- TEM REPORT -

Value migration in the ICT & Media Sector in Europe: an European tragedy?





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President's letter

It is a pleasure to me to introduce this report on "Value migration in the Telecom and Media sectors in Europe: an European tragedy?. This is the fourth annual report we present at the UIMP at Santander.

Until now, we have done surveys about what the Telecom and Media industries in Spain think about the future of these sectors four years ahead. Since the changes of perception of this community in only one year are small, we have decided to do this survey every two years. Thus, we have built this year a full report on the value migration game for the last eleven years, with a global scope, which we deem will be interesting for our readers.

We presented last year report at the XXVII Telecommunications Seminar held in Santander, at the Menendez Pelayo International University, at the extraordinary framework of the La Magdalena peninsula. Last year, its title was "Our sector: Fragile, robust or antifragile" and we think it was kind of an impact on the audience. It was based on the book "Antifragile", written by Nassim Nicholas Taleb, professor of Sciences of Uncertainty at the Massachusetts University.

We base our report this year on the book "Technological Revolutions and Financial Capital", written by Carlota Perez, a Schumpeterian economist with social interests, which have worked for Cambridge and Sussex and deployed a quite suitable perspective of the five technological revolutions that happened in the last two hundred and fifty years, and, more important, has explained the behavior of the financial capital in every phase of these revolutions. Why we have done so? Because we are now in the Sinergy phase of the Fifth technological revolution, after the explosion of the Internet bubble, and the framework of this phase is known from the experience of the precedent four waves. Readers interested do have a full explanation in the report. We expect that companies of these sectors can get some information about the challenges that, undoubtedly, will face ahead.

What are our findings? In the global landscape, terminals vendors and Internet companies have taken a big chunk of the global sector business and, unfortunately, none of the companies is European. European telecom operators have lost value over the last eleven years while American ones have grown in value. Regulation might be the responsible. The European Union has reacted and, may be, in the following years the trend reverses. Let us hope so. The growth of network equipment vendors has been sluggish and European ones, safe Ericsson, are in a quite bad shape. Nokia has sold its terminals division to Microsoft and now Microsoft is rolling back its investment. At the top of the IT vendors by market capitalization, the only European is SAP, while the cloud providers are striving. Our European Media companies value have halved in eleven years while Netflix is achieving high marks.

What is happening in Europe? We think it is a mix of "political" regulation, fragmentation and lack of investment to create a breeding ground to promote new businesses focusing on

"WHAT IS HAPPENING IN EUROPE? WE THINK IT IS A MIX OF *POLITICAL* REGULATION, FRAGMENTATION AND LACK OF INVESTMENT"

Digital Europe, as the EU like to say. EU institutions are slow and we do not count on an active Venture Capital structure to develop new businesses. Europeans are smart enough to compete with the world but they get no support from the infrastructure needed to do so.

It seems, lately, that the EU has realized that we have a problem to achieve its objective of a Digital Europe. Let us see what happens. We badly need in Europe the determination to impulse definitely the digital technologies and services to make it happen.

I am very grateful to the Telecom and Media division of Altran Spain, led by Ana Mosquera, who will present this report in Santander in September and to her team, together with Altran Business Consulting Spain. Both of them has made, together, what I think is a good job of which we are proud.

As usual when I have to say farewell to all of you, I hope that our successes are many and our mistakes are few, so, you readers, can find a reward from reading our report.



José Ramón Magarzo Presidente Ejecutivo Altran Iberia

Prologue

The first requirement for an effective decision making is measurement. This is the key principle which led, six months ago, the strategic consultancy unit and the Telecoms & Media division of Altran to elaborate a report on value migration in the restless ICT hyper-sector, one of the industrial clusters where the volatility, complexity, ambiguity and uncertainty dominating the world today, have more clearly and severely impacted.

From our vocation for service, we realized that in order to better assist our clients in their adaptation to this new reality, we should determine and evaluate the impact of these new forces, not only by identifying and assuming a model able to explain the entire situation and forecast what is to come next; but also by determining the causes that have shaped the current industrial scenario and could define its immediate evolution.

Taking into consideration these beliefs, we decided to address an analysis of economic value transference among the diverse segments that constitute the global sectorial map, placing special emphasis on our main client's region: Europe.

This exercise has enabled us to specify and quantify intuitions held by the vast majority of industry executives, establishing - when it could be reliably determined - comparative approaches between players, segments, sectors and regions evolution.

We trust that the findings obtained - along with Prof. Carlota Pérez framework contribution, and the outlooks about complex issues such as repremiumization, relationship between investment and regulatory cycles, or post-merger

"TO BETTER ASSIST OUR CLIENTS IN THEIR ADAPTATION TO THIS NEW REALITY, WE SHOULD DETERMINE AND EVALUATE THE IMPACT OF THESE NEW FORCES"

integration - can shed light on the industrial scenario, contributing to trigger the decisive impulse that the ICT sector demands in Europe.



Octavio Egea Managing Principal Altran Business Consulting

ALTRAN BUSINESS CONSULTING

Altran Business Consulting is the management advisory services unit of Altran, specialized in fast-changing and highly competitive industries. By challenging conventional thinking and applying a customized problemsolving approach, we help business leaders to explore new opportunities for growth, overcome crucial strategic challenges, enhance key organizational capabilities, increase corporate efficiency and gain competitive edge in a globalized marketplace.

Introduction



In the last ten years, many changes have taken place in the ICT and Media sector all over the world. The launch of new fixed and mobile telecommunications technologies, the arrival of smartphones and tablets to the mass market, Internet companies (also called Over the Top (OTT) companies) have consolidated and IT vendors have structured the Cloud Computing approach. Additionally the increase in network speeds have allowed video and media applications to flourish.

These new companies and other traditional ones have created, all together, what we know as Digital Economy, where all economic sectors, in different ways, are introducing the advantages of these new technologies into its business processes, from payments to education; from purchasing to marketing; from health to tourism and many more aspects of their activities.

Carlota Perez (London School of Economics, Cambridge University and Tallin University), in her book *"Technological revolutions and financial capital"*, written in 2002, sets a plausible approach to the introduction of new technologies. According to her thesis, there are four phases in the surge and establishment of new technological revolutions: the Irruption phase, the Frenzy phase, followed by a crisis or bubble that explodes, and continues with a Synergy phase and, after that, a Saturation phase. In these phases, the financial and the production capital can be aligned or misaligned. We think we are now in the Synergy phase of the fifth technological revolution, the Age of Information and Communications, where financial and production capital seems to behave in an aligned way. This age started in 1971, with the first microprocessor, and will expand for nearly sixty years, as all the previous "EVEN WHEN THEY TEACH, MEN LEARN. THE WAY IS LONG IF ONE FOLLOWS PRECEPTS, BUT SHORT IF ONE FOLLOWS PATTERNS."

Lucius Annaeus Seneca

ones. We have already suffered the Internet bubble explosion in 1999 and 2000 and, after the year 2000, we are enjoying the development of solutions that are driving us to the Digital Economy (an excerpt from the book is available in Annex I).

The object of this report is to analyze the value migrations that have taken place between the different ICT and Media sector segments for the last ten years and, when it is appropriate, compare the European position versus the rest of the world, mainly the USA.

We will analyze six segments of this industry. The analysis methodology will consist in characterizing every segment by a set of relevant companies in the segment. We think that this approach will lead to figures that are significantly representatives of the full segment. We will analyze the firms that are part of every segment and their value be tracked for the last ten years (from April 2004 to November 2014). We equate value to the market capitalization of every company. Adding up the firm's value, we can get to the segment value, being able to compare the behavior of every segment, as well as the total industry value (including only the sample companies we have considered).

The six segments under study are:

- Telecommunications operators
- Telecommunications vendors
- Terminal vendors
- IT vendors (HW and SW)
- Internet companies (OTTs)
- Media companies

Let us proceed to the description of each of the segments and the companies selected to characterize them.

Telecommunications operators

Companies included in this segment are:

- ATT
- Verizon
- Vodafone
- America Movil
- Telefonica
- Deutsche Telekom
- France Telecom
- British Telecom
- Telecom Italia

As seen, we include three American operators and six European operators. The reason is that the American and European clusters selected present a similar value by the end of 2014.

This will allow us to check the value evolution of each company and compare it to the rest of companies in their cluster but also to compare the value evolution of each cluster to check the Europe versus USA value behavior for the last ten years.

Telecommunications vendors

Companies included in this segment are:

- Cisco
- Qualcomm
- Ericsson
- Nokia
- Juniper
- ZTE
- Alcatel Lucent

We have also considered including Huawei, but its shareholder structure is, somehow, different from the rest of their competitors. In the selection are included three American vendors, three European vendors and one Asian vendor. We think that this sample is significant enough of the whole segment.

We will make comparisons between companies and clusters to explore its value migration for the last ten years.

Terminal vendors

Companies included in this segment are:

- Apple
- Samsung
- TCL
- Sony Mobile
- Lenovo
- LG

After the sale of the Nokia terminal division to Microsoft, we have decided to include Nokia in the telecom vendors segment and not including Microsoft in this segment because its revenue stream in this area is not yet relevant.

As we can see, there is a majority of Asian vendors facing the Apple challenge and, regretfully, no European vendor shows up in the list.

IT vendors

Companies included in this segment are:

- Microsoft
- IBM
- Oracle
- HP
- SAP

Only one European company and four American ones are part of this segment. They are included according to their market cap by the end of 2014.

Internet companies

Companies included in this segment are:

- Google
- Amazon
- Facebook
- eBay
- Yahoo

So far, only American companies are relevant to the value of this segment.

Media companies

Companies included in this segment are:

- Vivendi
- Lagardere Media
- Pearson PLC
- Walters Kluwer
- Mediaset
- Netflix
- ITV PLC
- France Télévisions
- Grupo Prisa

The set of proposed companies is made of eight European companies and only one American company because we want to focus on the evolution of the Media segment in Europe.

Methodology



We will analyze the value behavior of these 41 companies belonging to the mentioned segments, thru the evaluation of its value in April 2004 and its value in November 2014. We will take one value sample for each company by the end of each month during this period. Companies created during this period will be included in each segment with its initial value as if it were its April 2004 value. We will use currency exchanges by November 2014 in the value evaluation. As previously stated, we equate value to the market cap of the company in the stock exchange where is guoted.

We will explore, when they are appropriate, the following comparisons:

- Total sector evaluation thru the addition of the values of each segment (with the sample companies we have included), with its initial and final values over the period. Initial and final contribution of each segment in the initial and final evaluation. This will show the initial and final contributions of each segment in absolute and relative terms and will allow a fair calculation of the value migration that has occurred over the period under study.
- A similar calculation for each defined segment, with the absolute and relative contribution of each company included in the segment, that will allow understanding the value behavior of every company compared to the other segment companies.
- Value evolution of the different segments and their comparison, to check the relative value migration between segments compared to the total sector value.
- When it is appropriate, value evolution of the different clusters defined in every segment. This will allow comparing the value behavior of different regions or global businesses in the sector.
- In every segment, comparisons of the value evolution of different companies in this segment.

We propose a top-down approach, from the global sector to segments and companies, creating, when it is relevant, clusters of companies in those segments where it is pertinent comparing regions and its performance.

3

Value evolution

The global ICT and Media sector



Under the premises of this report, the universe of the global ICT and Media sector will consist in the 41 companies mentioned above. We chose them with the criteria of their value by November 2014 as well as a representation of USA, Europe and Asia main players. Thus, we believe that, despite they do not cover the sector as a whole; this sample should be representative enough to derive and extrapolate the analysis results to the total global sector.

We show below the global sector value evolution over the period April 2004 to November 2014.

GLOBAL ICT AND MEDIA SECTOR MARKET CAP EVOLUTION



Figure 1

We can observe that the value never went below 1.500 B\$ and that the real value impulse came during the last five years. If we focus on the initial and final value of the ICT and Media sector (under the sample conditions expressed above), we depict the result below.

TOTAL MARKET CAP AT START AND END



Figure 2

But, what has been the value evolution of the different segments in the sector? It is obvious that the value growth will be different for the segments in the sector. Let start with the value absolute contribution of each segment to the total sector value. We will focus later on the value migration between segments.



SEGMENTS MARKET CAP FROM START TO END

Figure 3

We can see that the major contributors to the global sector value (all above the 800 B\$ mark) are the IT vendors, terminals vendors, Internet players and telecom operators (this does not mean they are the winners in the value migration game). Network vendors and Media companies are second tier contributors. It is remarkable the impressive value growth of terminals vendors and Internet players over the period. What does it mean? For us, it is a quite simple conclusion: in both segments operate global companies that address global markets with mass products and services. This is not the case for the rest of competitors segments. Telecom operators are regional businesses and, when trying to go global, they use a multidomestic business approach. The demand for network vendors is limited by the universe of telecom operators and big corporations but they do not address a mass market (save those who are trying to enter the terminals market). IT vendors address corporations, not mass markets. Thus, the winners go hand in hand with the user in a global perspective.

Let check what has been the value growth of every segment over the period.



SEGMENTS AND TOTAL MARKET CAP GROWTH OVER THE PERIOD

Figure 4

It is clear where the value has grown and who will be the winners and losers in the value migration game. All those segments that have grown less than the global sector value growth have missed the target.

Let put this in perspective regarding segments participation in the global value at the beginning and end of the period under study.



MARKET CAP SPLIT BY SEGMENT

Figure 5

It is quite relevant the value migration between segments in the last ten years (according to the significative sample included in the analysis). Telecom operators have lost more than 9 pp in the total value pie, but, at least, they keep a fifth of the value. The situation of network vendors is even worse because they have practically halved its participation in the total sector value. As already stated, terminals vendors multiply by more than four their participation and Internet companies follow suit with a close to a three times bigger participation in the sector since the beginning of the period. Each of these segments represent more than a fifth of the total sector value. IT vendors, despite they are the more important contributors to the sector value in absolute terms, have lost ground because they have decreased by close to a 30% its relative weight in the global sector, but they keep more than a fifth of the total sector value. Media companies are close to half of the initial participation they have got at the beginning.

Thus, we can state that terminals vendors and Internet companies are the winners of this contest while the rest of segments are the losers. We have explained why in our conclusions some paragraphs above.

However, not all segments value have the same accuracy in terms of value volumes. The telecom operators segment would be the less accurate one in terms of absolute value volumes, because there are many more operators in America, Europe, Asia, Australia and Africa that would add up to the total value of the segment, but the study of all operators in the world is out of the scope of this analysis. But we think that this sample is valid to establish relative comparisons regarding the value of different clusters. This is consequence of the regional nature of this business. A similar reasoning applies to the Media companies included in the sample. But the rest of segments present a global nature regarding their businesses and in the sample selected are included the main players in each of these segments. Thus, its accuracy is far bigger than the first two in terms of value creation (or destruction).

Now, we will analyze the value behaviour of every segment and try to detect relevant differences by geography or companies.

4

Telecommunications **Operators**



4.1. Value evolution

We show below the value evolution of the telecom operators segment using the selected sample of companies.



MARKET CAP EVOLUTION FOR TELECOM OPERATORS SEGMENT

Figure 6

In absolute terms, this segment has grown close to a 50% in value over the period under study. We show below the initial and final values for this segment.

TELECOM OPERATORS SEGMENT VALUE AT BEGINNING AND END



Figure 7

But this growth has been quite different for the operators in the sample. The American ones have grown well over the average growth of the segment while the European ones, save BT and Vodafone, have lost value over the period. We show below the value evolution of operators in the sample.



OPERATORS MARKET CAP EVOLUTION

Figure 8

We show below each operator value growth over the period and the total segment growth.

OPERATORS MARKET CAP GROWTH FOR THE PERIOD



Figure 9

We can see the sluggish behavior of European operators versus the healthy growth of American ones. Food for thinking. We will analize later this issue and try to find some sort of explanation.

Advancing some rationale, there are several reasons why this could happen:

- Fragmentation in the European telecom market
- EU policies and regulations. The trend has been protecting the users and creating a competition level that could destroy value.
- The crisis in Europe and its impact on the consumers
- The lack of network investment driven by all the points above.

We will try to analize in depth all the above issues when we finish this section.

Let analyze now the segment market cap split at the beginning and the end of the period under study.

OPERATORS MARKET CAP SPLIT



Figure 10

All American operators increase their value share in the total value segment over the period while the European, save BT, lower their value share. It is remarkable the value share increase of America Movil followed by Verizon and ATT. BT increases a tiny 2% its value share while the rest of European operators lower theirs, with Vodafone losing 1 p.p., Telefonica 5,5 p.p. and DT 4 p.p.. Orange and Telecom Italia have lost 5 p.p. and 7 p.p. respectively.

These surprising results compell us to undertake a more detailed analysis, that follows.

4.2. Telecommunication Operators comparisons

4.2.1. Europe versus USA operators

We show below the value evolution of American and European operators clusters.



AMERICAN CLUSTER MARKET CAP EVOLUTION



EUROPEAN CLUSTER MARKET CAP EVOLUTION

Figure 12

As we can see at a glance, the American cluster has more than doubled its market cap over the period while the European one shows a slothful behavior.

If we depict the split of the total market value for each cluster at the beginning and end of the period, results are discouraging for Europeans.



MARKET CAP SPLIT BETWEEN EUROPEAN AND AMERICAN OPERATORS AT THE BEGINNING AND END OF THE PERIOD

Figure 13

We show below the absolute values of the initial and final market cap for each cluster.



INITIAL AND FINAL CLUSTERS MARKET CAP



We can see that the European cluster has destroyed value over the period. Let see what has been the growth of the clusters.



CLUSTERS MARKET CAP GROWTH OVER THE PERIOD

Figure 15

This is something that the European Union has to think over it. As we will explain later, it seems that the new EU government is aware of this issue if we want jump starting the Digital Economy in Europe.

Let try to get deeper into the reasons why this has happened.

Let start with unit prices, that is a very simple concept: if we divide the price paid by the quantity consumed we will get to a fair ratio to compare, apart from unlimited offers, the price a user is paying by MB of service (having previously included voice usage equivalent bandwidth into the calculation). In a report from the Telecom, Media and Technology division of HSBC, that we consider excellent, *"Supercollider. European mobile consolidation is win-win for operators and citizens alike"*, published in February 2014 and devoted to the mobile European business (too bad they did not include the fixed business but conclusions can be extrapolated), they calculated the mobile voice plus data unit price per MB (\in) for major European countries and the USA. This table is shown in the next figure.



MOBILE VOICE PLUS DATA UNIT PRICE PER MB (€)

Figure 16



USA DISCOUNT

Figure 17

We show above the unit price discount of the USA versus the European unit price average. But the estimated ARPU in the USA market is 69 \$ versus an estimated European one of 38 \$. The reason is simple: according to Cisco, the average user

consumption in USA is 810 MB per month while the European one is only 415 MB per month. This difference in consumption leads to the ARPU difference.

Why this difference in consumption?. Because, according to Cisco, in 2012 the average mobile data speed in USA was 2,5 Mb versus 1,5 Mb in Europe, that means a 75% higher speed in USA. Why this difference?. Because USA has been outinvesting Europe regarding CAPEX for telecom infrastructure deployment as shown in the following graphic.



RELATIVE EUROPEAN INCUMBENTS VS INTERNATIONAL PEERS CAPEX

Figure 18

Europe is falling behind its international peers in terms of investments and, as we will see later on, that is the main reason of why European unit prices are higher.

But a report from Infonetics Research in November 2014 announces that, globally, operators capex will reduce its growth, that is bad news for the reduction of unit prices intent, as will be explained below.



GLOBAL OPERATORS CAPEX

Figure 19





Figure 20

But, which factors drive unit prices down?. There are static and dynamic factors, according to a remarkable article written in 2013 by F. Jeanjean (Orange): *"Static and dynamic causes of the decline in the price of mobile telecommunications services"*. Dynamic factors are those dependent on the demand and the production technology, the rest are static.

The factors driving unit prices down are:

- Declining operating costs, because an increase in operating costs increases unit price, so its impact is positive unless they decline. This is a static factor.
- Increase in competitive intensity in the market. An increase in competitive intensity would drive down EBITDA margin
 and unit price. Its impact is negative unless the competition is reduced. This is a static factor.
- Network investment increase. This will lower marginal costs and lower prices. The increase in service quality will lead to more consumption. Its impact is negative on unit prices because investment will increase traffic volume. This is a dynamic factor.
- Users learning time. Users will consume more capacity over time as they acquire more experience of using mobile services by imitation of more knowledgeable people around them (viral expansion). Its impact is negative in unit prices because it increases traffic volume. This is a dynamic factor.

Based on this approach, in the HSBC report mentioned above, "Supercollider. European mobile consolidation is win-win for operators and citizens alike", they developed a sophisticated model to measure the impact of each of the four factors in the evolution of unit prices reductions for the period 2008-2012 in main countries in the world. They observed the real evolution of unit prices during the period, ran their model and compare observed and model results. Findings are shown in the table below.

COUNTRY	UNIT PRICES (OBS)	OPERATING COST	COMPETITION	INVESTMENTS	TIME	UNIT PRICES (MOD)	DEVIATION
France	-201%	5%	-10%	-111%	-104%	-220%	-9%
Germany	-207%	-4%	1%	-111%	-114%	-228%	-10%
Italy	-200%	-23%	0%	-99%	-85%	-208%	-4%
Japan	-214%	32%	-1%	-128%	-107%	-205%	4%
Spain	-258%	-26%	-7%	-120%	-129%	-282%	-9%
UK	-235%	-5%	-4%	-125%	-121%	-255%	-9%
USA	-173%	20%	-2%	-109%	-88%	-179%	-3%
Brazil	-189%	30%	-1%	-120%	-107%	-197%	-4%
China	-62%	75%	-17%	-62%	-54%	-58%	6%
India	-67%	47%	-8%	-36%	-72%	-68%	-1%

ACCUMULATIVE UNIT PRICES IMPACTS FROM HSBC MODEL (2008-2012)

For us, a model whose biggest deviation versus the real figures is limited to 10% is a quite reliable model. We can drive relevant conclusions from the table above, being our focus on reducing unit prices for the sake of more accesible, rich and cheaper mobile services for users.

- All European countries, save France, have increased their negative operating costs impacts on unit prices over the
 period (which is positive), while the rest of the world operators have significantly increased their positive operating
 costs impacts (which is negative).
- Competitive intensity impacts are surprising. After many years listening to the EU policies being the advocates of
 competition, at the aim of reducing users prices, it comes out that its impact is close to nil, compared with other
 impacts. Recently, with the new EU government in place, it seems that they have realised such a mistake, but it will
 take time before policies are really updated in this regard.
- It is clear that static factors are far less important than dynamic factors, as shown in the table above. But EU regulators
 have, somehow, neglected the importance of dynamic factors, as we have seen in the Austrian merger case between
 Hutchinson and Orange. Food for thinking.
- Investments are close to half of the impact of negative influence in unit prices reduction (which is positive). Thus, operators capex is key for this reduction. However, as previously stated, the operators global capex would decrease its growth in the coming years. Bad news to get to the minimal unit prices objective.
- Users learning time impact is surprising as well. Its impact is quite close to the investment impact. Being a bit ironic, we would propose operators to promote a sort of friends and family program to spread the availability of new services (driven by new technology) and speed up the learning of potential users. It would be easy, well received by clients and will drive unit prices down significantly.

REPREMIUMIZATION

Ver the last decade telecommunications market has undergone a process of commoditization of services that has led to a constant price war and therefore dwindling margins. The trigger has been the lack of differentiation between the services in the eyes of consumers. Telecom operators have based their marketing campaigns just on price and promotion. Commercials hardly have ever tried to educate customers about other traditional sources of differentiation such as technology, innovation or investments required to deliver quality network service. So, the main result is how consumers today just look for the cheapest price as the main selection criteria to choose an operator.

A lever against commoditization is the pursuit of premiumization or repremiumization in the telecom services, to differentiate the product portfolio and the brand from competitors, and at the same time raise the value perceived by consumers and therefore their willingness to pay for telecom services and loyalty. Some general drivers of premiumization are related to:

- Aspiration Aspiration drives the premiumisation process of a brand, product or service.
- **Customization** Products and services customization to reach a closer fit to consumer needs.

Increase the well-being	easier consumer lives.
Brand image	Companies should be seen as a consistent and accessible reference for consumers. Any effort toward repremiumization must be aligned with brand values.

In particular, telecom operators have a long path to raise their value proposition levels in different matters like:

- Empowerment of customer digital experience through enhanced services according to the strong digital lifestyle of a significant part of their customers portfolio and the new technological possibilities.
- Shift on communications to experiential attributes rather than strongly comparable and lowly valuable propositions based on price and features.
- Repremiumization initiatives must be embedded in the company culture, values and processes to ensure commitment making it sustainable over the time and becoming a differentiation factor from competitors.

Regarding the new EU position, we include below a summary of its planned actions regarding ICT future. We hope that this will drive to the 2020 objectives. The seven pillars proposed have to be tracked closely after many delays in the EU plans (remember Lisbon).

In the face of the deep crisis affecting its economy and society, Europe needs to tap into new sources of growth in areas that will reinforce its competitiveness, drive innovation and create new job opportunities. (European Commission)

As the world moves rapidly towards an Internet-based economy, directly affecting everything from traditional services such as banking and insurance to new sectors such as online retail, and from industrial production to energy supply, ICT is increasingly seen as a source of the smart, sustainable and inclusive growth envisaged in Europe 2020. However, Europe lacks a genuine single market for electronic communications. The Union is fragmented into distinct national markets and as a result Europe is losing out on a major source of potential growth. The European Commission therefore welcomes the conclusions of the <u>2013 Spring European Council</u>, calling for measures to create a Single Telecoms Market as early as possible.

Three years of consultations, public events and private meetings inform these proposals - including two major public events with 1.000 participants in June. On 11 September 2013 (<u>calendar</u>), we adopt a legislative package for a "Connected Continent: Building a Telecoms Single Market" aimed at building a connected, competitive continent and enabling sustainable digital jobs and industries.

<u> Pillar I: Digital Single Market</u>

Pillar II: Interoperability & Standards

Pillar III: Trust & Security

Pillar IV: Fast and ultra-fast Internet access

Pillar V: Research and innovation

Pillar VI: Enhancing digital literacy, skills and inclusion

Pillar VII: ICT-enabled benefits for EU society

It seems that EU will allow now domestic markets consolidation and repair and even cross border M&A to reduce fragmentation. This could lead to many M&A opportunities, as indicated below (at January 2015, we assume that many more when this report is published).

COUNTRY	BUYER	TARGET	TARGET OWNER	COMMENTS
Belgium	Telenet	Base or Mobistar	KPN/Orange	Voo could be interested
Belgium	Mobistar	Base	KPN	Sinergies and price increase for Telenet MVNO
Denmark	Telenor/Telia	TDC	TDC	Footprint expansion
Denmark	Telenor/Telia	Telenor DK/Telia DK	Telenor/Telia	Maybe a JV
France	Iliad	Bouygues Telecom	Bouygues	Sinergies to avoid roaming costs
France	Altice (Numericable)	Bouygues telecom	Bouygues	Fixed/Mobile convergence
Germany	Vodafone	United Internet Access	United Internet	Moving lines to cable
Italy	Vodafone	Fastweb	Swisscom	Fixed/Mobile in a country with no cable, sinergies and good price
Italy	3 Italia	Wind mobile	Vimpelcom	Sinergies and good price
Italy	Vodafone	Wind Infostrada	Vimpelcom	Good price

M&A OPPORTUNITIES

Figure 22

M&A OPPORTUNITIES

COUNTRY	BUYER	TARGET	TARGET OWNER	COMMENTS
Italy	Telefonica	Telecom Italia	Telecom Italia	Who knows?
The Netherlands	KPN	Tele2	Tele2 Netherlands	Buying spectrum
The Netherlands	Telefonica	KPN	KPN	Why not?
Spain	Orange or Vodafone	Yoigo	Telia	Spectrum value
Portugal	Altice (Numericable)	Portugal Telecom	OI	Sinergies with Cabovisao and fixed/mobile convergence
Sweden	3 Sweden	Tele2 Sweden	Tele2	Maybe good price
UK	ВТ	O2 or EE	Telefonica/DT&Orange	Fixed/Mobile convergence
UK	Hutchinson (3UK)	O2 or EE	Telefonica/DT&Orange	Fighting BT
UK	Talk Talk	Tesco Mobile	Tesco	Access to stores
UK	Sky	Talk Talk	Talk Talk	Building fiber
UK	Vodafone	Talk Talk	Talk Talk	Building fiber presence
UK/Europe	Vodafone	Liberty Global	Liberty Global	Buying cable all over Europe
ИК	Softbank or ATT	Vodafone	Vodafone	They want to enter in Europe

Figure 23

According to Barclays Equity Research (November 2014), these M&A deals would lead to:

- 5 to 9% Opex savings
- 12 to 15% Capex savings
- About 1% revenues synergies

Of course, these figures would differ in each specific case but will improve the situation of the European telecom market.

We think that the reasons why Europe is lagging behind USA in telecommunications services have been outlined. The old superiority of European telecommunications services by the times of GSM is over. Let get now into more detailed potential reasons for the European telecom weakness.

CRITICAL SUCCESS FACTORS IN PMI

he Post Merger Integration (PMI) is a critical phase to realize value of a merger. PMI phase can make the difference between value creation deal (adding value above the sum of the parts) and value destroying deal. However PMI phase is impacted by complexity of the operation, time compression or the unfamiliarity of it for the executives.

In this context, 5 streamlines are key to ensure business as usual, integration and transformation of the NewCo: Strategy, Leadership and Organization, Change Management, Integration Management and Synergies

Strategy - To succeed in a merger and acquisition process the acquirer has to clearly identify the problem to be addressed at an early stage of the process (pre-acquisition), defining a sound strategy and detailing objectives to reach. This global strategy would help to define deal criteria and target selection and at the same time prepare the organization for the coming complex process.

Leadership and Organization - A first step in PMI phase is to identify and determine the executives' team to lead the process, as well as the organization, areas of responsibility and roles. The allocation of the right profiles is the key to ensure resources, commitments and focus on the process. This team will be responsible for defining the combined company, planning the integration, identifying synergies and setting a clear communication and reporting system.

Change Management - Strong external and, particularly, internal communication plans allow different stakeholders to understand merger benefits and value

generation. Fluent communication makes the alignment of interests easier and maintains rumors away. Besides communication, change management success in an integration process demands special attention to cultural particularities and differences between both organizations concerned.

Integration Management - For each particular situation the integration process and scope has to be defined depending on particularities of parts, intended objectives and external factors, derived from strategy. To maximize deal value, integration planning shall start during the final phase of the closing of the deal with the organization design, integration project work streams definition, synergies target quantification or the communication plan. All the integration process is managed by a full-dedicated project management office with specific resources to ensure commitment.

Value Creation - One of the main goals both companies are looking for in a merger is to elicit positive synergies in cost and revenues. Identifying and estimating synergies in a pre-merger analysis are the keys to determine the deal price, however it's not an easy task and there is a risk of deviations, therefore, a loss of value risk in the PMI phase. Creating value not only comes from synergies, as economies of scale, value chain integration, product and brand optimization or best practices sharing, but also from maintaining current value, in particular through key people retention and customer retention. Certainly, it is remarkable that negative synergies exists and must be carefully considered, like integration costs or the potential increase in employee benefit costs in order to align salary levels.

4.2.2. Capex versus margins

At this point, we may ask: why operators can not invest more and improve their unit prices and the quality of their services?

Falling unit prices (increasing value for money users receive) are driven mainly by investment, as we have seen above. Those operators able to achieve sufficient profitability to support high investments will be those that provide the lowest unit prices. The fundamental reason for introducing a new technology or improvements in the existing ones is lowering unit costs. This would reduce marginal usage cost and marginal price. Traffic volume will grow and this will lower average unit cost and average price.

Thus, the first question can be changed to a different one: what should be the profitability level required to sustain network investment, at the aim of minimising unit costs and prices?

In the HSBC report mentioned before, an analytical model was developed and their conclusion was that an EBITDA/Revenue ratio between 35 to 40% was needed to make sure that the level of investment would drive the right technological upgrades to keep unit prices at the optimal level. Operators not achieving this ratio would be unable to update their network to deliver low unit prices and, subsequently, attractive profitable prices for their services. Not many European operators are in such a level of profitability, thus, the M&A activity depicted above seems to be valid.

An empirical analysis presented in the above referred report (addressing 16 countries over the 2001-2011 period) and using two innovative concepts, Capex per user (CAPU) and margin per user (that means EBITDA divided by the number of subscribers (MAPU)), shows that its correlation is statistically significant. But this is true up to a point. At this point, CAPU relies less in MAPU and is better combined with the potential market growth (PMG), as shown in the next chart.

TEM REPORT

CAPU AND MAPU CORRELATION



Figure 24

In the analysis, the transition point occurs at a MAPU of 104 \$, while in the analysis from F. Jeanjean, already mentioned, the transition takes place at 117 \$, this is why we have set the 110 \$ mark as an average. In fact, up to the breakpoint CAPU is quite well correlated with MAPU. After this point, CAPU correlates with the product MAPUxPMG.

The conclusion is that margin drives capex, but only up to a point. This point is about 110 \$ margin per user. Beyond this point, capex is influenced by the market conditions and the growth potential. In a low penetrated market, network investment continues at a rapid pace because there are opportunities for growth. In a saturated market, there is less incentive to spend on CAPU. The breakpoint means a CAPU of about 70 \$. We have to estate that these are orientative figures and will change depending on countries, operators and market conditions, but it is a first approximation to the relationship between capex and margins.

Before the breakpoint, additional margin is invested in additional capex because it is efficient. Beyond the breakpoint, additional margin, once achieved an efficient investment level, is spent in other areas.

What are the MAPU levels in Europe? Are they above or below the 110 \$ theoretical mark? An HSBC analysis done in 2013 indicates that, save Belgium and Switzerland, the rest of countries are below this mark, with UK close to half of the 110 \$ level, as shown in the table below.

2013 MAPU IN \$

	2013 MAPU in \$ (HSBC est)
Belgium	112,5
Germany	81,4
Italy	90,7
Portugal	74,3
Spain	94,8
Switzerland	217,9
UK	63
France	106,5

Figure 25

Consolidation to diminish fragmentation, allowing European operators to reach the EBITDA/Revenue levels needed for efficient network investments and also EU investments to recover from the crisis, are the key points to really launch the Digital Economy concept in our continent.

Using data from the *UBS European wireless database* for the period 2007-2011, five years in the middle of our ten years period under study, we want to check one of the European countries and also the European operators, which are part of our sample, with relevant mobile operations during this five years period, regarding the MAPU and CAPU perspective. The selected country is Spain and then we will proceed analysing Vodafone UK, Telefonica Spain, Telecom Italy and Orange.

4.2.2.1. Spanish operators case

In the case of Spain, we have analysed Telefonica Spain, Vodafone and Orange. Results are shown below.

SPANISH OPERATORS MAPU (€)



Figure 26

The Spanish MAPU reduction rate in the last three years of the period is a 12,6% reduction per year. If we assume additional reductions in the range of 10% to 13% for 2012 and 2013, this will lead to a Spain's market MAPU in 2013 in the range of 93\$ to 97\$, which is coherent with the MAPU (94,8 \$) shown for Spain in the table above for 2013.

Regarding CAPU in the Spanish market, results are shown below.



SPANISH OPERATORS CAPU (€)

In 2011, the Spanish CAPU was at 31\$ approx. Should we assume that, in the case of the Spanish market, CAPU is driven only by MAPU because the Spain's CAPU is well below the estimated 60\$ mark we have referred to above? This may well be so. In fact, this may be a signal of underinvestment in the mobile Spanish market, that, we suspect, could be extended to Europe.

4.2.2.2. European operators case

Just to clarify and prove this signal, let's analyse the figures of the selected mobile operators from our sample.

EUROPEAN OPERATORS MAPU (€)



Figure 28

EUROPEAN OPERATORS MAPU EVOLUTION (€)



From 2008 to 2011, the MAPU for this set of operators diminished by a 7,7% per year on average. If we assume additional reductions in the range of 8% to 10% for the following years, in 2013 this MAPU would stand at the range 120 \$ to 123 \$, that is close to the 117 \$ indicated by F. Jeanjean in the previous mentioned paper. The figures for Vodafone are also coherent with the MAPU indicated for UK, despite Vodafone MAPU is higher than UK's average (80 \$ versus 63 \$).

Regarding CAPU, figures are shown below.

EUROPEAN OPERATORS CAPU (€)



Figure 30

EUROPEAN OPERATORS CAPU EVOLUTION (€)



Figure 31

As we already saw in the case of Spain, CAPU for this set of operators have stabilised at the 32 \$ level, showing again the same signal of underinvestment that we had detected for the Spanish case.

The conclusion is straightforward: in Europe, despite a MAPU higher than the 110 \$ set as the MAPU-CAPU break point, CAPU is close to half the 60 \$ level, indicated as the optimal CAPU for technology renewal and sustainability. This adds up to our thesis of underinvestment in mobile infrastructures in Europe.

4.2.3. Capex versus competition intensity

In the previous section we have analysed the relationship between capex and margins. But investments should also be related to the competition intensity in a given market. If the competition intensity in a market is low, there is little motivation to invest because clients have, practically, no choice but to buy what is offered in the market. To the contrary, if competition intensity in a market is very high, operators also have little motivation to invest, because they will get very little returns from their investments (Schumpeterian effect).

A paper written in May 2014 by Georges Vivien Houngbonon and Francois Jeanjean, "Is there a level of competition intensity that maximizes investment in the mobile telecommunications industry?", provides clear insights into the question.

The authors included a panel of 187 operators from 77 countries for the period 2003 to 2012. The variables used were 1 - Lerner index (equivalent to 1- (EBITDA/Revenue)) to measure the competition intensity and operators Capex as the investment variable.

They found an inverted U relationship between competition intensity and investment. The level of competition intensity that maximizes investment stands at 62%, thus the maximum investment level is reached when EBITDA represents a 38% of total revenue. It shows that the potential technological progress, measured by the impact of investment on the reduction of the marginal cost, is the main determinant of the investment maximizing the competition level.

Despite the scope of the model included mobile operations only, let's extrapolate and apply the above reasoning to the Spanish market as a whole in the period 2012-2013, before the sales of ONO and Jazztel to Vodafone Spain and Orange, just to check which operator was overinvesting or underinvesting, according to the previous approach. It's clear that the above conclusions can not be applied to a specific case but have to be understood as a rule of thumb in this matter.

4.2.3.1. Spanish operators capex versus competition intensity case

The 1 - Lerner index approach to measure the competition intensity felt by each operator (Telefonica, Vodafone, Orange, ONO and Jazztel), leads to the following results in Spain:



COMPETITION INTENSITY IN THE SPANISH MARKET (2012-2013)

Figure 32

The 62% rule on competition intensity are somehow close to Telefonica Spain and ONO, but far away the competition intensity felt by the rest of operators, with Jazztel leading the pack. Telefonica Spain and ONO were close to the optimal competition intensity to maximize investment but the rest, mainly Jazztel, were in a difficult situation. Vodafone Spain and Orange belong to groups with deep pockets that can afford investments to increase its market presence, as we will analyse later. But, how does it compare to the capex volumes of each of the operators?



CAPEX/REVENUE IN THE SPANISH MOBILE MARKET (2012-2013)

Figure 33

In 2013, the European Capex/Revenue average stood above 14%, while Telefonica and Vodafone were at the 11% level. Regarding the analysis above, it is noteworthy:

- Only Telefonica and ONO present a competition intensity below the optimal. This means that they have EBITDA/ Revenue ratios above 38%. It is surprising the low capex level at Telefonica.
- The rest of the operators present a competition intensity in the range of 70-80%, far from the optimal point at 62%. This implies quite low EBITDA/Revenue ratios, that may justify low investment in the Vodafone and Orange cases.
- It's remarkable the Jazztel's high Capex/Revenue figures while its competition intensity is higher than 80% (EBITDA/ Revenue lower than 20%). May be they were strengthening its infrastructure to face its acquisition, that took place in 2014.

As we know, in 2014, ONO was acquired by Vodafone at a price of 7,2 B \in and Jazztel was acquired by Orange at a price of 3,4 B \in . But, what would have happened if these transactions would have taken place in 2011, regarding competition intensity and investment?



COMPETITION INTENSITY IN THE SPANISH MARKET (IF TRANSACTIONS BEFORE 2012)

Figure 34

We can see through these figures that Telefonica holds a 20 points difference in competition intensity with its competitors, despite the acquisitions of ONO and Jazztel, but Vodafone has slightly approached the optimal competition intensity point at 62%. Orange moves away from the optimal point after Jazztel acquisition.

CAPEX/REVENUE (IF TRANSACTIONS BEFORE 2012)


Vodafone and Orange improve its investment figures after the acquisitions. We expect that, in 2014, Telefonica and Vodafone (Sprint project) get aligned to the expected European Capex/Revenue ratio of 16%.

We would also analyze the mobile market in Spain (fixed operations not included) for the period 2007-2011, like we have done in the section before, dealing with CAPU and MAPU concepts.

In the mobile market, the competition intensity for each operator is depicted below along this period.

COMPETITION INTENSITY IN THE MOBILE BUSINESS IN SPAIN



Figure 36

As we can see, Telefonica Spain keeps a low level of competition intensity though growing smoothly over the period. Orange is far away the optimal 62% point, but Vodafone behaves quite close to the optimal though deviating in the last two years of the period. However, total market competition intensity over the period is in the range 58% to 65%, close to the optimal 62%. Now, let's have a look at the capex from each operator over the period.



CAPEX/REVENUE IN THE SPANISH MOBILE MARKET

Figure 37

The correlation coefficient relating competition intensity and investment reaches a value of 0,206, that means that, despite not very strong, there is a correlation.

4.2.3.2. European operators capex versus competition intensity case

We can also apply this reasoning to the set of operators selected from our sample, like we have done in the previous section devoted to margins and investments. Now we will try to find a relationship between capex and competition intensity for European operators.

The competition intensity for the set of selected operators follows.



COMPETITION INTENSITY FOR EUROPEAN OPERATORS

Figure 38

Given the high competition in the UK mobile market, above figures for Vodafone UK can be expected (HHI lower than 20%). Telefonica and Telecom Italia present low and quite similar figures for competition intensity. Orange in France is the operator running closer to the optimal 62% in the inverted U relationship between competition intensity and investment and the total average of these operators presents a range between 58% and 62% which is quite relevant regarding the optimal investment point.

Let's see what is the Capex/Revenue ratio for these operators during the period.



CAPEX/REVENUE FOR EUROPEAN OPERATORS

Figure 39

Telefonica and Orange low levels of investment are surprising. Even Vodafone UK, in a much higher competitive market beats the investment ratios of both of them, while Telecom Italia keeps a guite healthy ratio of investment.

The correlation factor between competition intensity and investment for these four European operators is 0,3224, stronger and much higher than the one presented for the mobile Spanish market calculated above.

As a conclusion, like other reports have shown, there is a non negligible relationship between competition intensity felt by each operator and investment, as we expected.

But, once proven the relationship above, another question arises: is there also a correlation, not in case of individual operators, but markets as a whole, between the competition intensity in the market and the investment in the country? In such a case, which is the correlation factor?

Usually, the Herfindahl and Hirschman Index (HHI) is used to assess the competition intensity level of a sector in a country. HHI is related to the sum of the squares of the market shares of all players operating in the sector, expressed in percentage points. In a perfect monopoly, HHI amounts to 10.000 and in a very competitive market its value is close to nil. HHI is also expressed as a percentage of its maximum value. By the way, a lower HHI means a more competitive market.

The EU (and the USA) uses this index to assess M&A processes and check the impact on competition intensity in a given market after such events. The EU considers that a competitive market should present an HHI close or lower than 1.500 (or 15%), something difficult to achieve in a capital intensive and fragmented sector. Following this criteria for the domestic telecom sectors may lead to returns lower than needed to keep a healthy investment that secures technological renewal, as the EU is recently realising. This is a good approach to evaluate what would be the impact on HHI if a global telecom European market is considered, reducing fragmentation, something that we will analyze later in this section.

In this regard, we have analized the binomial competition intensity versus country operators capex in ten major European countries in 2013, that we deem representative of the European telecom sector. Sources of data analysis are Altran own calculations, operators web information and the *Exane-Arthur D. Little report 2013: Capex, the long march.*

The HHI of each country under study in 2013 is depicted in the next figure.





Figure 40

As expected, the only market in Europe with HHI lower than 20% is UK and The Netherlands follows suit with a 25% HHI. Belgium leads the pack with a 44% HHI, that means being the less competition intensity country of the ten under study. The rest of countries are in the 30% to 40% HHI range.

The Capex/Revenue versus HHI for each country follows.

CAPEX/REVENUE AND HHI

	Capex/Revenue	нні
ик	11,26%	19,85%
Sweden	11,91%	36,45%
Spain	12,76%	38,85%
Germany	14,91%	34,58%
Belgium	15,37%	43,85%
Austria	15,41%	38,14%
Portugal	15,93%	34,52%
France	16,52%	35,56%
The Netherlands	16,53%	25,07%
Italy	19,03%	38,90%

Figure 41

What is the correlation, if any, between these two variables?. The results are depicted in the next figure.



CAPEX/REVENUE AND HHI CORRELATION BY COUNTRY IN 2013

Figure 42

The correlation factor is 0,3251, practically the same as we have found comparing mobile operations of four European operators analyzed above. Thus, we can infer that telecom investments in a market and competition intensity in this market are also correlated, in this case, **including mobile and fixed operations in the country**, something that we deem relevant.

But what is still pending is the question: what would be the competition intensity in a single European telecom market?. Considering that we can extrapolate the results of these ten countries to the future single market (but with 2013 figures), that we deem plausible, the results would be:

REVENUE AND MARKET SHARE

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Figure 43

This would lead to a 11,48% HHI for such a single European telecom market, well below the 15% mark stated by the EU as the level of a competitive market. In this unified market, synergies of scale and reach together with the inherent consolidation that would take place, would allow for stronger European operators with margins and financial muscle to optimize investments and really buid up the Digital Economy in Europe.

Just to draw the top 12 operators with bigger market share in this European single market (by 2013), check the graphic below. Obviously, this can change if the M&A potential events, previously commented in this report, take place.



TOP 12 OPERATORS MARKET SHARE IN A SINGLE EUROPEAN MARKET

Figure 44

INVESTMENT AREAS FOR TELECOM OPERATORS

Nowadays operators are in a market of high competition: internal, against other operators, and external, against OTTs. The search for quality differentiation and new consumer trends such as connecting devices, streaming media or greater reliance of users on its devices in their daily life, will demand an exponential growth in data traffic. According to "Ericsson Mobile Report-June 2015" growth in data traffic will reach 6,2 ExaBytes (EB) per month by the end of 2020 in Europe (8 times more than in 2014). In addition, the search of new revenue streams makes operators to invest in complementary business activities. In this market context telecom operators are facing a capex intensive cycle in different areas.

As in previous years, operators will continue to invest in 4G mobile networks with and expected global investment of €170 billion until 2020. This new CAPEX in 4G addresses two needs, the increase of the network coverage in Europe from around circa 70% to 95%, and the improve capacity. 4G technology will increase speed and the ability to customize services resulting in a better customer experience, as well as efficiency.

In fixed communications and broadband, the optical fiber (FTTH) is one of the biggest challenges that are

taking place in the networks. The commitment of European Digital Agenda 2020 regarding FTTH aims to achieve a coverage rate of 100 Mbit/s higher than 50. The investment required to achieve a full coverage of FTTH in Europe range from \notin 200 and 250 billion. Exponential data traffic growth for the years to come relies on FTTH as in 4G, the only way to meet demand. Besides, the development and operation of FTTH networks provide gains in efficiency due to lower operating costs.

Increases in speed, in both networks, open a range of new services where operators must invest if they want to compete. Among them are TV services across multiple devices, music, games and other media content in streaming that operators must make available to its customers. As well they must include services based on other technologies as Cloud, internet of things (IoT) or M2M where several strategies are adopted: infrastructure investments, partnerships or purchase of companies that already offer these services. While in these domain, telecom operators face intense competition from current players and new entrants, in particular from OTTs.

LINKING TELECOMS REGULATION AND NETWORKS INVESTMENTS

On the last decade, European operators have found it hard to carry out high investments in network infrastructure to meet Europeans demand for high speed services due to hash market regulation and policies defined as "the toughest in the world" by HSBC in its Global Telecoms Regulatory Heatmap report. This tight framework has shed uncertainty regarding operator's ability to monetize the capex investment needed to follow customers' demand, damaging innovation and productivity.

As operators found themselves unable to transform investment in revenues, European fixed-line and mobile platform deployment has been restrained compared to other developed regions around the world in the last 10 years. Under this scenario, European Commission has published non-discrimination and cost methodology recommendation in 2013 - which is set to last until at least 2020-, increasing the flexibility of operators to set their own wholesale fibre prices.

This new policy environment and the European commissioner's determination to improve regulatory landscape, providing mechanisms to allow consolidation while the European Telecoms Single Market (TSM) arrives, are encouraging telecom operators in Europe to increase spending again. This current situation in the EU closely follows US telecom operator's behavior in the last decade, where policy makers (Federal Communications Commission) also adapted US regulation to foster network and platforms upgrades and deployment, abandoning unbundling and permitting consolidation.

Contrary to EU tendency, nowadays US industry is transitioning to a more fragmented and regulated situation due to the Government policy on net neutrality and the FCC series of policies that clearly benefit small market players over the larger ones (AT&T and Verizon).

Although EU telecom market seems to have begun a new investment cycle, it is remarkable that the European network infrastructure has fallen a long way behind other developed regions such as US, and that there is still a long way ahead to meet international peers.

Regarding investment and regulatory cycles, US highinvestment slot lasted about 10 years, meanwhile the European capex investment-constrained scenario, favoring arbitrage and resale over capex, lasted about 15 years. These two periods are merely indicative since both cycles are likely to accelerate in the future due to a length reduction in the technology products' life cycle, forcing policy makers to become more agile to be able to meet consumers demand and technology innovation.

Wavelength of regulatory cycle seems twice that of technological cycle: regions acquire technological leadership, toughen regulation, which discourages capex, costing them technological leadership - and then lighten regulation to regain technological leadership.



5

Network Vendors



5.1. Value evolution

In the telecom operators sample there were a selection of the biggest (in terms of value) operators in Europe and America, that won't cover the total value of telecom operators worldwide (despite they are a significant sample). In the case of network vendors we would say that we are representing the global sector. They are global companies serving a global business and they have a worldwide reach. Thus, in this case, the conclusions we can derive from the analysis below really represent the global behavior of this segment.

The value evolution of the network vendors segment over the period is shown below.

NETWORK VENDORS MARKET CAP EVOLUTION



Figure 45

The highest value reached is close to 500 B\$ while the lowest one is close to 200 B\$. In the last six years it has been moving in the high 200 B\$ mark and the low-medium 300 B\$ level. Let check the initial and final values for this segment.

NETWORK VENDORS TOTAL MARKET CAP GROWTH FOR THE PERIOD



Figure 46

This means a 8,22% growth in ten years, not very impressive. Let see what has been the individual vendors growth in the sample, trying to get some conclusions.



NETWORK VENDORS MARKET CAP EVOLUTION



We may derive some conclusions that we will analyse in detail later on:

- A quite drastic value loss for European vendors over the period, save Ericsson.
- A dismal value behavior of USA vendors over the period. Cisco and Juniper present small value losses while Qualcomm more than double its value.
- Despite their growing importance, Asian vendors still represent a fraction of the global sector value, that is still dominated by the USA firms.

Let see the growth of each company in the last ten years.

NETWORK VENDORS MARKET CAP GROWTH OVER THE PERIOD



Figure 48

Only Qualcomm and ZTE have increased its value over the period, ZTE coming from a very small value figure. Alcatel and Nokia have lost half of its value in ten years, which is annoying. Even Cisco has not increased its value, something weird. The segment split is shown in the next figure.

NETWORK VENDORS MARKET CAP SPLIT



Figure 49

All European vendors reduce their value share, Cisco holds its position and Qualcomm, with more than one third of value share, is challenging Cisco supremacy.

Let compare the behavior of European and USA network vendors.

5.2. Europe vs USA network vendors analysis

Let compare the value evolution of European and USA network vendors clusters.

EUROPEAN NETWORK VENDORS MARKET CAP



Figure 50

After reaching a peak at 180 B\$ by the end of 2007, their value has been in the 60 to 80 B\$ range, with a low of 40 B\$ in 2012. They have lost close to half of its value since the beginning of the period, which is abash.

USA NETWORK VENDORS MARKET CAP



Figure 51

Peak close to 300 B\$ and low at 150 B\$ in 2009. After that, they have been in the 200 B\$ range, but they have grown over the period.

Let have a look at the market cap split of both clusters at the beginning and end of the period.



USA AND EUROPE NETWORK VENDORS TOTAL MARKET CAP SPLIT

Figure 52

European network vendors only represent one fifth of the clusters combined value when they had more than one third at the beginning., which is sickening somehow.

Find the initial and final market cap values for both clusters in the next figure.



EUROPE AND USA NETWORK VENDORS MARKET CAP AT START AND END

Figure 53

As advanced, European network vendors have destroyed value in ten years, while American ones have increased value, although modestly for a ten years period.

The percentage of gains and losses are depicted below.

NETWORK VENDORS MARKET CAP GROWTH (USA AND EUROPE)



Figure 54

ICT MARKET CONCENTRATION MOVEMENTS

n mature markets with high competence and tight margins like the telecom vendors industry, which is impacted by Asian competitors, or the telecom operator one, in mature markets like Europe or USA, concentration M&A deals appear as a strategy among competitors looking for gaining size and market share, entering in attractive or complementary markets, or synergy alignment to gain competitiveness

In this sense, significant examples of concentration deals have taken place in recent years resulting in fewer companies with higher power in its respective markets:

Arris acquisition of Motorola Home (2B€) (April 2013)

ARRIS is a premier video and broadband technology company with an emerging international presence. The acquisition of Motorola Home allows them to arise in those international markets with less financial risks as diversification grows. The result of the combination of both companies is a global player in video delivery and broadband technology.

Telefonica Deutschland acquisition of E-Plus (8,1B€) (July 2013)

Telefonica, who already owns O2 Germany, bought the smallest German operator to combine both companies producing a new player who could compete against T-Mobile and Vodafone Germany.

Vodafone buying ONO (7,2B€) (March 2014)

Vodafone's recent acquisition of Ono creates a leading combination of both fixed and mobile in the Telecom market. This was an answer to Telefonica movements, and with this move Vodafone ensures as well a strong broadband infrastructure plus a TV platform to compete on the new quad play market.

Vivendi sells SFR to Numericable (13,5B€) (April 2014)

This movement allows Numericable group to face the market leader, Orange, with a quad play product. Growth potential is another objective in this transaction.

Lenovo buying Motorola Mobility (2,55B€) (October 2014)

Lenovo is known as the strongest player in the PC market. Their mobile department is less known in western markets, e.g. market share in the U.S is zero, but it has a relevant presence in Asia, being the leader in developing countries. Lenovo wants to get more presence in new markets to have a chance to face PC market and China decelerations. Motorola appears then as a valuable asset because of the power of the brand, with a high presence in USA.

An example of the current consolidation stage in Europe, could be seen nowadays in the French market. After the irruption of Free mobile, who grabbed a 15 per cent share, competition became strong between companies. Now, after the operation stated above, Numericable-SFR aims to acquire Bouygues, the third operator group in France, through a takeover bid of 10M; it will reduce the number of the French market players to three if government and regulator approve the operation that will evict Orange as the largest mobile company in France.

6

Terminal **Vendors**



6.1. Value evolution

We are firmly convinced that the set of vendors included in this sample really represent the behavior of the global segment. They have been selected based on the market cap they held by the end of 2014. We have not included Huawei and Xiaomi in this segment because their value related to terminal sales is not yet relevant. Thus, we face a clash between a single USA vendor and a bunch of Asian vendors. As of today, Apple, the sole USA vendor, is winning the battle.

A recent report from ABI Research (February 2015), whose summary we attach below, supports our statement.

ABI Research reports that certified Android smartphone shipments fell quarter-on-quarter for the first time in 4Q 2014. In what is traditionally a shipment spike quarter, certified Android shipments fell from 217 million in 3Q 2014 to 206 million in 4Q 2014, mainly due to Apple iOS' 90% growth from 39.3 million to 74.5 million iPhones shipped, but also due to forked Android.

"Google's Android is being attacked by Apple's iOS at the high end and forked Android and AOSP at the low end in high growth emerging markets. The Android One initiative has slowed forked Android and AOSP growth outside China, but Apple's success has taken the high end of the market away from certified Android's premium tier vendors," said Nick Spencer, Senior Practice Director, Mobile Devices, ABI Research.

"4Q 2014 has been a seismic quarter in the smartphone industry and many premium tier Android vendors may once again review their operating system and therefore content and service strategies in light of Apple and forked Android vendor Xiaomi's success. Worrying times for Google's mobile services and Android, but it presents opportunity for other service providers and even operating systems," added Spencer.

SMARTPHONE UNIT SHIPMENTS BY OS

SMARTPHONE UNIT SHIPMENTS BY OS WORLD MARKET: 3Q 2014 TO 4Q 2014					
OPERATING SYSTEM	SHIPMENTS	3Q 2014	4Q 2014	QOQ GROWTH %	
Android	(Millions)	217.49	205.56	-5%	
Forked Android (AOSP)	(Millions)	85.47	85.00	-1%	
iOS	(Millions)	39.27	74.50	90%	
Windows Phone	(Millions)	9.02	10.70	1 9%	
Others	(Millions)	3.18	2.34	-26%	
TOTAL	(Millions)	354.44	378.00	7%	

Source: ABI Research

Figure 55

Does it mean that there is no way to fight Apple? Who knows, but its preeminence is astonishing so far.

Let proceed to the analysis of the terminals vendors segment. The market cap evolution (equivalent to our concept of value) over the last ten years is shown in the next graphic.





Figure 56

The growth of the value of this segment over this period is really relevant, coming from 100 B\$ to 900 B\$. Needless to say, this comes hand in hand with the launch of new devices like smartphones and tablets and its introduction to the mass market. In the last four years, the value has jumped from 500 B\$ to 900 B\$.



TERMINAL VENDORS SEGMENT VALUE GROWTH

Figure 57

Let's explore now the individual behavior of the terminals vendors in the sample in terms of value growth over the period.



TERMINAL VENDORS MARKET CAP EVOLUTION

Figure 58

We can derive some findings:

- All terminals vendors increase their value over the period under study.
- While at the beginning of the period Apple's value was less than one sixth of Samsung's value, at the end of the period, Apple's value is more than six times the corresponding value for Samsung, a terrific track record.
- Apple's value is more than three times the value of the sum of all Asian vendors together. Apple's win, value wise, is
 incontestable.

Let's check the value growth of each company over the period.

TERMINAL VENDORS VALUE GROWTH OVER THE PERIOD



Figure 59

Apart from the outstanding Apple's value growth, both Lenovo and LG beat Samsung in this regard, but coming from quite low values at the beginning of the period.

Let's see what is the value split at the beginning and end of the period.

DEVICE VENDORS MARKET CAP SPLIT



Figure 60

Apple's value growth is so overwhelming that even Lenovo, whose growth has been higher than 500%, dilutes its participation in the final split. LG comes to less than one third the participation that it had at the beginning. The Samsung case is amazing. With two thirds of segment market value at the beginning, it reduces its value participation more than four times, despite growing in value a 100% over the period. It is clear that Apple's "reverse razor blade" strategy has paid off, while the others were trying to increase market share based on price. Apple has set up an integrated HW plus SW plus Apps ecosystem that his competitors have been unable to duplicate. One of the reasons may be the proprietary nature of IOS, Apple's operating system, that perfectly integrates into its ecosystem, while the others are using Android, whose owner is Google. May be Tizen, Samsung's proprietary operating system, is the next bet of the Korean giant, but it is so far away from IOS dominance that it is unrealistic to expect any impact in the medium term.

6.2. Apple case

6.2.1. Apple versus Samsung

In the last quarter of 2014, Samsung has sold close to three times more devices than Apple. But the results, value wise, are dismal, as we can see from the value evolution of both companies.

SAMSUNG VALUE EVOLUTION



Figure 61

After a peak of about 170 B\$ by mid 2013, value has come down to about 130 B\$ by the end of 2014.



APPLE VALUE EVOLUTION

Figure 62

Apple's value has reached its peak at closing to 700 B\$ by the end of 2014.

But, what are the major differences between Apple and Samsung, terminals wise?

- Apple's "reverse razor blade"strategy is paying off. For those not familiar with the concept, it is quite simple. How
 do make money razor manufacturers?. They sell razors at cost but they strongly charge all spare items or refills. It is
 not Apple's case. They make money out of every step of the selling process. They make money out of terminals sale
 and also out of AppleApps store. They also make money out of spare items and complements to their terminals line.
 Samsung has a different approach, closer to the "razor blade" strategy. This is why they posted a 2014 fourth quarter
 reduction in profits versus one year ago.
- Apple offers a fully integrated HW plus SW plus Apps ecosystem, with interoperability between different devices, that is unmatched in the industry. Samsung do not own the operating system they use for the majority of the smartphones

they sell. Android belongs to Google and this, sooner or later, will pay a toll. IOS fully belongs to Apple. Tizen, the Samsung's propietary operating system for smartphones and tablets, has a negligible market share in the worldwide market and it will take many years to reach a relevant position.

- Apple's user experience and quality of products, save incidents, is second to none in the market, together with an inspirational brand awareness from the users side. Users are proud of owning an iPhone or an iPad.
- Samsung is squeezed in the high end by Apple and in the low end by low cost Asian manufacturers, like Lenovo, Xiaomi and Huawei, thus, Samsung's units shipped market share and profits are declining. In fact, in the fourth quarter of 2014, Samsung and Apple shipped 74,5 million terminals, that means a 20% market share for Apple (coming from a 18% one year ago) and a 20% for Samsung (coming from a 30% one year ago). This has led to a 36% Samsung drop in operating profits in the fourth quarter of 2014, compared to fourth quarter of 2013.

This leads to Apple being the most successful company in history. An excerpt of an interesting article about the ten reasons why this has happened is included later in this paper.

6.2.2. Apple versus Asian terminal vendors

Let's compare the value evolution of Asian terminal vendors and Apple, the sole American vendor in the sample.



ASIAN MARKET CAP EVOLUTION

Figure 63

It presents a low in the 80 B\$ range by the end of 2008 and a peak at 240 B\$ by mid 2013. Since then they have evolved in the range of low 200 B\$.

APPLE MARKET CAP EVOLUTION



After peaking at little more than 600 B\$ by the end of 2012, it went down to a low of 400 B\$ by mid 2013. Since then, it has been growing up to 700 B\$ by the end of 2014.

Let's look at the market cap split at the beginning and end of the period.

VENDORS CLUSTERS MARKET CAP SPLIT



Figure 65

It is astonishing the market cap split of the selected sample by the end of the period, mainly when we see what were the initial split values.

If we draw the initial and final market cap values for both clusters, we reach the results below.



MARKET CAP OF TERMINAL VENDORS CLUSTER

Figure 66

We have to get back to Apple's strategy explanation, that we conducted above in this section, to understand what are the reasons for such a graph.

In a recent analysis from Trendforce (January 2015), they published the trends in the smartphone market from the 2013-2015 period, including the top ten smartphones vendors based on units market share in a global basis, that we show below.

RANKING	2013	MARKET SHARE	2014	MARKET SHARE	2015 (F)	MARKET SHARE (F)
1	Samsung	32,5%	Samsung	28,0%	Samsung	26,6%
2	Apple	16,6%	Apple	16,4%	Apple	16,4%
3	Lenovo	4,9%	Lenovo	7,9%	Lenovo	7,4%
4	Huawei	4,4%	LG	6,0%	Huawei	6,6%
5	LG	4,3%	Huawei	5,9%	Xiaomi	6,5%
6	Sony	4,1%	Xiaomi	5,2%	LG	6,1%
7	Coolpad	3,6%	Coolpad	4,2%	TCL	4,1%
8	ZTE	3,2%	Sony	3,9%	Coolpad	4,0%
9	Nokia	3,0%	ZTE	3,1%	ZTE	3,4%
10	RIM	2,5%	TCL	2,7%	Sony	3,1%
	Others	20,9%	Others	16,7%	Others	15,8%
Units M		927,2		1166,9		1290,3

Figure 67

We can derive some findings from the table above, taking into account that 2015 figures are only forecasts:

- The drastic drop in Samsung's market share from 2013 to 2014. This loss of market share seems that will flatten in 2015. But it is creating trouble in the Korean giant. They are overspending in marketing costs to recover from this drop and profits have been impacted. Its offer is too wide and they have to shrink it, something that the company has announced that will take place in 2015 (30% less smartphone models in 2015).
- The solidness of Apple in the second place, keeping its market share over these three years. As we saw, 2014 last quarter results have been outstanding which means a good 2015 start.
- Lenovo, with its recent Motorola acquisition, is keeping the third spot in the list, with units market share higher than 7%. Together with Huawai, LG and Xiaomi, it is eroding Samsung dominance in Asian markets.
- Huawei, LG and Xiaomi, all in the 6% market share range, add up to a close to 20% global market share, something
 quite relevant if we look into the future.
- Sony is smoothly reducing its market share year over year. Something to pay attention to.
- Nokia (for obvious reasons) and RIM have dissapeared from the top ten terminal vendors list.

The graph form of this table is shown in the next figure.



UNIT GLOBAL MARKET SHARE EVOLUTION FOR TERMINAL VENDORS

Figure 68

After all the above, is Apple the best company ever? Some people think so. We use to say that it may be true, but another company, according to Schumpeter's "creative destruction" paradigm, will arrive to the market and may overtake Apple's records. We do not know how and when it will happen, but for sure, will happen. May be the next technological revolution will come with a new blend of companies that will shadow the performance of present terminal vendors.

6.2.3. Apple strengths

But, for the time being, Apple is the best company in the market. Why?. We summarize below a Mike Elgan's article from February 2015.

- 1. As of today, Apple nearly twices the market value of the world's second most valuable company, Exxon Mobil.
- 2. Apple is the world's most valuable brand. Forbes ranks Apple's brand as twice as valuable as Microsoft (second) and far more valuable than Google (third).
- 3. Apple makes more money than any company ever. In the last quarter of 2014, Apple made a 18 B\$ profit, which is the largest quarterly earnings of any company ever in a single quarter, reaping a 93% of all smartphones profits.
- 4. Apple has a cashflow problem. Yes. Apple doesn't spend enough. It seats on 178 \$B cash that they do not want to return to shareholders for tax reasons.
- 5. Apple has crushed all rivals. All conflicts with Microsoft, Google or Samsung have ended up with Apple winning. The recent alliance with IBM to join forces to address mobile enterprise strategy may be a letal weapon for competitors.
- Apple has mostly solved the phone theft problem, thanks to its Activation Lock feature. Theft figures have been reduced between 25 and 50%.
- 7. Apple has mostly solved the app discovery problem. Its recent partnership with Pinterest will allow users to pin apps to their boards as any other content.
- 8. Apple has mostly solved the China problem. While Samsung is being hammered by local makers, Apple is now the number one smartphone maker in China.
- 9. Apple has mostly solved the wearables problem. Talking about smart watches, Google has felt far short of its plans and has only sold about 720.000 units, only a 15% of a 4,6 millions units in 2014. The analysts predict that Apple will sell between 26 and 37 million smart watches in 2015.

10. Apple biggest bussiness oportunity has barely started. Mobile payments is a very big opportunity for Apple. Google and others have failed badly in this area. But Apple, with Apple Pay, based on convenience for the user, appears to be winning in the U.S. market. As of today, two thirds of all contactless payments in U.S. are made with Apple Pay.

You may agree or disagree with the above expressed opinions. But these are facts or nearly facts. Time will tell whether all predictions come to reality.

NOKIA AND BLACKBERRY COLLAPSE CASES

Research In Motion (RIM) since its creation in 1984 was focused in designing complex wireless data connection networks. By 1999 RIM launched its first telephone device under the BlackBerry brand. After several attempts, in 2003 Blackberry launched products with relative success supported by a QWERTY keyboard, global roaming capabilities, color screen and, the most important, the embodied Blackberry Connect licensing program that allowed connection with the Blackberry Entreprise Server.

By 2006 Blackberry became the must have device for every company manager or celebrity, it was included in every telecom operator portfolio and sweeping competitors in the smartphone market such Palm, HP, Dell or Nokia with its E90. Blackberry had a very strong position in the smartphone market thanks to their brand reputation, its focus on corporate users, the Blackberry Messenger service and the encrypted communications. Blackberry leadership remained until 2009.

However Blackberry lost the initiative in innovation after the first iPhone debut in 2007. Apple introduced new standards in design, ease of use, applications and seamless integration with the Apple portfolio (Mac Book, iPod, iTunes, etc.); immediately it seduced corporate users of Blackberry who use iPhone as their personal device. Furthermore, from 2010 competition in the smartphone segment increased with the launch of Android OS, which became the preferred operating system for vendors like HTC, Samsung or LG.

Within this context of technological and consumer preferences change Blackberry failed to adapt adequately and took erroneous strategic decisions. Among others, Blackberry tried to imitate its rivals away from its essence (Storm and Blackberry Playbook as response to iPhone and iPad), remained prisoner of one of its strengths, as the prevalence of security in its operative system prevented the development of an attractive ecosystem of applications, failed to read new trends in the smartphone market and forgot its customer base that still remained loyal to its products. Most important of all, Blackberry lacked a clear leadership continuously making changes in strategy without a clear direction.

Blackberry moved from a 20% share in the smartphone market in 2009 to less than 0.5% in 2015.

Similarities can be found in Nokia, who was the market leader in the mobile phone handsets industry and failed to adapt to changes in customer demands losing its leadership. Nokia appeared in the telecommunications market in 1960, when its electronics section was founded. Devices developed by this department became the global benchmark in mobile telephony until 2012 when it was surpassed by Samsung.

Although Nokia remained the world leader in mobile devices by 2012, its market share during the previous couple of years was based on its strong position in "dumbphones", a decadent market. In the smartphone league, Nokia focused all its efforts on developing mobile devices that were useful and with a very comprehensive (and complex to use) software (Symbian). But in this process Nokia neglected other market trends that were gaining weight like the importance of software design rather than hardware, the use of user-friendly devices or the importance of an appealing app ecosystem.

The concatenation of these misalignments with market trends together with wrong executive decisions, like the lack of a clear product strategy, the alliance with Microsoft to develop an operating system or the excessive confidence in the brand took Nokia to move from 50% market share in 2007 to less than 10% in 2015.

Similarities between the two cases are important, two leaders in the phone device market that have been relegated out of things by his inability to understand the technological changes taking place in their market.

Value evolution IT vendors



In the IT vendors company's sample, we have included the five companies with the highest market cap by the end of 2014. We cannot say that we are representing the full segment value, but we consider that the value of this sample is quite representative to analyse the behavior of this segment in the last ten years.

The value evolution of the IT vendors segment over the period is shown below.

IT VENDORS SEGMENT MARKET CAP



Figure 69

The highest value reached is about 900 B\$, by the end of the period, while its lowest value has been about 450 B\$ in 2008. Since then, after a fast recovery, it has been growing steadily.

Let see initial and final values for the segment.







The segment value has grown a 50,24% over the period, which is not very impressive. Let see what has been the individual vendors value growth over the period.

IT VENDORS GROWTH 2004-2014



Figure 71

It is remarkable that:

- SAP, together with Oracle, are the two IT vendors that we think have satisfied its shareholders, with quite healthy growths.
- Value growth for HP, IBM and Microsoft is not impressive at all, mainly for IBM.

In absolute terms, the value evolution over the period, follows.

IT VENDORS SEGMENT VALUE EVOLUTION



Figure 72

IT vendors value split at the beginning and end of the period follows.



IT VENDORS SEGMENT (% TOTAL MARKET SHARE)



We can derive some points which are noticeable.

- SAP has kept its value market share over the period, with a small increment.
- IBM as reduced its value market share over the period in about 7 pp, which is quite important.
- HP has managed to lose only 2 pp of its value market share, which is somehow interesting, after a decade of turmoil regarding its business model and M&A activity.
- Microsoft has lost its value market share by 3 pp, that, given that it is the highest value IT vendor, can be considered fair.
- Oracle has doubled its value market share over the period, something that we deem astounding.

CONDITIONS FOR THE DIGITAL ECONOMY IN EU

he ICT sector in Europe accounts an overall size of 874 billion euros in 2013 (25,1% of global market) where Telecommunications Services and Software and Computer Services stand out representing about a third of the total each one. Over the last decade (2003-2013) TV and Video Services together with Software and Computer Services have gained weight among other subsectors from 8.8% up to 11,3% and 25,3% to 28,9% respectively. In contrast, Consumer Electronics market size has decreased a 17,9%, particularly after the 2008 crisis. Compared to Europe, ICT sector in Asia/Pacific and USA reach a slightly larger market size, 1.039 and 1.075 billion euros (around 30% of global market each) respectively.

Although the European ICT market size is similar to the North American and Asian markets, there is a significant imbalance in the nationality of the key players who lead each subsector. In Telecommunication Services and TV and Video Services key players are local. But in Hardware and Software and Computer Services the market leaders in the global market are mainly from USA, while the Consumer Electronics is dominated by Asia. In all of these segments, European industries have a follower position.

In this context, European ICT players require the implementation of policies and measures to improve competitiveness of the industry at global level, such as:

- Promotion of higher public and private investments in R&D.
- Implementation of unified common policies under the European Union.
- Homogenization of regulation among different European countries to facilitate the expansion of players.
- Deregulation to encourage competition supporting technological development.
- Facilitation of financing for ICT companies and all the auxiliary industry and the reduction of tax burden on the sector.
- Ensure skilled labor resources through driven education plans together with an attraction program for skilled immigration.
- Encourage entrepreneurial culture to support emerging companies.
- Promotion of M&A operations in telecommunication operator segment to defragment the market.

According to this the European Commission settled the Digital Agenda for Europe 2020 which takes steps in this direction. Among its targets we can find "Achieving the digital single market", "Enhancing interoperability and standards" or "Investing in research and innovation".

8

Value Evolution Internet companies



In the Internet companies sample there is a selection of the biggest (in terms of value) companies, that won't cover the total value of the Internet companies segment worldwide (despite they are a significant sample). In the case of Internet companies segment we would say that we are representing quite well the global sector. They are global companies serving a global business and they have a worldwide reach. Thus, in this case, the conclusions we can derive from the analysis below really represent the global behavior of this segment.

The value evolution of the Internet companies segment over the period is shown below.

INTERNET SEGMENT MARKET CAP



Figure 74

The lowest value took place at the beginning of the period, around 100 B\$ and the final value has happened by the end of the period, close to 900 B\$.

Let's look at the initial and final values of the Internet companies sample.

INITIAL AND FINAL VALUES FOR THE INTERNET COMPANIES SAMPLE



70

This shows a 427% growth, the highest growth from all segments considered, which is impressive. Let's see what has been the initial and final market caps for all companies in the sample.



INTERNET COMPANIES MARKET CAP EVOLUTION

Figure 76

That leads to individual companies value growth represented below.

INTERNET COMPANIES VALUE GROWTH OVER THE PERIOD



Figure 77

Points to remark follows.

- Google's astounding growth, above 2.000%. The Android's operating system maker, that has also made inroads in smartphones, wearables, mobile payments and, recently, telecommunications services is, may be, the only company facing and fighting the Apple's challenge. However, as we will analyze later, it is still far away from Apple's effectiveness.
- Amazon's also impressive growth, close to 800%. Its global e-commerce reach and its successful positioning in Cloud Services are leading this value increase. Let's see what are its plans, if any, regarding wearables and mobile payments.
- Facebook has also grown impressively after its IPO, reaching above 400% growth since then. It seems that they are
 successfully managing mobile services launch and implementation. We would expect they continue in the line of
 providing more services to their users, increasing its value over time.
- Yahoo and Ebay show a growth over the period not comparable to the three champions.

After all these considerations, let's see how they impact initial and final market value split of our sample.



INTERNET COMPANIES MARKET CAP SPLIT

Figure 78

Some comments on the subject.

- The drastic loss of value market share for Yahoo and eBay, 15 and 24 points respectively. It is obvious they did not find the right strategy at the beginning of the period to manage their market positioning and the services offered.
- Facebook holds its value market share since its IPO, something remarkable taking into account the overwhelming growth of Google and Amazon.
- Google and Amazon's value market share, that has increased 33 and 7 points respectively. The reasons have been explained above.

Nevertheless, is Google capable to fight Apple? Let's analyze the present an future situation.

- Google's brand awareness is far away from Apple's brand. They are ranked third while Apple is ranked first, followed by Microsoft as the second more valuable brand.
- Google has lost every conflict with Apple regarding patents infringements and other issues.
- Apple, thru its recent partnership with Pinterest, has solved the apps discovery problem. This issue is still pending for Android's apps.
- Google has failed with its smart watches strategy. They planned to sell 1.000.000 units in 2014 and they only reached 720.000 units. Meanwhile, analists forecast that Apple will sell between 26 and 37 million smart watches in 2015.
- Google has failed in the mobile payments business while Apple, with Apple Pay, is running two thirds of all contactless payments in the U.S., as of today.
- With its IOS operating system, Apple provides a fully integrated HW plus SW plus Apps ecosystem, with interoperability between different devices, that is unmatched in the industry. This is not the case for the Android operating system, that cannot match IOS integration. In addition, Google develops, updates and maintain Android at its own cost, getting no return from this effort.
- Google has announced its intention to become an MVNO (Mobile Virtual Network Operator), where the MVNO buys minutes of voice services and GB of data services to resell them to users in more convenient conditions. But Google cannot provide an end to end service to its users because they are not a player in the terminals arena. They say they will use it as a platform to experiment with new services for Android smartphones. We would say this is a little ambitous project, because they cannot do otherwise. But this is not the case for Apple. They will also become an MVNO, but, in this case, they will sell iPhones and iPads that include the connection to Apple's MVNO, using in every case the most convenient cellular network for the client. Given the size of the Apple's clients base, the prices Apple will get from mobile operators will be unbeatable and they would be able to offer very affordable conditions for the access to all Apple's services. In addition, Apple can provide a full end to end service to its clients, owning client's
identity and preferences that will help them to drill down information to even improve its client's user experience. Operators will reduce their clients acquisition costs but will pay a toll: they will lose client's identification, that limits their marketing actions addressed to their client's base. As we can see, chances for Google beating Apple in this regard are nil.

As a conclusion, we do not envisage Google fighting Apple in the medium term for the reasons stated above.

OTT COMPETITION

n the last decade Telco operators have seen how the weights of voice and texting (SMS) services have declined towards data services. Between 2007 and 2014, the global mobile voice traffic has doubled from 100 to 200 Petabytes, meanwhile data traffic has gone from practically null to more than 2.800 Petabytes, getting double every 12-18 months (according to Ericsson Mobility Report, November 2014). One of the most critical factors in this trend has been the irruption of OTT services, especially those related to media content distribution.

OTT services include voice, texting and media (TV, radio, music) services to end-users, supported by telecom networks. One of the strengths of OTT services is their price competitiveness compared to traditional operator services. Usually OTT's revenues can be structured under these 4 following types:

Pay to download	The user pays one time to download the application. Operation use to be free.
Subscription	The user pays regularly for using the service. This type is well extended especially in media OTTs
Rental	Consists on payments for some content in a fixed period of time. When the time expires, the user does not have access to that content.
Advertising	In the case of free downloading and use OTT apps, revenues come from the advertisements shown inside the app. Sometimes revenues are leveraged on a "freemium" basis.

OTT services strengths are not only about lower pricing offering other advantages and enhanced services:

- OTT services offer enhanced services compared to traditional operators, the large databases that OTT handled allows users to access to multiple media contents and the technologies advancements provide new useful services.
- OTT service applications are conceived for a multiplatform system which permits full operation in different devices (TV, mobile phone, tablet...).
- OTT apps are fully integrated to social networks based on a common ecosystem and device (currently a very strong trend).

As an example, while a SMS can only carry 160 characters, the OTTs as WhatsApp or Line do not have limits. Also, these OTTs can deliver emoticons, photo, video, audio, location or contacts offering a full experience service. Another clear example is Netflix which got 60 millions of users and more of 100.000 titles (movies and series) in Q1 2015 available to consumer anytime.

Despite of the exponential growth achieved nowadays, the market trend is going to continue during next years. The lion's share in mobile traffic and OTT market share is expected to come from video, from 45% mobile traffic share up to 55%. By contrast, VoIP traffic share will drop from 29% in 2014 to 6% by 2020 due to VoWIFI services to come, despite constant growth in minutes of use.

However there are some regulatory threats to OTT development. The global character of OTTs and the net neutrality are clogging the norm developments. USA and EU have made feints in this field with specific actions so far. The European Commission do not see fair that operators have to compete against OTT "without being subject to the same regulatory regime". The intention of the public organism is to create a "fair and future-proof regulatory environment for all services".

Q

Value evolution Media companies



Media companies have a regional scope, thus, the sample we are using do not represent the global segment. However, we have included in the sample several European companies and one American company, this last involved in Internet media offerings, to be able to compare traditional media with new media firms.

The value evolution of the chosen companies for the sample is included below.

MEDIA SUBSECTOR MARKET CAP



Figure 79

As we can see, over the analyzed period, the maximum value of the sample companies is close to 110 B\$ and the minimum below 60 B\$. They represent but a small fraction of the total sector under study.

The initial and final values of the Media companies sample, follow.



INITIAL AND FINAL VALUES OF THE MEDIA SEGMENT SAMPLE

Figure 80

The growth of the sample has been a 23,35% over the period, which is not impressive at all. What would happen if we take out the American company (Netflix) and keep only the European companies in the sample?. Results are shown in the next figure.

MEDIA SAMPLE MARKET CAP (W/O NETFLIX)



Figure 81

If we compare it to the previous one including Netflix, the final value for the sample is close to 80 B\$, quite close to the initial value. That means that European companies in the sample have not increased its value over the period, which is quite interesting.

Let's see now what has been the market cap evolution of the companies sample.



MEDIA COMPANIES MARKET CAP

Figure 82

Let's try to get some interesting conclusions.

- Main TV based companies in the south of Europe, like Mediaset and TF1, have lost value over the period, in a quite important percentage. Lagardere and Grupo Prisa, with important publishing activities in France and Spanish spoken countries respectively, also join the pack.
- Growing companies include ITV (devoted to TV at a global scale), Pearson (largest multinational publishing and education company in the world), Wolters Kluwer (global information services and publishing company, selling products and services to professionals in a variety of sectors) and Vivendi (digital entertainment company, including music, TV and films for mass media and getting out of the telecommunications sector). But how much they grow?.
- The clear winner is Netflix, with its Internet based business model.

Then, what has been these companies growth over the period?



MEDIA COMPANIES MARKET CAP GROWTH 2004-2014

Figure 83

We can see the impressive value growth of Netflix, compared to the rest, mainly based on its Internet based digital business model. It is a clear example of value migration from traditional models to the new digital model. Value for media groups in Spain, Italy and France have plummeted over the period, save Vivendi, with a dismal value growth. UK and The Netherlands media groups have kept a fair value growth, but not comparable to Netflix.

Let's compare the value split at the beginning and end of the period for companies in the sample.

MEDIA COMPANIES SAMPLE MARKET CAP SPLIT IN 2004 AND 2014



Figure 84

Netflix increases close to twenty times its value participation in the total value of the sample, while Grupo Prisa practically dissapears. ITV, Pearson and Wolters Kluver increase its value market share by some percentage points, while Lagardere, Mediaset, TF1 and Vivendi get diluted in value. Vivendi still holds a third of the value of the sample.

Taking Netflix out of the equation and keeping only the Europe based media companies in the sample, let's compare its value growth over the period.



EUROPEAN MEDIA COMPANIES GROWTH 2004-2014

Figure 85

Something notewhorty is that the sum of European companies in the sample have lost value in ten years. Why?. May be they have not reached the global footprint that is needed for success these days and their business models are not digital enough. The comparison with Netflix is unavoidable.

Let's check the value market share for the European companies in the sample at the beginning and end of the period.

MEDIA CAP SPLIT FOR EUROPEAN COMPANIES IN 2004 AND 2014



Figure 86

There are astonishing figures: Grupo Prisa has divided by ten its value participation in the sample. Lagardere has more than halved its value participation; Mediase has divided it by three and TF1 has halved it. On the contrary, ITV has close to double it, Pearson has increased its participation by 80%, Vivendi has increased it by 20% and Wolters Kluwer by more than 50%. But in total, as we have already said, the sample has lost value over the period.

INNOVATION: USA VS EU

n the current context of permanent change and development that is suffering the ICT sector, innovation is a key factor, even more so, in the development of the industry and its competitiveness. As an initial approach, the intensity of R&D expenditure on GDP in EU-28 for 2012 was 1.92%, while the intensity in USA was 2.81% for the same period, according to OECD.

Focusing on the reasons behind the differences between USA and EU in innovation, the European Commission has done several studies. Every year it publishes the *"European Innovation Scoreboard"* comparing innovation drivers across EU against global competitors as the United States. Performance is measured through 25 indicators classified under three categories: enablers, firm activities and outputs.

The **Enablers** describe the main drivers of the result of external innovation to the firm and it drifts in three dimensions: *Human resources; Open, excellent and attractive research systems; and Finance and support.* In this category, US and EU-28 positions are similar in two indicators, *New doctorate graduates* and *R&D expenditure in the public sector,* while the American position is significantly stronger in the remaining indicators considered as *Population completed tertiary education, International scientific co-publications and Scientific publications among top 10% most cited*, with rates 25% to 46% higher than EU-28.

Meanwhile, the **Firm Activities** reflect innovation efforts done by the companies over three dimensions: *Firm investments; Linkages & entrepreneurship* and

Intellectual assets. In this category EU-28 has a close position to US on indicators related to intellectual assets (PCT patent applications). However US innovation environment is one step further in *R&D expenditure in the business sector*, and *public-private* co-publication performing 51% and 74% higher than EU-28 in those indicators.

The **Outputs** describe the results of innovation achieved in two dimensions: *Innovators* and *Economic effects*. EU-28 and US are in a balanced position in this indicators where EU-28 performs circa 15% better in *Exports of medium & high-tech products* and *Exports of knowledge intensive services*. Meanwhile United States performs 51% better than EU-28 in *License and patent revenues from abroad*.

As we see, attending to the indicators published by the European Commission, US overall innovation performance is significantly higher than EU-28.

Having said this, it is important to emphasize that EU-28 presents extreme differences between countries. While countries with a poorer innovation ecosystem, such as Bulgaria, Romania and Latvia, perform consistently under 50% of EU-28 average. In the opposite side, countries as Sweden, Denmark, Germany or Luxembourg perform far over EU-28 average, 25% higher in many indicators.

It is clear that Europe has a long way to go in order to reduce innovation differences against the United States, as well as to deepen in cohesion between member states of EU-28.

10

Conclusions



The exponential development of ICT since the first microprocessor, which was created in 1971, has embedded them in all areas of the economy and society in what is known as the Digital economy.

To get an idea about the current situation we will remind Carlota Perez's thesis statements, "There are four phases in the surge and establishment of new technological revolutions: the Irruption phase, the Frenzy phase, followed by a crisis or bubble that explodes, and continues with a Synergy phase and, after that, a Saturation phase". During 1999 and the beginning of 21st Century the Internet bubble explosion occurred so it seems legit to say that today we are in the Synergy phase.

In this context we have analyzed the different value migrations that have taken place in the ICT and Media segments during the last decade (2004-2014). For this purpose we have analyzed six segments of this industry comparing their behavior, those were:

- Telecommunications Operators; Americans and Europeans, ATT, America Movil or Telefonica, were included.
- Telecommunications Vendors; here were included Americans, Europeans and one Asian; Huawei wasn't included as it's privately owned.
- Terminal Vendors; there is no representation from Europe in this segment. Nokia have been included in the Telecommunications Vendors after the sale of its terminal division to Microsoft
- IT Vendors; those companies were included according to market cap
- Internet Companies; only American companies are considered here as Google, Amazon or eBay
- Media Companies; the focus is on the European market considering a single American company to compare.

The global ICT market shows a growing trend through the period of analysis; after a closer look inside the market we have realized that two segments stand out, IT Vendors and Terminal Vendors, they are the biggest segments, exceeding the figure of 850\$B, representing more than a 45% of the market. It's also remarkable how Terminal Vendors show a clear leadership in growth rate during the last ten years. One possible explanation could be related with how global companies, main players in those segments, offer mass products and services.

Concerning the Operator segment we see big differences between players. The European market has several particularities like a bigger fragmentation, stronger regulations and the great impact of the last financial crisis. This drives the European subsector to a lack of investment and a high unit prices, more than the American market.

Regarding this we remarked four factors, static and dynamic, which drive the unit price down:

- The declining in operating cost, something that has occurred in all European countries except France.
- Increase in competitive intensity
- Network investment increase as CAPEX is key for reduction
- Users learning time, this unexpected impact could be managed through family or friends 'get in touch' programs.

Another way to reach a lower unit price is get a higher traffic volume; to do this it's required an EBITDA/Revenue ratio between 35 to 40% to be able to update company networks. In this regard, there is a significant correlation between Capex per User (CAPU) and EBITDA Margin per User (MAPU) up to a point that we can estimate around 110\$ of MAPU, beyond this point Capex is better combined with the potential market growth (PMG).

Telecom investments are totally correlated with the competition intensity, but with an inverted U relationship which means that too high or too low competition discourages investments. If we focus in Europe we could say that the underinvestment signals detected in Spain, high MAPU levels and low CAPU, could extent to the whole continent reinforcing our statements that in an unified market, synergies of scale together with the inherent consolidation that would take place, will allow stronger European operators to optimize investments.

In this sense, it seems that EU will allow now domestic markets consolidation and even cross border M&A to reduce fragmentation. This could lead to many M&A opportunities and related savings: 5 to 9% OPEX savings, 12 to 15% CAPEX savings and about 1% in revenues synergies.

As opposed to telecom operators, the subsector of network vendor consists on a handful of global players serving a global market. Despite the global market structure and the concentration, overall growth performance has remained very poor during the period analyzed, just 8,22% on 10 years. But this weak growth hides unequal behaviors. While European players as Nokia and Alcatel have experienced decreases over 50%, Ericsson has almost maintained its size over the period. American players have experienced a similar disparity with Juniper and Cisco barely maintaining its market capitalization while Qualcomm more than doubled its size.

Terminal vendors market is dominated by a single USA vendor and a bunch of Asian vendors, there is an absence of relevant European players in terminal vendors market. Considering the market cap of the cluster analyzed, we appreciate a tremendous growth of 800% over the period. Values of all companies included in the cluster grew over the period considered, however, very relevant differences outcome from the analysis. While all Asian players experience important grows from +75% to 528%, Apple experiences an astonishing growth of 72 times over the period. At the beginning of the period Apple's value was one sixth of the Samsung value while at the end of the period it equals more than three times the value of the sum of Asian vendors.

The Apple dominance and differentiation comes from its reverse razor blade strategy, integrated SW and HW ecosystem and the ownership of its operating system while its rivals, who are trying to compete on price, work with Google OS. This makes us think that Apple could be the best company in the market.

With respect to IT vendors, it has experienced a 50,24% growth in the 2004-2014 period with an evolution quite volatile marked by the international crisis in 2008 and 2009. In this cluster the best performers have been SAP and Oracle showing growths of 72% and 218%. On the other hand IBM growth has been poor, circa 8%, what made it loose 7 p.p. of value share.

The cluster of internet companies' subsector is composed by the biggest companies in terms of value which are all American players with global reach. This cluster is clearly dominated by Google representing a 44% of share and a growth of 2.097% over the period. Google's value benefits from a wide portfolio of activities all related with different branches of the Digital Economy, as smartphones, wearables, mobile payments and, recently, telecommunications services. In the opposite side we find Yahoo and Ebay that show a poor growth over the period, not comparable to Google or even Amazon and Facebook.

Finally, there is a is a clear example of value migration from traditional models to the new digital model inside the Media Companies value evolution. As an example Netflix has an internet based business model shows an extreme dominance in this sector opposed to other media companies, specifically TV based companies like Mediaset or TF1. Value for media groups in Spain, Italy and France have plummeted over the period, save Vivendi, with a dismal value growth. UK and The Netherlands media groups have kept a fair value growth, but not comparable to Netflix.

Annex I

Excerpt from the book "Technological revolutions and financial capital" written in 2002 by Carlota Perez

When a technological revolution irrupts in the scene, it does not just add some dynamic new industries to the previous production structure. Through the configuration of a *techno-economic paradigm*, it provides the means for modernizing all the existing industries and activities. The process of diffusion of both, the revolution and its paradigm across the economy, constitutes a great surge of development.

Each surge has two distinct periods. The first two or three decades is the period of *installation*, during which the critical mass of the industries and infrastructures of the revolution are put in place against the resistance of the established paradigm and driven increasingly by the criteria and the turbulent dynamics of financial capital. At about mid-surge there is a *turning point* when the tensions that have built up are surmounted, creating the conditions for the period of *deployment*. During this period, which also lasts two or three decades, the transformation potential of the revolution spreads across the economy, yielding its full development benefits. Growth in this period is driven by the longer term criteria of production capital, with an institutional framework that tends to pursue a better balance between private and collective interests.

Each period in turn goes through two different phases, defining the changing character of the assimilation process, so that the recurring sequence is made up of four phases lasting around a decade or decade and a half each, *Irruption, Frenzy, turning point, Sinergy and Maturity*.

Given the modernizing power of the revolution and its techno-economic paradigm, each surge ends up raising the whole productive structure to a higher plateau of average productivity, while leaving a different fabric of interrelations among the branches of the economy. This evolution by long leaps would be the manner in which progress takes place in capitalism.

However, such massive economic transformations involve complex processes of social assimilation. They encompass radical changes in the patterns of production, organization, management, communication, transportation and consumption, leading ultimately to a different "way of life". Thus each surge requires massive amounts of effort, investment and learning, both individually and socially. That is probably why the whole process takes around half a century to unfold, involving more than one generation.

The *socio-institutional* framework adapts to each paradigm and, in turn, shapes the preferred direction in which the technological potential will be deployed and how its fruits will be distributed. But, this deep adaptation eventually becomes an obstacle for the introduction and diffusion of the next technological revolution. A society that has established countless routines, habits, norms and regulations, to fit the conditions of the previous revolution, does not find it easy to assimilate the new one. So, a process of *institutional creative destruction* will take place, with the simultaneous dismantling of the old framework and the gradual installation of the new. Nevertheless, some of the most significant institutional changes ara only induced, after about half a surge, by the mounting social and economic pressures.

In the economy, the interrelations between financial and production capital determine the rhythm and the direction of growth. Production capital ensures the full deployment and the widest spread of each technological revolution. Financial capital enables the succession of surges. When production capital at the end of a surge becomes conservative, due to having so much investment and experience tied to it, financial capital will break loose and end up either helping the initial big-bang of the next revolution or following it up by backing the new entrepreneurs in spreading it. When financial capital, during the period of installation of the new paradigm, takes the economy on a frenzied ride up a paper-wealth bubble, the new and modernized production capital will be ready to take over and lead a more orderly growth process, in the "golden age" that sees the full deployment of that revolution.

This changeover is aided by the institutions of governance and constitutes the *turning point* of the surge. It usually occurs after the bursting of the bubble and in the midst of the recession that follows. Changes in the rules of the game are necessary to curb the damaging short term practices of financial capital, and induce it to cater to the more long term interests of production capital. Some form of response is also required to the intense social pressures that come from the polarized income distribution characteristic of the frenzy phase. This response will modify the dynamics of the market profile, in terms of possible spending patterns, and will eventually influence the direction and rhythm in which potential supply will develop from the sinergy phase onwards.

The graphic below presents a condensed version of all the elements of the model, locating a particular surge (B) between the end of the previous one (A) and the beginning of the next (C). In it, the repeated pattern of emergence, replacement and deployment of technological revolutions and techno-economic paradigms can be identified, as well as the regularities in the changing behavior of production and financial capital and of the socio-institutional framework, along the four phases.

The figure concentrates on the dynamics of the core societies (where the revolution begins) and does not cover the whole life cycle of each surge. To do this, it would have to include both the gestation period, before the big-bang, and the redeployment period, after the next big-bang, when the mature industries of that surge outstretch and struggle for profitable survival by "rationalization", by reaching for markets in the periphery and/or by spreading production to locations with comparative advantages.

Thus, the figure does not deal properly with the surge as it spreads across the world. From that wider perspective, the long surges span a whole century, with each successive one covering a larger portion of the globe. A similar table constructed from the point of view of the peripheral countries would be very different, with a significant displacement of the phases.

The summary above suggests that there are three features in the functioning of the capitalist system driving development by surges and determining the recurring sequence that characterizes them:



DEVELOPMENT BY SURGES: THE ELEMENTS OF THE MODEL AND THEIR RECURRING CHANGES

Figure 87

- Technical change occurs by clusters of innovations forming successive and distinct technological revolutions that modernize the whole productive structure.
- Financial and production capital are interrelated but functionally separated agents, each pursuing profits with different criteria and behaviors.
- The socio-institutional framework has much greater inertia and resistance to change than the techno-economic sphere, which is spurred by competitive pressures.

Each of these features refers to how change takes place in one of the spheres that co-evolve in the process of development: technology, the economy and social institutions. It is the manner in which these changing spheres interact and influence each other that generates the sequence.



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INNOVATION MAKERS



