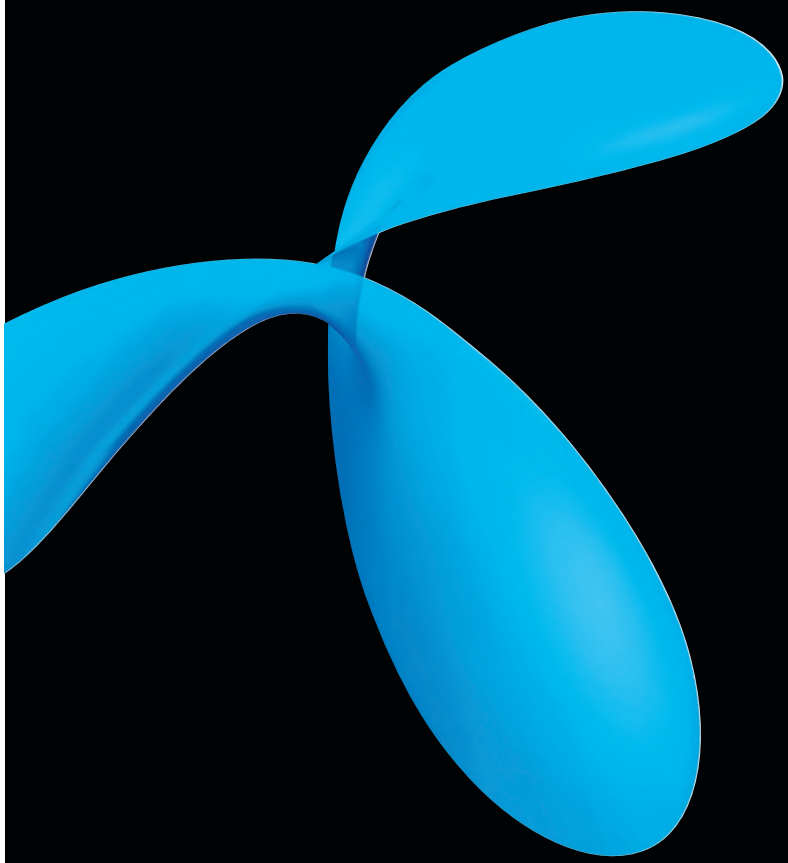
Economic Contribution of Mobile Communications.

telenor



Introduction from Telenor

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In many developed nations telephony and the Internet is taken for granted. On the other hand, in developing markets services such as energy, road infrastructure, banking and health care cannot.

Mobile services began to emerge in developing markets in 1990. At the time, the industry held a fundamental belief that this would soon become the predominant mode of communication. However, even to the optimist the scale and speed of its adoption- as well as its impact on social and economic development- has exceeded expectations.

By August 2007 there were 3 billion mobile connections in the world. It took fixed line telephony more than 125 years to reach 1 billion lines. Mobile connections grew from 1 to 3 billion in less than six. At present, new mobile phone connections are growing at around 45 million per month, or 1.5 million per day. 80% of growth over the next years is expected in emerging markets. Such growth is mirrored in Telenor's developing communities.

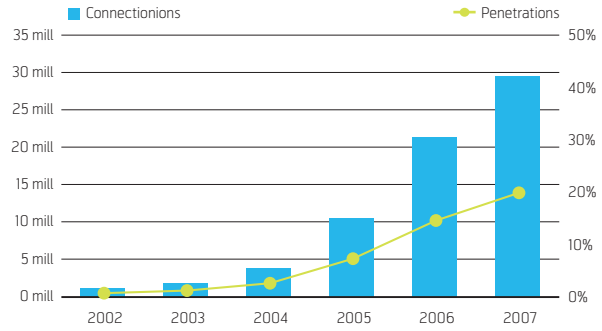
Telecommunications has demonstrable positive impacts on economic growth in developing countries, with independent studies estimating the effect to be almost twice as large as that in developed countries. Recent research by the GSM Association and Deloitte showed that the long-term GDP growth rate of a developing country may increase by as much as 1.2 percentage points with every 10 percent increase in mobile phone penetration. The Telenor Economic Impact Study, which you will be introduced to in this brochure, shows that the impact of mobile communications on a country's GDP can be even larger than that.

Mobile communication opens up information sharing long dominated by traditional barriers and gives a voice to the traditionally unheard. It is a tool to enhance economic, health and educational activities.

In short, access to a mobile phone is no longer a luxury. Today it is a necessity and a driver of development both for the individual and the nations.

Bangladesh

FIGURE 1: Connections and penetration in Bangladesh



SOURCE: Wireless Intelligence

Extensive economic and social benefits

Bangladesh is amongst the poorest countries in the world, with 50% of people living in poverty and a gross national income (GNI) per capita of $470. Despite a difficult business environment, the mobile communications sector is growing rapidly. The number of mobile connections has increased from 3.8 million in 2004 to over 29.5 million at the end of 2007. Penetration rates are reported to be just below 20%[1] and network coverage extends to over 97% of the population. Since 2001, the number of mobile subscribers has exceeded the number of fixed line subscribers and the ratio at end 2005 stood at approximately 11:1[2]. This growth has brought about extensive economic and social benefits for those working in the sector and the wider Bangladeshi population.

The mobile sector in Bangladesh contributed a total of BDT 260 billion to the economy in 2007, representing 6.2% of total GDP. This is an increase of over 250% since 2004 and represents 2.1% of total GDP. Deloitte estimates that the mobile communications industry contributed over BDT 91 billion of value add to the domestic economy in 2007, up from BDT 28 billion in 2004. When the impact of the economy wide multiplier is included, the value contribution in 2007 was BDT 128 billion up from BDT 39 billion in 2004. Of this value-add, the largest contributors are taxes and regulatory fees (68%). The rest is made up of wages, dividends and expenditures on corporate responsibility (CR).

Employment creation

Deloitte estimates that more than 111,790 jobs have been created by the mobile industry in Bangladesh to date[3]. This is an aggregated figure, and includes both direct and indirect employment.

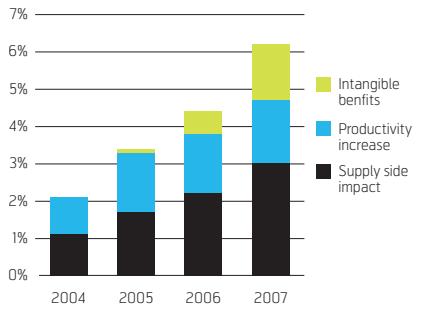
TABLE 1:
Contribution to employment from the mobile value chain in Bangladesh

Employment Impact	Number of employees (FTE)	Number of employees including multiplier
Mobile network operators	9,380	9,380
Fixed operator	1,120	1,570
Network equipment suppliers	13,180	18,450
Other suppliers of capital items	4,450	6,230
Handset distributors and retailers	10,360	14,500
Support services	3,100	3,700
Airtime and SIM distributors and retailers	39,930	55,900
CICs	950	1,320
Total FTE	**82,460**	**111,700**

Source: Operator data, interviews and Deloitte analysis on average wage rates. (Note this is employment directly created by revenue flows from the MNOs and does not represent total employment in the sector). We apply a conservative multiplier of 1 to MNO employment as we assume that much of the employment effect was captured in the first round revenue flows.

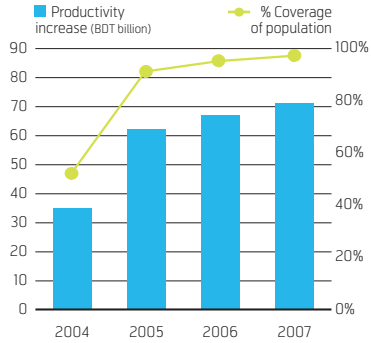
It can be seen that employment in related industries (indirect employment) constitutes a large proportion of the employment created by the mobile industry. This is due to the large number

FIGURE 2: Economic impact of the mobile communications industry in Bangladesh as a percentage of GDP



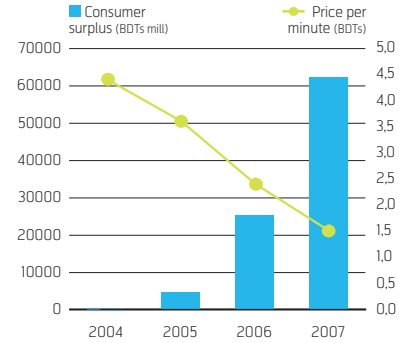
SOURCE: Deloitte analysis based on data provided by operators, interviews and analysis of company accounts and industry reports.

FIGURE 3: Productivity impact of mobile communications



SOURCE: Deloitte analysis based on interviews with industry players, benchmarks, and calculation.

FIGURE 4: Increasing consumer surplus



SOURCE: Deloitte analysis based on information provided by operators, interviews and analysis of company accounts and industry reports.

of parties who act either as suppliers to the MNOs or retailers or distributors of mobile services The largest contributors are airtime and SIM distributors and retailers making up 50% of total FTE.

As the mobile sector continues to expand and develop new services, its contribution to GDP is likely to further increase. Our analysis suggests that the dynamic effects of a 10% increase in mobile penetration would increase the long term GDP growth rate of a developing country by 1.2% (in comparison to 0.6% in developed countries)[4]. This means that the rapid increase in penetration experienced within Bangladesh may have contributed to long term economic welfare and raised growth rates by 0.6% during the last two years.

Large productivity gains

In Bangladesh, access to mobile communication can be instrumental in increasing the productivity of workers across sectors in both rural and urban areas. In particular, it can improve information flows within companies and between buyers and sellers; increase work flexibility; and promote business in previously underserved areas. Deloitte estimates the impact on the productivity improvements on the Bangladeshi economy by assuming that the productivity improvement will be experienced by workers whom use mobile phones for business purposes. Based on this, it can be assumed that a productivity gain of 10% annually has been experienced by mobile business users over the period 2004-2007, chosen as there is relatively low fixed line and internet penetration. We estimate that productivity gains of MBUs have increased GDP output by BDT 71 billion in 2007.

Social benefits

During interviews with those in different parts of the value chain, several sources of social benefits of mobile communications in Bangladesh were identified. These included: promotion of social cohesion and economic welfare; economic empowerment in low income rural areas; extension of communications to users with low education and those on low incomes; stimulation of local content; dissemination of educational and health information, and assistance in disaster relief.

The price of mobile telephony has been falling steadily in Bangladesh. At the same time, consumers have benefited from an increasing range of services and an increase in quality of service. Deloitte estimates that the consumer surplus has increased by BDT 62,212 million between 2004 and 2007.

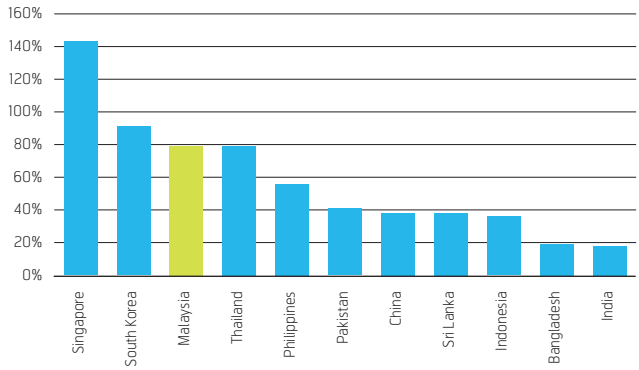
For further closure of the digital divide and for penetration to continue to rise mobile services need to become more affordable in Bangladesh. Schemes such as the sale of top-up vouchers in smaller denominations and the launch of low-cost handsets by handset manufacturers will assist in this. However, other initiatives including further reductions in handset import and SIM activation taxes alongside operator driven pricing initiatives could also stimulate further growth.

1 Source: Wireless Intelligence and operator data.
2 Fixed line connection data taken from BTTB 2005 Annual Report.
3 This excludes employment from Village Phone as employment is not full-time.
4 Tax and the digital divide 2006, Deloitte / GSMA

Malaysia

Population: 27 mn
Population growth rate: 1.8%
Population per sq km: 75
GDP per capita: USD 5,330
GDP pr capita PPP: USD 12,900
GDP growth rate: 5.9%

FIGURE 1: Mobile Penetration in Malaysia (SOURCE: Wireless Intelligence)



Significant Economic Contribution

The rapid development of the mobile communications industry in Malaysia has led to high population coverage and penetration rates above the regional average. This has brought widespread economic benefits to the national economy through value-add, employment and productivity improvements. Even those in the most rural areas have access to communications, which has assisted in the establishment of new businesses in these areas. The mobile industry in Malaysia is estimated to contribute MYR 21.3 billion to the national economy in 2007, representing 3.7% of total GDP. This compares to MYR 15.3 billion in 2005 (around 3.1% of GDP).

Contribution to employment

In Malaysia, employment in related industries (indirect employment) constitutes a large proportion of the employment created by the mobile industry. This is due to the large number of parties who act as either suppliers to the MNOs or retailers or distributors of mobile services.

FIGURE 2: Economic impact of the mobile communications industry in Malaysia

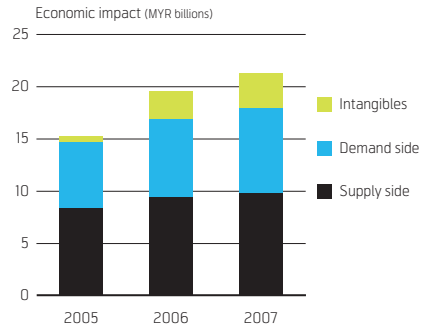
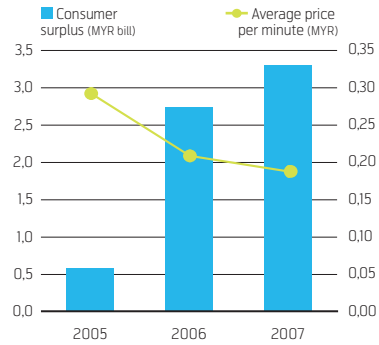


FIGURE 3: Increasing intangible benefits enjoyed by consumers in Malaysia



SOURCE: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by DiGi.com Bhd.

TABLE 1: Direct and indirect employment (2007)

Contribution to employment	
Direct (MNOs)	14%
Indirect (related industries)	63%
Multiplier effect	23%
Total employment (FTEs)	51,000

Source: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by DiGi.

Deloitte's analysis suggests that the dynamic effect of a 10% increase in mobile penetration would increase the long term GDP rate of a developing country by 1.2%. This means that the rapid increase in penetration experienced in Malaysia may have contributed to long term economic welfare.

Engine for increased productivity

Mobile communications can be instrumental in increasing the productivity of workers across sectors in both rural and urban areas. In Malaysia, Deloitte has found that access to mobile communications in particular can improve information flows within companies and between buyers and sellers; increase work flexibility; and promote business in previously underserved rural areas. This translates to a 7% increase in productivity for Malaysian workers and has increased GDP output by MYR 8.2 billion in 2007 alone.

Consumer benefits

Amongst the social benefits found by Deloitte to be enjoyed by Malaysian mobile communications consumers are subscribers being able to contact friends and family; access health and education services more easily; and access to value-add services.

The operators have become more efficient and have been able to lower their capital and operating expenditure, they have passed on a significant proportion these benefits onto consumers in the form of lower prices.

In a constantly maturing market, mobile operators in Malaysia are focusing on developing new product offerings to increase the value of mobile communications whilst at the same time being able to lower prices further. As Malaysia continues to develop its economy further and the focus of investment shifts towards service-based industries, the need for advanced communications infrastructure becomes increasingly important. Such infrastructure is also necessary to provide universal and affordable coverage to all Malaysians. Mobile networks have the potential to provide Malaysians in urban and rural areas with affordable reliable access to voice and broadband services.

Pakistan

Population: 166 mn
Population growth rate: 1.8%
Population per sq km: 206
GDP per capita: USD 753
GDP pr capita PPP: USD 2,600
GDP growth rate: 6.6%

Significant fiscal, economic and social contribution

The mobile communications sector has brought significant fiscal, social and economic benefits to Pakistan. The market has experienced exponential growth in penetration over recent years and population coverage has also increased considerably to over 70%.

Mobile networks are also reaching into rural areas of Pakistan, extending business opportunities and allowing social contact to be maintained much more easily among family and friends. The cost of owning and using a mobile phone continues to fall, due to the high level of competition in the domestic market, from six licensed operators, and the economies of scale available from the global industry.

The mobile sector in Pakistan contributed a total of PKR 342.8 billion to the economy in 2007, representing 5.1% of total GDP. The economic contribution of this sector has increased consistently year on year in Pakistan and is expected to increase further in 2008.

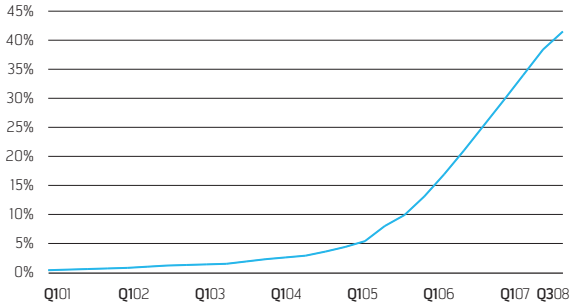
The government has made considerable efforts to deregulate and promote the development of the mobile industry. Furthermore, the licensing of new companies for the provision of mobile services has supported the rapid increase in competition and expansion of mobile usage in the country and, mobile number portability was enabled from March 2007.

Increasing competition between the MNOs has resulted in a reduction of the retail price of mobile calls. These decreases were particularly significant following the operational launch of Telenor and Warid in 2005. Mobile retail prices are low in Pakistan compared to regional neighbours and other countries. In terms of relative size, mobile retail prices are low in Pakistan compared to regional neighbours.

Employment creation

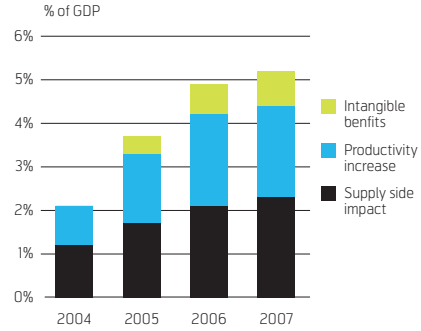
The mobile sector has substantial impact on employment levels in Pakistan through three different channels. 1) Direct employment of the industry and related industries; 2) support employment created by outsourced work and taxes that the government subsequently spends on employment generating activities; and 3) induced employment resulting from the above employees and beneficiaries spending their earning and creating more employment. Deloitte estimates that more than 247,000 jobs have been created by the industry to date.

FIGURE 1: Mobile penetration in Pakistan



SOURCE: Wireless Intelligence

FIGURE 2: Economic impact of the mobile communications industry in Pakistan



SOURCE: Deloitte analysis based on data provided by operators, interviews and analysis of company accounts and industry reports.

TABLE 1:
Contribution to employment from the mobile value chain in Pakistan

Employment Impact	Number of employees
Mobile network operators	11,000
Fixed operator	4,000
Network equipment suppliers	1,000
Other suppliers of capital items	1,000
Handset designers and producers	9,000
Support services	2,000
Airtime and SIM commission	145,000
Total	173,000

Source: Operator data, interviews and Deloitte analysis on average wage rates.

Increase in productivity

Mobile communications is often linked with an increase in productivity. In Pakistan, such impacts include for instance, encouragement of entrepreneurialism and growth in small business enterprises; improved information flows; reduction in travel time and costs; more efficient scheduling of resources; and increased working flexibility.

One example is the role of mobile communication in encouraging entrepreneurialism: mobile has encouraged the growth of small business and has increased its efficiency. For example, by being constantly reachable on their mobiles, many women in Pakistan have been able to start small businesses for the provision of beauty and hairstyle services, without the need to incur the initial costs of setting up beauty salons.

Deloitte estimates productivity gains to be 9% per business mobile user from 2006 onwards. Using these estimates, productivity in 2007 is estimated to have increased GDP output by PKR 139 billion. Whilst estimated that 95% of business workers in urban areas have access to a mobile phone, this figure falls to 43% in rural areas. This demonstrates the potential for further increases in economic productivity that could arise from the expansion of affordable mobile telephony into more rural areas.

Social benefits

Deloitte has identified several social benefits of mobile communications in Pakistan. These include improved access to health services; increase in educational facilities; social and family interaction, and disaster relief assistance.

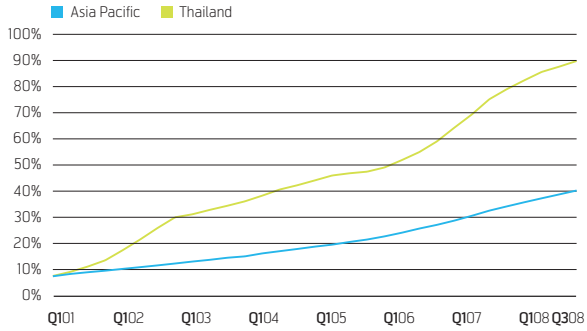
The provision of communications in rural areas is necessary for promoting long-term economic growth. Mobile communications has so far been more successful than fixed line in providing this access with both number of subscribers and population coverage far exceeding the fixed line operators.

By continuing to grow both its subscriber base and range of products, the mobile sector may be able to increase its contribution of GDP. This will occur in urban areas as operators roll out 3G networks and launch new services. However, the SIM activation tax may be hindering further roll-out into rural areas. The Government may therefore support the development of the sector through fiscal policies consistent with the remainder of the economy.

Thailand

Population: 65 mn
Population growth rate: 0.7%
Population per sq km: 126
GDP per capita: USD 3,038
GDP pr capita PPP: USD 9,200
GDP growth rate: 4.8%

FIGURE 1: Mobile Penetration rates in Thailand and Asia Pacific region



SOURCE: Wireless Intelligence

Extensive economic and social contribution

The mobile communications industry in Thailand has experienced rapid growth and development, bringing about extensive economic and social benefits for Thai people. At present the mobile penetration rate is 75%, which is more than double the average penetration rate for the region. The number of mobile connections outnumbers fixed line connections by 7 to 1, as the mobile network operators (MNOs) have effectively taken on the role of universal service providers.

The mobile industry plays a key role in the economic development of Thailand by creating employment, contributing to GDP, and creating an infrastructure that allows the economy to further develop and acting as a core source of foreign direct investment (FDI). Investment in telecommunications helps to increase investor confidence in other areas of the economy and therefore contributes to attracting foreign direct investment (FDI), which is responsible for 20% of the GDP of Thailand. There are also a large number of social benefits arising from widespread affordable access to voice and data communications services.

Intense price competition in the market has seen per minute prices fall by over 70% since 2003. Falling prices, combined with further network rollout into rural areas where around two thirds of the population lives, have been the key drivers of penetration growth.

Deloitte estimates that the mobile sector in Thailand contributed THB 393 billion to the economy in 2007, representing 4.9% of total GDP. This is almost one and a half times more than the contribution of THB 160 billion in 2004.

Employment and value-add to society

Deloitte estimates that the mobile industry employed almost 150,000 Thai full time employees in 2007. This figure includes direct and indirect employment opportunities within the MNOs suppliers to the MNOs distributors of handsets, airtime and SIM cards and retailers of mobile products and services.

Deloitte's analysis suggests that value-add contributed by mobile communications was THB 163 billion in 2007. 38% of this value-add consists of tax and regulatory fees: the remainder includes wages paid to Thai workers, dividends remaining in the country and expenditure on CR activities.

TABLE 1: Employment in Thailand

	2007
Direct (MNOs)	15,000
Indirect (related industries)	100,000
Multiplier effect	35,000
Total employment	150,000

Source: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by DTAC.

FIGURE 2: Economic impact of the mobile communications industry in Thailand

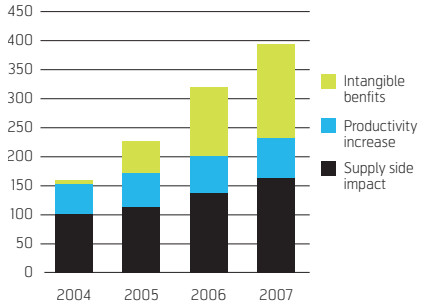


FIGURE 3: Productivity impact of mobile communications in Thailand

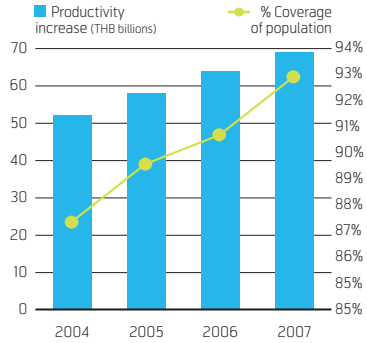
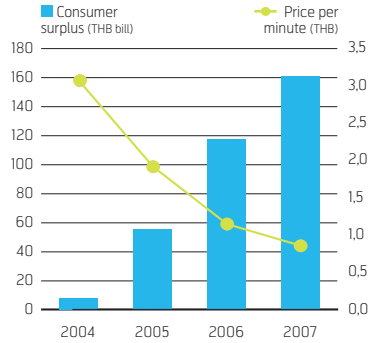


FIGURE 4: Increasing intangible benefits enjoyed by consumers in Thailand



SOURCE: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by DTAC.

Engine for increased productivity

Mobile communications can be instrumental in increasing the productivity of workers across sectors in both rural and urban areas. In Thailand, access to mobile communications has been found to improve information flows within companies and between buyers and sellers; increase work flexibility; and promote business in previously underserved rural areas. Deloitte estimates that the business use of mobile communications in Thailand leads, on average, to a 6% increase in productivity per mobile business user. Via these productivity increases, mobile communications will have increased GDP by THB 69 billion in 2007.

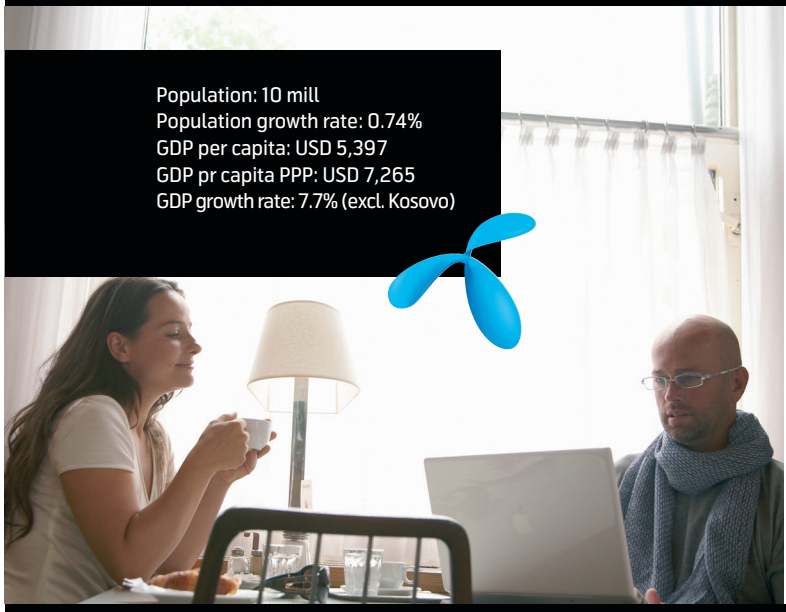
Consumer benefits

Deloitte found in Thailand that mobile phone consumers also enjoyed benefits such as: the promotion of social cohesion by acilitating contact between families and friends; assisting in disaster relief, for instance after the tsunami, and value-added services.

By providing the infrastructure necessary for businesses, a strong communications sector is fundamental to the international competitiveness of Thailand. The mobile communications sector in itself also makes an important contribution to the economic and social welfare of Thai people. For many, MNOs offer them access to communications that were previously unavailable to them, for instance, those with no credit history or people in rural areas.

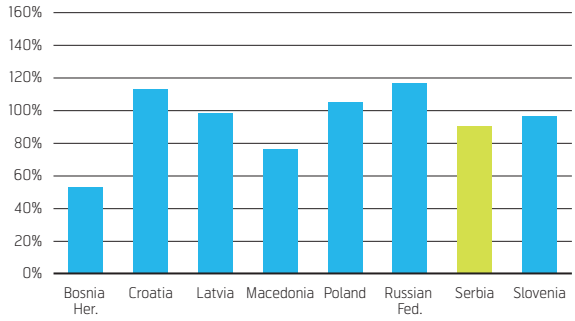
To continue and further this positive impact for Thai consumers and the economy as a whole, Deloitte recommends that the MNOs, regulator and Government need to work closely to ensure that an effective and sustained framework for competition is put into place which will support ongoing long-term investment in the mobile sector and hence the economy as a whole.

Serbia



Population: 10 mill
Population growth rate: 0.74%
GDP per capita: USD 5,397
GDP pr capita PPP: USD 7,265
GDP growth rate: 7.7% (excl. Kosovo)

FIGURE 1: Regional levels of mobile penetration, Q3 2007



SOURCE: Wireless Intelligence

Economic contribution deriving from privatisation and liberalisation

Serbia's mobile market has experienced a marked growth in the last four years, with connections increasing from 2 million in 2002 to over 6.5 million 2007. Penetration rates are reported to be 90% of population, standing at an estimated 72% when multiple SIM cards are accounted for. Since the introduction of mobile services until May 2007, only two mobile network operators have been active in the market. These are the incumbent fixed operator, Telekom Serbia, and another company partly controlled by the Serbian government, Mobi63. The latter was completely privatised in 2006, when Telenor acquired it for a sum of €1,155 million. In addition, at the end of 2006, Austrian mobile operator VIP was awarded a third 10-year licence for €320 million.

The economic benefits of the 2006 privatisation and liberalisation policies in the mobile market are numerous. The benefits also extended beyond the industry as the Government used the proceeds of the licence award and privatisation to fund infrastructure development. A national plan was developed to allocate the one-off proceeds: all national infrastructures, from roads and railways to the water supply infrastructure were redeveloped and upgraded[1]. A source within the Serbian Privatisation Agency claimed that the benefits of this one-off payment were not comparable with any other Eastern and Central European countries. The nature of the expenditures carried out within the national plan implies that the economic multiplier associated with the value added by the proceeds is likely to be extremely high. Deloitte estimates that the impact of the privatisation and liberalisation policies in the Serbian mobile market in 2006 was near to 5.7% of the Serbian GDP. Using a conservative estimate of 1.3 for the economic multiplier, Deloitte estimates that the total one-off impact was over 7.5% of GDP in 2006.

Based on analysis of the years 2006 (September to December) and 2007, following Telenor's acquisition of Mobi63 when actual competition in the market developed, Deloitte estimates that the economic impact of the mobile sector in Serbia is DIN 104 billion in 2007, representing over 4.1% of GDP. For 2006, this figure includes the impact of the proceeds from the privatisation of Mobi63 and the award of two mobile licences to Telenor and VIP. It can be seen that for 2006 the total impact represents almost 11.6% of the GDP

Employment and value-add

Deloitte estimates that the mobile sector employs 33,660 Serbians in 2007. This figure includes around 2,900 employees working directly for the MNOs. Further employment is generated by: network equipment suppliers; supplier of related services such as advertising, auditing and consulting services; employees in retail shops selling handsets, SIM cards and airtime. However, the total figure may not be representative of future employment opportunities. New retail shop chains are opening both in urban and rural areas, and other points of sale will soon add mobile scratchcards among their services.

FIGURE 2: Economic impact of the mobile communications industry in Serbia

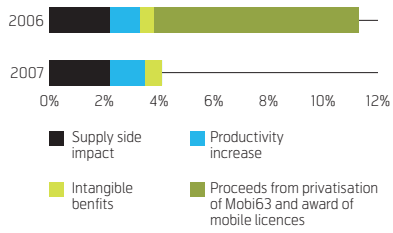
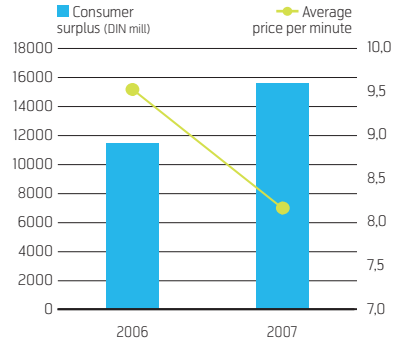


FIGURE 3: Increasing intangible benefits enjoyed by consumers in Serbia



SOURCE: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by Telenor.

TABLE 1: Employment in Serbia

	2007
Mobile network operators	2,860
Fixed telecommunications operators	630
Network equipment suppliers	180
Network support suppliers	785
Handset importers	270
Other suppliers of capital items	115
Suppliers of non-network support services	960
Airtime/SIM sellers and mobile phone sellers	20,750
Multiplier	7,110
Total domestic employment	**33,660**

Source: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by Telenor

Increased labour productivity

The impact of mobile telephony on the productivity of workers occurs through a number of channels. The most important are identified to be: improvements in information flows between buyers and sellers; reductionS in travelling time; and work becoming more flexible and accessible across the country. Using international benchmarks and interviews carried out in Serbia, Deloitte estimates that the business usage of mobile communication contributes to an increase of 7% in the productivity of an individual worker. This translates into an increase in GDP by DIN 32 billion in 2007 and represents 1.27% of GDP, which is a 27% increase on 2006.

Consumer benefits

Mobile communications provide a number of social benefits to consumers. These include: development of interpersonal and family communications, in particular between urban and rural areas; promotion of social cohesion; and extension of communication to those on low income.

The Serbian mobile sector has undergone a number of significant changes in the last two years. This includes the sale of Mobi63 to Telenor, the award of new licences including for 3G and developments in the regulatory regime.

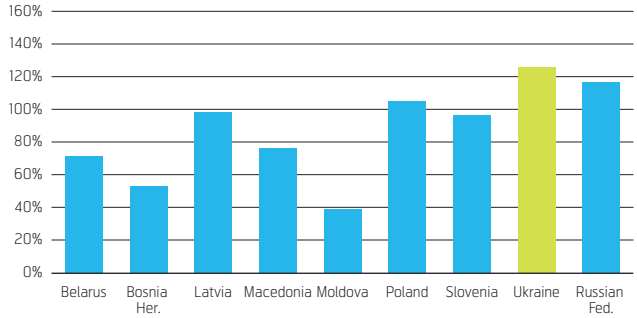
Mobile operators have delivered a range of benefits to the Serbian economy and the mobile sector is now estimated to constitute over 4% GDP. The inclusion of licensing and privatisation proceeds increased the contribution of GDP to 11.6% in 2006. In addition, mobile operators have played a significant role in attracting additional foreign investment in the country and in rolling out communication networks to under-served rural areas, increasing the potential economic activity in these areas.

1 This information was provided during interviews with the Communications Ministry and Regulator

Ukraine

Population: 46.3 mill
Population growth rate: -0.7%
Population per sq km: 81
GDP pr capita PPP: USD 7,700
GDP growth rate: 7.1%

FIGURE 1: Regional levels of mobile penetration, Q3 2007



SOURCE: Wireless Intelligence

Exponential growth and foreign investment

Ukraine's mobile market has experienced exponential growth since 2002. Mobile subscribers increased from 3.7 million in 2002 to over 57 million in 2007, an average growth of 70% per year. Penetration levels are of the highest in the region and mobile connections now outnumber fixed line by 5 to 1.

The Ukrainian communication market has benefited from foreign investors taking a long term interest in Ukraine. Their presence increases the likelihood of additional investments both in terms of affiliated business such as network equipment suppliers, and of business in general.

Deloitte estimates that the economic impact of the mobile sector in Ukraine is UAH 37 billion, representing 5.9% of total GDP. This is an increase from 2.9% in 2003.

Employment and value-add

Deloitte analysis shows that the contribution of the mobile sector has been significantly increasing over the last four years and that the mobile industry employs almost 120,000 Ukrainian full time employees. This compares with 75,000 in 2003.

TABLE 1: Employment in Ukraine

	2007
Mobile network operators	12,300
Fixed telecommunications operators	6,970
Network equipment suppliers	1,050
Network support services	7,090
Handset importers	280
Suppliers of support services	1,450
Airtime and mobile phone sellers	70,080
Multiplier effect	19,840
Total employment	**119,060**

Source: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by Telenor

Deloitte estimates suggest that the value-add impact of the mobile communication industry in Ukraine was UAH 18.3 billion in 2007. Including multiplier effects, the estimate of the total supply-side value-add to the Ukrainian economy in 2007 was UAH 22 billion. Government revenues made up over 75% of the value-add. The remainder comprises of domestic value add from domestic net wages, dividends and corporate social responsibility programs.

FIGURE 2: Economic impact of the mobile communications industry in Ukraine

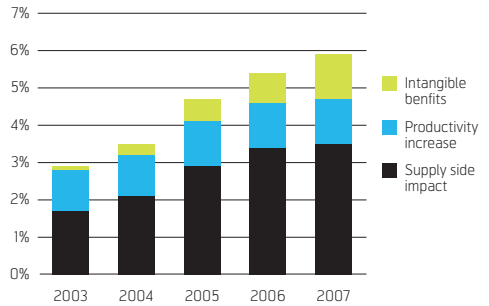
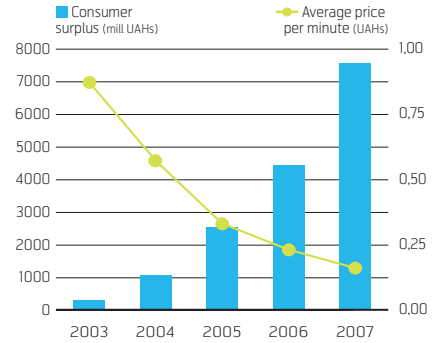


FIGURE 3: Increasing intangible benefits enjoyed by consumers in Ukraine



SOURCE: Deloitte analysis based on data provided by key industry players in interviews, analysis of company accounts and industry reports and data provided by Telenor.

Increased labour productivity

Interviews made by Deloitte in Ukraine suggest that mobile phones have had a strong impact on productivity in the following sectors: 1) Small trade and import/export businesses, where mobile communication has proved a powerful tool to estimating demand, updating estimates and finding new customers; 2) logistics for large companies, in particular for internal communication and transportation; and 3) the transport sector in urban areas, where for instance a number of cab driver companies have started coordinating actions through mobile phones.

Deloitte estimates that the business usage of mobile communication increases the productivity of a mobile business user by 9%. Based on this mobile communications increased GDP by UAH 7.7 billion in 2007 .

Consumer benefits

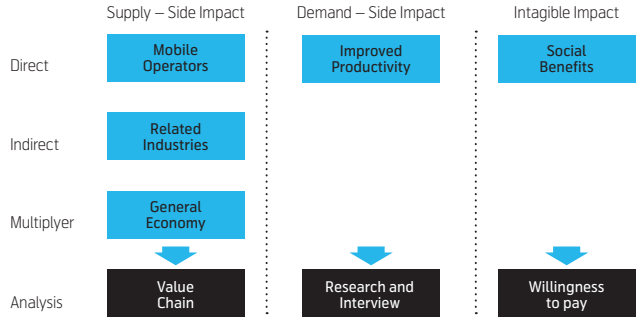
Social benefits found by Deloitte to be generated by mobile communications in Ukraine include: contribution to democracy development and openness of society; extension of communication to users with low education and literacy, particularly elderly people living in rural areas; and extension of communication to those on low incomes.

By continuing to grow its subscriber base and provide new services, the mobile sector may be able to increase its GDP contribution. A regulatory and licensing regime that combines international best practice with local consideration would be supportive of this growth opportunity. For example, the issuing of additional 3G licenses would allow for further service innovation including the delivery of data connectivity to a larger proportion of the Ukrainian population. This is of particular relevance given that today this lags behind most other countries in Eastern and Central Europe in terms of the development of 3G networks and the takeup of services. Issuing additional 3G licenses may also speed up the roll out of mobile broadband and could assist the Ukrainian government in achieving higher internet penetration.

Methodology

The approach taken by Deloitte to estimate the economic impact of mobile communications in Bangladesh, Malaysia, Pakistan, Serbia, Thailand, and Ukraine is based upon both static and dynamic analysis.

FIGURE 1: Structure of analysis of economic impact on GDP and employment (SOURCE: Deloitte)



Static analysis including intangible benefits

Static analysis refers to the impact of mobile services for a particular period of time and does not seek to estimate the longer term impacts of economic welfare. However, static analysis is extremely useful due to the greater availability of disaggregated data relative to dynamic analysis where a greater number of assumptions are typically required

Deloitte has utilized information provided by Telenor associates, together with interviews with industry players and assumptions based on economic literature and public sources to estimate the value of mobile communication to the economy in terms of employment and GDP, both direct and indirect, for each country. From this, the total economic impact has been defined as consisting of the following elements: 1) Direct impact from the mobile operators; 2) indirect impact from other industries related to mobile services; 3) indirect impact due to the surplus enjoyed by end users in terms of productivity improvements; and 4) indirect impact due to more qualitative social benefits enjoyed by the population.

Supply-side impact

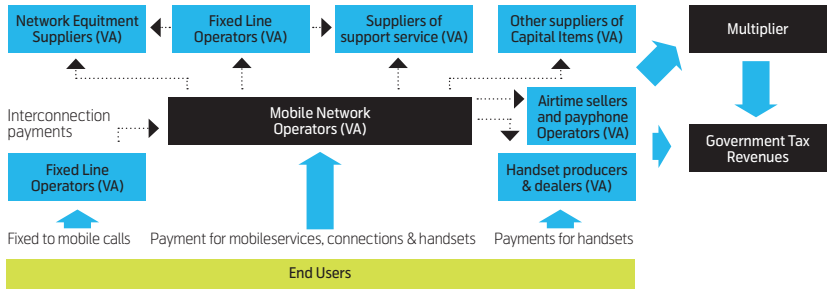
Deloitte quantifies the contribution of the mobile industry to the economy, covering the industry and its adjacent sectors. This is calculated by aggregating the direct, indirect and economy wide (multiplier) effects that have occurred in each year. The multiplier captures the idea that an initial spending rise can cause a further change in aggregate output for the economy as money circulates through sectors of the economy.

Each of the main stakeholders in the industry has been identified and assigned flows of value to. These flows are shown in the diagram below:

Direct value add from mobile network operators

Deloitte has determined five categories of economic value which are directly created by the mobile network operators (MNOs). These are: 1) Wage and employee benefits; 2) contractor costs; 3) taxes and regulatory fees; 4) corporate social responsibility; and 5) dividends.

FIGURE 2: Mobile value chain (SOURCE: Deloitte)



Note: Value Add is spesific to national economy and does not show international value add

Indirect value add

Deloitte has identified the revenues that flow directly from the MNOs to other domestic industry players, and estimated the proportion of revenues that are value add, using the five categories above. Estimates of proportions are based on interviews with industry players, operating and financial data from third parties and a review of annual reports of similar companies and similar studies.

Economy wide value add

The value-add created by the mobile industry will have a positive impact on the economy. This is captured in the study by multiplying the direct and indirect value-add by a multiplier. The range of multipliers having been used in other studies is from 1.1 to 1.7, and this study adheres to that, exact value depending on country.

Calculating contribution to employment

Mobile services contribute to employment through several channels:

- Direct employment of the industry and related industries;
- Support employment crated by outsourced work and taxes that the government subsequently spends on employment generating activities; and
- Induced employment resulting from the above employees and beneficiaries spending their earnings, and creating more employment.

In calculating employment Deloitte has chosen to apply the same multiplier as for GDP for each country.

Demand-side impact

There are numerous ways in which mobile services can improve productivity, particularly in developing countries where mobile services have 'leap-frogged' fixed line services and are the provider of universal service. The following important effects have been previously identified: 1) Substantial reduction of travel times and costs; 2) improved job search; 3) creation of market efficiency; and 4) encouraging entrepreneurialism.

No established economic methodology exists to estimate GDP and employment effects of such productivity improvements across the economy. As such, Deloitte has considered available evidence from the literature in the area and conducted interviews with stakeholders in order to provide an indication of the demand side impact of mobile communications in each of the countries. The impact on productivity improvements on the overall economy is estimated by assuming that the productivity improvement will be experienced by those employees who are likely to use their mobile phones within the economy.

Intangible impacts

The types of intangible impact identified include: 1) Promoting social cohesion; 2) extending communications to user with low education and literacy and to those on low income; 3) stimulating local content; and 4) assisting in disaster relief.

FIGURE 3: Increase in consumer surplus following a reduction in price (**SOURCE**: Deloitte methodology)

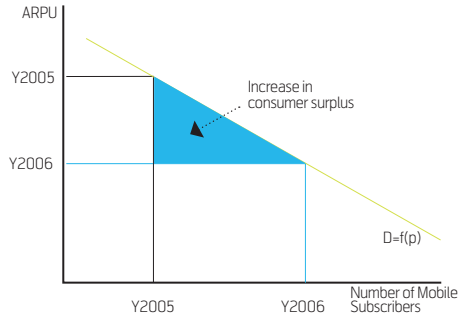
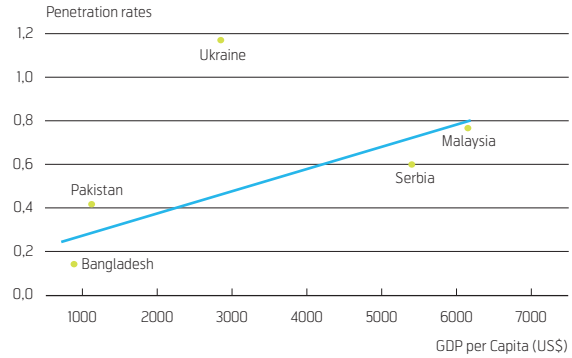


FIGURE 4: Income and mobile penetration in developing countries (**SOURCE:** Deloitte estimates using Wireless Intelligence and IMF data)



Deloitte uses the 'willingness to pay' concept to calculate the value of the intangible benefits of mobile telephony. Historical average revenue per user (ARPU) shows us how much customers are willing to pay for mobile services. If it is assumed that these intangible benefits of owning a mobile are unchanged over time, then the value of consumer surplus can be considered to be the difference between ARPU at the time of subscription, less ARPU today (which is likely to be less due to increased competition and other factors).

Dynamic impact: estimating the relationship between mobile communications and GDP

By dynamic relationship is understood the longer term impact that investment in mobile communications may have on general economic welfare and GDP growth rates in particular. A wide range of academic studies have demonstrated that a relationship exists between telecommunications penetration (originally fixed line, and more recently mobile) and economic growth . The following simple scatter plot demonstrates the basis of this relationship, showing a positive correlation between penetration rates and GDP per capita for a basket of developing countries.

In estimating a relationship between mobile penetration and economic growth it is crucial to recognise that there exists a two-way causality: the impact of increased mobile penetration and investment in mobile infrastructure on economic growth, and the impact of rising GDP on the demand for telecommunications services.

A regression is estimated for almost 60 developing countries in the Asia Pacific region, Africa and Latin America. For this sample, Deloitte estimates that a 10% increase in penetration could increase the GDP growth rate of 1.2% . The coefficient on average mobile penetration is approximately twice as large as the 0.59% increase in GDP found by Waverman, Meschi and Fuss (2005). We explain this result as being due to the sample including only countries from the poorest regions in the world, where the effect of mobile penetration will be the strongest. In developing countries, fixed phones have often never reached a sufficiently high penetration to generate a significant network effect. The use of mobile phones, on the other hand, is continuously expanding and can therefore be expected to play the same crucial role for the economic development that fixed phones had for developed countries.

Important notice

This report has been prepared in accordance with our Engagement Letter dated 26 September 2007 and on the basis of the scope and limitations as set out below.

This report has been prepared solely for the purposes of assisting Telenor ASA in quantifying the economic impact of the mobile industry in Serbia, Ukraine, Malaysia, Thailand, Bangladesh and Pakistan. The distribution of this document to other parties is subject to the restrictions on use specified in the Engagement Letter dated 26 September 2007. We have agreed that Telenor ASA may publish this report in its entirety or for a specific country by deleting only the executive summary and findings chapters for the other 5 countries and inserting the liability notice provided as Annex 7 to this report. No other party other than Telenor ASA is entitled to rely on this document for any purpose whatsoever and we accept no responsibility or liability to any other party in respect of the contents of the Report. Deloitte & Touche LLP accepts no responsibility for any reliance that may be placed on this document should it be used by any party other than the Recipient Parties or for any purpose that is not in accordance with the terms of the Engagement Letter.

This report is based on information that was available to us up until 19th December 2007 for all countries except for Bangladesh. Our Bangladesh findings were based on information that was available to us up until 12th January 2007.

Our work has been limited by the scope, the time, information and explanations made available to us. We have relied upon the documents and data provided by Telenor ASA, its subsidiaries, third parties and publicly available sources. We have no responsibility for the accuracy or completeness of this information and have not reviewed its overall reasonableness. The results produced by our modelling depend upon the information with which we have been provided. Actual results are likely to be different from those projected by the model due to unforeseen events and accordingly we can give no assurance as to whether or how closely the actual results ultimately achieved will correspond to the outcomes projected in the model.

Our work and our findings do not in any way constitute a recommendation as to whether policy makers should or should not proceed with any changes to regulations and legislation imposed on the mobile telecommunications sector or related industries. In particular, we draw Telenor ASA's attention to the fact that if we were to perform additional procedures then other matters might come to our attention that might be relevant to our predictions on the economic impact of the mobile communications industry. Similarly, if others were instructed to conduct appropriate independent procedures, other relevant matters might come to light.

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