Mobile operators’ investments

Europe needs a pro-investment mobile regulatory framework

Whitepaper based on IDATE study for Ericsson and Qualcomm

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1. Foreword

This paper investigates the level of mobile revenues, investments (Capex) and usage in Europe, as well as the interrelation between those metrics. The study compares the EU5 (France, Germany, Italy, Spain and the UK) with the other world mobile leaders, namely the USA, Japan and South Korea.

The results show that Europe is falling behind other regions in the use of mobile technology to benefit businesses and consumers and may be jeopardizing the region’s future ability to fully take advantage of evolving wireless technologies. The relative decline of revenue in recent years for Mobile Network Operators (MNOs) appears to be due to policy decisions aimed at maximizing short-term consumer benefits at the expense of long-term investment incentives. The data suggest this strategy is backfiring. The lower revenues in Europe have deterred MNOs from investing, which in turn delays the roll-out of networks and the adoption of services by consumers. Consequently, the unit costs of some services to consumers are higher than in other regions.

Investment in mobile communication infrastructure creates local employment and significantly contributes to growth, as an enabling factor for the digitalisation of other industries.

The Digital Single Market initiative is an opportunity to adopt a pro-investment and pro-innovation mobile regulatory framework, enabling Europe to lead in mobile communication through its attractive market size, growth potential and technology expertise. The findings and data of this study suggest consumers, businesses and individual European economies will benefit from policy makers’ adoption of a balanced regulatory framework that encourages investment in mobile infrastructure and technologies.
2. Mobile usage, revenues and investments

Over the past seven years, MNOs have faced a very difficult business environment in Europe, seeing their revenues decline steadily. Though MNOs maintained their investment effort, it was not enough to keep up with other regions’ MNOs who did not suffer from an equivalent loss of revenues. As a result, Europe is now lagging behind other regions in infrastructure deployment and service adoption.

2.1. Decreasing mobile revenues in Europe - growth in other regions

The EU5 and the USA are two markets of comparable size: 321 million inhabitants for EU5 compared with 319 million in the USA in 2014. In 2008, mobile revenues were at the same level in the USA and in EU5.

Since then the mobile revenues in EU5 have dropped considerably, while they have risen steadily in the USA. In 2014, there was a **EUR 87 billion** difference in mobile revenues between EU5 and the USA. The mobile revenues in EU5 are now roughly one half of the revenues in the USA.

![Figure 1: Mobile revenues evolution (billion EUR)](image)

These figures show a cumulated EUR 310 billion (2008-2014) mobile revenues difference between EU5 and the USA over a 7-year period of time.

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¹ Throughout the paper, the revenues, ARPU, CAPEX values were obtained by converting from local currency to Euros using the exchange rate applicable for a given year.
2.2. **ARPU declining in EU5, lowest of regions studied**

In 2008, the monthly mobile networks Average Revenue Per User (ARPU) was already lower in the EU5 than in the USA, Japan or Korea.

EU mobile users have been benefiting from improved mobile access over the past few years, from increased access speed and data volumes to better coverage and services. Despite these added benefits, the monthly ARPU has been decreasing in Europe between 2008 and 2014. Meanwhile, the monthly ARPU in euros was progressing in the USA.

As a result, the monthly ARPU is now 25 euros higher in the USA than in EU5.

![Figure 2: ARPU evolution (EUR/month)](image)

EU5 consumers have therefore enjoyed mobile services at a reduced price, in line with the initiatives from EU and national regulators looking to transfer economic benefits to end consumers.

While the short term economic gain for EU consumers is evident, this trend also directly impacts the MNOs ability to invest in new technologies and network upgrades.
2.3. Mobile revenues vs private consumption

To understand the impact of regulation on the price of service, it is also necessary to compare the evolution of the price of service with the evolution of private consumption. This indicates whether a service is taking a larger role in the consumers’ spending or not.

Figure 3: Mobile revenues vs private consumption, both normalised by 2008 value

Since 2008, private consumption is increasing in EU5, Japan, the USA and South Korea at comparable rate. However, the evolution of mobile revenues in these regions are completely different. While mobile revenues more or less follow private consumption in Japan and South Korea, in the USA mobile revenues grow faster than private consumption. EU5 is the only region where mobile revenues decline significantly. This indicates that Europe dedicates an ever smaller fraction of private consumption to mobile services, even though consumers benefit from much improved services. In other regions consumers maintain or even increase their expenditure on mobile network services, in relation to their overall consumption.
2.4. Mobile CAPEX: EU5 not investing in its mobile future

MNOs must invest continuously in infrastructure to update their network and deploy new technologies. The Mobile CAPEX is a good indicator of the level of investment performed by MNOs. Investments have been almost flat over the past few years in Europe, whereas they were growing everywhere, and growing significantly in the USA. Mobile CAPEX is much higher in the USA than in EU5.

![Figure 4: Mobile CAPEX in domestic networks (billion EUR)](image)

The contrast between EU5 and other regions is even more striking when taking into account the respective size of the markets. CAPEX per population (pop) ratios display the amount of money spent per inhabitant (EUR/inhabitant).

CAPEX per pop ratios are much higher in Asian countries and in the USA than in EU5. It is the highest in Japan with more than 100€ per pop per year, whereas the USA and South Korea are respectively at EUR 80 and EUR 60 per pop per year. Europe again falls behind with a widening gap towards the USA during the 2008-2014 period of time at less than EUR 40 per pop in 2014.
The situation is clear: Europe is investing a lot less in its mobile infrastructure – and therefore in its mobile future – compared to other regions. Consumers are denied the opportunity to benefit from innovation and superior services. The focus of regulators is maintained on lowest price while quality and service levels are deemed secondary elements.

This situation is not compatible with EU’s ambitions about its digital future, as stated by Günther H. Oettinger, Commissioner for the Digital Economy and Society: "More than ever, Europe needs top-class connectivity. This will ultimately determine the success of the Digital Single Market. We therefore need rules that underpin sustainable, market-based, high-performance fixed and wireless broadband infrastructures for 2020 and beyond. And it is not just about the telecoms sector; every part of our economy and society has a vital stake in these issues.”
2.5. Why are EU Mobile Network Operators not investing more?

One obvious question is to analyse why MNOs are investing significantly more in Japan, Korea and the USA than they do in Europe. A key indicator to shed some light on this question is the analysis of the CAPEX/revenues ratios, which compares the investments by MNOs with the revenues that they collect in a given region.

**Figure 6: CAPEX/Revenues (% of revenues)**

![Graph showing CAPEX/Revenues ratios for different regions](image)

CAPEX/revenues ratios in the USA, Japan and EU5 do not display any major difference and are in the 13 to 15% range. This reflects the fact that MNOs are large corporations who cannot commit to investments that are not correlated to increasing revenues. In other words, MNOs worldwide are subject to the same constraints set by investors.

EU MNOs are investing as much as they can, but their declining revenues simply prevent them from keeping up in the innovation and investment race with other regions.
2.6. One immediate consequence: EU5 late on LTE

One direct consequence of the lack of investment has been the speed of the LTE take-off. LTE has been expanding rapidly in the USA, Japan and South Korea but Europe is lagging behind in terms of LTE share and population coverage. The EU is today at least two years late in terms of LTE penetration.

Figure 7: Evolution of LTE share (% of SIMs)

Source: IDATE, based on NARMs and players
2.7. Mobile data usage: EU5 now a second rate player

Unsurprisingly, the growth of the mobile usage slowed down significantly in EU, compared with other regions, as users did not readily get access to state of the art networks and technologies.

Mobile data usage per pop per month in South Korea, Japan and the USA were above 1.5GB in 2014, about three times the level registered in EU5.

It should be noted that the data consumption ratios between the compared countries and EU5, approximately 3, is higher than the related ARPU ratios, approximately 1.5 to 3, which means that the price paid per bit delivered is significantly higher in Europe. The ARPU is smaller, but the unit price for what the consumer gets is higher. This is an expected but unfortunate result of a policy focus on lowest price (ARPU) instead of best value for service.

Cutting down on infrastructure investments results in short-term savings that can be transferred to consumers, but it also means that consumers will not benefit from the significant economies-of-scale that follow from order-of-magnitude increases in infrastructure capacity and the performance innovations of new network technologies. The European policies so far on making mobile broadband access affordable for its citizens have been ambitious and commendable, but they have been lacking a longer-term perspective that, through investments, secures the best value for the price paid.
2.8. Synthesis

Combining the results above and comparing data usage, LTE share, mobile CAPEX per inhabitant, and mobile ARPU show that Europe (EU-5) performed poorly compared to the USA, Japan and South Korea in 2014. Europe has accumulated delays in investments, revenues and mobile usage between 2008 and 2014.

MNOs in all four regions invest a fairly similar ratio of their revenues to upgrade existing networks or deploy new ones. However, the very low mobile revenue levels in Europe translate into very low mobile investments.

Europe is sacrificing its mobile future in order to maximize the short term lowest price for consumers. However, this comes at the expense of degraded service, since EU consumers do not have access to state of the art mobile technology and lag behind at least two years in in getting access to high performing networks.
3. The power of the European Market

Europe has unique attributes that would enable it to seize mobile leadership under the right regulatory and business environment, triggering a wealth of positive effects.

3.1. EU28 mobile market is almost twice as large as the USA market

In 2014, EU28 had 507 million inhabitants, to be compared with 319 million in the USA. This lays the ground for the world biggest digital market for networks and services.

Figure 10: Number of subscriptions (million)

Such a large market would naturally be more influential than other smaller markets like the USA, Japan or South Korea – provided the regulatory and business environment is comparable in all four regions.
3.2. The Digital Single Market is an opportunity for growth

Mobile communications today represent an essential component of the digital industry in Europe.

In EU5, MNOs invested EUR 11.5 billion last year. It is estimated by FFT\(^2\) that EUR 1 invested in the telecommunications sector generated EUR 6 of GDP and EUR 3 in taxes and social contributions. Reducing the mobile connectivity gap with leaders (the USA, Japan and South Korea) in terms of mobile service quality and mobile service usage – i.e. achieving top-class connectivity - should be a short term objective for Europe, as underlined by Commissioner Oettinger. The Digital Single Market (DSM) Strategy should play a significant role and Europe should continue its efforts towards 5G. Vertical markets such as automotive, health care, smart cities, and Industry 4.0 represent growth potential both for mobile and vertical players.

The DSM can provide an exit from the low cost, low investment vicious circle currently in place and move Europe towards a shared focus on mobile investment and growth. Under the right regulatory framework, state of the art technology and services could be developed and first deployed in Europe, before being exported elsewhere.

\(^2\) Fédération Française des Télécoms
4. How regulation can kick-start innovation, investment and growth

4.1. Relevant questions for regulators

While developing the DSM and taking it forward into practical policies it is essential to respond to the following questions:

- Do we want Europe to have the world’s best mobile communications infrastructure?
- Do we want Europe to lead in 5G innovation, development and infrastructure deployments?
- Do we want to develop our economy into the largest digital market in the world?
- Do we want Europe’s industries and verticals to be able to develop their connected products and services in Europe?

Depending on how these questions are answered, decision makers can leverage the DSM to steer away from the current environment under which Europe is losing ground every day, and use the DSM to create a positive spiral that would see Europe seize mobile leadership worldwide.

Figure 11: Triggering a positive spiral in Europe through DSM

Source: Ericsson and Qualcomm
4.2. Practical recommendations

4.2.1. Put investment at the heart of their regulatory strategy

5G will trigger a new investment cycle in mobile infrastructure worldwide. Boston Consulting Group estimates that USD 4 Trillion in worldwide investment in 5G is needed by 2020\(^3\). As this paper demonstrates, investment in mobile networks in Europe will not occur unless investors see a clear revenue growth path ahead. Some of the practical measures to nurture investment include:

- Differentiate regulatory regimes that apply to universal service infrastructures and cutting edge infrastructures, in order to boost investments in cutting edge infrastructures. In particular, adopt a 5G regulatory environment focusing on investment.
- Monitor MNOs Free Cash Flow (FCF)\(^4\) and ensure that EU FCF is on par or above FCF in other regions, in order to put MNOs in a position to invest.
- Improve coordination of the different European entities adopting regulation (EU Parliament; EC DG Competition, DG Connect, BEREC; national regulators) to achieve their joint regulatory objectives without hurting the economic environment.
- Adopt dynamic competition assessment and move away from static competition assessment.

4.2.2. Making sure EU Small and Medium Enterprises (SME) and verticals benefit from the mobile infrastructure

In order to ensure that European SMEs will benefit from digitalisation of their businesses, it is critical that they get the support of capable local partners acting purely as mobile communication enablers. The EU mobile infrastructure would best benefit the economy when run with a horizontal business model focusing on open, multi-service networks providing differentiated Quality of Service to any vertical actors. The absence of such open and horizontal state of the art communication platforms and services would force companies, SMEs included, to adopt vertically integrated solutions typically provided by Dedicated Solution providers – i.e. locking the user to their platform.

Decision makers should promote horizontal mobile business models in order to ensure that innovative SMEs benefit from their digitalisation.

4.2.3. Standards: the home of European innovation

Europe has a history of excellence in hardware and network innovation arising from cooperation between MNOs and vendors in the scope of contribution to standards. High quality standards play an absolutely critical role in enabling the horizontal business model for the mobile infrastructure by ensuring interoperability of devices and providing every single player with full access to the latest communication features.

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\(^4\) Why Mobile FCF is the right indicator to be considered: Capex mentioned focuses on money used to purchase, upgrade, improve mobile networks. EBITDA is an indicator of companies’ financial performance. EBITDA-CAPEX is a proxy for Free Cash Flow. It is more appropriate than EBITDA in capital intensive businesses and therefore should be the main focus of decision makers.
Several initiatives have recently tried to deposition Standard Developing Organisations by minimising the incentives for innovative companies to contribute to standards. These initiatives – if successful - would favour proprietary technology companies to become the sole providers of differentiated services. As result companies contributing their best technology into the standards (mainly European companies) as well as SMEs that create products that implement and build on standards to provide specific solutions to their customers would be seriously damaged. As associations representing 12 million SMEs have recently stated in response of the Public Consultation on Patents and Standards “when technology is built on proprietary systems the owners aims at creating their own market where other companies cannot compete …. slowing down innovation, creating prohibitive market conditions for SMEs, and ultimately inflating prices”.

High quality standards are the best insurance for SMEs and MNOs to get access to the latest technology at an affordable price.

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5. The Way Forward

By comparing the mobile communications markets and network investments during 2008-2014 in Europe (EU5) with those in the USA, South Korea, and Japan, this paper has shown that Europe needs new, network investment-focused policies. Today’s policies, which ambitiously have strived to make mobile communications affordable for European citizens, have resulted in short-term gains in terms of low-cost services for consumers. But this has come at the expense of much higher prices paid per bit and lower service quality. It has also pushed Europe’s deployments of the latest mobile communications network infrastructures at least two years behind the other regions. These infrastructure investments, and the order-of-magnitude capacity increases they bring, are crucial for transferring their economy-of-scale and innovation advantages into high-quality and high value per bit services to consumers.

Regulators and policy-makers in Europe are encouraged to consider the following three, imperative recommendations when developing the Digital Single Market for Europe and when taking it forward into practical policies:

- Put mobile communications network investments at the heart of the regulatory strategies.
- Make sure Small and Medium Enterprises benefit fully from their digitalisation by promoting horizontal mobile business models.
- Maintain focus on high-quality standards.
6. **Annex 1: how EU regulatory priorities depress investment in Europe – CERRE study**

This annex compiled by Ericsson and Qualcomm provides some external references discussing the relationship between regulation and investment.

The relationship between competition and investment has been debated for years. Competition regulators have consistently pushed the belief that increased competition would lead to higher investment, based on theories such as the ladder of investment\(^6\). In other words, higher competition does not only lead to lower prices but also to increased investment and better services. Such notions were disputed by economic actors, including investment bankers.\(^7,8\)

A recent CERRE study\(^9\) provided some quantitative facts about the relationship between competition and investment for mobile networks. The report states:

*Competition and regulatory authorities typically focus on the pricing implications of mergers, as they are concerned that increased concentration comes with higher prices for end users. However, authorities seem to have paid less attention to the impact that such mergers could have on efficiencies, and, especially, investments. […] While a merger will increase prices, according to our analysis investment per operator will also go up. For example, an average hypothetical 4-to-3 symmetric merger, in our data, would suppose an increase in the bill of end users by 16.3% when compared with a situation in which no merger would have occurred, while at the same time capital expenditure (our proxy for investment) would go up by 19.3% at the operator level.*

The study clarifies that the real choice for regulators is the following: maintain the cheapest price possible for the end user on existing service by sacrificing the future, or prioritize investment in a world class mobile infrastructure and thereby a better service for consumers.

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\(^7\) *Assessing the case for in-country mobile consolidation*, Frontier Economics, February 2015.


\(^9\) *Evaluating Market Consolidation in Mobile Communications*, Centre on Regulation in Europe, 15 September 2015.
## 7. Annex 2: methodology

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