RESEARCH &
KNOWLEDGE MANAGEMENT

TELECOMMUNICATIONS INDUSTRY

"Transformation of the industry"

7 November 2016

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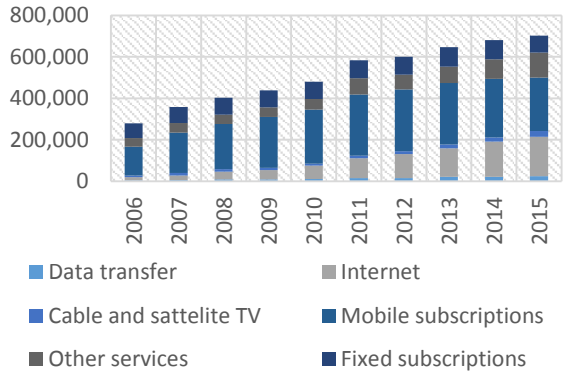
1 Key highlights

- Over the past decade, telecommunications industry has been actively deregulated, government monopolies were privatized and competition increased significantly. Global revenues from telecom services are expected to reach over EUR1.2trln in 2018 from EUR 1.1trln in 2015.

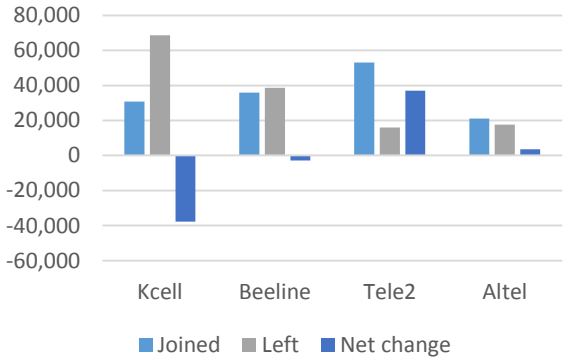
- Kazakhstan's relatively higher income per capita and young demographics make it an attractive telecom market. The structure of telecommunications services revenues in Kazakhstan has undergone significant changes mirroring global trends, revenue grew mainly in the mobile telephony and Internet segments. By 2016, the volume of telecommunication services reached more than KZT700bln.

Volume of telecommunication services, KZT mln (2006-2015)



Source: Kazakhstan Statistics Committee, Samruk-Kazyna

Change in number of subscribers with introduction of MNP, '000 subscribers, 9M16



Source: Operators data, Samruk-Kazyna

- In 2015-2016, the telecommunications industry in Kazakhstan started to experience challenging times for the first time since the 2000s. Most of the companies in the industry experienced declining sales, operating profits and EBITDA, as companies started to cut tariffs due to increased competition. The subscriber growth rate in 2016 was about 3% vs. 13% average between 2010-2015, as the market reached over 26 million subscribers in 2016.

- Provision of 4G licenses to all operators and introduction of Mobile Number Portability (MNP) significantly intensified competition on the largest market segments. Largest operators adjusted their development strategies, with Altel and Tele2 merging into one company, while Kcell and Beeline agreed on cooperation in infrastructure development. Nevertheless, Kcell and Beeline lost their market shares, while Tele2 and Altel increased the number of users.

- Both traditional and new segments of the telecom sector will experience significant changes in the coming years, new operating models will be developed due to digitization. Amid growing pricing pressure, cost containment, and rising competition within the telecom industry, companies are planning to increase their focus on business expansion in existing markets, new product development, and improving operational efficiency. Consequently, the key challenge would be to manage exponential growth of data volumes, while keeping network costs as low as possible.

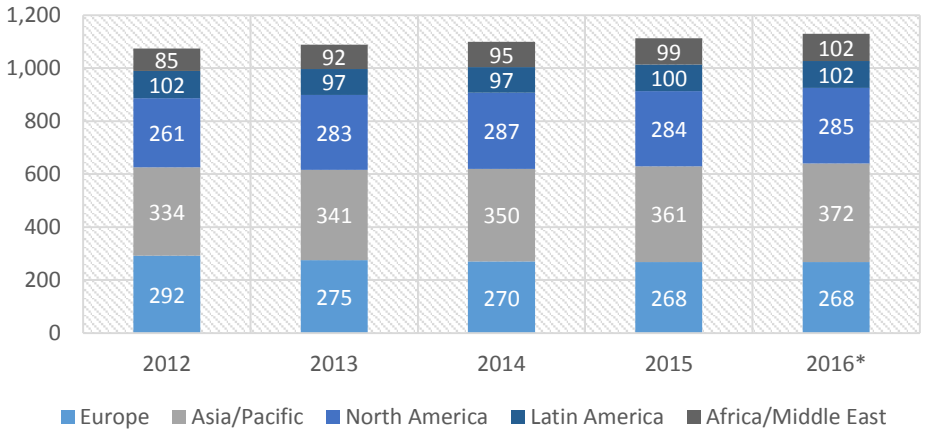
2 Introduction

Over the last decade, telecommunications industry and related services have shown impressive growth worldwide, becoming one of the key sectors of the economies of developed countries and playing an increasingly important role in the socio-economic life of the society. The telecom sector continues to be at the epicenter for growth and innovation for any industry. Mobile devices and related communications technologies remain the driver of growth with some key trends such as cloud computing, Internet of Things (IoT), and mobile payments. Over the past decade, the industry has been actively deregulated, government monopolies were privatized and competition increased significantly.

The importance of telecommunications industry to the economy cannot be understated. It is an essential input for virtually all businesses and is a key driver of all modern economies. International experience, particularly in European Union, Central and Eastern Europe, shows that liberalization boosts investment, market growth and propels sector development, innovative marketing techniques and entrepreneurial spirit. Markets tend to respond better to consumers' needs. This is particularly important for businesses that need advanced telecommunication services in order to grow. Thus general economy, overall employment and manufacturing productivity can benefit from higher investment and innovation in telecommunications generated by liberalization. Lower prices, innovative new services and increased investment in infrastructure are key inputs across almost all sectors of the economy.

The telecommunication services market is made up of two main services: wireline and wireless. Wireline services include fixed voice telephony and fixed broadband access services. The wireless telecom segment includes mobile voice services and mobile broadband access. More than three quarters of all of mobile and wireless users are in emerging markets, such as India and Africa, mainly due to large populations and the lack of fixed line infrastructure. However, the proportion of the population that has access to telecom infrastructure tends to be higher in mature markets (usually over 100%) and lower in emerging markets, particularly in rural areas, due to lower incomes and less network coverage.

Global telecommunications services market value, EUR bln (2012-2016*)



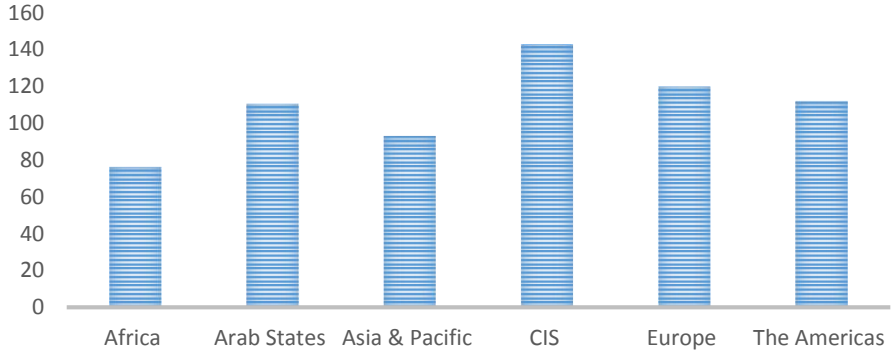
Source: Insight Research, Samruk-Kazyna

Traditional telephone calls continue to be the industry's biggest revenue generator, but the recent trends suggest that new segments, such as mobile internet, will be growing the fastest. Growth in mobile services outpaces fixed line services and the internet starts to replace voice as the main business. Consequently, the number of fixed connection subscribers decreased by 14.4% between 2005 and 2015.

The global revenue made from telecom services is expected to reach over EUR1.2trln in 2018 from EUR 1.1trln in 2015. With an estimated value of EUR373bln in 2015, the fastest-growing telecommunications services market is the Asia-Pacific region, followed by North America and Europe. The telecommunications market size has increased in the past two decades, due to cheaper and innovative technologies. The market has also benefited from increasingly skilled personnel and extensive investment in development of new technologies.

Revenues from fixed voice continue to decline as users switch to using fixed broadband and mobile. The industry is highly competitive with a large number of providers in both fixed line and mobile segments. In this environment, major players are looking for ways to improve efficiency, decrease costs and provide innovative solutions to individual and corporate customers. Fixed subscription costs decreased from USD11.3 per month in 2010 to USD10.5 in 2015 because of increased competition. Cost of mobile subscription declined from USD14.4 per month in 2010 to USD13.1 in 2015.

Mobile-cellular telephone subscriptions by region, per 100 inhabitants (2015)



Source: International telecommunications Union, Samruk-Kazyna

At the same time, the growing consumer base requires more capital investments into infrastructure and innovations such as mobile money transfer, video and entertainment and the Internet of Things. It is clear, that over the next decade the telecommunications industry will be defined by increasing demand for data transfer. The mobile subscription growth rates keep slowing down. Consequently, as the mobile voice market approaches the point of saturation, competition intensifies and profit margins narrow. In order to maintain growth operators will need to accelerate the expansion of data services.

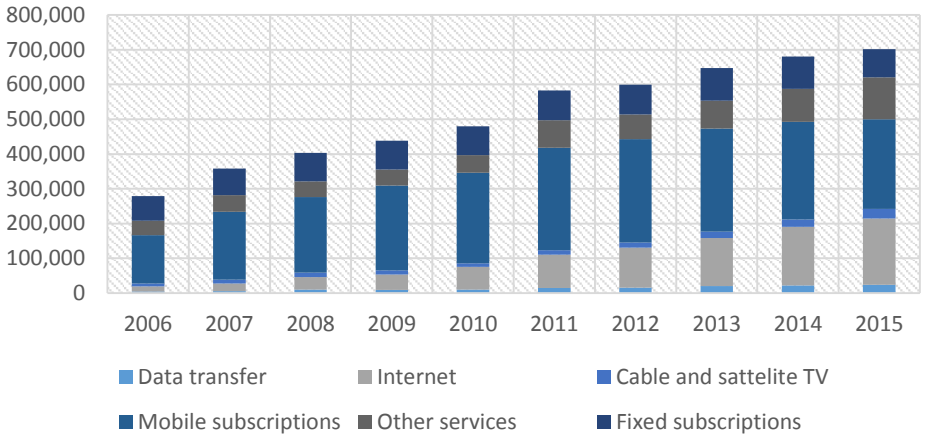
Both traditional and new segments of the telecom sector will experience significant changes in the coming years, new operating models will be developed due to digitization. Amid growing pricing pressure, cost containment, and rising competition within the telecom industry, companies are planning to increase their focus on business expansion in existing market, new product development, and improving operational efficiency.

Mergers and acquisitions are expected to increase within the telecom industry with emerging markets such as China, India, and Mexico offering prominent growth opportunities, especially in the data transfer subsector. This will require a much more segmented and targeted approach as data transfer requires large capital expenditures, while revenues will be smaller due to increased competition. Consequently, the key challenge would be to manage exponential growth of data volumes, while keeping network costs as low as possible.

3 Telecommunications industry in Kazakhstan

Telecommunications industry in Kazakhstan is one of the most important sectors of the economy. The Kazakh telecommunications market has experienced significant growth since its modernization in 1995 due to several competitive advantages compared with other countries in the region. Kazakhstan's relatively higher income per capita and young demographics make it an attractive marketplace, particularly for telecommunications. Evidence shows that the global financial crisis did not have a strong influence on the telecommunications market; the industry has successfully coped with the crisis and continued to grow. The structure of telecommunications services revenues in Kazakhstan has undergone significant changes mirroring global trends, revenue grew mainly in the mobile telephony and Internet segments.

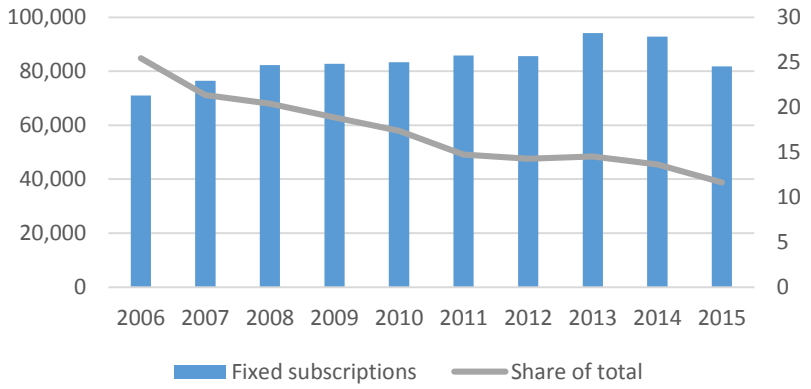
Volume of telecommunication services, KZT mln (2006-2015)



Source: Kazakhstan Statistics Committee, Samruk-Kazyna

Volume of telecommunication services reached more than KZT700bln, 27% of which came from Internet access services. Provision of internet services has been the main driver of the industry. Between 2013 and 2015, the share of revenues from this subsector increased from 21% to 27%. The share of revenues from mobile voice services, on the contrary, decreased from 46% in 2013 to 37% in 2015.

Volume of fixed subscription services vs. share of total telecom services, KZT mln (2006-2016)



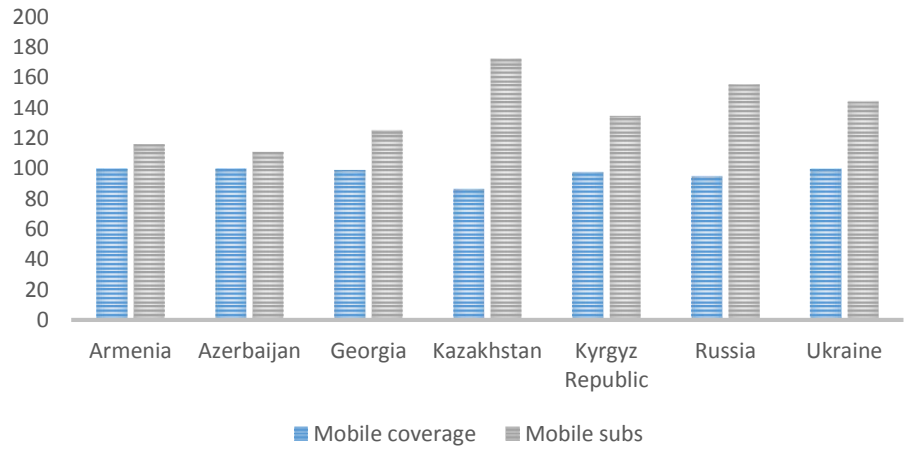
Source: Kazakhstan Statistics Committee, Samruk-Kazyna

The growth of fixed subscription market between 2000 and 2013 was mainly due to the growth of local telephony services, increased number of fixed telephone lines and tariff regulation. Since 2013, fixed

subscription market, including international and long-distance sub-segments, have been decreasing both in absolute values, and relative to the total volume of services. The volume of long-distance and international communication services shows a decrease by an average of 9% per year since 2009, due to it being displaced by mobile subscriptions and IP-telephony.

The country's mobile market has been booming since 2000 (no doubt boosted to some extent by the long delays in obtaining fixed-line services). The number of mobile services had exceeded fixed-lines by 2004 and has increased to surprisingly high levels of penetration. Kazakhstan's mobile market has experienced particularly strong growth over the last decade or so. Revenues from mobile services grew rapidly, on average by 17% annually until 2011. Penetration of mobile services reached 170% by 2015, partly due to the delay in advancing fixed-line services.

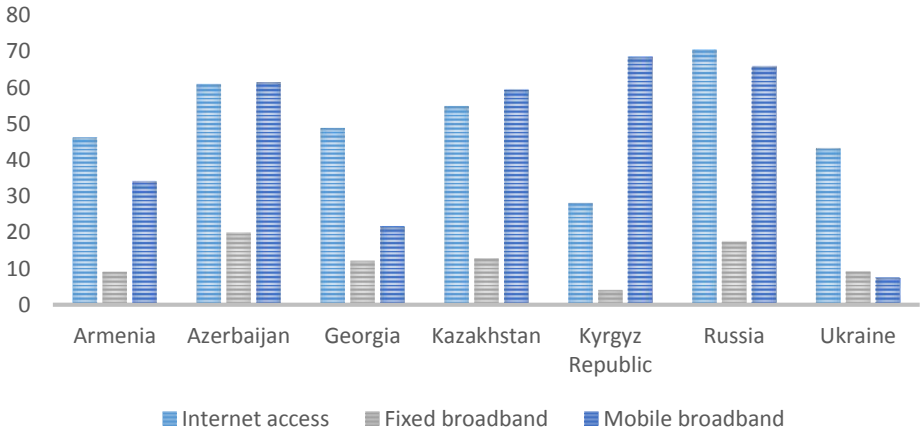
Mobile network coverage, % of the population (2016)



Source: International telecommunications Union, Samruk-Kazyna

Over the past 10 years, the minimum cost of calls to all destinations in Kazakhstan decreased 7-fold and amounts to 3 to 5 tenge per minute. From 2010 to 2015, interconnection rate was reduced from 20 tenge to 8 tenge. Since 2011, mobile operators started the conversion to the 3G data transfer standard, consequently, by the end of 2014, all villages with a population of 10,000 or more people are covered by the 3G network.

Internet access, mobile and fixed broadband, % of population (2016)



Source: International telecommunications Union, Samruk-Kazyna

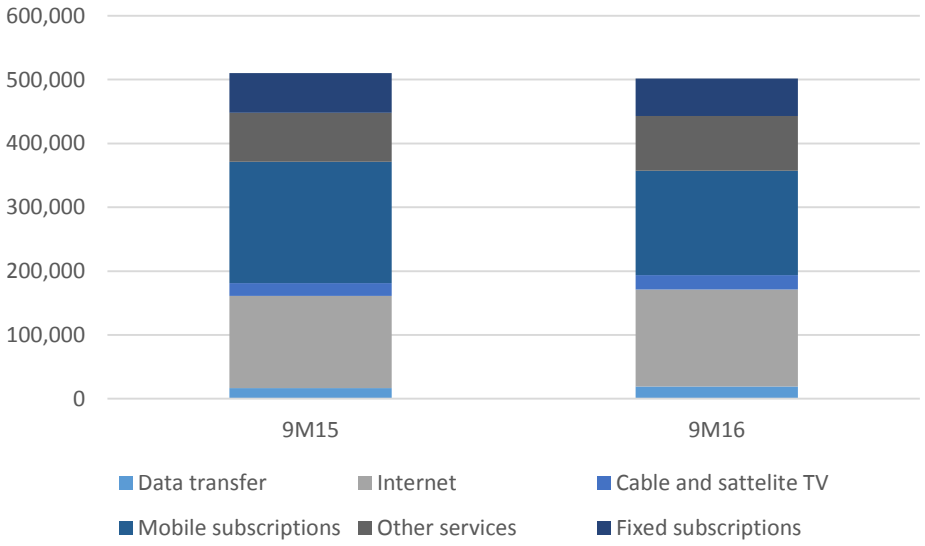
As for the broadband services, namely internet connections, Kazakhstan's market reached penetration of 55%. Nevertheless, the fixed market in Kazakhstan remains relatively underdeveloped, due to the dominance of the mobile broadband, which is in turn driven by the dominance of the mobile sector. Market penetration increased rapidly from 23% in 2010 to 57% in 2013. Since then the market stabilized and has been growing at a more moderate rate. Penetration by 2016 reached 61%.

Revenues from mobile data in Kazakhstan between 2013 and 2015 increased by almost 100%, ensuring the growth of the entire mobile market in 2014. The main factor in the growth of the mobile internet revenue was the increase in the number of subscribers using smartphones for data transfer. in 2014 their number exceeded 4.5 million, an increase of more than doubled compared with 2013 year. A significant impact on the market and had developed in the LTE network Kazakhstan (ALTEL), focused on the most demanding mobile users transmission data rate.

3.1 Recent performance of the telecommunications industry

In 2015-2016, the telecommunications industry in Kazakhstan started to experience challenging times for the first time since the 2000s. Most of the companies in the industry experienced lower sales, declining operating profits and EBITDA, as companies started to cut tariffs due to increased competition. The subscriber growth rate in 2015 and 2016 was 3% vs. 13% average between 2010-2015 as the market reached over 26 million subscribers in 2016. The mobile market is now highly mature and saturated. Mobile operators begin to lose revenue from its core competency - voice calls.

Volume of telecommunications services, KZT bln



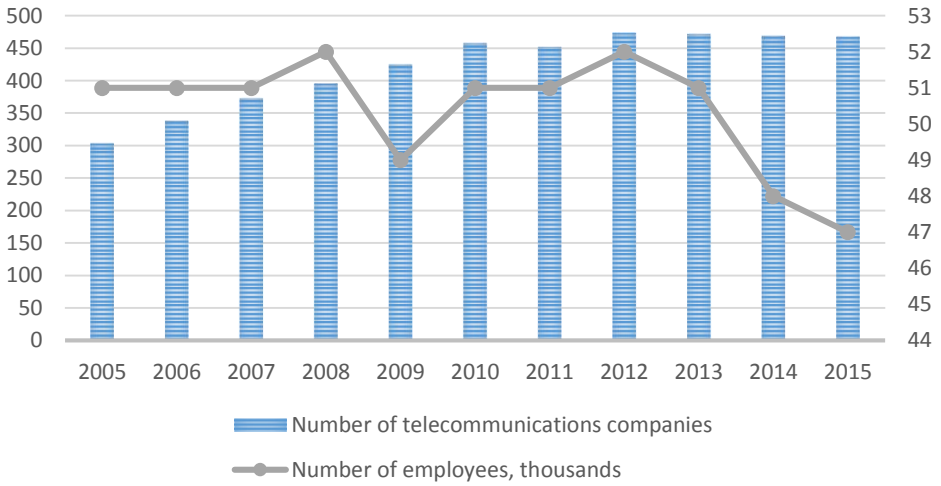
Source: Kazakhstan Statistics Committee, Samruk-Kazyna

In 2015 revenues from voice services in mobile networks decreased for the first time in the history of the market. Consequently, combined revenues from mobile subscriptions decreased despite continuous growth in the mobile internet subsector. Revenues from broadband and data transmission show continuous increases, but growth is slowing down, since the market is becoming increasingly saturated. As a result, the penetration of broadband connections in the cities exceeded 50% on average. Main operators of fixed broadband services are focusing on increasing the number of subscribers in fiber-optic networks, due to it having the highest average return per unit.

Because of the transformation of the industry, by the end of 3Q16, total revenues were distributed as follows: mobile communication (32.1%), Internet (30.58%), local telephone connections (6.74%), long-distance and international telephone connections (5.05%), other services (17.22%).

Decreasing profits have led to layoffs; the number of employees working in the industry has decreased over the last three years. Despite the worsened performance, telecommunications sector was one of the few to show profitability in 2015. However, the volume of communication services fell by 3% in 1H16 and amounted to KZT387bln, consequently labor productivity decreased by 6% as well. On average, communications services amounted to KZT55bln per month, 2 bln lower than over the last year. Productivity has decreased, despite, despite the increase in prices of communications services in Kazakhstan, which grew by an average of 4.4% YoY. Despite the increase of tariffs in the telecommunication industry, companies show weak growth and, in some cases, a decline in revenue and profits.

Number of telecommunications companies and employees (2005-2015)

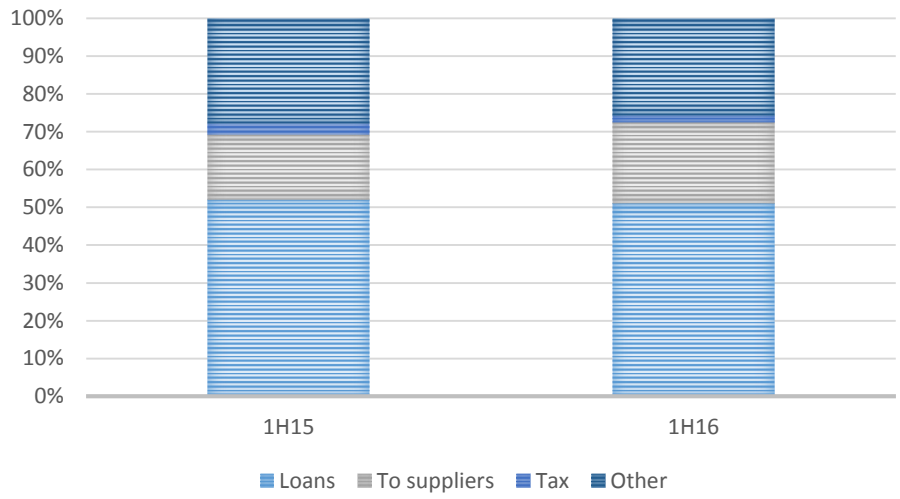


Source: Kazakhstan Statistics Committee, Samruk-Kazyna

Profitability of the companies in the telecom industry decreased to 14%, compared to 21% a year earlier. However, it is important to take into account the fact that this year's profitability in the sector is slowly recovering from a fall during the 2H15, when it amounted to only 7% in 3Q15 and 12% in 4Q15. Large and medium-sized enterprises show a larger profit margin (17%) in 2Q16, compared to 10% in 1Q16. Smaller enterprises are less stable, however, they still reached an average profitability margin of 6%.

Over the last year, the number of employees in the information and communications industry decreased by 8%, to a level of 65,700 people as at the end of July 2016, including 47,000 people in telecoms industry alone. Thus, the number of employees in the industry fell to its lowest level in the entire post-crisis period (2011-2016). Consequently, labor productivity in the telecom industry increased to 6 times higher than the level of wages. In 2015, the amount of wages fund in the sector amounted to KZT134bln, 4% less than a year earlier. Monthly wages at large and medium-sized enterprises increased, albeit only by 3.0%, and averaged KZT182 thousand per month.

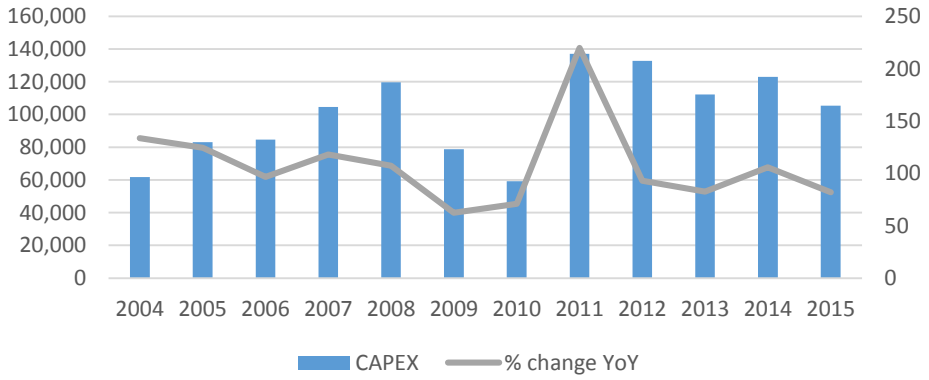
Structure of liabilities, 1H15 vs. 1H16



Source: Kazakhstan Statistics Committee, Samruk-Kazyna

Reduced sales in the telecommunications sector put pressure on the solvency of the industry. In 1H16, large and medium-sized enterprises in the telecom industry earned KZT56bln in profits. This is the lowest amount obtained in the sector since 2010. Increased cost of imports due to the devaluation caused difficulties for companies, the amount of debt to suppliers of goods and services grew by 25% to KZT134bln.

Capital Expenditures in telecommunications KZTmln, 2004-2015



Source: Kazakhstan Statistics Committee, Samruk-Kazyna

The largest players are optimizing their expenditures, reducing capital expenditures and other investments. Reduced CAPEX can limit future growth and effectiveness of operations. Since telecommunications industry is one of the most innovative, its development will largely depend on investments into new technologies and equipment. CAPEX decreased from their all-time peak of KZT137bln in 2011 to just KZT105bln in 2015.

3.2 Major players in the telecommunications industry

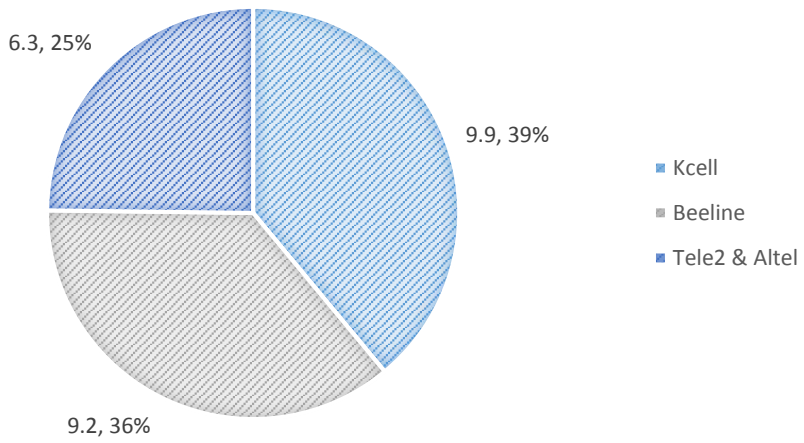
Kazakhtelecom is the largest player on the fixed line market. It is a state-owned enterprise that is the largest player on the telecommunications market. In 2012, the operator's fixed subscriber base made up roughly 93% of national fixed subscriber figures and it continues to be the largest telecom company in Kazakhstan. The main shareholders of the company are the National Welfare Fund Samruk-Kazyna

with 52,02%, Sobrio Limited with 24.47%, Bodam B.V. with 17,21%, Deran Services Limited with 7,75%. The government announced that Kazakhtelecom (KT) is in line for privatization over the next several years via a public share offer.

As for the mobile market, until 2016, Kazakhstan it was represented by four GSM-operators (**Kcell**, **Beeline Kazakhstan, Tele2 Kazakhstan and Altel**). Tele2 Kazakhstan and Altel, which is a Kazakhtelecom's subsidiary company, completed their merger in March 2016. This deal reduced the number of players in the market from four to three. Altel's migration from CDMA to GSM/UMTS/LTE technology has seen the company register impressive subscriber growth as well as increasing its market share. Total revenue from mobile services, as reported by Altel's parent company Kazakhtelecom, grew by 160% to KZT28,291mln (USD81.547mln) in 2015.

The joint venture (JV) of Tele2 Kazakhstan and Altel revenues in 2Q16 amounted to KZT21.6bln tenge. The share of Tele2 amounted to KZT14.2blne, an increase of 35% YoY. Subscription revenue in 2Q16 amounted to KZT16.3bln tenge. The subscriber base of Tele2 increased by 651.3 thousand customers compared to the same period last year and amounted to 4.8 million users. In addition, number of Altel customers reached 1.6 million. EBITDA of the joint venture in 2Q16 amounted to KZT1.8bln.

Mobile Market Shares, mln users (1Q16)



Source: Operators data, Samruk-Kazyna

Trying to keep up with increased competition, **Kcell** and **Beeline Kazakhstan** recently signed an agreement on the joint construction of the fourth-generation network in Kazakhstan. Kcell will build the network in seven regions: Almaty and Almaty region, South Kazakhstan, West Kazakhstan, Atyrau, Mangystau, Kyzylorda and Aktobe regions. Beeline Kazakhstan, in turn, will be responsible for deploying the network in other seven regions: Astana and Akmola oblast, Karaganda, Zhambyl, East Kazakhstan, North Kazakhstan, Pavlodar and Kostanai region.

3.3 Demonopolization and mobile number portability

In the end of 2016, the government lifted a monopoly on the provision of fourth-generation (4G) services in the telecommunications sector. The government has lifted the monopoly under which previously only the Altel company—a subsidiary of the state-owned telecoms provider, Kazakhtelecom—had the right to provide 4G services. The government will henceforth grant licenses on existing and new frequencies for 4G services to all of Kazakhstan's three mobile telephone providers.

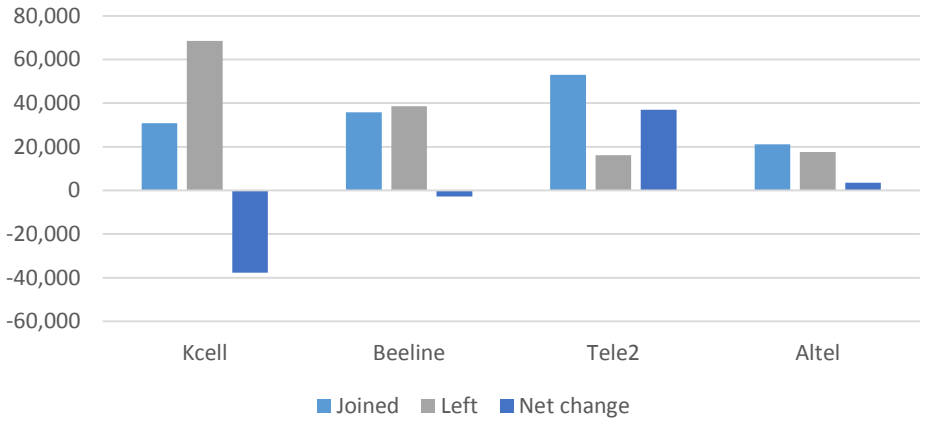
The move to de-monopolize 4G services comes after Kazakhstan formally joined the World Trade Organization (WTO) in December last year. The government had previously stated that it would not de-monopolize 4G services until 2018. Under its commitments to the WTO, the government has also undertaken to abolish a restriction of 49% on foreign equity in the telecoms sector by mid-2018, with the exception of the main state-owned operator, Kazakhtelecom.

The move is intended to increase competition in the telecoms sector, leading to an improvement in technical capacities and quality of services, and allowing larger numbers of subscribers to benefit from 4G services. The government has set the objective of rolling out 4G services to all villages with a population of at least 500.

Increased competition and active development of 3G and 4G technologies poses a threat for Kazakhstan operators, since there is a huge difference between the rate of growth in network traffic volume and income. In 2015, Kcell recorded traffic growth of 101.6% compared to 2014, Tele2 and Beeline reported similar dynamics. At the same time, the income of operators of mobile internet services rose on average by one third compared with the previous year. Profitability of data services will deteriorate further, as the amount of traffic is expected to grow substantially, requiring operators to invest in telecom infrastructure.

Another initiative, Mobile Number Portability (MNP), which was introduced in 2016, intensified competition on the market further. As a result of this policy, penetration rates are likely to go down, thus, further development of the sector would not be in quantitative saturation but in improving the quality of communication and data transmission. More than 140,000 users switched networks in the first three months after the launch of MNP in Kazakhstan at the start of this year. The biggest winner was third-placed operator Tele2, which lost 16,074 users but added 53,003 for a net gain of 36,929 subscribers. Next was smallest operator Altel which lost 17,553 users and added 21,099, leading to a net gain of 3,546 users. The two larger providers, Kcell and Beeline, both saw net subscriber losses, with the latter down by a net 2,767 users and Kcell losing a net of 37,708 users.

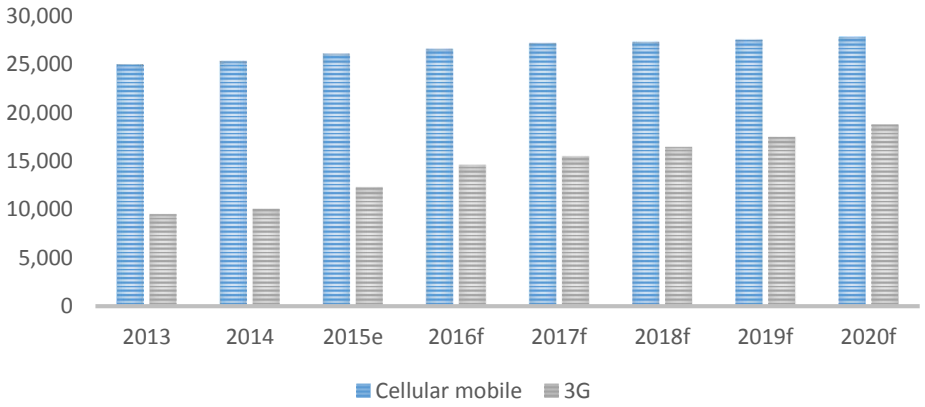
Change in number of subscribers with introduction of MNP, '000 subscribers, 9M16



Source: Operators data, Samruk-Kazyna

The total number of mobile broadband subscribers is expected to increase by 3% in 2016. By the end of 2020, the number of subscribers is expected to reach around 18.8 mln subscribers, given the introduction of MNP and non-restricted access to 3G and 4G licenses. This would be equivalent to 67.5 % of the total mobile market.

Actual and forecasted number of cellular and 3G subscribers (2013-2020f)



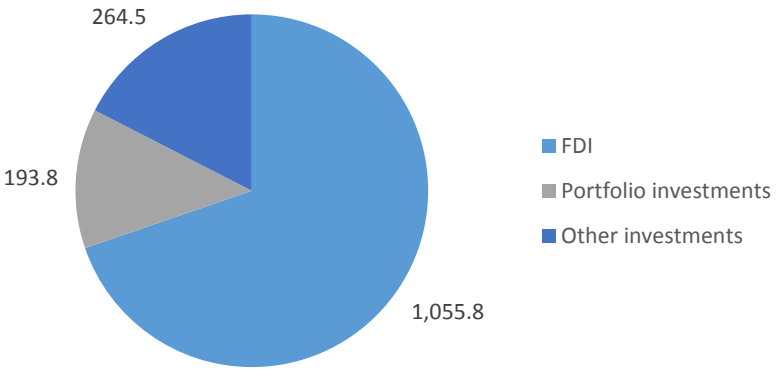
Source: BMI, Samruk-Kazyna

Currently, the telecommunications industry is undergoing transformation. Data transmission, mobile Internet, according to some experts, can amount to more than 80% of all mobile services in the next five years. On the other hand, there is a significant decline in revenues from voice and SMS. About 30-50% of consumers use smartphones, and this number is expected to reach as much as 90% within the next couple of years. All of Kazakhstan's cellular operators are expected to have 4G LTE networks live in all regional capitals by the third quarter of 2016, and to have expanded services to most cities by the end of 2016.

3.4 Attractiveness of the telecommunications industry for foreign investors

The rapid and successful development of telecommunications in the country encouraged a number of foreign companies both service providers and suppliers - to establish a presence in this emerging market. Since 1992, international operators and manufacturers have been active in Kazakhstan in providing services and installing state-of-the-art equipment, especially as part of the country's international telecom network. Recognizing the long-term potential of this market, many foreign telecom companies have been looking to invest and form partnerships with local telecom enterprises.

Foreign investments into telecommunications industry, as of 2Q16, USDmln



Source: Kazakhstan Statistics Committee, Samruk-Kazyna

There are around ten medium and large-sized enterprises that are fully or partially owned by non-residents, including mobile operators Kcell, Tele 2 and Beeline. Foreign investments into this industry

have reached USD1.5bln, including USD1.1bln of direct investments, as of 2Q16. The amount of investments has been decreasing, partially due to decreasing attractiveness of the industry. In the medium term, foreign companies are less likely to enter Kazakhstan's market due to unfavorable macroeconomic environment, devaluation of the national currency, as well as the need for substantial additional investments in the sector to compete with main competitors.

Consequently, Swedish telecommunications company TeliaSonera has already announced that it will sell off its share in Kcell and exit all seven countries in its Eurasia mobile network operating division - Kazakhstan, Uzbekistan, Azerbaijan, Tajikistan, Nepal, Georgia and Moldova - to sharpen its focus on its Sweden and Europe divisions . The strategic decision follows a troubled period in which the group was affected by investigations into corruption allegations in Eurasian markets, exacerbated by tough macroeconomic conditions and price competition across the Eurasia footprint. Following TeliaSonera's announcement to divest its Eurasia operations, Turkcell has reportedly offered in March 2016 to acquire full ownership of Fintur Holding as well as of TeliaSonera's direct share in Kcell.

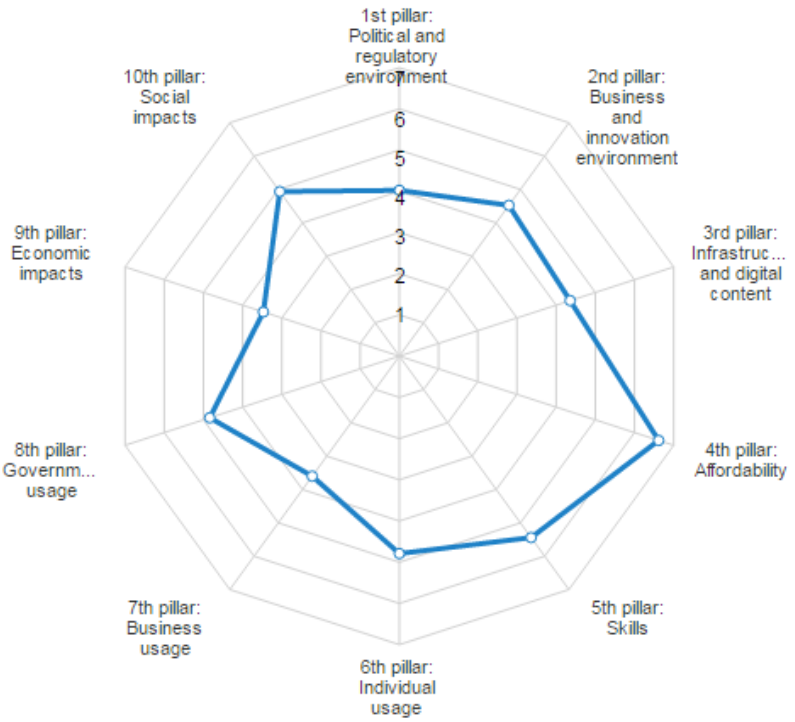
Another factor that limits foreign participation in the telecommunications industry is the legislation, which prohibits non-residents to own more than 49% of any telecommunications company, excluding mobile operators. This limit will be removed with Kazakhstan's inclusion into the World Trade Organization (WTO), although no particular time frame has been set. Kazakhstan's accession to the WTO will undoubtedly strengthen its ties with global trading partners, as export barriers are lifted and sectors such as telecommunications become more open to foreign investment.

3.5 International rankings and infrastructure

According to the World Economic Forum's Global Technology Report, Kazakhstan holds 39th place in the world by Networked Readiness Index (NRI), which measures the propensity of the economy to employ ICT. WEF notes high affordability and government usage of digital technologies in Kazakhstan. While quantitative indicators of development of the ICT industry, such as number of telephone lines or mobile users, reached average or above-average global levels, the quality of products and services in Kazakhstan has to be improved in order to achieve this transformation. Namely, Kazakhstan holds only 90th place in the world by firm-level absorption of technology and 73rd place by impact of ICT on new services and products. Still, Kazakhstan has one of the most affordable entry-level fixed-broadband (1.1% of GNI per capita) and prepaid handset-based mobile-broadband (1% of GNI per capita) in the CIS region.

Telecoms infrastructure in the country has improved rapidly over the last few years with the deployment of fiber optic cables, microwave links and satellite services. Kazakhstan is connected internationally via the Trans Asia-Europe (TAE) fiber-optic cable which today covers 20 countries, and spans from the east coast of China to Frankfurt in Germany. In 1999, Kazakhtelecom and Siemens partnered to deploy the 1,750km section of the cable from the country's border with China and Uzbekistan. The cable was built under an agreement between the country incumbents throughout 1994-95.In January 2011, Alcatel-Lucent announced the deployment of Kazakhstan's first Gigabit Passive Optical Network (GPON) for Kazakhtelecom in Astana, which enabled the company to deliver advanced broadband services.

Kazakhstan's rating in the Network Readiness Index (2016)



Source: UN E-Gov survey 2016

Kazakhstan's ICT infrastructure ratings

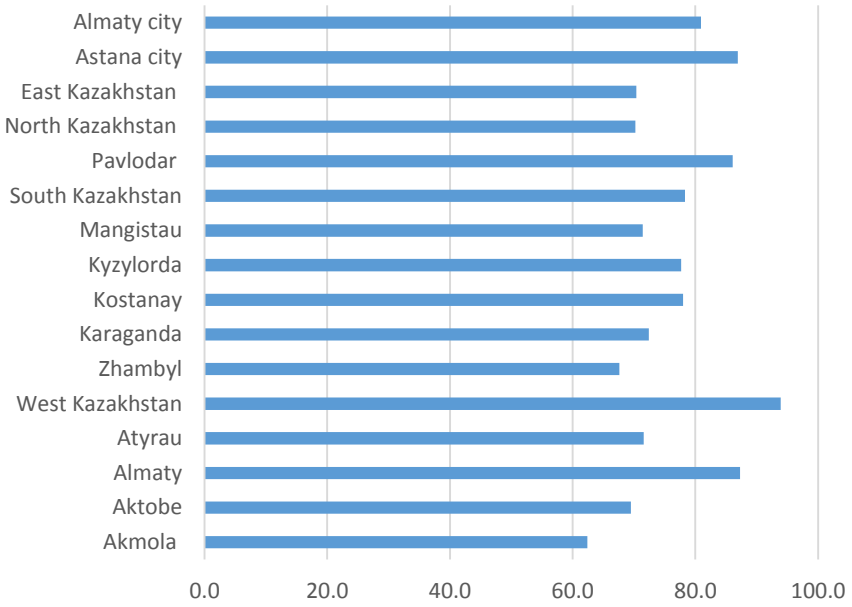
Country	Percentage of Individuals using the Internet	Fixed telephone subscriptions per 100 inhabitants	Mobile cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Kazakhstan	54.89	26.12	172.2	12.93	59.4

Source: UN E-Gov survey 2016

Kazakhstan has replaced virtually all of its analogue equipment with digital technology and by the end of 2011, 96% of its network was digital. Furthermore, in 2011, Kazakhtelecom announced plans to invest over KZT10 billion to expand its telecoms infrastructure with an expected completion date in 2016. The plans include the deployment of a large-scale FTTH network to be rolled out in the provinces of Aktobe, Atyrau and Mangystau.

However, existing infrastructure still limits access to Internet in rural areas and does not meet the needs of rural residents in terms of range, quality and speed. According to official statistics, the share of internet users varies between 62.4% in Akmola region and 93.9% in West Kazakhstan region. In order to reduce disparities between urban and rural regions, it is necessary to provide broadband Internet access in rural areas.

Internet users by region, % of population



Source: Kazakhstan Statistics Committee

To resolve this issue, the government together with JSC Kazakhtelecom is implementing the project to cover all rural villages with population of over 250 people with the fiber-optic communication lines. To increase the share of local content and availability of Kazakh internet resources, JSC Kazakhtelecom provides free traffic with speeds up to 100 Mb/s, as well as free hosting for 1 month.

Kazakhstan Development Bank, one of the largest development institutions is now involved in two major projects in telecommunications:

- KZT104bln loan to Altel to introduce LTE/GSM/UMTS networks with coverage of 5.7 million subscribers. The project will be completed by 2022, while the first phase is expected to conclude by 2018.
- KZT32bln loan to Transtelekom to finance the construction of hardware and software complex, including upgrades of over 10,000 km of fiber-optic communication lines. This project should be completed by the end of 2016.

As the largest land-locked country in the world with a very diverse landscape, connectivity is challenging to accommodate. With the increasing demand for improved telecoms infrastructure and services, the satellite communications market in Kazakhstan has been expanding at a considerable pace. Kazakhtelecom utilizes four Intelsat satellites with earth stations in different regions. Kazakhtelecom and a further three private companies were granted rights to use the Intelsat system, and Nursat, one of the three, was the first fully digital satellite to serve the entire country.

In spite of the current difficulties in the industry, development of the telecommunications sector is a priority for the government within the framework of diversified economic development. The Government plans to adopt a program "Digital Kazakhstan 2020", developed in accordance with the World Bank's methodology, to increase the growth of the share of ICT sector in GDP from 4% in 2015 to 5% in 2020. The program will be approved before the end of this year and implemented starting from 2017. The amount of funding for the Program from the republican budget is KZT228.5bln. Its purpose is to improve the competitiveness of the economy and quality of life through the introduction of digital technology.

Key indicators of the program are:

- increase the share of the ICT sector in the country's GDP to 5%,
- create 150 thousand additional jobs in the IT sector,
- increase labor productivity in IT sector by up to 37%,
- increase the digital literacy of the population to 85%,
- increase the share of internet users to 75%,
- improve "E-Gov" index (according to the UN methodology) to be in top 25 countries,
- improve e-participation index (according to the UN methodology) to be in top 20 countries.

In addition, national holding Zerde in partnership with SAP plans to adapt best practices of the SAP Institute for Digital Government, which accumulates the best practices of digital governments of developed countries, in particular Australia, Singapore and Denmark. SAP (one of the leaders in the corporate applications market) already has experience of cooperation with Kazakhstani state agencies. For example, last year SAP signed a strategic cooperation agreement with JSC Samruk-Kazyna. The agreement aims to increase the degree of process automatization of Samruk-Kazyna group from 30% to 70%. The economic effect of cooperation according to the Fund estimates will be about KZT200bln by 2020.

Technology advances have brought traditional business processes to a new level with a huge impact on the economic growth. Intelligent, interconnected systems, cyber-physical systems and cloud computing now enhance activities along the entire value chain. It means reduced costs and improved efficiencies, greater speed and scale, smarter products and services. Capitalizing on the potential of ICT is a key success factor for any economy in the coming years. Kazakhstan has started to implement new technologies in government and business processes with modest results, but there still is a lot of work to be done. This will require better cooperation between government agencies, businesses and citizens.

4 Conclusion

The importance of telecommunications industry to the economy cannot be understated. It is an essential input for virtually all businesses and is a key driver of all modern economies. Kazakhstan has made many positive improvements to its telecoms sector in the recent past, however many challenges remain to ensure active development of the sector in accordance with the best international experience.

The telecommunications industry is expected to grow slower than the general economy in the short-term, due to declining revenues on fixed and mobile voice services. Weaker macroeconomic environment will contribute to the industry slowdown. Mobile operators' total revenues will grow slower, as services rates decrease on data and voice call segments. Penetration rates are likely to go down, thus, further development of the sector would not be in quantitative saturation but in improving the quality of communication and data transmission.

At the same time, data segment will gradually assume a larger share in total revenues. As competition is getting more data-centric, operators with the highest smartphone penetration among subscribers will benefit the most. Consequently, the key challenge would be to manage exponential growth of data volumes, while keeping network costs as low as possible.

At the moment, mobile sub-sector is affected by worsening of the macroeconomic environment, overall decline in disposable income and increased fixed costs. In the medium-term operators will seek to

maximize the coverage of the market, especially mobile broadband (3G and 4G), and attracting customers from some segments, which were previously considered unprofitable. Operators have already started to cooperate more closely, in order to optimize their expenditures. In the nearest future, we see further development of such partnership strategies. Joint construction and use of the infrastructure can provide a significant reduction in capital expenditures. Creating a single developed network with non-discriminatory access instead of multiple overlapping networks for each operator will provide enormous savings in capex.

The telecommunications industry is undergoing transformation. Data transmission, mobile Internet, according to some experts, can amount to more than 80% of all mobile services in the next five years. On the other hand, there is a significant decline in revenues from voice and SMS. About 30-50% of consumers use smartphones, and this number is expected to reach as much as 90% within the next couple of years.

Active involvement of foreign companies in the mobile sub-sector demonstrates all advantages of liberalization in the industry. Other sub-sectors, such as fixed voice and broadband, television and other data services can benefit from increased competition, which will in turn improve cost-effectiveness of the entire industry. In the medium term, foreign companies are less likely to enter Kazakhstan's market due to unfavorable macroeconomic environment, devaluation of the national currency, as well as the need for substantial additional investments in the sector to compete with main competitors.

Further liberalization of the telecommunications sector will result in enhanced operational effectiveness and will provide a massive multiplier effect on other sectors of the economy. International experience, particularly in European Union, Central and Eastern Europe, shows that liberalization boosts investment, market growth and propels sector development, innovative marketing techniques and entrepreneurial spirit. Thus general economy, overall employment and manufacturing productivity can benefit from higher investment and innovation in telecommunications generated by liberalization. Lower prices, innovative new services and increased investment in infrastructure are key inputs across almost all sectors of the economy.

Accession to the World Trade Organization will require Kazakhstan to open access to its telecommunications marketplace and commit to the competitive supply of services. In addition, the government will need to put in place a regulatory regime that ensures that major providers of telecommunications services, such as KazakhTelecom, are required to grant access to the network to competing operators (i.e. interconnection) on a non-discriminatory basis. WTO membership will also require that major suppliers, such as KazakhTelecom, are not allowed to act in an anti-competitive manner, e.g. cross subsidizing below cost services with profitable services; using competitor information with anti-competitive results.

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