CHAPTER 1.8

Re-Establishing the European Union's Competitiveness with the Next Wave of Investment in Telecommunications

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The liberalization of telecommunication markets that started in Europe in the 1990s allowed competitors into Europe's markets and brought European consumers better service, lower prices, and a wealth of innovative services. It also enabled economic growth and established Europe as one of the world's leaders in the production of telecommunication equipment and services. Liberalization unlocked a wave of investment that served to increase the capacity of fixed and mobile networks. This modernization added digital communications capabilities to the existing copper network infrastructure, but did not replace the "last mile to the home."

Today, telecommunication networks worldwide face growing pressure to increase their capacity, driven by an explosion in consumer demand for newly available Internet services such as online or over-the-top video. To meet this demand, telecommunication players in the United States and Asia have already made massive investments to upgrade network technologies, focusing particularly on replacing the last mile of copper with fiber networks, which are much better for carrying big data. This has not happened in Europe, where the last mile still needs to be upgraded. At the same time, revenue and profitability growth in the European industry are falling. Europe's telecommunication industry now lags the rest of the developed world in many measures, and the region may soon fall behind the many developing countries that are rapidly leapfrogging older technologies.

Low investment in telecommunications puts at risk not only future consumer benefits but also the region's overall competitiveness. This chapter suggests that restoring both benefits and competitiveness will depend primarily on revising the European Union (EU) regulatory framework to allow revenues, profits, and thus rates of investment to recover. Although some Member States and the European Union as a whole have taken some encouraging policy steps, only bolder regulatory reform can release the scale of modernizing investment in telecommunications that Europe needs today if it is to re-establish its competiveness and enable future economic growth and consumer benefits.

EARLY COMPETITION: BENEFITS FOR EU TELECOMMUNICATION MARKETS AND CONSUMERS

In 1998, the European Union introduced a regulatory framework giving competing telecommunication operators the right to access existing copper and mobile networks at regulated wholesale rates. This policy innovation launched 15 years of intensified competition, producing substantial benefits for consumers:

- **Lower prices.** The price of a 10-minute fixed-to-fixed national call fell from €2.11 in 1998 to €0.72 in 2010—a reduction of 66 percent in 12 years.

Similarly, the price of a medium-usage basket of mobile telecommunication services fell from €42.05 in 2002 to €19.99 in 2010, a decrease of 52 percent in 8 years. Much lower prices mean that consumers are enjoying many more minutes of voice services: in the United Kingdom, the volume of outgoing voice traffic grew by more than 900 percent between 1998 and 2009.

- **Higher service levels.** Competition forced providers to try harder to retain their customers by providing higher levels of service. Before 1998, consumers had to wait several weeks to get a fixed line installed at home, but they can now get one in a matter of days. On the mobile service side, network coverage has greatly improved, the percentage of dropped calls has fallen, and customers can port their number in one day for free instead of having to wait several weeks and pay for the privilege.

- **Innovative services.** Competition also spurred operators to develop innovative consumer services. For example, mobile virtual network operators in Europe have tailored services to the particular needs of specific segments of the population. These customized services include cheaper international calls for migrant workers and web communities, ring tones, icons, applications, and discounts specially designed for youth markets. Alternative fixed operators have similarly introduced innovations, including cheap Internet protocol (IP) telephony representing 24 percent of all outgoing fixed voice minutes in the European Union in 2010, fiber Internet access, and bundled offers.

INVESTMENT RELEASE: THE NEED FOR A NEW REVENUE MODEL

The consumer benefits resulting from liberalization have been delivered by an infrastructure reaching the limits of its capability in terms of both its overall capacity and the performance provided to the end-user. Increased investment in both fixed and mobile will be required to re-establish Europe's competitiveness, thus both satisfying consumer and business demand and reaping the economic and productivity benefits that high-speed broadband technologies can deliver.

However, the old funding model for financing infrastructure will no longer work. In today's world, competition has reduced margins and operators are afraid to invest because they cannot be sure of making a return until the industry rules change. Stakeholders across the European telecommunication industry are debating the best way to reinvent the industry's revenue model to release the next wave of infrastructure investment that Europe needs. Speed is critical because, without more region-wide investment, Europe risks falling behind other regions.

New consumer demand requires major infrastructure investment

Fixed infrastructure investment in the early days of market liberalization focused largely on upgrading existing networks by adding fiber to the core, high-speed Internet-based switching, and digital electronics (DSL modems)—all of which allowed faster data communications. But the "last mile" connections between the modern core and the home remained copper based, ultimately limiting transmission speeds and volumes. Meanwhile, mobile investments focused primarily on introducing digital cellular technology to improve voice services. This technology could carry data at low speeds, as long as traffic grew modestly. These "old" network configurations will not be enough to support the next wave of services that customers are demanding.

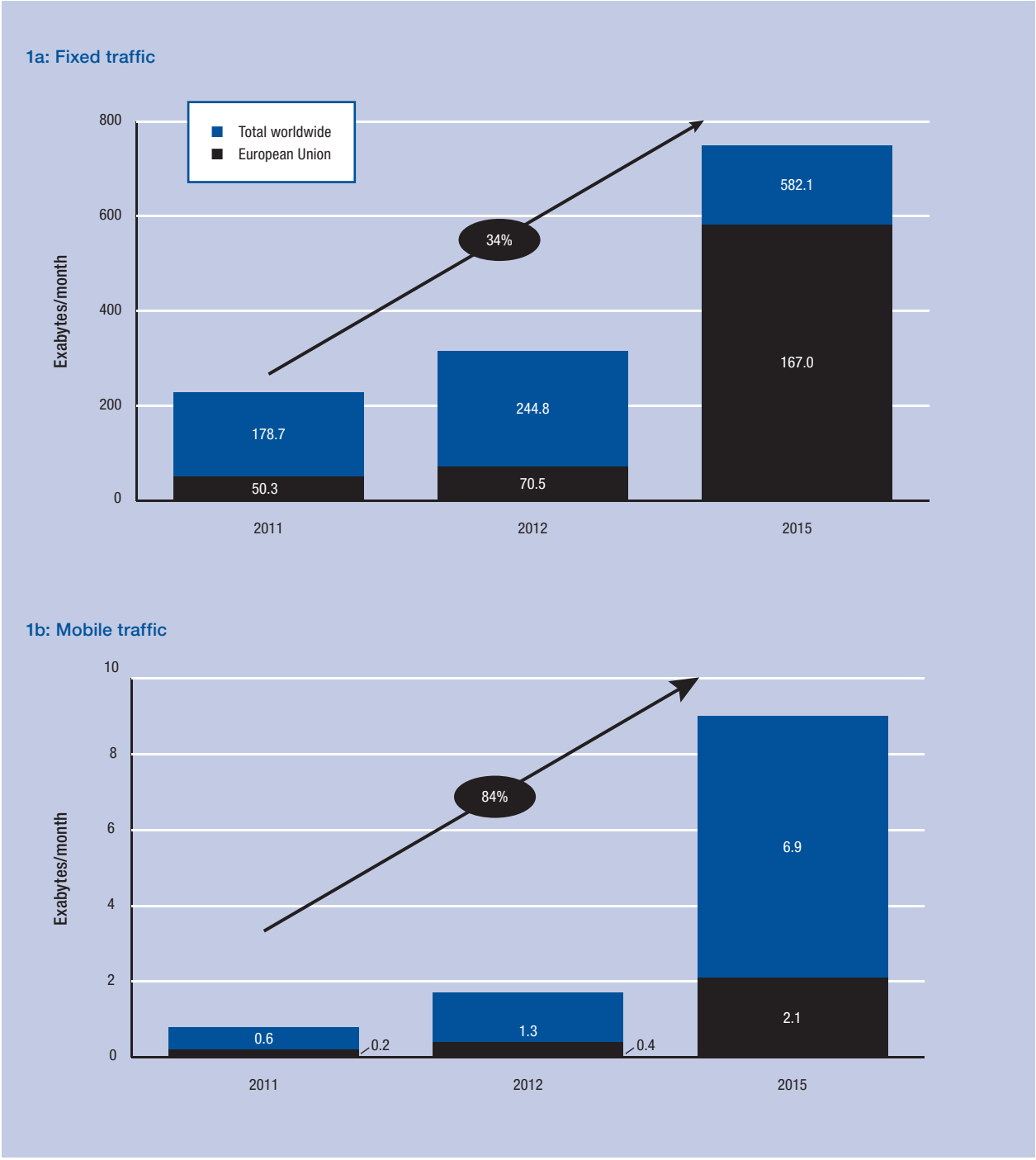
Worldwide, growing numbers of consumers want constant, high-quality wireless Internet access, along with higher traffic allowances and higher connection speeds, so they can enjoy newly available Internet services—such as over-the-top video—wherever they are. Greater technical and service expectations from customers have created an explosion in fixed and mobile Internet data traffic. As Figure 1 shows, the global volume of demand for fixed and mobile traffic is expected to grow by 34 percent and 84 percent, respectively, each year to 2015. In the United States, which leads the world in deploying 4G long-term evolution (LTE) mobile, today operators are experiencing year-on-year growth in demand of more than 100 percent.

The telecommunication industry everywhere needs to make huge investments in fixed and mobile infrastructure to cope with this new situation. But Europe's investment need is particularly large. According to our estimates, upgrading the fixed telecommunication infrastructure in the EU15 countries to achieve fiber-to-the-home (FTTH) household coverage of around 50 percent and vector-based very high bit-rate digital subscriber line (VDSL) for all other households will require €200 to €250 billion.[1] Similarly, revamping Europe's mobile infrastructure to create a mobile network using LTE technology and covering 95 percent of the EU15 population will take another €50 to €70 billion.

Europe's competitiveness lags in high-speed networks

Other regions are getting ahead in deploying next-generation high-speed fixed and mobile telecommunication infrastructures. For instance, more than 90 percent of homes in the United States are already passed by cable operators using hybrid fiber

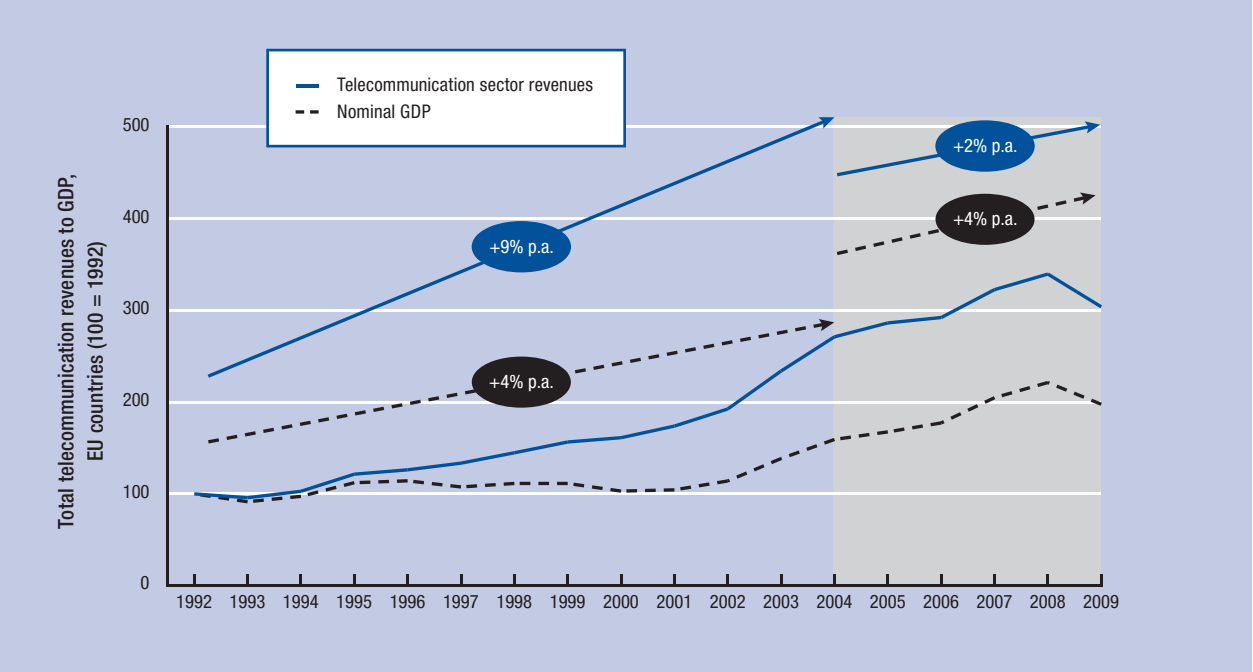
Figure 1: Over-the-top video: A driver of massive increase in Internet data traffic



Sources: Cisco 2009–11 Visual Networking Index; McKinsey team analysis.
Notes: CAGR = Compound annual growth rate. (1a) Fixed traffic excludes traffic from managed IP telephony and business consumers. (1b) The trajectory line assumes that CAGR slows from its current rate of more than 100 percent.

coaxial technologies. These can easily be upgraded to offer 100 Mb/s downlink and 50 Mb/s uplink speeds at much lower capital expenditure per subscriber than the kind of vector-based VDSL or fiber infrastructure currently under discussion in Europe. The United States gained this advantage partly by giving operators a fixed-term holiday from regulations obliging them to allow other operators to share their fiber links over the last mile and thus creating "loop unbundling." This encouraged operators to invest in fiber links. For instance, Verizon has now deployed FTTH to most of its subscribers. Developed economies in Asia (Korea, Japan, Hong Kong SAR, and Taiwan) have achieved, on average, more than 40 percent FTTH coverage, partly because the large number of people living in high-rise apartments in densely populated Asian cities makes households

Figure 2: Trends in the telecommunication sector, 1992–2010



Source: OECD, 2011.

easier to connect, but also because government support lowers the cost of deploying FTTH to network owners.

Both regions are also rapidly strengthening their mobile networks. In Q1 2012, around 64 percent of the worldwide 4G LTE subscriptions were in North America, 33 percent were in Asia Pacific, and only 3 percent were in Europe.

Technology leadership requires investment

Without further investments, Europe will continue to lose technology leadership across the telecommunication value chain to other regions. In the network infrastructure and equipment industry, European-based companies lost 21 percent of the total industry profit pool between 2006 and 2011 to companies from other regions. In the handset market, European manufacturers lost 22 percent of their worldwide market share to Asian and North American companies between 2007 and the first half of 2012.

Today's industry leaders on the services and applications side are mostly from outside the European Union. Most of the leading Internet companies—including Google, Facebook, eBay, Yahoo, Baidu, and Tencent—are based in either the United States or Asia; none of the 10 most visited Internet sites hails from Europe. Europe also has a low level of innovation. Five times more telecommunications-related patent applications are filed in the United States than in Europe.

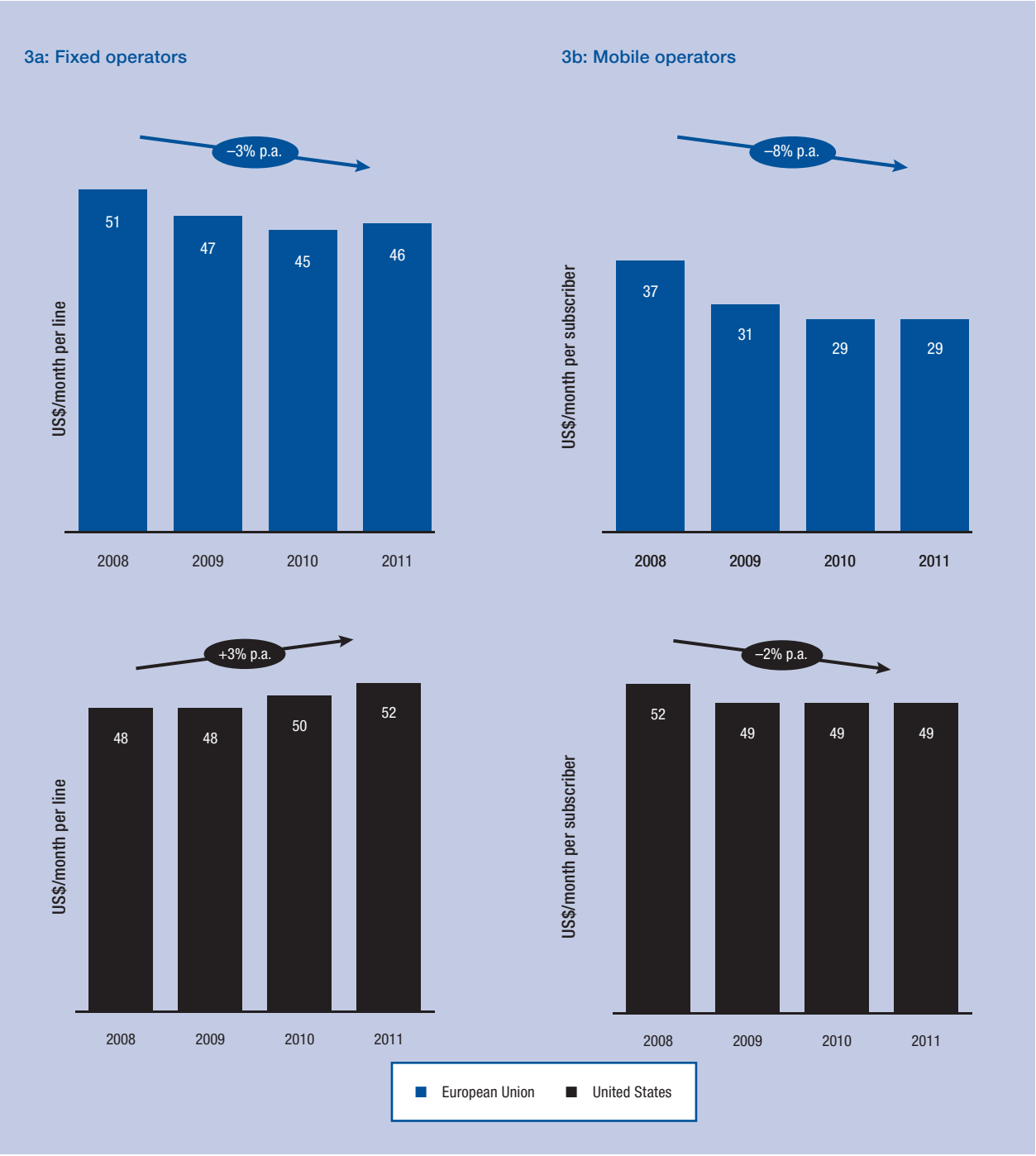
Not surprisingly, Europe's growing infrastructure and Internet service and application disadvantage is showing up in comparative Internet usage. With an Internet protocol (IP) traffic of 4,818 petabytes (PB) per month, Europe lags the top traffic-generating regions of North America and Asia, which produce 7,091 PB/month and 6,906 PB/month, respectively.

The telecommunication sector's impact on the economy at large

The low impact of Europe's telecommunication sector is evidenced by the fact that, for the first time since the 1990s, the industry in Europe is growing at a slower pace than the region's gross domestic product (GDP) (Figure 2). This development is mirrored in the numbers reported by the European Union on the value-added by the entire ICT sector. In the United States, the value-added at current prices increased by 8 percent between 2007 and 2010, whereas it decreased in the European Union by 5 percent. In real terms, the value-added increased by 18 percent in the United States and by 7 percent in the European Union. The decrease in the European Union is the result of the price pressure on both retail and wholesale levels.

This decline in value-added has taken a toll in the number of full-time employees working in the industry, which—for a sample of 10 European markets (Austria, Belgium, Denmark, Germany, Greece, Ireland, Luxembourg, Portugal, Spain, and Sweden)—has dropped from 497,000 in 2000 to 357,000 in 2009.

Figure 3: Operator revenue per subscriber, Europe vs. United States



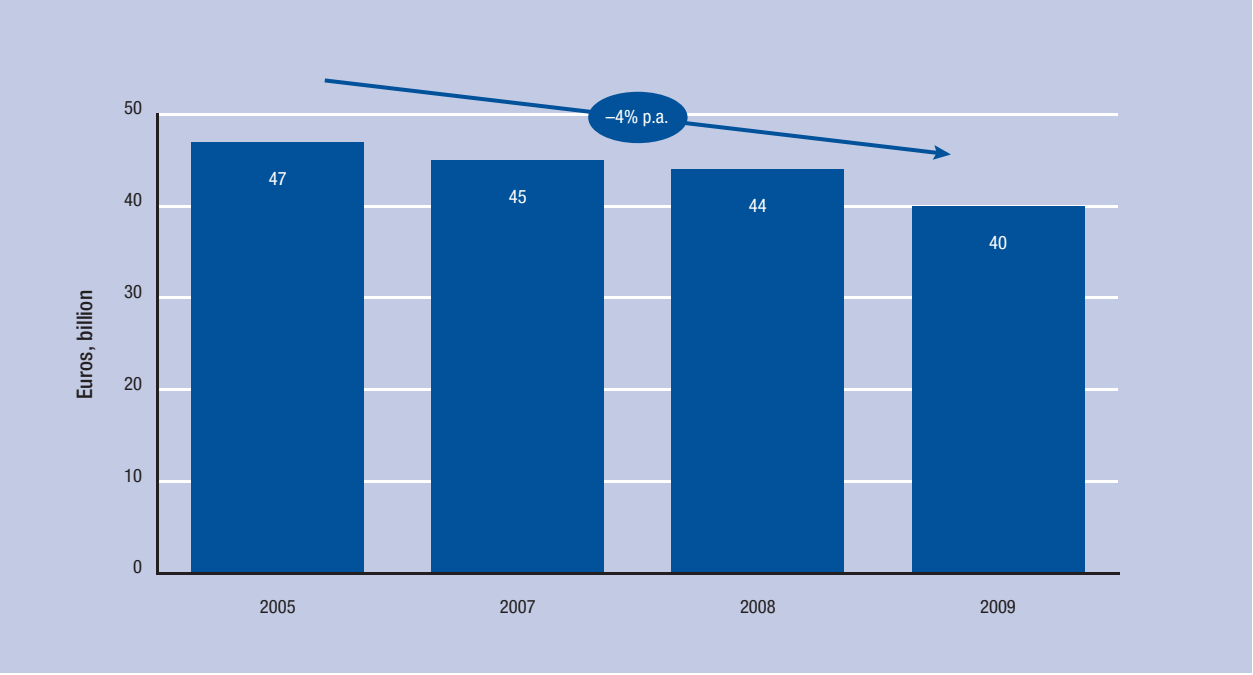
Sources: Pyramid Research, 2011a, 2011b.

EUROPE'S OPERATOR REVENUES: MEETING THE INVESTMENT CHALLENGE

Europe's telecommunication sector needs a revitalizing injection of investment. But relatively low growth and profitability are hindering the region's operators from meeting this new investment challenge.

Revenues for both fixed and mobile operators in Europe are falling. Average revenues from fixed-line subscribers have dropped from US$51 a month per subscriber in 2008 to US$46 a month in 2011, a fall of 3 percent a year. This represents an annual revenue loss of around US$15 billion for the fixed industry since 2008.[2] In the mobile sector, prices in Europe over the same period have decreased at around 8 percent a year. In contrast, US fixed-line prices increased by 3 percent

Figure 4: Annual capital expenditure, Western European operators (2005–09)



Sources: OECD, 2007, 2009, 2011.
Notes: Western Europe comprises the EU15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom) plus Norway and Switzerland. Capital expenditure is calculated over five years; data for 2009 are the latest reported by the OECD; data for 2006 are not reported by the OECD.

a year and mobile prices fell by only 2 percent a year between 2008 and 2011 (Figure 3).

Lower revenues in recent years have affected the European industry's profitability. Between 2004 and 2011, the earnings before interest, taxes, depreciation, and amortization (EBITDA) margins for the fixed market contracted by 4 percent a year, representing €5 billion to €7 billion a year of profits foregone.

Declining revenues and thinning EBITDA margins mean the telecommunication industry in Europe is investing less (Figure 4). From 2005 to 2009, Europe invested, on average, US$141 per head in telecommunications, while the United States and Canada, in contrast, invested US$212 and US$230 per head, respectively, implying a telecommunications investment gap between Europe and the United States of around US$100 billion over those five years. Moreover, McKinsey analysis shows that up to 80 percent of the telecommunication investments in Europe's 10 largest telecommunication markets are made by the two or three leading players in those markets.

Adding to their financial woes, large telecommunication operators have started to pay dividends to their shareholders reaching up to almost half of their cash flow in an effort to keep stock prices high despite all the indicators showing that the industry is past its initial peak. This understandable reaction only further diminishes the industry's capacity to invest and recover its dynamism.

REGULATING FOR INVESTMENT

Low investment in the telecommunication industry is hurting Europe's competiveness and denying consumer benefits. Revenue growth and profitability in the industry need to increase in order to unlock the scale of investment required to restore them both. Bringing revenue growth back to 4 percent a year could generate €450–500 billion of additional revenue over the next 10 years, according to McKinsey estimates. This would, in turn, generate an additional €150–200 billion of profit at current EBITDA margins—enough to get started on the essential investments in fixed and mobile networks outlined above. Public funds might fill the rest of the investment gap.

Restoring the industry's revenues to unlock investment requires a "New Deal"—that is, an industry framework that will not only allow pricing flexibility and promote consolidation among operators in both the fixed and mobile markets, but will also give operators the regulatory clarity needed to commit to larger, long-term investments in the industry.

Several policy steps in the right direction have been taken by EU Member States and by the European Union region as a whole. For instance, to encourage the construction of next-generation networks, the European Union has allocated some funding, initiated a public consultation on how to promote investment in these networks, and indicated in its policy statement in May

2012 that a more investment-friendly wholesale pricing regime is on its way (for more details, see Box 1).

INCENTIVES FOR INVESTMENT

As industry stakeholders shape the region-wide policy framework that Europe needs to underpin the rollout of next-generation fixed and mobile networks, McKinsey offers four additional ideas that relate specifically to market structure, pricing, wholesale access regulation, and spectrum.

- **Allow a reduction in the number of fixed and mobile operators.** As noted earlier, the fixed market in Europe is characterized by a large number of small players that compete on price; the few much larger players make little or no investment. Europe's consumers might be better served by a fixed industry with fewer, stronger players able to make larger investments but sufficiently numerous to ensure competition remains vibrant.

  Europe's mobile market also needs considerably fewer operators. The EU15 has 56 mobile operators, while the United States has only four to cover a similar size territory and population. Authorities should consider allowing operators in Europe to consolidate so they can operate networks and use resources such as spectrum in a more efficient manner.

- **Allow more pricing flexibility.** Operators need the flexibility to adjust prices to customers so they reflect the bandwidth and volume of data traffic that the customers require. With that flexibility, operators could consider charging more to the customers who are raising operating costs by demanding higher speeds, more services, and greater capacity over the Internet.

- **Restrict wholesale access regulation to a few basic services;** for example, unused fiber and ducts. Combined with allowing operators "regulatory holidays" for a reasonable period on any investments in new generation networks, restricting in this way would give operators a better chance of recouping their investments.

- **Give operators more spectrum in which to operate.** Such an increase in spectrum could contribute to this positive investment outcome. For example, allocating the second wave of the digital dividend spectrum (700 Mz) to wireless broadband use; enabling operators to acquire enough low and high frequency to give them the coverage and capacity they need to meet both exploding data demand and the "need for speed"; and ensuring that high-speed backhaul from cell sites is available by allocating appropriate frequencies for backhaul can all lift the investment value proposition.

A combination of the ideas mentioned above, along with the current measures implemented by the European Commission, could open the doors for the industry to

Box 1: Policy moves in the right direction

Some specific EU Member States and the European Union as a whole have made some recent regulatory changes that will help to unlock investment. These include:

- **Supporting co-investment initiatives.** Recently several operators in countries—including the Netherlands, Portugal, Spain, and Switzerland—have started to consider co-investment initiatives in which two or more operators would join forces to deploy expensive fiber networks. The operators will share the network, but will not be subject to wholesale access obligations that allow other operators access to the new network for a given period of time, usually the first five years.
- **Allowing geographic differentiation.** A forerunner in taking regional differences into account is the Portuguese decision not to regulate wholesale access in geographic areas where competition exists. In rural areas, operators can get support from public funding, which in turn will not be offered to companies operating in competitive areas.
- **Providing public funding.** In Sweden, government support for extensive municipal high-speed networks has stimulated the construction of next-generation fixed networks in rural areas, while mobile network sharing agreements have lowered the capital required to build new long-term evolution (LTE) infrastructure. At a regional level, the European Commission also recently created the Connecting Europe Facility to help fund the rollout of next-generation networks and pan-European digital services.
- **Maintaining the current wholesale price for access to "unbundled" copper connections.** The European Commission recently released guidelines indicating that wholesale prices for access to unbundled copper connections should be kept at their current levels so network operators can earn enough to fund the rollout of next-generation networks.
- **Modernizing spectrum policy.** The EU commission recently launched its Radio Spectrum Policy Program, which sets out general principles for managing spectrum in the European Union and defines key policy objectives. It has started to foster spectrum trading among operators to make more efficient use of available spectrum.

Source: McKinsey and Company.

invest and revitalize the European economy and re-establish its competitiveness on the global scene.

NOTES

1 EU15 countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

2 Incumbent operators of Austria, Belgium, France, Germany, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

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