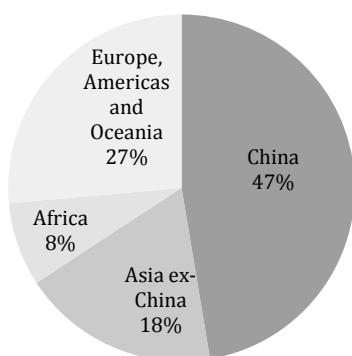


FIGURE 6 - REVENUE BREAKDOWN BY REGION. SOURCE: ZTE ANNUAL REPORT 2013

**Revenue Breakdown by Activity - ZTE**

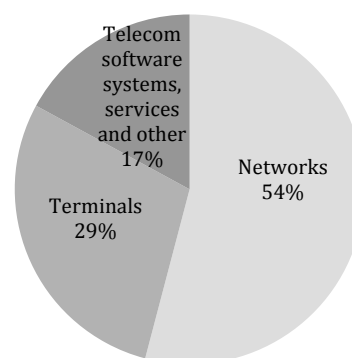


FIGURE 5 - REVENUE BREAKDOWN BY ACTIVITY. SOURCE: ZTE ANNUAL REPORT 2013

Contrarily to Huawei, ZTE still has a considerable dependence on China and they have been struggling to diversify their revenues away from the country. This is a clear risk for the company, as new players enter the Chinese telecom market and others increase their presence. Apple, for example, has overtaken ZTE in smartphone sales by the Q42013. The above breakdown shows that ZTE has not been able to generate revenues overseas that could compensate for the loss of market share internally.

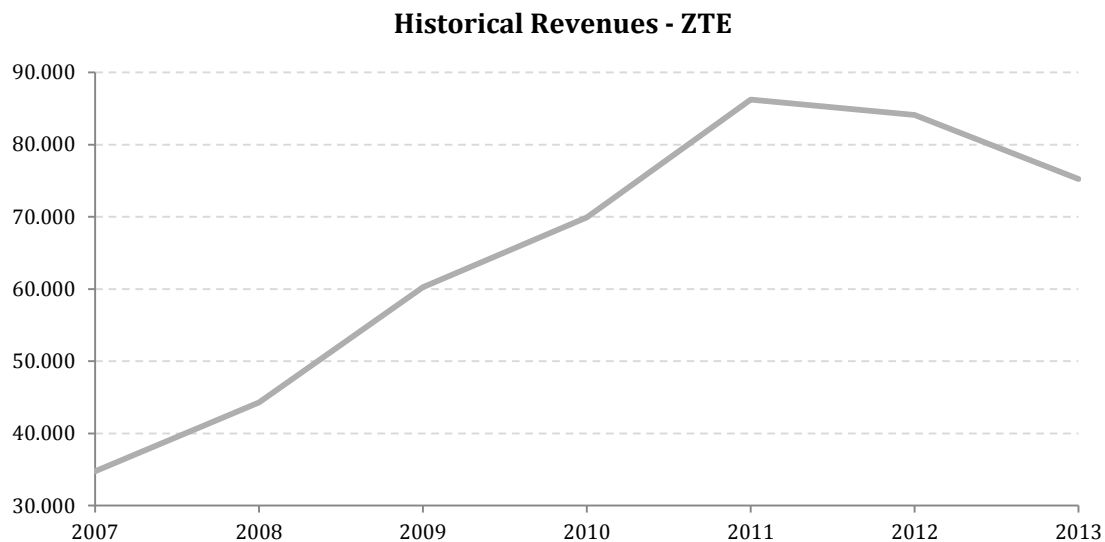


FIGURE 7 - REVENUES ZTE. SOURCE: ZTE ANNUAL REPORT 2013

Revenues have been decreasing since 2011, as prices have been falling. For already low-cost companies, it might be difficult to maintain the margins with decreasing revenues, except if they reduce their workforce or R&D.

ZTE had poor results in 2012 which were attributed to the postponement in the execution of some contracts, the decrease of domestic handset sales and the delay in some international projects. Furthermore, the gross profit margin, which has been around 35%, decreased to 26,5% due to not so advantageous contracts mainly in Africa but also in Asia and South America. Higher R&D expenditure, together with an aggressive marketing strategy, impacted on the operating results. The management admits the company lacked the efficiency and risk control to react to changes in the competitive framework.

On Addendum 4 in Annex 3 there are more reasons that may explain the revenue behaviour.

### 3.1.4. COST ANALYSIS

**Cost Breakdown by Category - Huawei**

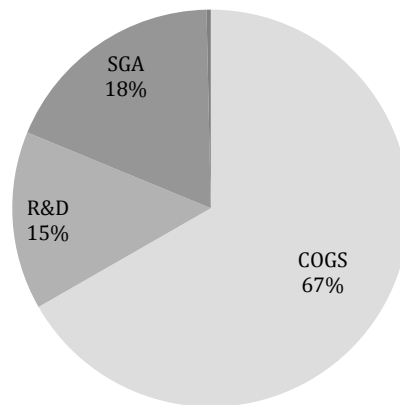


FIGURE 8 - COST BREAKDOWN BY CATEGORY. SOURCE: HUAWEI'S ANNUAL REPORT 2013

By looking at the above chart, we may see that Huawei spends most of the money with costs tied directly to production (COGS), as expected in any manufacturing company. In what regards Selling & Administrative costs and Research & Development, Huawei does not disclose enough information about these. We know, however, that the salaries of the employees allocated to R&D (roughly 50% of the personnel) are included in this category. It is difficult to understand their true cost structure once the management salaries are included in SGA expenses.

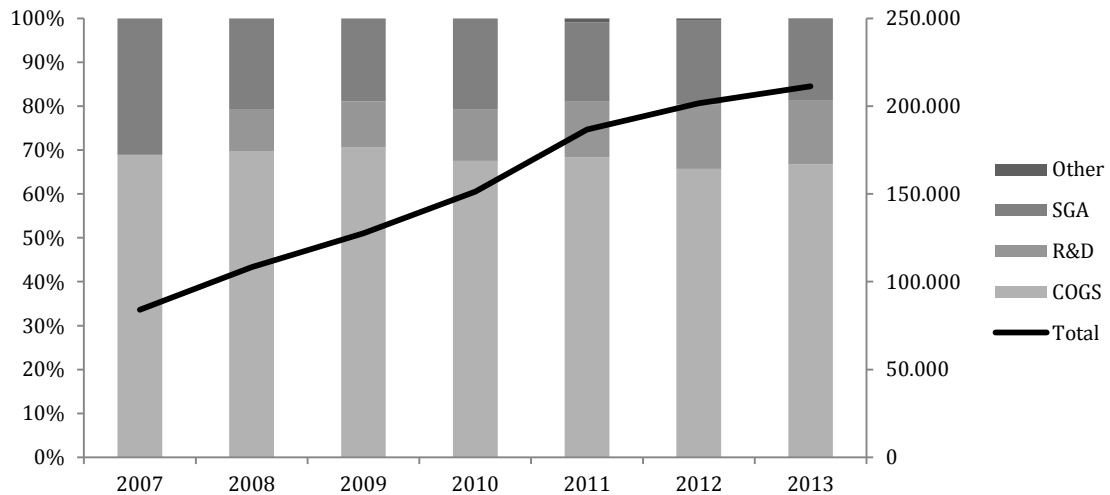


FIGURE 9 - COST BREAKDOWN HUAWEI. SOURCE: HUAWEI'S ANNUAL REPORT 2013

Overall, the company's costs have increased and accompanied the revenues. This has prevented the margins from increasing but they have been consistently high for the industry (40% on average). Historically, R&D expenses have always been at the centre of Huawei's cost structure. At inception, Huawei was importing equipment from the existing players in the market (Alcatel, Motorola, Ericsson and Nokia) and the first strategic

decision to succeed was to take the competitors' technology and improve it, developing their own in-house - reverse engineering. Zhengfei did not believe he would get access to avant-garde technology without internalising operations. From the beginning, R&D played the central role in Huawei's development. In 1990, for example, the R&D staff was 2.5 times the production staff. Even nowadays, with a much larger scale, roughly 50% of the 150 thousand employees are allocated to R&D.

**Cost Breakdown by Activity - ZTE**

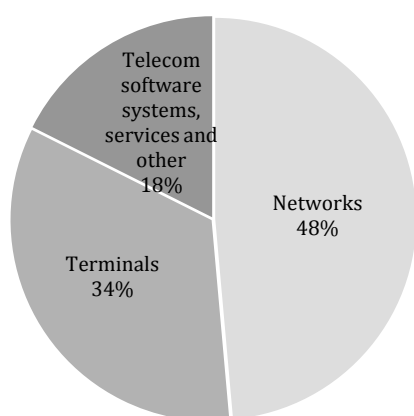


FIGURE 11 - COST BREAKDOWN BY ACTIVITY. SOURCE: ZTE ANNUAL REPORT 2013

**Cost Breakdown by Category - ZTE**

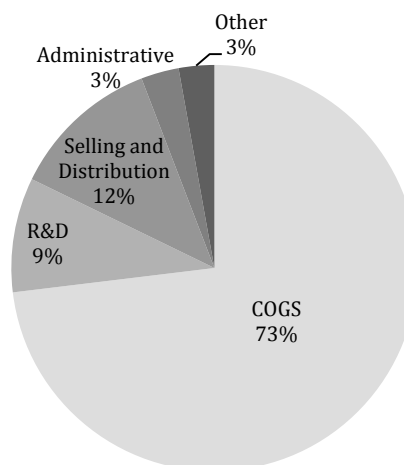


FIGURE 10 - COST BREAKDOWN BY CATEGORY. SOURCE: ZTE ANNUAL REPORT 2013

At a first glance, one notices the considerable weight that Cost of Goods Sold (COGS) has on ZTE's cost structure. This may not be necessarily detrimental, as it can bring flexibility if most of the COGS are variable. However, this does not seem to be the case, once COGS continued to increase in 2012, contrarily to Revenues. Research & Development costs have been stable with directors stating they target it at 10% of Revenues. Similarly to COGS, R&D costs also increased in 2012, perhaps in an effort to carry on with the recent breakthroughs, which have granted ZTE the #1 worldwide patent submitter status for the last 3 years. Selling & Distribution expenses include employees' wages, travelling expenses, transportation, rents, communication, consulting services, among others. These have been stable at 11-12% of Revenues and have decreased considerably in 2013 (-12%). Administrative costs include the expenses not linked to a specific function but rather to the company as a whole. It includes, again, wages and bonuses of senior management, travelling expenses, taxes, office expenses, etc. Other expenses are more volatile given their unpredictability but represent only a residual part of the total costs (1.9%, historical average). In this last category are included the provisions for bad debt and exchange rate losses, among others.

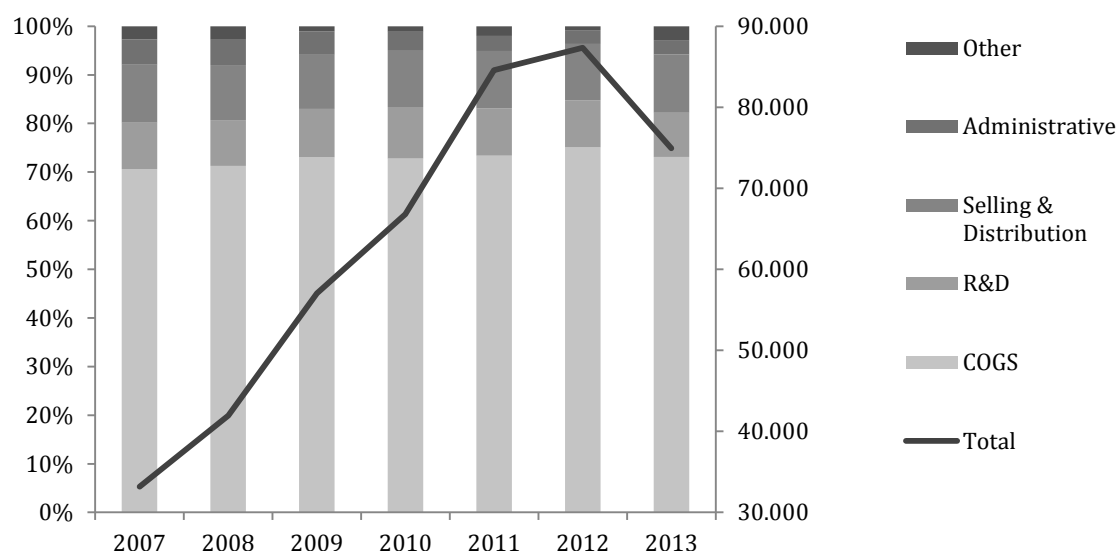


FIGURE 12 - COST BREAKDOWN ZTE. SOURCE: ZTE ANNUAL REPORT 2013

We may say that ZTE reacted quickly after their revenues peaked in 2011. The total costs peaked one year later, given the stickiness and inflexibility of some contracts. Overlaying both revenues and costs, it is noticeable that ZTE was not expecting the first drop in revenues for 2012 but adopted a defensive posture for 2013 by carrying on with the cost cuts.

On Addendum 5 of Annex 3 is the review of both the indebtedness and investment of both companies.

### 3.1.5. KEY FINANCIAL RATIOS

On the table below we have some statistics that allow us to analyse the profitability, financial structure and liquidity of Huawei from different perspectives and according to different metrics.

<b>Huawei Financial Ratios</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<b>Profitability</b>							
Return on Equity (before tax)	25,3%	27,8%	54,8%	50,7%	18,4%	26,0%	31,2%
Return on Capital (before interest and tax)	11,2%	16,3%	16,3%	19,3%	10,0%	10,2%	13,2%
Gross Margin (% of Revenue)	38,2%	39,7%	39,6%	44,0%	37,5%	39,8%	41,0%
Return on Assets (NI/Assets)	8,6%	6,6%	13,1%	13,8%	6,0%	7,4%	9,1%
Earning Power (EBIT/Assets)	11,2%	13,7%	15,1%	17,1%	9,6%	9,8%	12,6%
<b>Structure</b>							
Leverage	7,8%	16,0%	16,2%	12,7%	17,1%	17,9%	17,9%

Interest Coverage	6,2	2,4	16,8	11,7	3,0	7,2	6,1
(Equity+LT Debt)/Fixed Assets	3,0	3,1	3,4	3,0	2,4	2,2	2,4
FCFF to Gross Indebtness	-	-	96%	99%	124%	78%	63%
<b>Liquidity</b>							
Current Ratio	1,5	1,4	1,5	1,7	1,5	1,6	1,7
Quick Ratio	1,1	1,1	1,2	1,4	1,3	1,4	1,5
Cash Ratio	0,3	0,3	0,4	0,5	0,6	0,6	0,7

TABLE 5 - HUAWEI FINANCIAL RATIOS

In terms of profitability, we may say that Huawei has been increasingly profitable until FY2011, when COGS increased very significantly driving down the Gross Margin, while SGA and R&D costs also increased. During FY2011, Huawei borrowed funds long-term and short-term and this weighted on the ROE (before tax), as it is evident when compared to the drop in ROC (before interest and tax). Nonetheless, profitability has rebound in FY2012 and FY2013.

In what concerns the financial structure, Huawei has become more leveraged although the levels are quite low, in comparison to the return on their investments, which is reflected on the very healthy interest coverage. Contrarily to what happened to profitability in FY2011, the Free-Cash Flow to the Firm was the highest ever, with a successful sale of some assets and the improvement in trade credit conditions which significantly decreased the Working Capital.

Huawei is a company with a very good liquidity, which is verifiable by looking at both the Current Ratio and the Quick Ratio as they are above 1. This means that the company is able to pay its short-term liabilities in full with their current assets, even when we exclude inventories.

ZTE Financial Ratios	2007	2008	2009	2010	2011	2012	2013
<b>Profitability</b>							
Return on Equity (before tax)	14,2%	15,9%	19,8%	16,7%	10,9%	-9,2%	8,1%
Return on Capital (before interest and tax)	4,8%	5,4%	5,7%	5,2%	3,4%	-0,4%	3,0%
Gross Margin (% of Revenue)	32,7%	32,5%	30,9%	30,5%	28,0%	22,1%	27,2%
Return on Assets (NI/Assets)	3,5%	3,3%	3,9%	3,5%	1,8%	-1,7%	1,1%
Earning Power (EBIT/Assets)	4,8%	5,4%	5,7%	5,2%	3,4%	-0,4%	3,0%
<b>Structure</b>							
Leverage	23,8%	24,7%	26,9%	25,0%	28,4%	34,3%	31,8%
Interest Coverage	6,0	4,1	5,2	6,1	2,7	-0,2	1,9
(Equity+LT Debt)/Fixed Assets	3,9	3,6	3,9	3,6	3,7	2,8	2,9
<b>Liquidity</b>							
Current Ratio	1,42	1,40	1,34	1,35	1,32	1,13	1,24
Quick Ratio	1,09	1,12	1,12	1,11	1,09	0,98	1,05

Cash Ratio	0,28	0,36	0,33	0,30	0,31	0,30	0,32
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TABLE 6 - ZTE FINANCIAL RATIOS

ZTE has become less profitable in the last three years, as investment has been made and the result in terms of revenue growth has been poor. It is showing signs of improvement, as the company have successfully cut costs in FY2013, in a try to come back to positive earnings and cash flows. In fact, looking at the most recent financial report for 2014FY2014 will be very important to confirm whether the company is going in the right direction, the revenue forecast above made was below the actual numbers, showing that the turnaround was even more pronounced.

In terms of capital structure, the company has become more leveraged over time, despite having paid back a considerable amount of debt in FY2013.

In what regards liquidity, ZTE has been able to accumulate significant amounts of cash and has kept its current liabilities proportional to that, providing some stability on this matter, counterbalancing with the lower interest coverage ratio.

On Addendum 6 of Annex 3 there is the review of ZTE's market performance.

## 4. VALUATION

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The full standalone valuation of both companies is on Addendum 1 of Annex 4, being that the Equity Value of the companies following the WACC method is RMB 70,814 million for ZTE and RMB 492,864 million for Huawei.

### 4.1. HUAWEI + ZTE

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After having a view on the Telecom industry and on both companies' value in separate, it is now time to analyse why they could potentially become a single entity through integration. This section starts with an M&A due diligence to identify common grounds and potential deal killers. After that, a valuation of the joint entity will be conducted, including the potential synergies that could emerge from the deal.

As we may see on the SWOT Analysis on Addendum 2 of Annex 4, there are many commonalities between both companies. For that reason, by merging, ZTE and Huawei could leverage strengths and opportunities, share their weaknesses and gather efforts to eliminate them. Also, the exposure to threats could be better managed through a more competitive position and higher bargaining power.

A review on Corporate Governance and on both companies' business platforms can be found on Addendum 3 of Annex 4

In the next section, we will analyse and quantify the potential synergies from the integration, which can be at several levels: revenues, costs, investment, financing. According to a report from (Price Waterhouse Coopers, 2014)<sup>4</sup>, cost synergies are more easily delivered than revenue synergies because these really depend on the behaviour of resellers, customers, competitors. According to (Bruner, 2004), the market is persuaded by cost-cutting synergies but sceptical about other motives. Synergies are financially beneficial but also carry costs and risks, which will also be exposed.

#### ***Revenue Synergies***

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>Revenues</b>	314.258	328.907	344.243	360.302	377.117	394.724	413.161	432.468
ZTE Share	23,9%	23,9%	23,9%	23,9%	23,8%	23,8%	23,8%	23,8%
Huawei Share	76,1%	76,1%	76,1%	76,1%	76,2%	76,2%	76,2%	76,2%

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<sup>4</sup> PwC M&A Integration Survey Report 2014



<i>%growth</i>	3,3%	4,7%	4,7%	4,7%	4,7%	4,7%	4,7%	4,7%
<i>Revenue Enhancement</i>			1,0%	2,0%	1,0%			
<b>New Revenues</b>	<b>314.258</b>	<b>328.907</b>	<b>347.686</b>	<b>371.183</b>	<b>392.391</b>	<b>410.711</b>	<b>429.895</b>	<b>449.983</b>
<i>%growth</i>		4,7%	5,7%	6,8%	5,7%	4,7%	4,7%	4,7%

TABLE 7 - REVENUE SYNERGIES

In terms of revenues, there would be many benefits from the merger. Firstly, the new entity would become world's #1 Telecom Equipment Vendor (ex-mobile phones), overtaking Ericsson. In what regards handsets, it would improve its positioning, getting closer to Apple and Samsung as world's #3 Smartphone Vendor. This would certainly improve the perception of these two companies, especially by carriers, while the image among consumers would take more time to change. Moreover, Huawei will have access to ZTE's client base and could benefit from the reduced competition, not only in winning contracts with operators but also in pricing power.

### *Cost Synergies*

#### **Cost of Goods Sold**

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>COGS</b>	(195.780)	(206.448)	(212.125)	(217.877)	(223.698)	(229.581)	(235.518)	(241.501)
<i>ZTE Share</i>	28,0%	27,2%	27,3%	27,3%	27,4%	27,4%	27,4%	27,5%
<i>Huawei Share</i>	72,0%	72,8%	72,7%	72,7%	72,6%	72,6%	72,6%	72,5%
<i>%growth</i>		5,4%	2,7%	2,7%	2,7%	2,6%	2,6%	2,5%
<i>Efficiency improvements</i>		2,0%	-2,0%	-1,0%				
<i>Economies of scale</i>			-2,0%	-2,0%				
<i>Shared facilities and distribution</i>		2,0%	-1,0%	-1,0%	-1,0%			
<b>New COGS</b>	<b>(195.780)</b>	<b>(214.789)</b>	<b>(209.836)</b>	<b>(207.012)</b>	<b>(210.418)</b>	<b>(215.951)</b>	<b>(221.536)</b>	<b>(227.164)</b>
<i>%growth</i>		9,7%	-2,3%	-1,3%	1,6%	2,6%	2,6%	2,5%
<b>Gross Profit</b>	<b>118.478</b>	<b>122.458</b>	<b>132.118</b>	<b>142.425</b>	<b>153.419</b>	<b>165.143</b>	<b>177.643</b>	<b>190.966</b>
<i>ZTE Share</i>	17,3%	18,3%	18,4%	18,6%	18,7%	18,8%	19,0%	19,1%
<i>Huawei Share</i>	82,7%	81,7%	81,6%	81,4%	81,3%	81,2%	81,0%	80,9%
<i>Gross Margin</i>	37,7%	37,2%	38,4%	39,5%	40,7%	41,8%	43,0%	44,2%
<i>%growth</i>	11,5%	3,4%	7,9%	7,8%	7,7%	7,6%	7,6%	7,5%
<b>New Gross Profit</b>		<b>114.118</b>	<b>137.850</b>	<b>164.171</b>	<b>181.973</b>	<b>194.760</b>	<b>208.359</b>	<b>222.820</b>
<i>New Gross Margin</i>		34,7%	39,6%	44,2%	46,4%	47,4%	48,5%	49,5%

TABLE 8 - COST OF GOODS SOLD SYNERGIES

Similarly to the forecasts for each company, the COGS will be determined by the Gross Margin. The sources of synergies here will be through improved efficiency, enhanced

economies of scale (especially for being a horizontal merger) and cost cuts made possible by the share of facilities and distribution channels (include job cuts in manufacturing). For FY2014, enjoying economies of scale should be more than offset by some initial inefficiency in production and some increased costs caused by the adjustments in the facilities and the inefficient use of the distribution channels (revoking contracts and duplicated channels). In the following years, as production increases, the synergies would become more evident as the integration moves forward but with a marginally decreasing benefit.

## Research & Development

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>R&amp;D Costs</b>	(37.510)	(37.109)	(37.532)	(37.914)	(39.148)	(39.472)	(41.316)	(43.247)
<i>ZTE Share</i>	18,2%	19,1%	19,7%	20,4%	23,0%	23,8%	23,8%	23,8%
<i>Huawei Share</i>	81,8%	80,9%	80,3%	79,6%	77,0%	76,2%	76,2%	76,2%
<i>%growth</i>	-1,8%	-1,1%	1,1%	1,0%	3,3%	0,8%	4,7%	4,7%
Integration		5,0%	2,0%					
% Cut			5,0%	5,0%	5,0%			
<b>New R&amp;D</b>	<b>(37.510)</b>	<b>(38.965)</b>	<b>(36.369)</b>	<b>(36.018)</b>	<b>(37.190)</b>	<b>(39.472)</b>	<b>(41.316)</b>	<b>(43.247)</b>

TABLE 9 - RESEARCH & DEVELOPMENT SYNERGIES

This category most likely has a high potential for synergies but most of them might be hidden and hard to measure. According to (Gerpott, 1995), the integration of companies who produce complementary R&D leads to the development of more advanced technologies. Also, a joint management of innovation allows firms to increase efficiency, namely in intellectual property management (costs with patents, lawsuits, etc.). On the other hand, (Lane & Lubatkin, 1998) state that differences between companies (culture, processes or knowledge) can create difficulties for the transition of knowledge. In sum, this is a sensitive matter in that the benefits can be easily destroyed (Chakrabarti, Hauschildt, & Süverkrüp, 1994) - the integration needs to be careful and it will be costly. However, the elimination of doubled efforts and the improvement of processes will enable a considerable cut. The joint R&D department will certainly produce better technology and allow the company to profit from that through higher quality products, which will be reflected in the revenues. According to (Gantumur & Stephan, 2007), on average, the merged entity realises improvements in innovation performance which are driven by the success/weakness in R&D of each company prior to the operation. Hence, considering both companies' position in what regards patent filings and technological breakthroughs in recent years, we can expect good things to come from the integration on the R&D part.

## Selling, General and Administrative Expenses

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>SGA Expenses</b>	(50.161)	(57.626)	(60.317)	(63.134)	(66.084)	(69.174)	(72.408)	(75.795)
ZTE Share	22,4%	19,6%	19,6%	19,5%	19,5%	19,5%	19,5%	19,5%
Huawei Share	77,6%	80,4%	80,4%	80,5%	80,5%	80,5%	80,5%	80,5%
%growth		14,9%	4,7%	4,7%	4,7%	4,7%	4,7%	4,7%
Rebranding		10,0%	-5,0%	-2,0%				
Staff cuts		1,0%	-5,0%	-3,0%				
<b>New SGA</b>	<b>(50.161)</b>	<b>(64.022)</b>	<b>(60.478)</b>	<b>(60.176)</b>	<b>(62.988)</b>	<b>(65.932)</b>	<b>(69.015)</b>	<b>(72.244)</b>

TABLE 10 - SELLING, GENERAL AND ADMINISTRATIVE COSTS SYNERGIES

For FY2014, SGA costs will go up, due to the rebranding that needs to be done and due to the rigidity of labour. In the following two years, it will be possible to reduce expenses since there is now only one brand, one marketing department, one management team and some doubled administrative positions can be cut.

## Depreciation & Amortisation

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>Depreciation &amp; Amortisation</b>	(5.502)	(6.011)	(7.432)	(8.855)	(10.464)	(12.033)	(13.088)	(13.703)
ZTE Share	31,7%	29,3%	29,6%	29,6%	28,2%	26,5%	25,2%	25,0%
Huawei Share	68,3%	70,7%	70,4%	70,4%	71,8%	73,5%	74,8%	75,0%
%growth	2,8%	9,2%	23,6%	19,2%	18,2%	15,0%	8,8%	4,7%
Sales of PPE, intangible, etc.			-10,0%	-10,0%	-5,0%			
<b>New Depreciation &amp; Amortisation</b>		(6.011)	(6.689)	(7.970)	(9.941)	(12.033)	(13.088)	(13.703)

TABLE 11 - DEPRECIATION & AMORTISATION SYNERGIES

The number of ongoing projects for R&D centres and factories of both companies should be excessive for the merged entity. If the capacity of production is used more efficiently, then some fixed assets and buildings can be alienated and the amount of depreciation reduced. Most of the benefits regarding depreciation should take time to come, though.

## Capital Expenditure

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>Net CAPEX</b>	(9.157)	(9.745)	(9.735)	(10.809)	(10.415)	(6.955)	(4.132)	0
ZTE Share		35,1%	33,8%	23,9%	17,3%	13,5%	23,8%	
Huawei Share		64,9%	66,2%	76,1%	82,7%	86,5%	76,2%	
%growth	-10,0%	6,4%	-0,1%	11,0%	-3,6%	-33,2%	-40,6%	-100,0%
Elimination of doubled efforts (cut)				2,0%	3,0%	2,0%	1,0%	

<b>New Net CAPEX</b>	(9.745)	(9.735)	(10.593)	(10.102)	(6.815)	(4.090)	0
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TABLE 12 - CAPITAL EXPENDITURE SYNERGIES

Capital Expenditure is an important matter for both companies given their ongoing expansion plans, which requires considerable sums of money to build new infrastructure and acquire more equipment. Considering the projects in which both companies are already involved, it would be difficult to cut the expense in the two upcoming years given the capital commitments and contracts already signed. However, between FY2016-2019, with a common direction and objective, the investment could be done more efficiently, avoiding the doubled efforts that would exist if they were separate entities.

### Working Capital

	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Accounts Receivable	123.368	129.097	134.668	140.482	146.550	152.883	159.492	166.390
Accounts Payable	128.542	135.829	140.092	144.446	148.890	153.422	158.042	162.745
Inventories	37.363	39.322	40.475	41.650	42.847	44.064	45.302	46.559
DSO	143	143	141	138	136	136	135	135
DPO	240	231	244	255	258	259	260	261
DI	70	67	70	73	74	74	75	75
CCC	(27)	(21)	(32)	(43)	(48)	(49)	(50)	(52)
<b>NWK</b>	<b>32.189</b>	<b>32.590</b>	<b>35.052</b>	<b>37.687</b>	<b>40.507</b>	<b>43.525</b>	<b>46.752</b>	<b>50.204</b>
<b>ΔNWK</b>		<b>400</b>	<b>2.462</b>	<b>2.635</b>	<b>2.820</b>	<b>3.017</b>	<b>3.228</b>	<b>3.452</b>

TABLE 13 - WORKING CAPITAL SYNERGIES

In terms of trade credit conditions, both companies have already good relationships with stakeholders and considerable bargaining power. Despite of the increase in size that results from the merger, I do not believe that significantly more bargaining power can be achieved. Nonetheless, the merged entity benefits from Huawei's extremely good conditions.

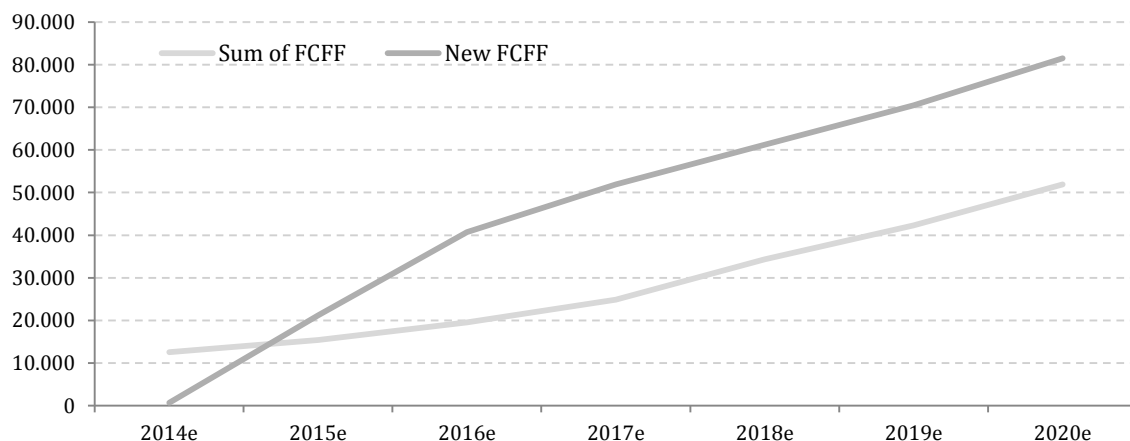


FIGURE 13 - FREE CASH FLOW SYNERGIES

As we may observe on the plot above, the Free Cash Flow to the Firm is enhanced by the synergies, especially in the first two years. In FY2014, though, there is an inherent integration cost that drives the FCFF down 94%.

### Financial Synergies

According to a study by (J.P.Morgan, 2009), there are considerable benefits when a company manages to have its credit rating changed from High Yield to Investment Grade. They estimate that changing from BB to BBB would have financial synergies around 13-14% of the total combined value. In this case, the outstanding numbers presented by Huawei (interest coverage, mainly) allow for the rating of the combined firm to be higher than the average rating of the companies when valued separately.

### Cost of Capital

Industry D/E	<b>35%</b>
D/V	25,93%
Beta (unlevered)	0,87
Beta (levered)	1,17
Market Risk Premium	4,96%
Country Risk Premium	1,92%
Ke Merged Entity	<b>10,89%</b>
After-tax Kd Merged Entity	<b>3,11%</b>
Risk-free Rate	2,85%
Default Spread AA	0,70%
Default Spread China	0,60%
Tax Rate	25%
Illiquidity Discount	<b>20%</b>
WACC Merged Entity	<b>8,88%</b>
<i>g</i> Merged Entity	2,80%

TABLE 14 - COST OF CAPITAL OF THE NEW ENTITY

With the merger, the companies would take the opportunity to adjust the capital structure to the target and so no adjusting Debt-to-Equity ratio is used. Regarding the cost of debt, the overall synthetic rating would be AA for which the default spread would be lower than the average of the two separate entities, once ZTE has a greater indebtedness than Huawei. In fact, the ratios that are important to rating agencies would improve and the merged entity would have better access to markets and higher financial flexibility. In addition, the fact that ZTE is a publicly-traded company brings liquidity to the new entity because of its higher transparency and because Huawei would get closer to going public. For this reason, the illiquidity discount used to the valuation of Huawei would still apply but the discount would be lower.

## Valuation

		%
DCF Value of ZTE	70.514	12,52%
DCF Value of Huawei	492.864	87,48%
<b>Equity Value of Merged Entity (w/o synergies)</b>	563.379	
<b>Equity Value Merged Entity (w/ synergies)</b>	817.397	
<b>Value of Synergies</b>	254.018	
<b>P(Success)</b>	75%	
ZTE Share	23.739	
Huawei Share	165.923	
Premium to Valuation	33,67%	
Premium to 2013 Market Capitalisation	48,04%	

TABLE 15 - VALUATION OF THE NEW ENTITY

After forecasting the impact of the synergies and computing the new discount rate, we are in position to discount the free cash flows and the terminal value, using the WACC method. That leads us to the total firm value of the merged entity to which we subtract both companies' net debts. The difference between this amount and the sum of the value of the two entities separately will be the value of the synergies. Naturally, these are inherent to ZTE but also to Huawei so it seems fair to attribute the synergies according to the estimated value of each company in order to reflect not only the different scale but also the difference in the competitive position and skill. Hence, the synergies attributed to ZTE are RMB 23.739 million, which correspond to 34% of ZTE's Equity Value, being RMB 94.253 million the maximum amount that Huawei should offer. However, we need to take into account that ZTE is currently undervalued, with a market capitalisation of RMB 49.414 million. Hence, Huawei will be offering less than the maximum but will have to pay a minimum of RMB 73.153 million, which correspond to the current market cap plus the

value of the synergies (weighted by the current market cap). The price of acquisition should lie between these limits, depending on the selling shareholders' willingness to sell, which lies upon the deal structure. This will be further discussed in the next section.

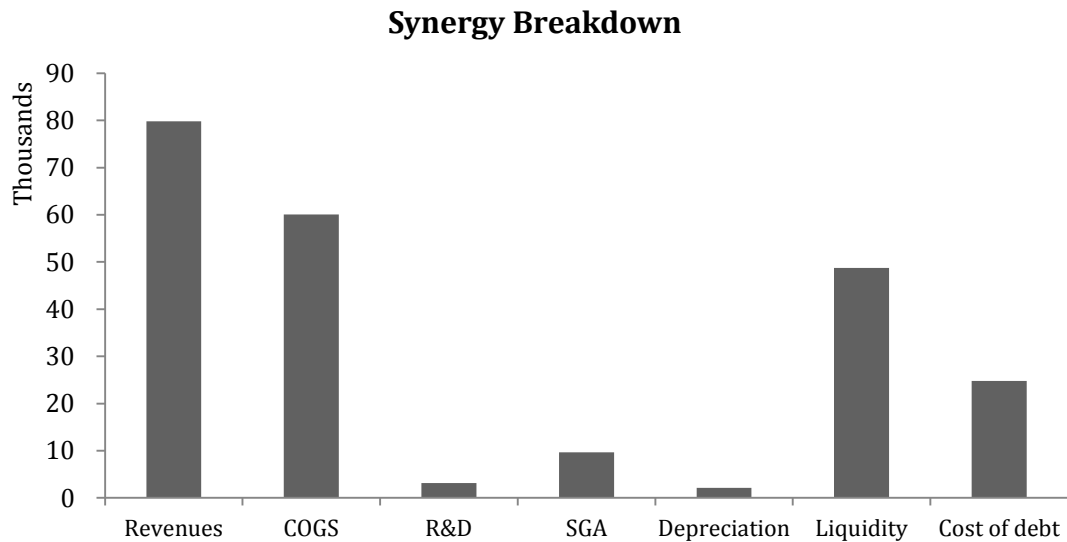


FIGURE 14 - SYNERGY BREAKDOWN

Synergies are fairly split between costs and revenues, with Sales and COGS being the largest contributors in absolute terms. All in all, Operational Synergies account for 67% of the Total Synergies, while Financial Synergies account for 33%. The sources of synergies are identified and seem sufficiently diverse to cover the failure on any of them.

## 5. THE TRANSACTION

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After analysing the synergies that result from the integration, we may state that the operation would create value and make complete sense to happen, considering the characteristics of both companies. However, according to (Sirower & Sumit, 2006), M&A creates value at a macroeconomic level but mostly through the premium paid to the target and not through the realisation of the estimated synergies. There are several causes for this, being the details of the transaction among the motives. In this last section, we will elaborate on how the deal would be in terms of type of operation, method of payment and whether the shareholders would win or lose.

### 5.1. DEAL TYPE

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When planning to integrate, companies must decide on how the integration will happen and what it will be. According to (Steiger, 2008), there are two main takeover approaches: asset deals and share deals, being the latter the most common in large transactions. They both have advantages and drawbacks. Purchasing a company's assets would not, *per se*, transfer the ownership of the company in terms of legal control. A share deal is, in turn, legally simpler (no need to go through all the contracts for the assets, selecting preferred assets, etc.), avoids sales tax issues and preserves any advantageous tax saving asset. This might not always be an advantage, in what taking on all the assets and liabilities of the target might be harmful. Nonetheless, this asset deals are preferred by buyers for its discretionary possibilities. On the other hand, equity deals require agreement among shareholders, with cooperation between firms being very important. In addition, in China, it would need the approval of Chinese authorities and would be subject to scrutiny, especially when ZTE is state-owned.

### 5.2. FORM OF INTEGRATION

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It is very important to not underestimate the matter related to the deal itself, as it might compromise the success of the operation. In some cases, it is possible to profit from most of the synergies by simply establishing partnerships such as joint ventures. In fact, if the potential gains do not go much beyond knowledge share, it might not be necessary to merge management teams, operations, brands, etc.. A joint venture would not be necessary, given the similarities between both companies. According to **Hennart and Reddy (1997)**, joint ventures are preferable over acquisitions when many assets are indivisible, the company does not have experience in the other's business, which make



post-integration issues more likely and even foreseeable. On the contrary, Huawei and ZTE have very strong R&D departments which would benefit from working together, though. However, these are costly departments that would benefit from common IP management, no litigation against each other and elimination of doubled efforts. Moreover, a market share increase, more bargaining power towards stakeholders, increased efficiency and economies of scale are powerful motives for a horizontal integration like this, especially when both companies have the same core businesses and are experiencing rapid expansion in a contemporary global project. That being said, it makes sense to target with this transaction a high degree of integration.

In this particular case, given Huawei's greater scale and proved capacity to generate high cash flows, there should be a stock acquisition where Huawei takes over ZTE. An acquisition, however, has a negative connotation in the market as it sounds more hostile. Consequently, it is important to be cautious about the communication and signalling, especially because Huawei is privately-held, which makes all the impact go through ZTE's share price. This can become an issue if the price of the target goes up massively, by which the acquirer may then have to buy an overvalued stock instead of an undervalued one.

### 5.3. DEAL STRUCTURE

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The two most common ways of payment for a transaction are with stock or cash or a combination of both. According to (Rappaport & Sirower, 1999), in 1988, 60% of all M&A deals in the United States were paid entirely in cash and only 2% entirely in stock. Ten years later, we were seeing a different situation, with 50% of the deals being all-stock.

Cash is the most liquid and least risky way of payment, as it fully reflects the value of the deal and the transaction risk (synergies not realising) is borne solely by the acquirer. This, according to (Rappaport & Sirower, 1999), represents the biggest difference between cash and stock. On a cash-only transaction, there is a simple transfer of ownership but when stock is added to the deal, the target's shareholders that receive the shares are also subject to the post-deal performance. In addition, despite cash is quicker to finance, it will be subject to capital gains tax. Whether the source of the monies is excess cash or unused credit lines, it may affect the acquirer's debt rating, liquidity ratios and capital structure. Normally, cash is more used when interest rates are low and the acquirer has access to reasonable credit facilities (healthy financials) and in more capital-intensive companies. On the downside, if too much cash is used, bondholders might become unwilling to subscribe future interests, as the management is not acting to pursue their interests.

Equity may also be used through the issuance of equity to the target's shareholders. It reduces the Debt-to-Equity ratio and debt might become cheaper in the future. If equity is perceived to be overvalued, like a currency, it makes more sense to pay with equity. Normally, the acquired company's shareholders receive restricted stock with a lock-up period, in order to prevent the share price from going down very fastly. However, on a share deal, it might happen that the target shareholders gain a considerable controlling position in the acquirer, which is something that needs to be accounted for.

(Zhang, 2001) and (Hansen, 1987) agree that the larger the target, the more likely it is that the buyer will pay with stock. In the present case, though, since Huawei is privately-held, all the impact of the announcement and market reaction will be through ZTE's share price. This represents a considerable risk to Huawei as ZTE can go from undervalued to overvalued. Having said this, Huawei should be firm with the offer and make it all-cash so that the signalling is strong and confident.

At current conditions, Huawei seems to have unused credit lines and a big pile of cash so cash can be seen, by far, as the cheapest solution. The structure of this deal should thus be 100% Cash, sourced from cash in excess of the minimum cash balance plus debt.

	Buyer	Target
Company Name	Huawei Technologies	ZTE Corporation
Currency	RMB	RMB
Transaction Date	01-01-2014	
Ticker	HUA	ZTE
Unaffected Share Price	-	15,98
Offer Premium	-	48,04%
Offer Share Price	-	23,66
Shares outstanding	NA	3.439
% Free Float	-	43,56%
% Institutional Shareholders	-	56,44%
Min % in M&A (China)		
Purchase Price		81.363
To acquire control		45.921
To acquire free-float		35.442
Cash for control		45.921
Cash for free-float		35.442
Cash available		
Cash balance	73.399	20.118
Minimum Cash	50.000	15.000
Total Cash available for transaction	28.517	
Existing debt	23.033	32.537
Total Debt	55.570	
New debt to pay for transaction	52.846	

TABLE 16 - TRANSACTION DETAILS

This structure assumes one needs to acquire 100% of the target. Huawei has unused debt capacity and so the additional debt is assumed not to have a major influence on the cost of debt.

All in all, according to (Sirower & Sumit, 2006), when one is looking into the deal structure, it is vital to assess whether the management teams have experience in M&A, if the credit history of the acquirer is solid, whether the earnings that are left from the operation are sufficient to manage the business and the level of trust between seller and buyer.

#### 5.4. RETURN TO SHAREHOLDERS

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On this type of deals, the parties who make the decisions are shareholders from both sides. Hence, the return that they get or expect to have is, actually, what makes them move forward in the operation or abort. For (Eccles, Lanes, & Wilson, 1999), there are several reasons for so many deals to have failed since many decades: overenthusiasm by management teams, overestimation of the strategic benefits, overpayment and weak integration effort with consequent issues. All this harms shareholders' return, therefore being important to analyse the expected outcome of the deal, which, with this regard, is highly linked to the deal structure.

M&A is a business turned to future gains and since the outcome of the deals is uncertain, parties put return at risk. According to (Sirower & Sumit, 2006), the Shareholder Value At Risk (SVAR) is the premium paid over the acquirer's market value before the operation is announced. Despite Huawei is privately-held (does not have a liquid market capitalisation), its shareholders are exposed to a loss of (28.461/ 352.454).

On ZTE's side, the fact that this would be an all-cash deal, would allow its shareholders to lock-in the premium and safeguard from any failure on this deal. According to (Sirower & Sumit, 2006) sellers are the ones who win the most from transactions but, on average, M&A should pay significant returns both to sellers and buyers (Bruner, 2004).

According to (Bruner, 2004), returns to buyers are higher when there is a true strategic motivation, synergies are credible and the deal is paid in cash. Conversely, returns to buyers are lower when the bidding is on public firms, not being a merger of equals and when the M&A market is hot.

## 5.5. RISKS

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Inherent to the integration, because it is based on expectations about the future, there are several risks with many different sources. Firstly, in the beginning of the process, the strategic fit between two companies can be overstated, thus causing an overestimation of synergies. Secondly, valuation-wise, there are the usual risks of any valuation which cause large discrepancies between the projections and the reality: interest rate risk, tax rate risk, currency risk, etc. Thirdly, in terms of integration itself, issues might arise regarding implementation: cultural and governance differences, communication issues, incompatibilities between departments and difficulty in the integration of employees. All these causes delays in implementation and enhance integration costs that were not initially accounted for, which will be paid by the shareholders - in this case, by Huawei's shareholders only, as this would be an all-cash transaction. Eventually, depending on the seriousness of the issues, other stakeholders could be affected.

More precisely, with Huawei-ZTE, some risks are clear and we are able to point them out:

- R&D departments might not be easy to integrate on different skills, different software and processes
- Elimination of competition between both might reduce the pace of innovation
- As ZTE is a big company, there could be an excessive focus on integration and both companies might get sloppy towards the business
- Overestimation of cost cuts and other synergies, which happens frequently (Cullinan, Le Roux, & Weddigen, 2004). The authors also agree that underestimating synergies by ignoring them is also detrimental to value creation
- ZTE's weak financial health might have a more detrimental impact to Huawei than expected
- The market has a very positive outlook regarding the transaction and ZTE's price rallies. Huawei will suddenly have to pay more for the acquisition.
- The deal team does not do a good job. (Aiello & Watkins, 2000) say it is very important that roles are well-defined, with a clear leader and that they should not get overenthusiastic about the deal, being ready to kill it at any time, if necessary.
- If the deal is seen as hostile, that can trigger anti-takeover defences which might lead to its failure
- Overpaying for the target, as a consequence of overenthusiasm and valuation mistakes. According to (Cullinan, Le Roux, & Weddigen, 2004), it is of major importance for the acquirer to know the maximum price he is willing to pay

- In terms of anti-trust regulation, it might be that Chinese authorities do not approve the deal because of the increase in market share that the merged entity would have

## 5.6. ALTERNATIVES

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If Huawei is looking to expand through M&A there are other companies that could integrate with Huawei, although only in the handsets business:

HTC, which has been losing market share, has always had the highest standards of quality but has been struggling to generate cash flows. It is also a Chinese (Taiwan) company, experienced in the smartphone market and which could help Huawei go up the value chain and improve its branding and perception.

Lenovo, another Chinese company, which acquired IBM's PC business in 2005, has roughly the same revenues as Huawei. Around 80% of the revenues, though, are from the Notebook and Desktop businesses, which is not really within Huawei's scope. On the other hand, Lenovo was #2 mobile phone vendor in China, according to (International Data Center (IDC), 2014). For market share reasons, Huawei might be interested in acquiring solely the Handsets business of Lenovo.

Nokia, the Finnish Telecom giant, is a very experienced company and has contributed to several breakthroughs and much of the evolution of mobile phones as we see them today. According to some news, heads of Huawei consumer business consider there could be some synergies but Windows Mobile OS is weak, has a quite small market share and there is a licence fee, while Android is free.

Alternatively, both companies could pursue a lower degree of integration to test some synergies, i.e. a pre-operation alliance. However, since the two companies share the same markets, in the medium to long-term, it could lead to cannibalisation.

Finally, they could stay independent from each other and follow separate paths, giving up on all the synergies (especially economies of scale, market share and R&D) but avoiding the potential costs that could cause big losses to the merged entity and compromise its success.

## 6. CONCLUSION

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The purpose of this work was to assess the value of two Telecom Equipment giants and to simulate a deal between them. Both ZTE and Huawei have a story of success, especially Huawei, which has been outpacing the majority of the competitors and has seen extraordinary growth. The technological evolution and the intensification of the competition in the industry have incentivised or forced some of the players to integrate - Alcatel-Lucent and Nokia-Siemens are the main examples. In their strategy, ZTE and Huawei aim to tackle the leaders both in the Networks (Cisco and Ericsson) and Terminals (Apple and Samsung) business lines. Hence, their best reaction would probably be to merge, as they both present similarities and complementary strengths. By analysing both companies, it was possible to detect several sources of synergies and estimate their value, mainly coming from revenue enhancement, scale, efficiency and R&D. The realisation of the synergies would depend on whether the integration process would be successful and smooth. To this purpose, it was proposed that Huawei acquired ZTE in a friendly takeover, avoiding any waste of opportunity to make this one great deal.

Most of the work developed in this dissertation is based on expectations and estimations. The numbers used for the valuation might not verify and the integration might be more or less smooth but I am convinced that these companies gain more if they are a single company rather than two separate entities.

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## 10. ANNEXES

### ANNEX 1

**Table 1**

<b>Acquirer</b>	<b>Target</b>	<b>Year</b>	<b>Value (US\$)</b>
Vodafone Group	Mannesmann	1999	203 billion
AOL	Time Warner	2000	182 billion
Verizon Communications	Cellco Partnership	2013	130 billion
Altria	Philip Morris International	2007	113 billion
RFS Holdings	ABN Amro	2007	98 billion
Pfizer	Warner-Lambert	1999	89 billion
AT&T	BellSouth	2006	89 billion
Exxon	Mobil	1998	85 billion
Royal Dutch	Shell Transport & Trading	2004	80 billion
Glaxo Wellcome	SmithKline Beecham	2000	72 billion

*Source: Financial Times*

### Addendum 1

#### *Operational Synergies*

- **Economies of scale:** Higher cost-efficiency. Increasing the size of the company results in lower average cost of production;
- **Higher market share:** Market power increase is not necessarily good. Companies involved in horizontal mergers are more motivated by increased efficiency (Bruner, 2004);
- **Greater bargaining power:** Higher market share and reduced competition enable higher bargaining power both upstream and downstream. The merged entity will be able to negotiate better supply conditions and also have increased pricing power;
- **Combination of functional strengths:** more evident when companies are in the same business;
- **Higher growth in new or existing markets:** for example, ZTE has been establishing in Africa for quite a long time and has its network and distribution channels there, which provide Huawei with an easier access;
- **Diversification:** It is considered a discussable motivation for M&A, provided that investors are able to do it on their own, without any cost to managers, unless the integration creates a new product, new market or sector (Bruner, 2004)

### *Financial Synergies*

- If one firm has excess cash and the other has high NPV projects but lacks the money, the merge will make those investments possible;
- Debt capacity and credit facilities might improve if the cash flows increase and are stable;
- **Tax benefits:** more evident when companies trade with each other. If the target has operating losses, it will reduce the tax charges of the acquirer. Also, there might be excessive depreciation after the merger, once some facilities may be sold for integration purposes.

---

### **Addendum 2**

Deals might turn out unsuccessful for numerous reasons, among which are the lack of strong strategic motives for the transaction, overpayment and lack of post-deal planning and effectiveness. According to (Damodaran, 2006), one of the causes for this to happen is the excessive power given to managers in detriment of shareholders, as managerial hubris (when managers believe they would manage a target company more efficiently than the current management) and the winner's curse (when there is information asymmetry and a bidder ends up overestimating the value of the auctioned asset), take over managers' decision-making capabilities.

Empirical evidence suggests that there is a great distance between the detection of a possible synergy and its delivery to shareholders. Management teams often get so blinded by the theoretical advantages of synergies that they end up miscalculating it by being too optimistic, not taking into account the costs of integration and, ultimately, paying huge premia that exceed the value of synergies, conducting both parties to losses. There are many examples of flawed transactions, which are described below.

America Online (AOL) and Time Warner was the second largest deal of all time (even the biggest, depending on the source) and it is considered the biggest failure ever. Right before a burst of the Dotcom bubble, this huge merger happened between the Web-search engine and the mass media company. After the market crash, AOL lost considerable value and missed much business in the following years, the time when Internet was starting to evolve. Due to poor integration, both business units lost market share and the management found low transferability between industries. They disintegrated in later 2000s.

Sprint and Nextel became the third largest telecom carrier in 2005. Sprint was on the consumer market and Nextel specialised in businesses so they gained access to each other's client bases. However, different corporate cultures and values had both companies focused on divergent factors, which caused a loss in market share. The lack of a common vision led to poor execution, enhancing the differences between the two parties.

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### **Addendum 3**

#### ***M&A in the Telecom Industry***

In a study done by McKinsey & Company, it was estimated that between 2001 and 2011 USD 1.5 trillion were spent on M&A transactions in the Telecom industry. In its analysis over the past deals, McKinsey concluded that the motivations changed with time. We started seeing less cross-border activity, probably companies started realising it would be easier to deliver synergies by integrating in markets and with companies which they know better. Nonetheless, internationalisation is expectable given the recent accumulation of cash and it will depend on how well companies can seize economies of scale and how much industry concentration regulatory entities will allow. Also, the willingness to shift away from the main business activity may create room for some type of non-core investments.

Regarding the Telecommunications industry, (Gantumur & Stephan, 2007) consider that M&A has evolved quite significantly in the past ten years, with deregulation, technology developments and the convergence seen across the sectors having the greatest influence. In fact, the industry has become more integrated, broadening the competitive environment to an international framework. This makes companies shift their focus from internal markets to become worldwide suppliers and race for being the technology leaders or to provide the most fulfilling product in terms of customer needs. These achievements are usually synonym of being a market leader (Brodt & Knoll, 2004). Logically, for this reason, companies aim to have the most advanced and innovative R&D facilities and, in many cases, that is enabled by corporate restructuring. Actually, companies have shown tendency to prefer M&A deals to other type of agreement, once it allows immediate control and rapid action in this fast paced, increasingly complex industry (Capron & Mitchell, 1997)

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### **Addendum 4**

It takes the value of a company as being the present value of its future cash flows, discounted at a rate that reflects the uncertainty of the same cash flows. Cash flows (CFs)

are a more reliable measure of the income generated by the firm, as they represent actual cash received by the company available for creditors, while earnings are ultimately an accounting figure. However, one may use cash flows at different levels. For the purpose of this thesis, the three most common cash flows are considered: Dividends, Free Cash Flow to Equity (FCFE) and Free Cash Flow to the Firm (FCFF). It can be said that the definition of free cash flow is widely agreed and, as an example, according to (Brealey, Myers, & Allen, 2007), it represents the amount of cash that is available for paying out to investors, shareholders and bondholders (Koller, Goedhart, & Wessels, 2010), after the necessary reinvestment in the business.

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## Addendum 5

Taking into account dividends, one may use the Discounted Dividends Model (DDM), which takes the actual dividend paid to shareholders. This is, according to Damodaran, the source of the problems. There may be companies that consistently pay out dividends below or above than they can afford, therefore provoking incorrect valuations. The reasons for this to happen are of different nature: managers know shareholders prefer a stable dividend and that a change on the amount paid can damage the company, be it because they cannot maintain a higher dividend or because a smaller dividend signals weakness and the market may react too negatively; companies might retain earnings for future investments; if dividends are taxed more than capital gains, the manager has an incentive to keep the excess cash rather than paying it out; dividends might be used for signalling, once again distorting the actual performance of the company for that period; lastly, managers may choose to take some precautionary measure and build a big cash pile to insure them against bad times. This last motivation has been quite evident in these last years (after 2009), when markets started to rebound but many large caps decided to keep large amounts of cash, for prevention. Hence, there is now more room and conditions for increased M&A activity. Unfortunately, there is no available information about Huawei's dividend policy so regardless of whether the company pays dividends or not, it leads to another well-known set of models - Free Cash Flow to Equity (FCFE) models. This approach is an alternative to the DDM, which solve the above stated problems, since it uses the potential dividend, i.e. assumes all the available cash flow is paid out as dividends, discounting it, again, at the unlevered firm cost of capital (required return by shareholders). The FCFE is computed as follows:

$$(10) \quad FCFE = Net\ Income + Depreciation + Aftertax\ asset\ sales - CAPEX - \Delta(Net\ Working\ Capital) + \Delta(Net\ Debt)$$



When FCFE=Dividends, it is clear that the outcome of both models will be the same. Also, if the amount kept with the company is invested in zero NPV projects, both models are equivalent as well. Another good reason to drop DDM is, as Damodaran states, the fact that in an environment where there is the possibility that the control structure of the company changes, the dividend policy might also changes, therefore the FCFE gives a better estimate of value.

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### Addendum 6

According to (Modigliani & Miller, 1963), discounting the tax shields at the risk-free rate and assuming market efficiency leads to the following relation between levered and unlevered betas:

$$(11) \quad \beta_L^{MM} = \beta_u + \frac{D}{E} \left[ \beta_u - \beta_d + \left( T * \frac{k_d}{MRP} \right) - PVTS \left( \frac{k_u - g}{D * MRP} \right) \right]$$

(Sick, 1990) and (Fieten, et al., 2005) agree on the way of computing the PVTS above.

The formula suggested by (Myers S. C., 1974) is valid only for growing perpetuities.

$$(12) \quad \beta_L^{MY} = \beta_u + \frac{D}{E} (\beta_u - \beta_d) * \left[ 1 - T * \frac{k_d}{(k_d - g)} \right]$$

The computation of the cost of capital for a leveraged company proposed by (Miles & Ezzell, 1985) described below, leads to the following relation between the levered and the unlevered betas:

$$(13) \quad \beta_L^{ME} = \beta_u + \frac{D}{E} (\beta_u - \beta_d) * \left[ 1 - \frac{T * K_d}{(1 + K_d)} \right]$$

(Lewellen & Emery, 1986) agree that the above is the most consistent method. (Harris & Pringle, 1985) argue that tax shields have the same risk as the company's cash flows. Consequently, they should be discounted at the cost of assets  $K_u$ , with the following relation to beta:

$$(14) \quad \beta_L^{HP} = \beta_u + \frac{D}{E} (\beta_u - \beta_d)$$

(Inselbag & Kaufold, 1997) defend that in case the company has a fixed target amount of debt, one should follow (Myers S. C., 1974). If the objective is to have a constant D/V ratio, then (Miles & Ezzell, 1985) should be used.

(Damodaran, 2006) assumes that  $\beta_d=0$  given that all risk is related to shareholders and debt even has a tax benefit. Nonetheless, he admits that debt might have market risk. Hence, the formula that relates the levered and unlevered betas is:

$$(15) \quad \beta_L^{DAM} = \beta_u + \frac{D}{E} * \beta_u(1 - T) \left\{ -\beta_d * \frac{D}{E} \right\}$$

(Fernández, 2003) does some sensitivity analysis for all the methodologies and finds some inconsistencies in all of them, concluding his formulae are the most adequate, for a company that fixes the book-value leverage ratio, in a world without leverage costs.

$$(16) \quad \beta_L^{FE} = \beta_u + \frac{(\beta_u - \beta_d) * D * (1 - T)}{E}$$

### Addendum 7

Modigliani and Miller state, in an early approach, that, in a world without tax, the market value of a company is not affected by its capital structure, as investors can deleverage by diversification - Proposition I. On a second conclusion, they defend that the expected rate on a share is the rate of a “pure equity stream” plus an equity premium, which relates the capital structure to the spread between the return on equity and the return on debt - Proposition II. Mixing both propositions, they conclude the average cost of capital is not independent of the capital structure, rather falling when leverage increases until a certain level. Regardless of the type of financing used, the marginal cost of capital will be the average cost of capital. This was the first major step for the WACC method and DCF, in general. In (Modigliani & Miller, 1963), introducing taxes, they state that for any tax deductible source of financing, the marginal cost is the rate of after-tax unlevered cash flows, independent of the tax rate and the interest rate. The cost of capital should be the average of costs, weighted by the capital structure.

### Addendum 8

Being the tax rate the one rate that equates the FCFE to the FCFF, i.e.  $FCFE = FCFF + \Delta(\text{Net Debt}) - \text{Interest}(1 - T)$ . Fernández argues that the values of debt and equity used for the computation of the capital structure are neither the book values nor the market values but rather the outcome of the valuation. When valuing companies, people usually use the book value of debt, thus assuming the cost of debt (Kd) being equal to the required return on debt. However, what if the value of debt (D) is not equal to its book value (Dbv)? (Fernández, 2002) argues that the WACC should be adjusted, becoming:

$$(17) \quad WACC = \frac{E * Ke + D * Kd - Dbv * T * r}{E + D},$$

Being Kd the required return to debt and r the cost of debt.

Some problems may arise because of the existence of debt:

- If the capital structure is not constant, one should use a variable WACC and forecast the Debt-to-Equity ratio. (Fernández, 2002) proved that the relationship between the equity values of different years is given by  $E_t = E_{t-1}(1 + Ke_t) - FCFE_t$ . Also, we may estimate the value of debt in the future by  $\Delta D = FCFE - FCF + Interest(1 - T)$ ;

$$(18) \quad \text{Company Value} = \sum_{t=1}^t \frac{FCFF_t}{(1+WACC_t)^t} + \text{Terminal Value}$$

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### Addendum 9

(Modigliani & Miller, 1963) state tax shields should be discounted at the risk-free rate ( $Kd=Rf$ ), which is valid only when the company has a pre-set amount of debt. It actually provides inconsistent outcomes for growing companies. In fact, this matter was not the main concern in their article.

(Myers S. C., 1974), (Luehrman, 1997), (Brealey, Myers, & Allen, 2007) and (Damodaran, 2006) agree that tax savings should be discounted at the cost of debt  $Kd$ , given it is related to the interest on debt. Myers defends that the risk of the tax shields is the same that the one of debt.

$$(19) \quad PVTS^M = \frac{D*Kd*T}{(Kd-g)}$$

(Harris & Pringle, 1985) and (Ruback, 1995) suggest that the discounting should be at  $Ku$  - the cost of capital of the unlevered firm. (Miles & Ezzell, 1985) state that first year's tax shields are to be discounted at  $Kd$  and at  $Ku$  onwards. Here, the underlying assumptions vary, meaning that by discounting it at  $Kd$ , one is assuming a fixed debt amount and a constant debt-to-equity ratio when discounting at the  $Ku$ . (Miles & Ezzell, 1985) realise that if  $\frac{D_t}{D_t+E_t} = X$ , then  $D_t$  is proportional to the  $FCF_t$ . Therefore, they correct the formula of the PVTS to:

$$(20) \quad PVTS^{ME} = \frac{D*Kd*T}{(Ku-g)} * \frac{(1+Ku)}{(1+Kd)}$$

(Taggart, 1991) argues that Miles & Ezzell should be used when the target capital structure is adjusted once a year and Harris & Pringle when continuously adjusted.

(Fernández, 2007) presents a different way for assessing the tax shields. His claim is that debt policy is determined in book values and managers pay more attention to book values

rather than market values, as do rating agencies. Consequently, he derives PVTS for a fixed leverage ratio in book value terms:

$$(21) \quad PVTS^{FER} = \frac{D * Ku * T}{(Ku - g)}$$

On his empirical study for US companies, Fernández compares the correlations between debt and assets in book values against market values. He finds that correlations in book values are higher and that for market values the correlation is 0.23, on average, while according to Miles and Ezzell it should be 1.

$$(22) \quad FCFE_0(1 + g) = FCFF_0(1 + g) - D_0 * Kd * (1 - T) + g * D_0$$

The value of equity today is equal to the present value of the expected equity cash flows. Discounting expected equity at  $Ke$ , then  $E = [FCFF_0(1 + g)] / (Ke - g)$  and the previous equation yield:

$$(23) \quad E * Ke = Vu * Ku - D * Kd + PVTS * g + D * Kd * T$$

$$(24) \quad Ke = Ku + \frac{D}{E} [Ku - Kd(1 - t)] - \frac{PVTS}{E} (Ku - g)$$

Hence, discounting FCFE at the WACC, we can establish a relationship between the WACC and PVTS:

$$(25) \quad WACC = Ku - \left( \frac{PVTS}{D + E} \right) (Ku - g)$$

Fernández claims that the correct computation of WACC lies on a correct valuation of the tax shields. Depending on companies' debt policy, one should choose the appropriate method, being his suggestion more realistic, according to his empirical studies.

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## ANNEX 2

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### **Addendum 1**

In China, the telecommunications market has had double-digit growth rates in recent years and has become very developed. In 2000, it was already the second biggest telecom market in the world but it overtook the United States two years later, with 207 million fixed line subscribers and 190 million mobile subscribers, making China the most important single market for telecom equipment since then. Although it has been the biggest market for a long time, its network infrastructures remained poor, with

penetration rate below 20% in 2002 and less than 50% of the population had access to basic telecom services, i.e. fixed telephone lines.

It is important to distinguish China and the other emerging countries from the developed countries. In the former we see fast development and growth, while in the latter it is more about market share taking through competitive pricing. Penetration rates in developing countries average 40%, while in the developed world it was 80%, by the end of 2012<sup>5</sup>. China, among developing countries, is a particular case as it is rapidly adhering to new technologies, having a mobile phones penetration rate of 83% in 2012, of which around 50% were smartphones. In terms of 3G subscribers, China is still way behind Japan's 99% or USA's 81% penetration rates but in absolute terms it is the biggest market in the world. On the table below, we may see the evolution of the penetration rates in China for telephone lines, mobile phones and broadband.

China telecom penetration rates (% of inhabitants)	2009	2010	2011	2012
Fixed telephone lines	23,7%	22,1%	21,3%	20,7%
Cellular customers	56,5%	64,6%	74,6%	83,0%
Broadband subscribers	7,8%	9,5%	11,2%	13,0%

TABLE 17 - SOURCE: DIGIWORLD YEARBOOK 2013

## Addendum 2

### Networks

This business includes a variety of technologies that are used in the development of mobile broadband and wireless networks. On the table that follows, we have an analysis of the competitive advantages of the "Networks" providers. According to (Infonetics Research, 2013)<sup>6</sup>, seven criteria should be used to determine a score, which can define the positioning of each company in the market.

















	Market Share	Share Momentum	Financial Stability	Solution Breadth	Technology Innovation	Product Reliability	Service and Support
1	 ERICSSON	 HUAWEI	 CISCO	 HUAWEI	 CISCO	 Nokia Siemens Networks	 CISCO
2	 HUAWEI	 CISCO	 ERICSSON	 Nokia Siemens Networks	 Nokia Siemens Networks	 ERICSSON	 Nokia Siemens Networks
3	 Nokia Siemens Networks	 ZTE	 HUAWEI	 ZTE	 HUAWEI	 Nokia Siemens Networks	 ERICSSON

Table 18 - Top-3 Telecom Infrastructure Vendors by Criterion in 2013 (Infonetics)

<sup>5</sup> According to GSMA Intelligence

<sup>6</sup> "Telecommunications Equipment Vendor Leadership Scorecard" - Infonetics Research Report 2013

Rank	Vendor	Score	2012 Revenue	2011 Market Share	Strengths/Weaknesses
1	Huawei	3.74	\$22.7B	16%	Strong in market share and share momentum; Good financial stability; Low product reliability
2	Ericsson	3.67	\$28.6B	20%	Strong in market share and greatest revenues; Good financial stability
3	Cisco	3.56	\$12.3B	9.5%	Very high financial strength; Strong technology innovation
4	Nokia-Siemens	2.94	\$18.2B	9.7%	Good product reliability and technology innovation
5	Alcatel-Lucent	2.80	\$15.7B	12.3%	Strong in solution breadth and product reliability; Weak financial stability and market share momentum
6	ZTE	2.51	\$8.2B	8.4%	Good market share momentum; Broad product portfolio; Weak in product reliability and other services offered; Weak financial stability

TABLE 19 - TELECOM VENDOR SCORECARD 2013 (INFONETICS)

By looking at the tables above, we may notice the differences between telecom equipment companies, each with its strengths and weaknesses - on Table 4 in Annex 2, there is a more detailed table. No company is absolutely better than the others. Some have the financial resources, some the quality products while others have broader solutions. According to Infonetics, Huawei is the best-scoring firm, though lacking the reputation and product reliability. Ericsson is the second-best although it looks stagnant. ZTE shows important strengths but is missing the necessary reliability to strive in this demanding market.

**Huawei** has a strong presence in Africa and it won big contracts in Canada and New Zealand. However, in India they are seen as a security threat and an unfair competitor. Also, in Australia, they were banned from taking part in the broadband system.

**Ericsson** is much more dependent on Europe and the US and it was more impacted by the economic troubles of recent years. Ericsson has recently left the joint venture with Sony on the network equipment sector, the one where it still is the strongest player worldwide. Given the fact that they have no barriers in the US, Ericsson was able to capture a considerable market share there.

### ***Terminals***

This category consists of equipment used to access networks. It is not limited to mobile handsets, as it also includes USB modems, wireless modems and routers, video products, among others.

Worldwide Mobile Phone Market Share				Global Smartphone Market Share		
Company	2011	2012	2013	Company	1Q2013	1Q2014
Samsung	17,7%	22,0%	24,6%	Samsung	32,4%	31,2%
Nokia	23,8%	19,1%	13,9%	Apple	17,5%	15,3%
Apple	5,0%	7,5%	8,3%	Huawei	4,7%	4,7%
ZTE	3,2%	3,9%	3,3%	Lenovo	3,9%	4,7%
LG	4,9%	3,3%	3,8%	Others	41,5%	44,1%
Huawei	2,3%	2,7%	2,9%	Total	100,0%	100,0%
TCL	N/A*	2,1%	2,7%			
Lenovo	N/A*	1,6%	2,5%			
Sony	1,8%	1,8%	2,1%			
Yulong	N/A*	1,1%	1,8%			
Others	33,7	34,9%	34,0%			

TABLE 20& 8 - SOURCE: GARTNER

\*- Smaller than HTC, Blackberry and Motorola

The “Terminals” sector is practically common sense, given the hype around smartphones and the intense coverage that is done to terminals manufacturers. In what regards the major players, the situation is simple to describe. Apple, with its successful series of the iPhone has had skyrocketing sales and has made it to the second largest market share since it entered the market in 2007. Nokia, the Finnish company that once had the largest piece of the mobile telephony market, has been overtaken by Apple and the other Asian smartphone manufacturers, although it still holds a considerable share of the overall

mobile phones sales. In 2013, the emergence of low-cost Chinese manufacturers who have had great acceptance in the Chinese market, has taken market share from the top-sellers.

Huawei became the world's third largest smartphone manufacturer mainly because of the fast-growing Chinese market. Since its foundation, Huawei has always been focused on entering minor markets first. It has done it in China, during the telecommunication infrastructure boom and in Africa, for example. Their pricing was competitive and they undercut Ericsson and Nokia's share in these continents. Only around 2009 did Huawei (and ZTE) start to focus on the mobile phone market, to add to the traditional telecom equipment. ZTE, alongside with Lenovo, has focused more on selling lower quality products in emerging markets.

Companies like Apple seem to struggle to enter the Chinese market. Nonetheless, it is the 7<sup>th</sup> top player in China but it has been growing. Apple's CEO Tim Cook stated that two-thirds of their 3Q2012 earnings in Asia were generated in the Greater China region. This was considered a great progress but the fact that iPhones do not support TD-SCDMA, the main Chinese wireless standard, represents a great drawback to Apple's penetration in China.

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### Addendum 3

They have been two of the biggest patents filers in the world, allowing them to have potentially valuable products. Huawei is believed to have around 45% of more than 140 thousand employees allocated to R&D. Both companies are very innovative, competitive and globally present.

#### TOP 10 PATENT APPLICANTS

RANK	APPLICANT	ORIGIN	2010	2011	2012
1	<b>ZTE</b>	China	1,868	2,826	3,906
2	Panasonic	Japan	2,153	2,463	2,951
3	Sharp	Japan	1,286	1,755	2,001
4	<b>Huawei</b>	China	1,527	1,831	1,801
5	Bosch	Germany	1,302	1,518	1,775
6	Toyota	Japan	1,095	1,417	1,652
7	Qualcomm	United States	1,675	1,494	1,305
8	Siemens	Germany	8,30	1,039	1,272
9	Philips	Netherlands	1,433	1,148	1,230
10	Ericsson	Sweden	1,147	1,116	1,197



As one might see on the table above, both ZTE and Huawei have been filing thousands of patents a year. ZTE, in particular has an impressive growth of patent applications, representing a great asset in terms of intellectual property. From 2011 to 2012, Huawei has had a small decline, which might be a result of lower R&D expenses or lower effectiveness of the investment.

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#### **Addendum 4**

##### ***Bargaining power of suppliers***

In this industry, the market share is very important, as it improves the perception of the brand and it allows the introduction of complementary products and services along with the original product. Hence, suppliers have a considerable bargaining power. To further support this, a mobile phone, for instance, has a large number of components and not many software providers, which, especially in the smartphone market gives high power to software suppliers. However, despite having to negotiate all the components and being this more difficult to coordinate than just one component, there are many component suppliers, and this decreases their bargaining power. As an example, 7.6% of ZTE's purchases are from their number-one supplier and 22.2% are coming from the top-five suppliers.

##### ***Bargaining power of Clients***

Clients have great bargaining power in this sector both in "Networks" and "Terminals". The infrastructure investments are huge and there is a fierce competition for providing the best solutions and win the most projects. Regarding handsets, carriers buy a large number of devices, which adding to the restrictiveness of phone plans, reduces the industry profitability. ZTE sells 15.9% of its production to their top client and the top-five clients represent 37.3% of Sales.

##### ***Threat of substitutes***

In terms of "Networks", the biggest threat is that fixed lines and broadband are replaced by wireless connection but this is also in the scope of business of the equipment manufacturers, therefore not being an important threat, as long as companies reorganise towards wireless communication and are not too dependent on "old" technologies. As far as "Terminals" are concerned, the threat of substitute products is decreasing, as smartphones functionalities boom. Actually, desktops were replaced by laptops which were replaced, to a certain extent, by smartphones. In the meantime, tablet PCs surged and

more portable laptops were invented. However, their development and widespread use was outpaced by smartphones. Mobile handsets have been replacing devices like GPS, MP3-players, cameras and a number of other non-technological good, such as agendas and books.

### ***Barriers to entry***

In this industry, competition is intense and the technological requirements are high. Attaining productive R&D and significant economies of scale is probably the most impeding barrier. However, nowadays, the barriers of entry are not as many as they used to be in past years, probably because the financial crisis and the dynamics of the industry have made the licensing and setup procedures simpler. Nonetheless, entry-level firms are only able to offer low-cost/low-range mobile phones. Competition is fierce in that segment and new companies have to strive to make ends meet. Moreover, the Telecom Equipment sector is becoming more concentrated and market shares do not vary significantly, as we can see on Tables 7 and 8.

### ***Degree of rivalry***

The two Chinese giants, Huawei and ZTE, who accounted barely for 10% of the segment in 2008, represent now 25% and growing. Their massive investment in R&D over the last years and their low-cost structure has put pressure on their western competitors (Cisco, Ericsson, Alcatel-Lucent, etc.), with some of them being able to keep up with it, while others started struggling and showing weakness. Ericsson acquired operations in Europe which will allow them to benefit when Europe starts with LTE networks largely.

In terms of the market for mobile phones, Samsung's growth has been slowing down. In addition, LG and Sony, alongside with Huawei, are serious competition to Apple and Samsung in the smartphone market. The increasing number of features that mobile phones can include brings players from outside the industry into the market (telecom services companies, computer hardware, consumer electronics, etc.), increasing the degree of competition, something that used not to happen in the past.

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### **Addendum 5**

There are some limitations to strategy, there are some governments that suspect of Huawei and ZTE. Actually, the United States considered it a threat to national security because of its alleged connections to the Chinese military, which will prevent Huawei from acquiring companies or win contracts in America. Huawei has tried many times to buy American technology companies but all of them have been overruled by the Committee on Foreign Investment or other official entity. In the US, it is believed that Huawei is heavily

subsidised by the Chinese government and that they do not respect intellectual property. On the other hand, ZTE has been accused of having sold American technology to Iran. Both Huawei and ZTE are “painted with the same brush”. Therefore, they are both heavily affected by news or any turmoil on whichever.

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## Addendum 6

### ***Mobile Subscribers***

The number of unique subscribers has more than tripled from 2003 to 2013. The annualised growth rate has been high (7.7%) and is expected that the number of subscriptions reaches 4,334 million by 2020, despite the annualised growth rate will be much lower (3.5%).

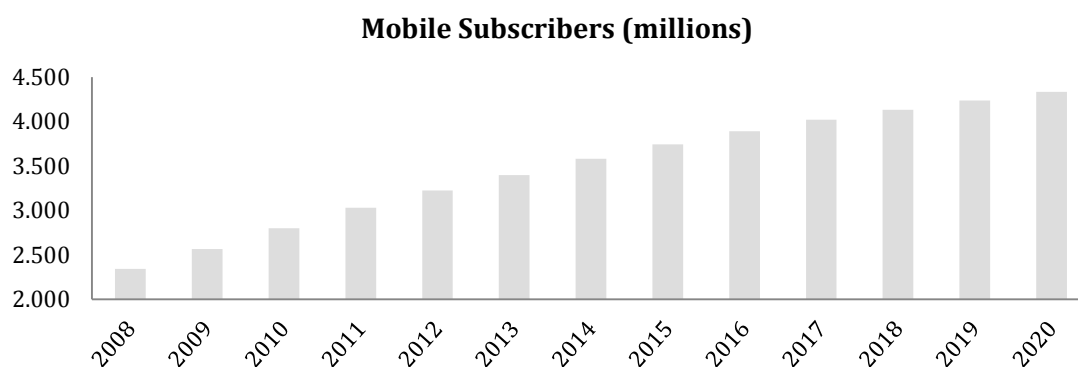


FIGURE 15 - SOURCE: GSMA INTELLIGENCE

### ***Regulatory environment***

The world is becoming undoubtedly more interconnected and an increasing number of countries are developing into more advanced broadband networks, at an increasing pace. There is a clear difference between the times of fixed broadband services and the mobile broadband, in terms of pace of growth, which Cisco estimates to be three times faster. That constitutes a challenge for governments not only in monitoring matters but also to sustain this growth, forcing them to adapt the framework and regulatory models. It is important to understand that this industry is transnational and that cross-border cooperation is essential to ensure that clients have access to affordable and safe networks. The increased use of data has raised the problem of securing privacy and data protection. Also, social networks and mobile apps have increased concerns over privacy. The regulatory environment must deal with these issues, while incentivising investment. For example, forcing companies to decrease prices and to use public networks might change their willingness to invest in higher quality service and faster connectivity.

### ***GDP growth***

Naturally a key driver, the economic growth contributes to consumption and investment, which drive more growth, simplistically speaking. The economic situation in the developed countries has been better, as we see some stagnation. China has slowed down as well as the majority of the other emerging economies. This has driven investment down, more precisely carriers' CAPEX, which harmed Telecom Equipment companies' revenues. The way the world economy goes in a near future will certainly have an impact on the confidence to invest in the development of Telecommunication.

### ***Enterprise and federal IT spending on infrastructure***

Private and public investment is also a very important factor to this industry. The Chinese government, for example, has had a crucial role in the Telecom market development over the last 20 years, through the attribution of subsidies to companies and incentives to banks to finance the industry.

### ***Technological Convergence***

With innovative inventions, Telecom companies have been able to enhance and broaden the capabilities of their products, which are gradually fulfilling more of the customers' needs. In addition, switching to broadband-enabled multiple screens, such as smartphones, laptops and tablets has made the population increase the amount of information they share with companies, which are looking at data from an informational perspective, i.e. how they can create value by using the personal data that they collect. Following this, new concepts and ways of storing and processing information have emerged (Cloud Computing and Big Data). The way this influences Telecom Equipment is simple: there will be a huge demand for the fastest communication products, able to process large amounts of data efficiently and with a reasonable price. The impact of this on equipment manufacturers will depend on their R&D quality and capacity and on their strategy, which determines whether they survive or not in this fast-paced market for innovation.

### ***Carriers CAPEX***

According to a (Price Waterhouse Coopers, 2014)'s report, 64% of telecom operators say their CAPEX is driven not by business objectives but by technology. This creates a vicious cycle between operators and equipment manufacturers, given their activity depends on operators' CAPEX, which affects their investment in R&D. After the slowdown in investment in the recent years, operators are expected to invest strongly in the

development of communication, namely 3G, 3G+ and 4G (LTE). This driver has a direct influence on equipment companies' revenues.

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### ANNEX 3

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#### **Addendum 1**

**Huawei** aims to broaden the services offered to customers: provide a more complete service, extend the services from end to end, both in terms of hardware and software. Dedicate more resources to the consumer business and enterprise business, as both have seen greater growth than the carrier networks segment. Also, they created a system that did not require products to be updated as a whole but part by part, which provides cheaper and customised updates to clients. This was a big boost to its success in Europe. In addition, the company seeks to be more open to other companies and work in cooperation, more specifically in consulting, HR, financial management and R&D. All in all, Huawei aims to be the best equipment manufacturer with the most reasonable price.

Huawei's strategy has had to be realigned given certain blockages to their expansion, such as:

- 2008: Forced withdrawal of a bid for 3Com, a US Tech company, after not being approved in Washington;
- 2010: Multi-billion dollar contract with Sprint to supply network infrastructure lost after government intervention;
- 2011: Forced withdrawal of \$2 million IP bid to buy patents from a US company;

**ZTE** recognises the changes in consumers' needs: faster, smarter and more versatile communication technology. The company intends to be on the edge of the IT convergence, through their advanced R&D department. Regardless of the client type (carriers, enterprises or consumers), ZTE wants to be closer to clients and help to achieve higher efficiency and cost savings. For example, the company developed a proprietary big data engine, which they are implementing in their carrier clients business models. For enterprises, they provide a broader range of solutions, such as software to integrate all the needs of workers (transport, leisure, healthcare, etc.) so that enterprises can increase productivity. In terms of handsets, ZTE is focused on what they believe to be after touchscreen mobile phones - speech-based interfaces. The final goal is to provide powerful, secure and state-of-the-art solutions, which means going up the value chain to achieve higher profitability.

ZTE has successfully managed to internationalise and reduce their dependence on China until 2008 but, after that, revenues from China soared and since then the company derives around half of their revenues from their home country. Hence, this is still a concern of management and changing their source of revenues is in their medium-term objectives.

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### **Addendum 2**

In the 90s, international players were present in China but more concerned about selling to large companies in urban areas, thus neglecting rural areas where margins were thin. Huawei's Founder & CEO, Zhengfei, saw an opportunity there. Huawei faced many challenges throughout the implementation of the strategy but had the support of local government institutions that also saw a business opportunity. The same reasoning was applied to developed countries versus developing ones, as the latter needed affordable technology. Huawei partnered up with these countries and by 2004 their revenues from overseas were already greater than the ones generated in China. It is important to note, though, that Huawei does not offer low-cost products in emerging markets but rather advanced telecom technologies, which foster their innovation, diversify the source of revenues and enable the company to experiment different business models across the world.

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### **Addendum 3**

The expansion and internationalisation of Huawei have had their roots in their internal business model. Huawei's products, along with the majority of Chinese firms, were always perceived as low-quality. This has forced Huawei to set prices considerably lower than competition, which, along with the focus on developing countries, allowed Huawei to enter Russia, Thailand, Brazil and South Africa with aggressive pricing between 1997 and 2001. Soon after that, the company was making major sales in Europe and has become more present in the continent in recent years. In the UK, for example, they currently supply last-generation equipment to EE and BT. Huawei has now become a more respected and trusted company. The contracts they win are theirs not because of cheap prices and imitations but rather because of Huawei's top-notch technology, made possible by their huge investment in R&D and the fact that about half of their staff is dedicated to this department. The ultimate goal here might well be to be perceived as a European company.

In terms of activities, Carrier Networks is clearly Huawei's core business, with 70% of the share. It includes Wireless Networks, Fixed Networks, Carrier Software and Network Energy (efficient solutions to reduce emissions and preserve more energy). The second source of revenues is the Consumer Business and it is mainly composed of mobile

handsets and software. The Enterprise Business accounts only for 6% of the revenues in 2013 but it has been growing. In this segment, Huawei offers solutions to companies and governments, such as storage, security, cloud computing and servers.

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#### **Addendum 4**

Operators have been reluctant to invest in equipment on that they might be waiting for a certain number of people to buy 4G-capable devices before investing fully in the development of the network. Even so, 3G developments and large scale 4G deployments are expected in 2014/2015. Governments' policies regarding telecommunication are towards the development of networks and, on one side there are the emerging markets, which need very basic equipment and on the other are the developed markets that need maintenance and further improvement to keep up with increased data traffic and demand for more and more speed, stability and coverage. In terms of terminals, its growth will accompany the penetration of mobile communications and the expansion of applications. Important partnerships with major global carriers were created in order to ensure more operation, worldwide.

ZTE has been signalling a focus on its core business by selling many of its non-core assets, like their participation on Shenzhen ZNV Technology Co., related to the monitoring of the environment. After this and other disposals, the company has now more funds to invest. Also, the penetration it has had in telecom operators overseas, the existing opportunities in 3G/4G in the domestic market, where they have a great market share and most revenues come from, and their robust revenue growth from low/mid ranged smartphones constitutes very good opportunities for ZTE to become one of the world's leading smartphone makers. However, most of the opportunities are common to the majority of the players. It all comes down to whoever does the better devices or develops the best-quality, fastest, most reliable and reasonably priced technology.

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#### **Addendum 5**

##### **Indebtness**

	2007	2008	2009	2010	2011	2012	2013
<b>% Short-term Loans</b>	<b>29,8%</b>	<b>48,1%</b>	<b>32,5%</b>	<b>17,2%</b>	<b>25,8%</b>	<b>18,4%</b>	<b>11,7%</b>
<b>% Long-term Loans</b>	70,2%	51,9%	67,5%	82,8%	74,2%	81,6%	88,3%

TABLE 22 - SOURCE: HUAWEI'S ANNUAL REPORT 2013

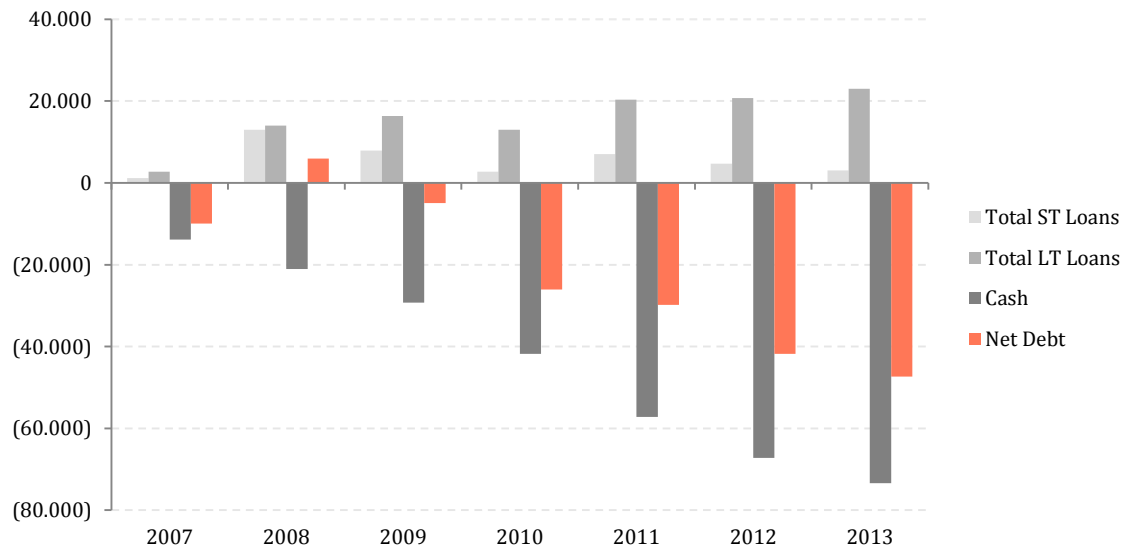


FIGURE 8 - SOURCE: HUAWEI'S ANNUAL REPORT 2013

In the beginning, Huawei had difficulty in raising equity capital and was forced to get loans at high cost (20 to 30 per cent). By 1995, though, the company was noticed by the government which started to support Chinese telecommunications firms, in order to make China independent in terms of information management. From then on, Huawei won many major contracts in different areas of infrastructure development. According to internal statements, the governmental support was of vital importance to Huawei's success.

Looking at Figure 8, we can see that Huawei has been able to generate large sums of cash without the need of debt. Its Net Debt is negative, which is equivalent to say that Net Cash is positive.

	2007	2008	2009	2010	2011	2012	2013
<b>% Short-term Loans</b>	45,0%	44,0%	36,6%	37,0%	38,8%	54,7%	47,2%
<b>% Long-term Loans</b>	55,0%	56,0%	63,4%	63,0%	61,2%	45,3%	52,8%

TABLE 23 - SOURCE: ZTE ANNUAL REPORT 2013



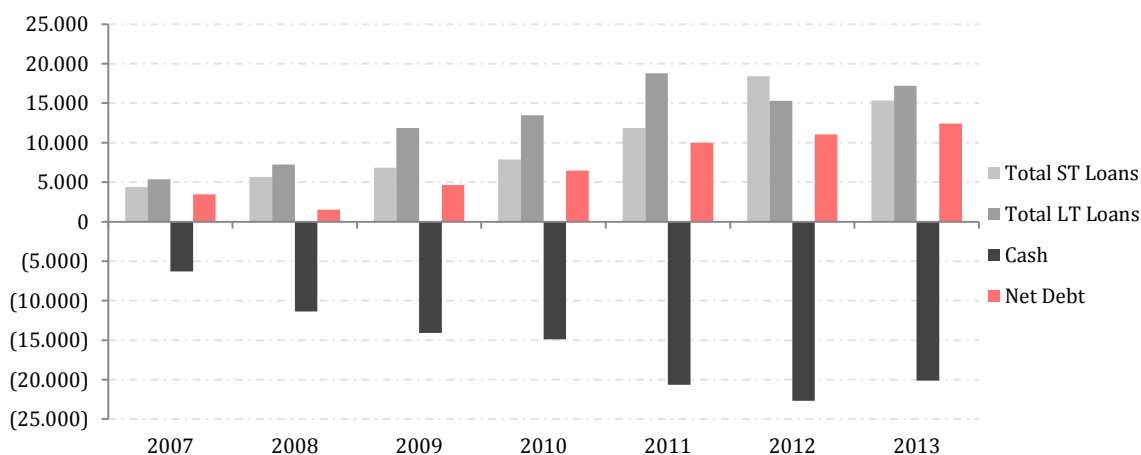


FIGURE 16 - SOURCE: ZTE ANNUAL REPORT 2013

According to ZTE's financials, debt has been used mostly for working capital. Among the long-term debt, there were loans in Chinese Renminbi and in US Dollars. The first are fixed-rate loans while the latter are floating rate, in order to control for an appreciation of the RMB. In 2013, the net debt increased despite the decrease of working capital needs, which made the company decrease their cash, to some extent due to an abnormal adverse exchange rate fluctuation but also for facing costs in a year of poorer revenues. Other than that, there has been a stable balance between long-term and short-term debt and Net Debt has been increasing. Along with lower earnings, this has put pressure on the company's ability to meet its debt obligations, as we can see in the next table.

### Investment

Huawei Capital Expenditure	2009	2010	2011	2012	2013
<b>Net CAPEX</b>	<b>3.481</b>	<b>1.760</b>	<b>5.839</b>	<b>7.409</b>	<b>6.470</b>
<i>Net Capex as % of Revenue</i>	<i>2,3%</i>	<i>1,0%</i>	<i>2,9%</i>	<i>3,4%</i>	<i>2,7%</i>
<i>Growth Rate</i>		<i>(49,4%)</i>	<i>231,8%</i>	<i>26,9%</i>	<i>(12,7%)</i>

TABLE 24 - SOURCE: HUAWEI'S ANNUAL REPORT 2013

Throughout the years, Huawei has been expanding its facilities, building R&D centres and campuses. Until 2000, they stayed in their Shenzhen headquarters and have now facilities in more than 12 cities in China, astonishing projects still in expansion. In addition, there are 16 R&D centres spread worldwide (China, France, Germany, India, Italy, Sweden, United States and Russia). In terms of services and support, they have developed a Big Data centre in Dublin, as well as a Service Operation Centre in Jakarta and a Risk Control Centre in London. All the investment had a common purpose: to provide more and better solutions, work more efficiently and to achieve significant breakthroughs in every field.

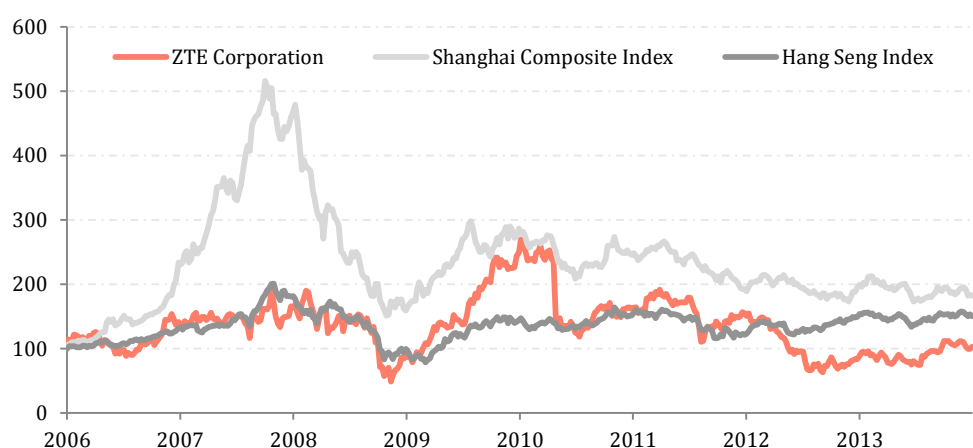
<b>ZTE Capital Expenditure</b>	2007	2008	2009	2010	2011	2012	2013
<b>CAPEX (accounts) w/o R&amp;D</b>	<b>1.805</b>	<b>1.935</b>	<b>2.488</b>	<b>3.810</b>	<b>3.843</b>	<b>2.766</b>	<b>2.687</b>
<i>Net Capex as % of Revenue</i>	5,2%	4,4%	4,1%	5,5%	4,5%	3,3%	3,6%
<i>Growth Rate</i>		7,2%	28,6%	53,2%	0,9%	(28,0%)	(2,8%)

TABLE 25 - SOURCE: ZTE ANNUAL REPORT 2013

Research & Development expenses can be seen as an investment by companies operating in Technology, Industrials, Pharmaceuticals and Healthcare. Hence, the share of ZTE's revenues invested in R&D is very significant. In this field, ZTE has been trying to improve its competitiveness by implementing a set of changes: improvements across several platforms to improve support, control and service (a mega-data platform has been created; the operating systems platforms have been expanded). Also, the company has shifted its focus in order to give a higher priority to government and enterprise networks, which have been elevated to 2<sup>nd</sup>-tier business units.

However, Capital Expenditures (CAPEX) are necessary to create the conditions for ZTE to pursue their goals. Having said that, ZTE has been developing the Deep Blue Laboratory, an R&D centre for emerging technologies. Moreover, they have been establishing joint innovation centres with carriers, such as the Xi'an R&D Centre and the Nanjing R&D Centre. Apart from this, CAPEX also includes equipment installation projects and machinery and equipment purchases or upgrades.

## Addendum 6



Statistic	Historical Value (2013)
<b>Average Price</b>	14.4
<b>Price-Earnings Ratio (PER)</b>	34.0
<b>Shiller PER</b>	37.7
<b>Price-to-Book Value</b>	1.8

<b>Dividend Yield (avg. past 7Y)</b>	0.6%
<b>Payout Ratio (avg. past 7Y)</b>	19.6%

ZTE is a company with a broad solution base and, at this moment, with market share momentum. Their big engineering, manufacturing and R&D infrastructure enables them to be quickly expanding to very developed mobile handsets. On the other hand, its financial position is weak, the product reliability is perceived as low and being publicly traded makes it more difficult to raise money without issuing new shares. In the last years, ZTE's strategy of penetration through aggressive pricing has caused profitability problems that now endanger the company's financial soundness. The market's response has reflected the company's situation, as the share price has been dropping back to its 2006 level.

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## ANNEX 4

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### **Addendum 1**

In this section, making use of the methods discussed in the first chapter, the views for the industry and the market and the characteristics of each company, we will now forecast the companies' performance and come up with a value of each company as of the beginning of 2014. Several assumptions are made which will be described along the process. The forecasts were made up to 7 years, the period for which there is a considerable number of studies, being long enough to elaborate on the direction of both companies in a near future.

### ***The Target - ZTE***

The Telecom Equipment industry is in transition from a growth phase to a mature phase. The pace of innovation has been high, with many recent breakthroughs (4G, 3D printing, Cloud storage, Big Data Analytics, Autonomous vehicles, etc.) and there is still more than half of the world population to be provided even with the most basic telecommunication devices. Consequently, we believe that the industry will be growing strongly until 2020. Only after that date, will it be more mature and will grow at a slower pace.

### **Revenues**

According to (Damodaran, 2006), revenue growth might be better to use in forecasts than earnings growth, as it is not affected by accounting policies, being more persistent and predictable. Hence, the forecast was made according to the expectations for each category: "Networks", "Terminals", "Telecom software systems, services and other". Several reports were consulted and the outcome was the following:

<b>Revenue by Activity (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Total Revenues</b>	<b>75.233</b>	<b>78.647</b>	<b>82.222</b>	<b>85.966</b>	<b>89.887</b>	<b>93.994</b>	<b>98.297</b>	<b>102.805</b>
<i>Growth Rate</i>	<i>-10,6%</i>	<i>4,5%</i>	<i>4,5%</i>	<i>4,6%</i>	<i>4,6%</i>	<i>4,6%</i>	<i>4,6%</i>	<i>4,6%</i>
<b>Networks</b>	<b>40.696</b>	<b>42.250</b>	<b>43.864</b>	<b>45.539</b>	<b>47.278</b>	<b>49.084</b>	<b>50.958</b>	<b>52.904</b>
<i>Growth Rate</i>	<i>-2,2%</i>	<i>3,8%</i>	<i>3,8%</i>	<i>3,8%</i>	<i>3,8%</i>	<i>3,8%</i>	<i>3,8%</i>	<i>3,8%</i>
<b>Terminals</b>	<b>21.702</b>	<b>22.753</b>	<b>23.854</b>	<b>25.008</b>	<b>26.219</b>	<b>27.488</b>	<b>28.819</b>	<b>30.214</b>
<i>Growth Rate</i>	<i>-24,7%</i>	<i>4,8%</i>	<i>4,8%</i>	<i>4,8%</i>	<i>4,8%</i>	<i>4,8%</i>	<i>4,8%</i>	<i>4,8%</i>
<b>Telecom software systems, services and other</b>	<b>12.836</b>	<b>13.645</b>	<b>14.504</b>	<b>15.418</b>	<b>16.389</b>	<b>17.422</b>	<b>18.519</b>	<b>19.686</b>
<i>Growth Rate</i>	<i>-6,3%</i>	<i>6,3%</i>	<i>6,3%</i>	<i>6,3%</i>	<i>6,3%</i>	<i>6,3%</i>	<i>6,3%</i>	<i>6,3%</i>

This forecast was elaborated according to industry reports from (GSMA, 2014)<sup>7</sup> and **Analysys Mason**<sup>8</sup>, which used revenue drivers for the Telecom Equipment sector, such as GDP growth, penetration rate, the CAPEX of Telecom Operators considered a good predictor of Telecom Equipment sales. The main reasons for the turnaround in Revenues for FY2014 are the fact that ZTE won a 60% share of China Mobile's 100G project and the creation of partnerships with operators around the world to launch award-winning technology, such as VoLTE network. Despite thinking ZTE is a better-than-average company, these forecasts can be considered conservative.

Given the considerable investment in R&D of recent years and the networks developments still to be made in the developing countries (3G improvements and 4G deployment), ZTE's core activity "Networks" should be providing the greatest slice of revenues. However, the other two segments should gain some importance, as we see the company starting to compete with top smartphones manufacturers, launching state-of-the-art handsets as there is an increasing demand for more advanced smartphones. In addition, the increasing use of services and new concepts like Cloud Computing, the Internet of Things and the Smart City has caught ZTE's attention for being an emerging and profitable business.

### Cost of Sales

<b>Cost of Sales (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Total COGS</b>	<b>(54.775)</b>	<b>(56.229)</b>	<b>(57.849)</b>	<b>(59.501)</b>	<b>(61.182)</b>	<b>(62.892)</b>	<b>(64.629)</b>	<b>(66.393)</b>

<sup>7</sup> "GSMA Intelligence Mobile Economy 2014". GSMA is a global association of telecom operators which collects data and conducts analysis and industry reports to support decision-making and planning.

<sup>8</sup> "Analysys Mason: Telecoms Software Forecast 2013". Analysys Mason is an advisory company for telecom, media and technology, which produces specialised intelligence.

<i>Growth Rate</i>	-16,4%	2,7%	2,9%	2,9%	2,8%	2,8%	2,8%	2,7%
<i>% Sales</i>	72,8%	71,5%	70,4%	69,2%	68,1%	66,9%	65,7%	64,6%

In the FY2013, Revenues fell 10.6% and ZTE was able to cut the Cost of Sales in 16.4% and they have been reporting gains in efficiency. In order to forecast COGS, profit margin forecast was made, using historical information - the arithmetic mean of the last seven years for FY2014. From then on, profit margins were increased according to forecasts and tendencies for each of the three categories of products. The outcome seems reasonable, with ZTE showing a rebound back to past levels. After last year's reduction, I would expect some rigidity in reducing costs for FY2014 and FY 2015 but, after that, further gains of efficiency, greater scale, etc. will probably lower the average cost and increase margins.

<b>Gross Margin (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Gross Margin</b>	<b>20.458</b>	<b>22.419</b>	<b>24.373</b>	<b>26.465</b>	<b>28.705</b>	<b>31.102</b>	<b>33.667</b>	<b>36.412</b>
<i>Growth Rate</i>	10,1%	9,6%	8,7%	8,6%	8,5%	8,4%	8,2%	8,2%
<i>Profit Margin</i>								
<i>Networks</i>	34,6%	34,5%	35,5%	36,5%	37,5%	38,5%	39,5%	40,5%
<i>Terminals</i>	14,6%	19,3%	20,3%	21,3%	22,3%	23,3%	24,3%	25,3%
<i>Telecom software systems, services and other</i>	24,9%	25,3%	27,3%	29,3%	31,3%	33,3%	35,3%	37,3%

As one may see in the table above, there is currently a discrepancy between the margins ZTE has on each business line. In the future, I believe there will be a convergence of the margins, as products and services integrate. Also, as a result of the shift on the quality of products offered and the technological breakthroughs of recent years, the margins should go up, mainly on "Terminals" (higher-end handsets, with state-of-the-art features) and "Telecom software systems, services and other" (emerging business currently under development and exploration but with high potential for profit).

### Other Income and Gains

<b>Other Gains or Expenses (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Other income and gains</b>	<b>4.549</b>	<b>2.347</b>	<b>2.430</b>	<b>2.516</b>	<b>2.607</b>	<b>2.702</b>	<b>2.802</b>	<b>2.906</b>
VAT Refunds	2.315	1.821	1.904	1.991	2.081	2.177	2.276	2.381
<i>as % of Revenue</i>	3,1%	2,3%	2,3%	2,3%	2,3%	2,3%	2,3%	2,3%
Dividend Income	22	22	22	22	22	22	22	22
Government Grants	1.151	503	503	503	503	503	503	503

Disposal of investments	1.062	0	0	0	0	0	0	0
<b>Other Expenses</b>	<b>(2.119)</b>	<b>(1.448)</b>	<b>(1.514)</b>	<b>(1.583)</b>	<b>(1.655)</b>	<b>(1.731)</b>	<b>(1.810)</b>	<b>(1.893)</b>
<i>as % of Revenue</i>	2,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%

Mainly composed by VAT rebates or tax subsidies, these are assumed to be the historical average proportion of sales and stay in that percentage for the future. Government Grants are assumed to be constant and equal to the historical average amount. Dividend Income is expected to stay constant and the company is not expected to sell any position in other companies. Other expenses are assumed to be proportional to revenues according to the historical average.

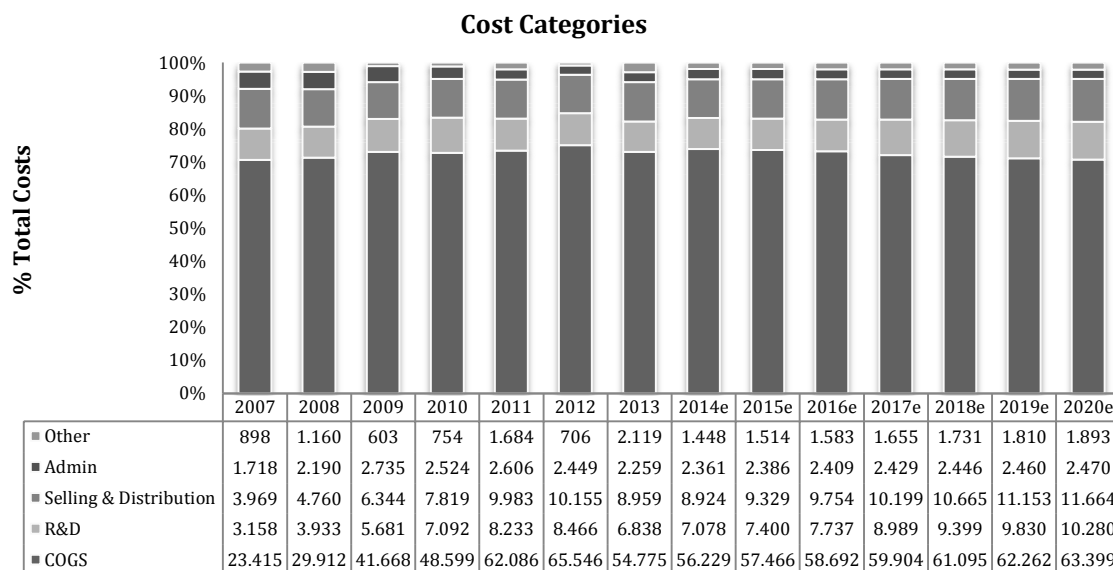
## Research & Development

<b>R&amp;D Costs (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Total R&amp;D Costs</b>	<b>(6.838)</b>	<b>(7.078)</b>	<b>(7.400)</b>	<b>(7.737)</b>	<b>(8.989)</b>	<b>(9.399)</b>	<b>(9.830)</b>	<b>(10.280)</b>
<i>Growth Rate</i>	-19,2%	3,5%	4,5%	4,6%	16,2%	4,6%	4,6%	4,6%
<i>% Sales</i>	9,1%	9,0%	9,0%	9,0%	10,0%	10,0%	10,0%	10,0%

Investment in innovation will continue to be the propeller of ZTE's success. In their financial reports, it is clear that R&D expenses should be around 10% of Sales. However, the company has invested considerable amounts of money in recent years, without it having translated into significant increase in revenues. In my opinion, ZTE should be decreasing the amount of R&D until FY2016 and take profit from the previous investments. After this period, it should be go back to the 10% of Sales level in the predicted future.

## Operating Costs Evolution

Selling and Distribution expenses were taken as a percentage of Sales, which has happened almost invariably. Indeed, there is a relation between what is sold and how much is spent on those sales, being it marketing, transportation or warehousing, among others. In what concerns Administrative Expenses, they were also considered as a percentage of Revenues which was used to predict the future. Other Expenses were simply assumed to be the average percentage of sales from 2007 to 2013.



In sum, we will see R&D expenses gaining ground given a pick up on investment and COGS to decrease in proportion of Revenues assuming gains in efficiency. Apart from these, ZTE's cost structure should not change significantly in the future.

### Finance Costs

<b>Financing Costs (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Interest Expense</b>	<b>(1.650)</b>	<b>(2.307)</b>	<b>(1.304)</b>	<b>(1.489)</b>	<b>(935)</b>	<b>(1.051)</b>	<b>(1.030)</b>	<b>(1.003)</b>
Interest Coverage	1,87	1,39	2,98	3,16	5,15	5,71	7,20	8,93

It was decided that the target debt-to-equity ratio should be the industry average one and that the forecasted capital structure should tend to it. Hence, the level of debt will be proportional to the market value of equity, which was forecasted by multiplying the book value of equity by the industry's market-to-book ratio. Having said that, the interest expense would be the forecasted level of debt multiplied by the cost of debt  $Kd$  before tax.

### Income Tax

The tax rate used was the marginal tax rate on company tax for China-based companies, 25%. The reason for this choice was that the effective tax rate varies year-on-year and depends on the subsidiary companies of the group and on particular situations. This can be considerably distorting, therefore the use of the marginal tax rate is a safer practice.

### Capital Management Policy

<b>Working Capital (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
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<b>Accounts Receivable</b>	<b>43.048</b>	45.002	46.883	48.845	50.893	53.031	55.262	57.591
%Sales	57,2%	57,2%	57,0%	56,8%	56,6%	56,4%	56,2%	56,0%
<b>Accounts Payable</b>	<b>28.673</b>	29.434	30.861	32.337	33.862	35.438	37.063	38.738
%COGS	52,3%	52,3%	53,3%	54,3%	55,3%	56,3%	57,3%	58,3%
<b>Inventories</b>	<b>12.434</b>	12.764	13.132	13.507	13.889	14.277	14.671	15.072
%COGS	22,7%	22,7%	22,7%	22,7%	22,7%	22,7%	22,7%	22,7%
<b>Net Working Capital (NWC)</b>	<b>26.809</b>	28.332	29.154	30.015	30.920	31.870	32.870	33.924
<b>ΔNWC</b>	<b>(987)</b>	1.523	822	862	904	950	1.000	1.054

Trade Credit (days)	2007	2008	2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
DSO	201	185	204	217	213	214	209	209	208	207	207	206	205	204
DPO	209	229	211	212	210	184	191	191	195	198	202	206	209	213
DI	116	110	82	91	88	64	83	83	83	83	83	83	83	83
OC	317	295	286	308	301	278	292	292	291	290	290	289	288	287
CCC	108	66	75	96	91	94	101	101	96	92	88	83	79	74

The forecast of the Working Capital was made assuming the historical average proportions of the accounts to which it is related. Accounts Receivable and Inventories are not much different from the industry average, unlike Accounts Payable, which might indicate that ZTE has better-than-average relationships with suppliers and it is expected that they keep those relationships in the future. In addition, inventories should remain the same (in proportion to COGS) as it may not be easy to improve inventory management significantly and the level is close to the industry average.

As a consequence of the improved relationships upstream and downstream and of the financial soundness recovery, the Cash Conversion Cycle (CCC), which represents the number of days inputs take to transform themselves into a cash flow, will improve overtime and get back to its 2009 level. The shorter the cycle, the less capital has to be tied to the production process.

### Capital Structure

Capital Structure (%)	2007	2008	2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Debt-to-Equity Ratio	31,3	38,6	42,8	28,5	29,3	49,9	68,3	50,0	45,0	40,0	35,0	35,0	35,0	35,0

Despite what (Fernández, 2002) defends, that the debt-to-equity ratio at book value (D/Ebv) is the one at which both rating agencies and managers look for its presumed higher stability and easiness of control, it does not seem to be a good representation of



reality. (Damodaran, 2006) argues that if the market capitalisation of a company decreases, say, 20%, it should mean that the debt weighs more on the value of the company. If the expectations of equity investors are worse, should the expectations of bond investors stay the same? Market values might vary more than book values but, if annual averages are used, it should be possible to identify trends. Regarding ZTE, it was decided that a target D/Emv should be used and that it should be the industry's capital structure. As ZTE's market cap has dropped in recent years, the D/Emv jumped. Short-term debt repayments for 2014 are around RMB 15 billion and that will allow the company to improve its capital structure. If we compare  $D/Emv_{(t-1)}$  with  $Kd_{(t)}$ , the average interest rate paid by ZTE was for a capital structure close to the target. Also, the interest coverage ratio was the third-highest since 2007 and the Earning Power (EBIT/Assets) was the highest. Hence, it seems like it is a reasonable target D/Emv.

### Capital Expenditure (CAPEX)

Capital Expenditure (RMB mil)	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<i>Net CAPEX/Sales</i>	3,6%	4,4%	4,0%	3,0%	2,0%	1,0%	1,0%	0,0%
<b>Net CAPEX</b>	<b>2.687</b>	<b>3.422</b>	<b>3.289</b>	<b>2.579</b>	<b>1.798</b>	<b>940</b>	<b>983</b>	<b>0</b>
<i>Depreciation/Fixed Assets</i>	14,7%	12,8%	12,8%	12,8%	12,8%	12,8%	12,8%	12,8%
<b>Depreciation</b>	<b>1.745</b>	<b>1.760</b>	<b>2.199</b>	<b>2.622</b>	<b>2.953</b>	<b>3.184</b>	<b>3.304</b>	<b>3.431</b>

ZTE has been investing big sums of money in Research and Development centres and in equipment and machinery. The evolution of Capital Expenditure in the future was predicted using historical information and is tending to the value of the Depreciation in FY2020, i.e. the expansion CAPEX (net of depreciation) should be zero. Depreciation & Amortisation were forecasted according to an estimation of the depreciation rate, which was the average of the yearly relation between Depreciation and Fixed Assets. ZTE has different policies for land, building, machinery, electronic equipment, motor vehicles, intangible assets, etc. and using the average depreciation rate of 12,8% seems to be a good approximation of the future depreciation.

### Acquisitions

It is assumed that ZTE has no planned acquisitions, which would distort the analysis for constituting sporadic events.

### Discount Rate

The discount rate for valuing future cash flows as of today is the most important computation in any DCF valuation. It reflects the risk of cash flows being generated by the company. The way the discount rate is computed depends on the valuation method we are using: for the WACC, formula (14) should be used and it is composed of the levered cost of equity and the after-tax cost of debt weighted by the capital structure; for the APV, we use the unlevered cost of equity to value free cash flows and the cost of debt to value tax shields. On the following tables, we may see what inputs were used to generate which rates.

<b>Cost of Equity</b>		<b>Cost of Debt</b>	
7Y US T-Bonds	<b>2,35%</b>	Default Spread BB+	<b>2,75%</b>
US LT Inflation	<b>2,04%</b>	CDS Default Spread China	<b>0,60%</b>
China LT Inflation	<b>2,54%</b>	Tax Rate	<b>25%</b>
Rf Local Currency	<b>2,85%</b>	After-tax Kd	<b>4,28%</b>
Market Risk Premium (MRP)	<b>4,96%</b>	Average interest rate paid after tax	<b>3,57%</b>
Composite Country Risk Premium	<b>1,73%</b>	Perpetual Growth Rate	<b>2,80%</b>
Adjusted Beta Unlevered (Bloomberg)	<b>1,03</b>	<b>Bankruptcy</b>	
Levered Beta (Miles&Ezzell)	<b>1,38</b>	Credit Rating Fitch	<b>B+</b>
Unlevered Cost of Equity (Ku)	<b>9,75%</b>	Probability of Default	<b>15,24%</b>
Levered Cost of Equity (Ke)	<b>12,07%</b>	Cost of Bankruptcy	<b>30%</b>

With regards to the Cost of Equity, for the risk-free rate, the 7-year United States Government Bond rate was used and then converted to local currency by taking into account the inflation differential between the United States and China. This adjustment was necessary for currency consistency purposes - it would not be equivalent to use Chinese Government Bonds once these are issued by a different entity, therefore carrying a different default risk. The market risk premium (MRP) used was the one computed by Damodaran for 2014, which is equal to the geometric average return of US Equities over T-Bonds between 1928 and 2013. As China is an emerging market and ZTE is exposed to other markets, the MRP was added by the Country Risk Premium (CRP) taking into account a rating-based CDS default spread over AAA-rated sovereign bonds. Since ZTE's revenues are not exclusively coming from China (represents only 47%), a composite CRP was computed, taking into account the revenue breakdown by region - this should reflect the exposure to each region with more precision, as it does not assume a 100% exposure to China. The Beta to use in equation (10) was taken from Bloomberg (regression of the company's returns on the Shenzhen Stock Exchange Index) and the adjusted version was considered, as it is more forward looking than the raw Beta as it assumes a tendency to the

market beta of 1. To lever the Beta and to account for the financial structure, Miles & Ezzell's approach was applied once we are assuming a fixed Debt-to-Equity ratio, which is the industry average. The same beta was used for all the operations because I consider them to be similar, i.e. being affected by the same factors in a highly correlated manner. Making use of the above parameters, we can plug them into the CAPM formula to get both the Unlevered Cost of Equity ( $K_u$ ) and the Levered Cost of Equity ( $K_e$ ).

For the Cost of Debt ( $K_d$ ), a default spread was added to the risk-free rate. This default spread is not according to ZTE's current B+ credit rating by Fitch but according to a synthetic rating not accounting for the two last years, achieving a cost of debt slightly higher than the average interest rate paid over the last 7 years. It was considered that 2012 and 2013 were atypical years and the reasons are the following: Telecom Equipment companies have been held up by Carriers' inaction in what regards capital expenditures. This has driven revenues down, costs up and the investment through debt has been considerable. ZTE's capital structure changed significantly but there is a big portion of debt to be repaid in 2014 and I believe ZTE has conditions to shift its debt-to-equity ratio back to "healthy" levels, once we see a pickup in carrier's CAPEX. Given the currently higher default risk, debt financing is undoubtedly more expensive but I consider this an abnormal situation. In addition, this makes equity financing more attractive and the market-to-book ratio is still higher than 2. This is why the current credit rating was not fully considered to compute the cost of debt.

The principle above was not used for the Cost of Bankruptcy. The Cost of Debt is considered in valuing future cash flows, thus being important to consider an average, optimal or target possible situation. Quite differently, if a company has excessive debt today, the possibility of default increases so it can be seen as a static "picture" of the company.

In what regards the Perpetual Growth Rate, the OECD's forecast for the World's GDP growth rate until 2020 was used, as ZTE and Huawei are becoming more international and globally present.

After forecasting all the variables necessary to a DCF valuation, we can now compute the free cash flows for the next 7 years.

<b>Free-Cash Flow to the Firm</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>EBIT</b>	<b>3.088</b>	<b>3.195</b>	<b>3.892</b>	<b>4.705</b>	<b>4.818</b>	<b>6.004</b>	<b>7.421</b>	<b>8.963</b>

- EBIT x T	(772)	(799)	(973)	(1.176)	(1.204)	(1.501)	(1.855)	(2.241)
+ Depreciation	1.745	1.760	2.199	2.622	2.953	3.184	3.304	3.431
- $\Delta$ Other non-cash items	1.578	0	0	0	0	0	0	0
- CAPEX	(2.687)	(3.422)	(3.289)	(2.579)	(1.798)	(940)	(983)	0
- $\Delta$ NWK	987	(1.523)	(822)	(862)	(904)	(950)	(1.000)	(1.054)
<b>FCFF</b>	<b>3.938</b>	<b>(788)</b>	<b>1.007</b>	<b>2.710</b>	<b>3.864</b>	<b>5.796</b>	<b>6.887</b>	<b>9.099</b>

ZTE is expected to have negative Free Cash Flow to the Firm for 2014 as the pickup in revenues is still in the beginning and the cost controls have some lags on the implementation side. As revenues increase, capital expenditure stabilises and trade credit conditions improve to past levels, the FCFF will gradually improve and drive ZTE towards their full potential.

### WACC Valuation

The Weighted-Average Cost of Capital was computed using the widely known formula (14) and the forecast assumes a target debt-to-equity ratio to which the company tends. Despite gradually adjusting, the impact on WACC is not significant so only one discount rate was computed, using the target capital structure. This yielded a Cost of Capital equal to 10.05%.

After computing the WACC, what follows is to discount the free cash flows for the forecasted period and calculate the Terminal Value, which is considered a perpetuity that grows at rate  $g$ . The sum of the discounted cash flows and the terminal value will be equal to the value of the company, from which we need to deduct the Net Debt to achieve ZTE's Equity Value. Assuming the number of shares is the same as in 2013 (3.439,308 million) we can also have an estimate of the value per share.

<b>WACC Valuation</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
Discounted Cash Flows		(716)	831	2.033	2.635	3.591	3.878	4.655
Terminal Value								129.058
<b>PV(Terminal Value)</b>	<b>66.026</b>							
<b>Enterprise Value</b>	<b>82.933</b>							
<b>Equity Value</b>	<b>70.514</b>							
<b>Equity Value per Share</b>	<b>20,50</b>							

### APV Valuation

The Adjusted-Present Value method isolates the cash flows generated by the company from the side-effects of debt. As such, the cash flows are valued as if the company were fully equity-financed (discounted at  $K_u$ ), then adding the tax savings allowed by the use of debt. Among the different approaches, we discount the so-called tax shields at the pre-tax  $K_d$  on the first year and at the unlevered cost of equity  $K_u$  on the subsequent years, to be consistent with Miles & Ezzell's approach. Naturally, using debt has potential drawbacks, such as bankruptcy risk, which has associated costs. In order to estimate the bankruptcy costs, they were considered to be a percentage of the firm's value with a probability of occurrence dependant on the credit rating. According to (Korteweg, 2007), the cost of financial distress is on average around 30% of the enterprise value so this was used and the probability of default was the one estimate by Moody's for companies rated B+. Subtracting the Bankruptcy Costs and Net Debt to the Unlevered Value of the Firm and to the Tax Shields, we achieve ZTE's Equity Value.

<b>APV Valuation</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
FCFF	<b>3.938</b>	(788)	1.007	2.710	3.864	5.796	6.887	9.099
Discounted @ $K_u$		(718)	836	2.050	2.663	3.640	3.941	4.744
Terminal Value								134.567
PV(TV)	<b>70.158</b>							
Unlevered Value of the Firm	<b>87.313</b>							
Interest Tax shields		720	455	496	363	408	465	537
PVTS		681	377	375	250	256	266	280
Terminal Value	<b>4.025</b>							7.720
Sum of PVTS	<b>6.511</b>							
Bankruptcy Costs	<b>3.992</b>							
Enterprise Value	<b>89.832</b>							
<b>Equity Value</b>	<b>77.414</b>							
<b>Equity Value per Share</b>	<b>22,51</b>							

The two methods should yield roughly the same result but they were not computed jointly, which may cause the differences. The WACC, for instance, does not clearly separate effects from assets and from liabilities and this might contaminate the valuation. Divergent approaches to the target capital structure, tax shields valuation and beta levering/unlevering should also create room for discrepancies. In any case, the market price of the company should be around the above levels. The price as of the end of 2013 was 15,4 which leads to the conclusion that ZTE is undervalued, with an upside of 43-47%.

### Sensitivity Analysis

<b>g/WACC</b>	<b>-2%</b>	<b>-1%</b>	<b>0%</b>	<b>1%</b>	<b>2%</b>
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-1%	92.495	75.043	61.944	51.781	43.689
-0,5%	100.457	80.575	65.953	54.780	45.990
0%	109.937	86.993	<b>70.514</b>	58.143	48.541
0,5%	121.413	94.527	75.752	61.940	51.383
1%	135.591	103.497	81.827	66.260	54.569

On the table above, we may see the impact that a change on two of the main forces in a valuation - the perpetual growth rate and the cost of capital.

## ***The Acquirer - Huawei***

Since Huawei is not publicly-traded, there are some constraints that need to be overcome. Fortunately, in accounting terms, Huawei uses Hong Kong IFRS and the accounts are approved by an independent auditor, which facilitates coherence with ZTE's accounts. Valuation-wise, because there are no market values, betas and ratings are not available and no market debt-to-equity ratios can be estimated - this can be approximated by using industry averages, both for the betas and the capital structure. Moreover, especially in an employee-owned company as Huawei, it is difficult to distinguish salaries from dividends - there is no mention to dividends in the financial reports, which means that dividends are somehow included on the employees' pay (for the ones that hold shares). In addition, an illiquidity discount should apply to account for the fact that Huawei is not publicly-traded, which is one of the assumptions of the most used discount rate estimation models - no transaction costs. According to (Silber, 1991) the illiquidity discount should be around 20-30%.

### **Revenues**

<b>Revenue by Activity (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Total Revenues</b>	<b>239.025</b>	<b>250.259</b>	<b>262.021</b>	<b>274.336</b>	<b>287.230</b>	<b>300.730</b>	<b>314.864</b>	<b>329.663</b>
<i>Growth Rate</i>	<i>8,6%</i>	<i>4,7%</i>	<i>4,7%</i>	<i>4,7%</i>	<i>4,7%</i>	<i>4,7%</i>	<i>4,7%</i>	<i>4,7%</i>

With more than three times the Revenues of ZTE, Huawei has had an annualised revenue growth rate of about 17%. Despite the fact that in the financial reports there was no revenue breakdown by activity, Huawei has roughly the same business lines as ZTE. However, for precaution, a different driver was used: an overall Telecom Operators' CAPEX growth, which yielded practically the same total revenue growth as for ZTE. Despite the different scale, both companies seem to have similar long-term revenue growth potential (R&D's central role, location, brand perception, knowledge share,...) despite Huawei has had a more successful business model, to this date.

### **Cost of Sales**

<b>Cost of Sales (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Total COGS</b>	<b>(141.005)</b>	<b>(150.220)</b>	<b>(154.660)</b>	<b>(159.185)</b>	<b>(163.795)</b>	<b>(168.486)</b>	<b>(173.256)</b>	<b>(178.102)</b>
<i>Growth Rate</i>	<i>6,4%</i>	<i>6,5%</i>	<i>3,0%</i>	<i>2,9%</i>	<i>2,9%</i>	<i>2,9%</i>	<i>2,8%</i>	<i>2,8%</i>

<i>% Sales</i>	59,0%	60,0%	59,0%	58,0%	57,0%	56,0%	55,0%	54,0%
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Regarding the Cost of Sales, no breakdown was available and that limited the forecast. The forecast was made through gross margins, as explained below.

### Gross Margin

<b>Gross Margin (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Gross Margin</b>	<b>98.020</b>	<b>100.040</b>	<b>107.362</b>	<b>115.151</b>	<b>123.436</b>	<b>132.244</b>	<b>141.608</b>	<b>151.561</b>
<i>Growth Rate</i>	11,8%	2,1%	7,3%	7,3%	7,2%	7,1%	7,1%	7,0%
<i>Profit Margin</i>	41,0%	40,0%	41,0%	42,0%	43,0%	44,0%	45,0%	46,0%

Huawei has been consistently increasing its Gross Margin, without significant drops, and I believe the same will happen in the future. For 2014, the profit margin should be the historical average, growing one percentage point in the subsequent years, as the company shifts to higher-end products and makes the process more efficient, worldwide.

### Other Income & Gains and Other Expenses

<b>Other Gains or Expenses</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Other Income &amp; Gains</b>	<b>1.450</b>	<b>795</b>	<b>795</b>	<b>795</b>	<b>795</b>	<b>795</b>	<b>795</b>	<b>795</b>
Disposal of Investments	985	0	0	0	0	0	0	0
Government Grants	465	795	795	795	795	795	795	795
Others	0	0	0	0	0	0	0	0
<b>Other Expenses</b>	<b>(727)</b>	<b>(1.158)</b>	<b>(1.213)</b>	<b>(1.270)</b>	<b>(1.330)</b>	<b>(1.392)</b>	<b>(1.457)</b>	<b>(1.526)</b>
Expense on Factoring	(550)							
Others	(177)							

The only source of “Other Income” should be the grants given by the government, which is expected to keep supporting the company in the future. The amount received should be equal to the historical average. In what regards “Other Expenses”, these should be tied to revenues in a proportion of 0.5%, the historical average.

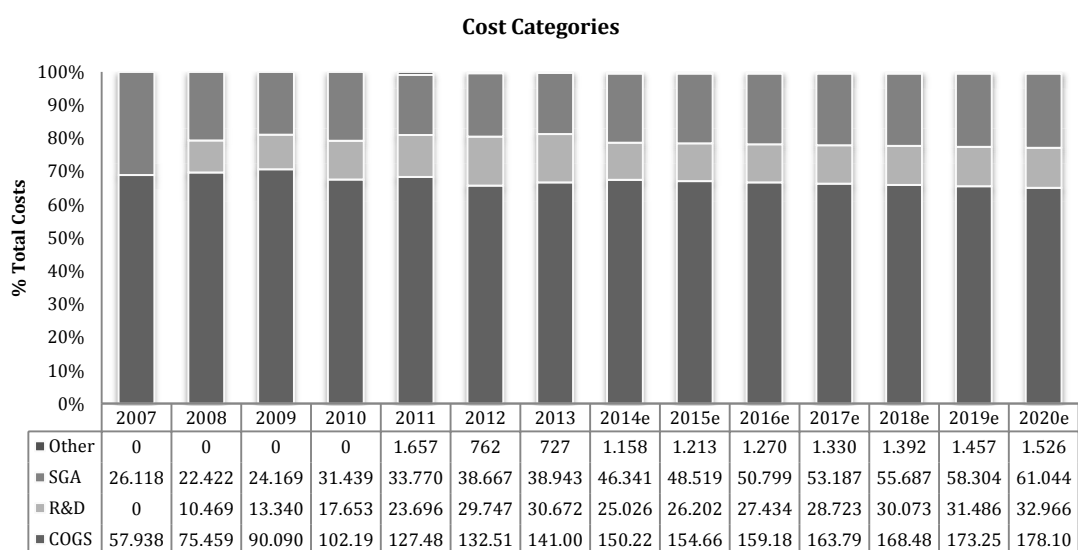


## Research & Development

R&D Costs (RMB mil)	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
<b>Total R&amp;D Costs</b>	<b>(30.672)</b>	<b>(30.031)</b>	<b>(30.132)</b>	<b>(30.177)</b>	<b>(30.159)</b>	<b>(30.073)</b>	<b>(31.486)</b>	<b>(32.966)</b>
<i>Growth Rate</i>	3,1%	-2,1%	0,3%	0,1%	-0,1%	-0,3%	4,7%	4,7%
<i>% Sales</i>	12,8%	12,0%	11,5%	11,0%	10,5%	10,0%	10,0%	10,0%

Huawei's focus on R&D has been highlighted in the last section as the vital activity for the company's success. On average, the expense with R&D has been 10-11% of Revenues, same as for ZTE. Consequently, I believe that ZTE's 10% of Revenues target is realistic for Huawei too. The decrease towards the target needs to be gradual so that the expense does not drop considerably because the money is tied to development projects around the world, mainly related to 5G communication, cloud computing and storage.

## Operating Costs Evolution



Overall, R&D will have slightly less importance while SGA costs gain weight. In fact, I expect Huawei to tie more funds into promotion, brand awareness and wages, as the globalisation moves forward and the company moves up on the value chain. Nonetheless, the changes are small and Huawei should keep roughly the same cost structure.

## Finance Costs

<b>Financing Costs (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Interest Expense</b>	<b>(1.358)</b>	<b>(710)</b>	<b>(2.038)</b>	<b>(2.795)</b>	<b>(3.509)</b>	<b>(4.665)</b>	<b>(5.457)</b>	<b>(6.348)</b>
Interest Coverage	21,45	26,83	11,31	9,83	9,13	7,94	7,58	7,33

Similarly to ZTE, in this model, one of the assumptions is that the company has a target capital structure to which it tends in the next years. Having said that, as the company's book value of equity increases, debt needs to accompany it, as long as the interest coverage is still within AAA rating limits. The forecasted value of debt was then multiplied by the average interest rate paid before tax.

## Income Tax

As for ZTE, the Income Tax for Huawei should also be 25%, the marginal tax rate. This ensures no distortions caused by particular tax payments in certain years or different effective tax rates across the subsidiaries.

## Capital Management Policy

<b>Working Capital (RMB mil)</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
<b>Accounts Receivable</b>	<b>80.320</b>	<b>84.095</b>	<b>87.785</b>	<b>91.637</b>	<b>95.657</b>	<b>99.852</b>	<b>104.230</b>	<b>108.799</b>
%Sales	33,6%	33,6%	33,5%	33,4%	33,3%	33,2%	33,1%	33,0%
<b>Accounts Payable</b>	<b>99.869</b>	<b>106.395</b>	<b>109.231</b>	<b>112.109</b>	<b>115.027</b>	<b>117.985</b>	<b>120.979</b>	<b>124.007</b>
%COGS	70,8%	70,8%	70,6%	70,4%	70,2%	70,0%	69,8%	69,6%
<b>Inventories</b>	<b>24.929</b>	<b>26.558</b>	<b>27.343</b>	<b>28.143</b>	<b>28.958</b>	<b>29.787</b>	<b>30.631</b>	<b>31.488</b>
%COGS	17,7%	17,7%	17,7%	17,7%	17,7%	17,7%	17,7%	17,7%
<b>Net Working Capital (NWC)</b>	<b>5.380</b>	<b>4.258</b>	<b>5.898</b>	<b>7.672</b>	<b>9.588</b>	<b>11.655</b>	<b>13.882</b>	<b>16.280</b>
<b>ΔNWC</b>	<b>2.655</b>	<b>(1.122)</b>	<b>1.640</b>	<b>1.774</b>	<b>1.916</b>	<b>2.067</b>	<b>2.228</b>	<b>2.398</b>

Huawei has had extremely good relationships with suppliers, when compared to the industry average (Accounts Payable represent around 45% of COGS). Back in 2010, 81% of its COGS were trade credit but this percentage has been decreasing and I expect it to decrease further in the future, although the company will still have very good financing conditions. In what regards the receivables, Huawei is expanding its client base and this increases the power over customers but no major change is expected. In terms of Inventories, similarly to ZTE, these would ideally decrease in size as it becomes difficult and costly to manage and technology is very fast-paced these days and quickly becomes obsolete. Huawei does not want to increase this risk by blindly pegging Inventories

growth to Sales growth. However, this is not an easy task, especially for an already low proportion. Therefore, Inventories/COGS should stay unchanged.

Trade Credit (days)	2007	2008	2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
DSO	156	154	155	138	128	126	123	123	122	122	122	121	121	120
DPO	277	293	284	295	264	263	259	259	258	257	256	256	255	254
DI	104	111	101	98	76	61	65	65	65	65	65	65	65	65
OC	260	266	256	236	204	187	187	187	187	186	186	186	185	185
CCC	-17	-27	-28	-59	-60	-76	(71)	(71)	(71)	(71)	(70)	(70)	(70)	(69)

If we look at the Cash Conversion Cycle (CCC), Huawei has such good trade credit conditions that the inputs transform into cash flows in no time. The situation is likely to stay similar to what it currently is.

### Capital Structure

Capital Structure (%)	2007	2008	2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Debt-to-Equity Ratio	9,1	37,4	37,8	18,7	30,7	27,7	26,7	35,0	35,0	35,0	35,0	35,0	35,0	35,0

Since Huawei has low leverage and a big pile of cash, it was decided not to use the Net Debt-to-Equity ratio, as the company has negative Net Debt, i.e. Net Cash. Regardless, the company has lower indebtedness than its industry peers and it could benefit from more debt and from a lower cost of capital. The low debt use is probably coherent with the astonishing growth Huawei has seen in past years, the ability to generate high cash flows and with the ownership structure that incentivises equity over debt.

### Capital Expenditure (CAPEX)

Capital Expenditure (RMB mil)	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Net CAPEX/Sales	2,7%	2,5%	2,5%	3,0%	3,0%	2,0%	1,0%	0,0%
Net CAPEX	6.470	6.323	6.446	8.230	8.617	6.015	3.149	0
Depreciation/Fixed Assets	13,7%	14,4%	17,1%	19,1%	22,2%	28,6%	40,3%	73,2%
Depreciation	2.088	1.890	2.698	3.806	3.757	4.251	5.233	6.234

The concept of Net CAPEX, as explained by (Damodaran, 2006), is the investment in expansion, i.e. net of depreciation. Considering the lack of information regarding this matter in Huawei's financial reports, the Capital Expenditure is assumed to be the contracts or capital commitments made by the company in (t-1), providing us with data until 2014, inclusive. For the following years, it is assumed that the ratio (Net

CAPEX/Sales) will tend to 0, as the company matures in terms of scale. The gradual but considerable increase seems plausible given Huawei's expansion plan, which means to have growing scale and higher business presence, especially in Europe.

## Acquisitions

Huawei is not expected to make any acquisitions in the upcoming years.

## Discount Rate

Cost of Equity		Cost of Debt	
7Y US T-Bonds	2,35%	Default Spread AAA	0,40%
US LT Inflation	2,04%	CDS Default Spread China	0,60%
China LT Inflation	2,54%	Tax Rate	25%
Rf Local Currency	2,85%	After-tax Kd	2,51%
US Market Risk Premium (Damodaran)	4,96%	Average interest rate paid after tax	6,06%
Composite Country Risk Premium	1,92%	Perpetual Growth Rate	2,80%
Beta Unlevered (Bloomberg) Adjusted	0,85	<b>Bankruptcy</b>	
Beta Levered (Miles&Ezzell)	1,06	Credit Rating (Synthetic)	AAA
Unlevered Cost of Equity (Ku)	8,70%	Probability of Default	0,002%
Levered Cost of Equity (Ke)	10,17%	Cost of Bankruptcy	30,00%

The computation of the Cost of Equity ( $Ke$ ) was similar to what was done for ZTE, except that the Country Risk Premium comes slightly different given the different revenue breakdown. Also, the beta used for Huawei was the Telecom Equipment industry beta for Chinese companies instead of a company-specific one which was not available. In what concerns the Cost of Debt ( $Kd$ ), the method used for ZTE yielded a result that seemed too low when compared to the average interest rate effectively paid by Huawei. It is important to note that this value is not adjusted for liquidity. For calculating the bankruptcy costs, I used the probability of default estimated by Moody's for the AAA rating, which was synthetically attributed to Huawei based on interest coverage, Return On Capital, Long-Term Debt-to-Capital, among others indicators of financial soundness.

The step that follows, after the forecast, is to compute the free-cash flows in order to be able to implement the DCF method. The table below contains the decomposition of the Free-Cash Flow to the Firm, from the EBIT until the final value, the amount available to (re)pay the company's shareholders and bondholders.

Free-Cash Flow to the Firm	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
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<b>EBIT</b>	<b>29.128</b>	19.053	23.060	27.466	32.043	37.038	41.372	46.547
- EBIT x T	<b>(7.282)</b>	(4.763)	(5.765)	(6.867)	(8.011)	(9.260)	(10.343)	(11.637)
+ Depreciation	<b>3.757</b>	4.251	5.233	6.234	7.511	8.849	9.783	10.272
- Δ Other non-cash items	<b>(1.934)</b>	0	0	0	0	0	0	0
- CAPEX	<b>(6.470)</b>	(6.323)	(6.446)	(8.230)	(8.617)	(6.015)	(3.149)	0
- Δ <i>NWK</i>	<b>(2.655)</b>	1.122	(1.640)	(1.774)	(1.916)	(2.067)	(2.228)	(2.398)
<b>FCFF</b>	<b>14.544</b>	13.340	14.441	16.829	21.011	28.546	35.436	42.784

Huawei is expected to keep generating very strong cash flows, continuing to show its unique capacity to generate high earnings and transform them into cash. Having calculated the FCFF, we can now proceed to the valuation.

### WACC Valuation

Again, as for ZTE, the cost of capital was computed using the traditional formula, which yielded a WACC equal to 7.96%.

<b>WACC Valuation</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
Discounted Cash Flows		12.331	12.339	13.291	15.337	19.261	22.100	24.664
Terminal Value								745.580
PV(Terminal Value)	<b>470.676</b>							
Enterprise Value	<b>442.498</b>							
<b>Equity Value</b>	<b>492.864</b>							

After discounting the forecasted yearly cash flows and adding it to the Terminal Value, a growing perpetuity, we arrive to the Value of the Firm. To this number, an illiquidity discount should be applied, affecting both equity and debt, once Huawei is privately-held. According to (Silber, 1991), the illiquidity discount falls between 20-30% almost invariably and it depends on the firm size, financial health, etc. Consequently, a discount of 25% was used because, despite Huawei being a very sound large company, it has an inflexible ownership structure, which adds uncertainty in what regards corporate governance. To the adjusted Value of the Firm we need to add the cash balance and subtract debt to have the value of the equity. Unfortunately, Huawei does not disclose the number of shares outstanding, thus not being possible to compute the value on a per-share basis.

### Adjusted-Present Value

<b>APV Valuation</b>	<b>2013</b>	<b>2014e</b>	<b>2015e</b>	<b>2016e</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>	<b>2020e</b>
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FCFF	<b>14.544</b>	13.340	14.441	16.829	21.011	28.546	35.436	42.784
Discounted @ Ku (Adjusted)		12.273	12.222	13.104	15.050	18.811	21.483	23.862
Terminal Value								745.580
PV(TV)	<b>415.828</b>							
Unlevered Value of the Firm	<b>532.633</b>							
Interest Tax shields		178	509	643	757	970	1.080	1.161
PVTS		173	431	643	757	970	1.080	1.161
Terminal Value								19.677
Sum of PVTS	<b>16.641</b>							
Bankruptcy Costs	<b>3</b>							
Enterprise Value	<b>411.953</b>							
<b>Equity Value</b>	<b>462.319</b>							

The APV method yields a slightly lower value but very close. The interest tax shields are increasing over time as Huawei's equity increases. It is assumed that no dividends are distributed (at least officially) so all the cash flows will be reinvested into the company. Regarding bankruptcy, the costs are almost negligible given the company's AAA credit rating.

In sum, Huawei is worth around 7x more than ZTE. The difference between the two companies, despite both being roughly the same age and from the same country, should have identifiable causes. Huawei's business model has proved to be better than ZTE's one: the centrality of R&D, avoiding foreign competitors by penetrating in unexplored markets instead, the strong government support and the extremely good relationship with suppliers might have originated the hiatus.

### Sensitivity Analysis

g/WACC	-2%	-1%	0%	1%	2%
-1%	832.493	672.230	562.808	483.542	423.617
-0,5%	920.007	725.815	598.292	508.359	441.688
0%	1.033.362	791.615	<b>640.364</b>	537.062	462.205
0,5%	1.185.982	874.344	691.045	570.641	485.701
1%	1.402.545	981.499	753.279	610.453	512.876

Both companies have potential to expand and they have competitive advantage in many fields which could be leveraged if they were jointly managed, not in competition with each other but rather gathering efforts to overtake the competition from overseas. In the next section, we identify potential gains from the integration, without focusing on the type of deal that might take place. The operation will be regarded on chapter 4.

### **Comparable Companies Multiples Analysis**

In order to complement the DCF analysis conducted above, we will now value both companies taking into account the characteristics of other companies in the industry, considered comparable according to different criteria. The first peer group was created in SPSS using the two-step cluster, only for Chinese Telecom companies and these were grouped according to the capital structure and the Return-on-Equity. The second peer group was made according to the same criteria but manually in Excel, using the K-mean clustering technique for two centroids (Capital Structure and Return on Equity). The third group was naively picked and is composed by Telecom companies with market capitalisation above USD 1 billion, regardless of the country. For the last peer group, the same market capitalisation criterion was applied but for Chinese companies only.

Statistic		Peer Group			
		SPSS (China)	Cluster (China)	Manual (Worldwide)	Damodaran MC>\$1B
<b>PER</b>	Average	90,51	29,61	627.301,88	38,37
	Median	52,31	23,68	28,30	28,20
<b>Huawei</b>					
Net Income	21.003				
EBITDA	32.885				
	Enterprise Value				
	Value of Net Debt				
	<b>Value of Equity</b>	<b>1.098.562</b>	<b>497.351</b>	<b>594.322</b>	<b>592.180</b>
<b>ZTE</b>					
Net Income	1.434				
EBITDA	4.833				
	Enterprise Value				
	Value of Net Debt				
	<b>Value of Equity</b>	<b>74.986</b>	<b>33.949</b>	<b>40.568</b>	<b>40.421</b>

Firstly, we used the Price-Earnings ratio (PER) as the multiple to use in the valuation. This multiple tries to measure how companies are over/undervalued but it only makes sense when doing a relative analysis and considering comparable companies. Given that this multiple is not normalised, the mean is very susceptible to the influence of outliers so the median was computed for the four peer groups and multiplied by the Net Income of each company to arrive directly to the Value of Equity.

Statistic		Peer Group		
		SPSS (China)	Cluster (China)	Damodaran MC>\$1B
<b>EV/EBITDA</b>	Average	57,74	20,74	39,15
	Median	27,07	18,22	20,77
<b>Huawei</b>				
Net Income	21.003			
EBITDA	32.885			
	Enterprise Value	890.197	599.165	683.021
	Value of Net Debt	-50.366	-50.366	-50.366
	<b>Value of Equity</b>	<b>940.563</b>	<b>649.531</b>	<b>733.387</b>
<b>ZTE</b>				
Net Income	1.434			
EBITDA	4.833			
	Enterprise Value	130.831	88.059	100.383
	Value of Net Debt	12.419	12.419	12.419
	<b>Value of Equity</b>	<b>118.412</b>	<b>75.640</b>	<b>87.964</b>

On this second table above, the multiple Enterprise Value-to-EBITDA is used. This ratio is usually considered a pure valuation metric and it has a number of advantages over the PER: it is not distorted by the capital structure of the companies or by the CAPEX, therefore it allows to value companies with less similarities. In addition, by using an enterprise value multiple instead of an equity multiple, we are valuing the whole business being EV/EBITDA considered a good measure of value and taken as an approximation to the number of years in which the business pays the acquisition cost.

Looking at both tables, we see some discrepancies. For ZTE, the weak Net Income in FY2013 has driven down its value but, not accounting for depreciation and interest, the valuation is considerably higher, which might indicate that the company could benefit from the reduction of indebtedness. In Huawei's case, the results are more consistent, once the company does not have excess debt and is able to generate very strong earnings, even at the Net Income level. It is important to note, though, that the valuation of Huawei is not adjusted for liquidity, for which an illiquidity discount should be applied. The same 25% used on the DCF approach might also be appropriate in this case and should be applied to the Enterprise Value.

### Peer Groups

Manual Worldwide (Market Cap above \$1Billion)	SPSS (China)	Cluster Analysis	Damodaran
AAC Acoustic Technologies	AVCON Information Technology Co., Ltd. (SZSE:300074)	CCT Land Holdings Limited (SEHK:261)	China Mobile Limited (SEHK:941)
ADTRAN Inc.	AVIT Ltd. (SZSE:300264)	Datang Telecom Technology Co., Ltd. (SHSE:600198)	China Telecom Corp. Ltd. (SEHK:728)



BYD Electronic	China All Access (Holdings) Limited (SEHK:633)	Hengtong Optic-electric Co., Ltd. (SHSE:600487)	China Unicom (Hong Kong) Limited (SEHK:762)
Loral Space & Communications,	China Wireless Technologies Ltd. (SEHK:2369)	TCL Communication Technology Holdings Ltd. (SEHK:2618)	China United Network Communications Limited (SHSE:600050)
Filtronic PLC	Datang Telecom Technology Co., Ltd. (SHSE:600198)	Xi an Haitian Antenna Technologies Co. Ltd. (SEHK:8227)	HKT Trust and HKT Limited (SEHK:6823)
CommScope Holding Company, Inc	DingLi Communications Corp., Ltd. (SZSE:300050)		AAC Technologies Holdings Inc. (SEHK:2018)
Eutelsat Communications	Fiberhome Telecommunication Technologies Co., Ltd. (SHSE:600498)		China Communications Services Corporation Limited (SEHK:552)
Avigilon Corp	Fujian Sunnada Communication Co., Ltd. (SZSE:002417)		Vtech Holdings Ltd. (SEHK:303)
Birla Ericsson Optical Ltd	Hengtong Optic-electric Co., Ltd. (SHSE:600487)		PCCW Limited (SEHK:8)
ARRIS Group, Inc.	Jiangsu Etern Company Limited (SHSE:600105)		Dr. Peng Telecom & Media Group Co., Ltd. (SHSE:600804)
TCL Communication	Jiangsu Yitong High-Tech Co., Ltd. (SZSE:300211)		Fiberhome Telecommunication Technologies Co., Ltd. (SHSE:600498)
Cisco Systems Inc	Kyland Technology Co., Ltd. (SZSE:300353)		Guangzhou Haige Communications Group Incorporated Company (SZSE:002465)
Harris Corporation	Longcheer Holdings Ltd. (SGX:L28)		Hutchison Telecommunications Hong Kong Holdings Ltd. (SEHK:215)
Chi- All Access holdings	LottVision Ltd. (SGX:M22)		Shenzhen Techo Telecom Co., Ltd. (SZSE:000555)
Evertz Technologies Ltd	Nanjing Panda Electronics Co. Ltd. (SEHK:553)		Datang Telecom Technology Co., Ltd. (SHSE:600198)
EchoStar Corp.	Nanjing Putian Telecommunications Co., Ltd. (SZSE:200468)		Beststone Holding Co.,Ltd. (SHSE:600640)
Foxconn Inter-tio-l	Qingdao Eastsoft Communication Technology Co.,Ltd. (SZSE:300183)		Asia Satellite Telecommunications Holdings Limited (SEHK:1135)
JDS Uniphase Corporation	Routon Electronic Co., Ltd. (SHSE:600355)		Shenzhen Coship Electronics Co., Ltd. (SZSE:002052)
Himachal Futuristic Commu	Shaanxi Fenghuo Electronics Co., Ltd. (SZSE:000561)		BYD Electronic International Company Ltd (SEHK:285)
Internet Initiative Japan Inc.	Shenzhen Coship Electronics Co., Ltd. (SZSE:002052)		Fujian Star-net Communication Co.,Ltd. (SZSE:002396)
Knowles Corporation	Shenzhen Sunway Communication Co., Ltd. (SZSE:300136)		SmarTone Telecommunications Holdings Ltd. (SEHK:315)
Astra Microwave Products Ltd	Shenzhen Zowee Technology Co., Ltd (SZSE:002369)		TCL Communication Technology Holdings Ltd. (SEHK:2618)
Laird PLC	Synertone Communication Corporation (SEHK:1613)		Eastern Communications Co., Ltd. (SHSE:900941)
LM Ericsson Telephone Company	Telestone Technologies Corp. (OTCPK:TSTC)		Qingdao Eastsoft Communication Technology Co.,Ltd. (SZSE:300183)
Aksh Optifibre Ltd	Vtech Holdings Ltd. (SEHK:303)		Nanjing Panda Electronics Co. Ltd. (SEHK:553)

Motorola Solutions, Inc.	Weifang Beida Jade Bird Huaguang Sci-Tech Co.,Ltd. (SHSE:600076)	Telling Telecom Holding Co., Ltd (SZSE:000829)
Netgear Inc.		Sumavision Technologies Co., Ltd. (SZSE:300079)
Nokia Corporation		Hytera Communications Corporation Limited (SZSE:002583)
O-Net Communications Group		CITIC Telecom International Holdings Limited (SEHK:1883)
QUALCOMM Incorporated		
Sapura PLC		
Chi- Wireless		
Vindhya Telelinks Ltd		
Vitec Group (The) PLC		
VTech Holdings Ltd.		

## Addendum 2

### SWOT Analysis

	ZTE	Huawei
Strengths	<ul style="list-style-type: none"> <li>Market share momentum</li> <li>Broad product portfolio</li> <li>Government support</li> <li>Innovation (World's #1 patent filer)</li> <li>Competitive pricing</li> <li>Skilled workforce</li> <li>Carrier contracts around the world, especially in the US and Japan</li> <li>Banks support</li> <li>Low-cost Chinese company</li> </ul>	<ul style="list-style-type: none"> <li>Market share</li> <li>Financial stability</li> <li>Financing conditions</li> <li>Innovation (World's #3 patent filer)</li> <li>Carrier contracts in Asia and Europe</li> <li>R&amp;D workforce</li> <li>High profitability</li> <li>Low-cost Chinese company</li> </ul>
Weaknesses	<ul style="list-style-type: none"> <li>Product reliability</li> <li>Low financial stability and higher financing costs</li> <li>Loss of market share</li> </ul>	<ul style="list-style-type: none"> <li>Product reliability</li> <li>No acceptance in the US</li> <li>Damaged reputation among end-consumers</li> </ul>
Opportunities	<ul style="list-style-type: none"> <li>Acquisitions</li> <li>Access to global markets</li> <li>Reduce dependence on China</li> <li>Further penetration in EM with lower to mid-end handsets</li> <li>Improve reputation with the more widespread presence</li> <li>BRICS 3G penetration still low. ZTE has good distribution channels and clients in Africa and</li> </ul>	<ul style="list-style-type: none"> <li>US market entry if appropriate measures are undertaken</li> <li>Improve reputation with the more widespread presence</li> <li>Room for price competition and market share increase</li> <li>Chinese carriers want to go global</li> </ul>

South America		
Threats	<ul style="list-style-type: none"> <li>• Political risk</li> <li>• High competition prevents price increase despite state-of-the-art technology</li> <li>• Economic risk of a macro backdrop</li> <li>• Rising costs of raw materials</li> <li>• Tax rate increase</li> <li>• Disperse business lines/ Lack of focus</li> <li>• Considered unfair competition by EU government can cause a ban</li> </ul>	<ul style="list-style-type: none"> <li>• Political risk</li> <li>• Economic risk of a macro backdrop</li> <li>• Rising costs of raw materials</li> <li>• Tax rate increase</li> <li>• Private company limitations might harm financing</li> <li>• Considered unfair competition by EU government can cause a ban</li> </ul>

### Addendum 3

#### *Corporate Governance*

For (Schleifer & Vishny, 1997), firms with stronger corporate governance are worth more. Factors like shareholder protection, legal systems, board independence and anti-takeover defences have a big influence.

The way organisations are directed and controlled has had an increasing importance in recent years, as poor corporate governance can lead to corruption. Over the history, several scandals in large companies such as Enron in 2001 (involving also the consultancy company Arthur Andersen) and Parmalat in 2002, that were examples of poor corporate governance and lack of transparency that were hiding huge frauds. In China, many companies that were inclusively listed in the United States have been accused of fraud, some having been advised by the most renowned investment banks. Despite the world not trusting Chinese companies in full, ZTE and Huawei have made an effort to at least seem more transparent and engage in Corporate Social Responsibility. Their financial accounts are stated both in Accounting Standards for Business Enterprises (ASBEs) and in Hong Kong Financial Reporting Standards (HKFRS). ZTE is audited by Ernst & Young and Huawei by KPMG, two of the Big Four in Consultancy. In the table below are some important features of good corporate governance, which companies should have and, in this case, it is vital that we can find similarities between the firms that are analysed.

	ZTE	Huawei
<b>Ownership</b>	Public	Private (employee owned) 84,187 employees and the founder (1.4% share)

<b>Compliant with Corporate Governance Standards for Listed Companies</b>	Yes	NA
<b>One controlling shareholder</b>	Yes. Zhongxingxin (31%)	No
<b>Nomination, audit, remuneration and evaluation committees</b>	Yes	Yes
<b>Stock incentive plan</b>	Yes	Yes
<b>Number of board meetings</b>	15	12
<b>Independent non-executive directors</b>	6 people. Attend but seldom in person	0
<b>Dependent non-executive directors</b>	6 people, including chairman and vice chairmans	0
<b>Dependent executive directors</b>	3 people	17 people
<b>Directors: appointment term</b>	3 years	5 years.
<b>Internal control</b>	Yes, reviewed by the Audit Committee	
<b>Others</b>	1 CEO	1 CEO and rotating CEOs; 3 shareholders' meetings (60 representatives)

### ***Business platforms***

ZTE and Huawei are two telecom equipment companies that have been competing with each other in China, primarily, and worldwide, more recently. They have similar business lines, being carrier networks the core business of both and they are present in roughly the same markets. In addition, they have approximate ages and are in a contemporary strong process of internationalisation. More importantly, they both generate in-house technology with two of the most active R&D departments in the world.

As both companies share clients and markets around the world, they have complementary strengths in what regards R&D and market coverage. Moreover, they have had a considerable support by the government and by Chinese banks and they both prioritise innovation and knowledge as their most vital activity, which was the reason why both

companies internalised R&D in their early years. Business culture, country, location, product range, geographical presence and values seem to be common grounds. Therefore, integration between these companies seems to be a natural and viable step.