Towards a Connected World

Socio-economic Impact of Internet in Emerging Economies

telenor group

Growth comes from truly understanding the needs of people, to drive relevant change

Foreword

It is with great pride and pleasure that we present the Telenor-BCG report on the socio-economic impact of Internet in emerging economies.

The Internet is undoubtedly one of the most powerful forces shaping our world today. This is particularly true for emerging economies, where it has the potential to fundamentally change how people live, work and develop. As a global telecommunications operator with strong interests in emerging economies, Telenor is committed to building a deeper understanding of this critical issue.

Telenor found that the impact of the Internet in emerging economies has not previously been studied in a comprehensive way. Therefore, The Boston Consulting Group was commissioned, together with Telenor experts, to execute in-depth research into the adoption and impact of the Internet in such countries, focusing on Bangladesh, Thailand and Serbia.

While the future can never be predicted with certainty, we trust that these findings will serve as an invaluable starting point in any discussion of the Internet for policy-makers, regulators and all other stakeholders as we work together to build a connected world.

Jon Fredrik Baksaas
President and CEO

Introduction

With this study we aim at estimating how the Internet will impact three countries, economically and socially over the next ten year period. Bangladesh, Serbia and Thailand span a broad geographical as well as developmental range, and may hardly seem comparable at the first sight. However, the different development levels of the three countries enable general implications to be drawn also for similar countries across the range, from the least developed to economies that are poised to join the ranks of developed economies in the near future.

The three study countries occupy different positions on the scale of **Internet adoption**. Currently, less than 2% of households in Bangladesh are Internet subscribers, whereas Serbia has a household penetration rate of 31%. This suggests that Internet is still in its infancy in Bangladesh, while Serbia is already in a rapid growth phase. Thailand is currently somewhere in the middle, poised for takeoff.
(Exhibit 1)

In Bangladesh, Internet adoption will start accelerating first after 2018. reaching 10% in 2020., while Thailand sees rapid growth from 2014, tapering off slightly towards the end of the study period and reaching 26% in 2020. In contrast, Serbia grows at a high but decelerating rate and will be at 42% uptake in 2020.

Economic benefits

(Exhibit 2)
This increasing Internet density has the potential to generate **significant economic benefits.** In terms of overall GDP contribution in 2020, the Internet is expected to contribute 2.6% of total GDP in Bangladesh, 3.8% in Thailand, and 5.2% in Serbia. The bulk of this contribution comes from the **increased productivity** that users of the Internet enjoy, in services, manufacturing as well as agriculture.

Internet penetration will also spur entrepreneurship, resulting in an increase in the number of new business activities, which on the next level is a **key driver of job creation.** Research suggests that a 10 percentage point increase in Internet penetration in Internet penetration is correlated with a 1% increase in the annual rate of new business formation. In this scenario, job creation could reach between 94K and 129 K per year in the three countries by 2020

Another key benefit of this increased economic activity will be tax revenues for the governments. Over the ten year period, it is estimated that the Internet could contribute 4.2% of government revenues in Thailand, 4.6% in Bangladesh, and 1.8% in Serbia. More than 50% (in Bangladesh and Thailand, almost 90%) of these tax revenues are generated by Internet users, not the providers. This highlights that Internet services are **a capital good** that enables increased production across the economy. High taxes on the provision of such services will delay or reduce job creation, and ultimately stifle the development of the economy.

Social gains

Across all three countries, three issues were consistently highlighted as development areas: Education, health care and rural development.

Firstly, the Internet has the potential to improve access to education and quality of education in multiple ways, and can be applicable to a broad spectrum of countries. For examples, in countries where access to basic education is a problem, Internet-based self-learning initiatives can be used to supplement the school system.

Secondly, as the shortage of medical doctors is a key constraint for most developing countries, the Internet can enhance healthcare through increasing the number of patients a physician can serve, with webcams and real-time communication with field medical officers via handheld computers. This can play a large and important role in acute situations, for instance in the tracking of disease outbreaks.

Thirdly, in many developing countries, a large part of the population lives in rural areas. Here, incomes are on average lower, and also more volatile due to reliance on agriculture. The Internet can help increase and diversify sources of income. It can create alternative income opportunities through entrepreneurial businesses around the Internet value chain, from providing Internet access to providing services to Internet users. It can also be used to address infrastructure gaps and enhance the provision of essential services, such as government, banking and remittances.

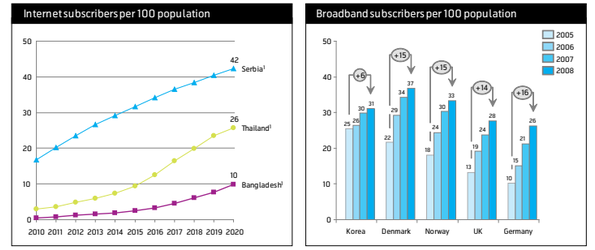
In addition to the three critical areas, the Internet can contribute to areas such as the environment. By enabling people to work from home, transact with banks or governments electronically, and shop online, the Internet can contribute to control of carbon dioxide emissions and hence have a positive impact on the climate change issue.

Key challenges to adoption – Awareness, accessibility and regulatory barriers

The conditions required to increasing accessibility, awareness, advocacy, facilitation and value for users may be absent in emerging economies. Governments and regulators play **a key role** in creating awareness and opportunities to experience benefits of Internet, for instance supporting the dispersion of telecentres and focusing on IT literacy in schools.

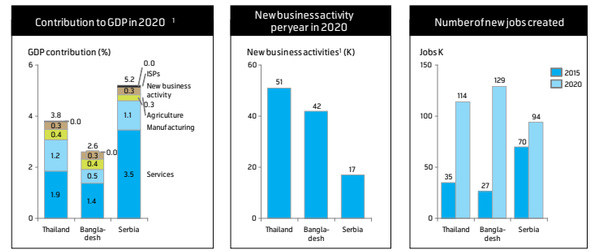
Governments and regulators also have the responsibility of ensuring that there is a high quality regulatory regime in place. All else being equal, uncertainty reduces investment, and as such governments and regulators should work towards minimising perceived regulatory uncertainty. Higher investment positively impacts adoption by accelerating accessibility, particularly in rural areas. To minimise uncertainty, governments and regulators should aim to put in place clear and credible long-term plans, a pro-investment, pro-competition regime, and a supportive environment for the entire Internet eco-system as will be described more in detail in the country sections to follow. Happy reading!
(Exhibit3)

Exhibit 1 - Overall penetration in Serbia, Thailand could reach current OECD levels by 2020, with Bangladesh some years behind



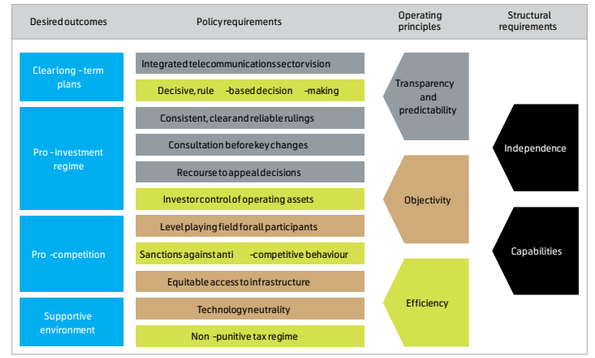
Source: BMI, OECD, Euromonitor; BBS; NSO; Statserb; EIU; CIA World Factbook; Manobi; UNCTAD; OECD; EU; Deloitte; MIT/CMU; Expert interviews; BCG analysis

Exhibit 2 - Internet adoption has potential to generate significant economic benefit

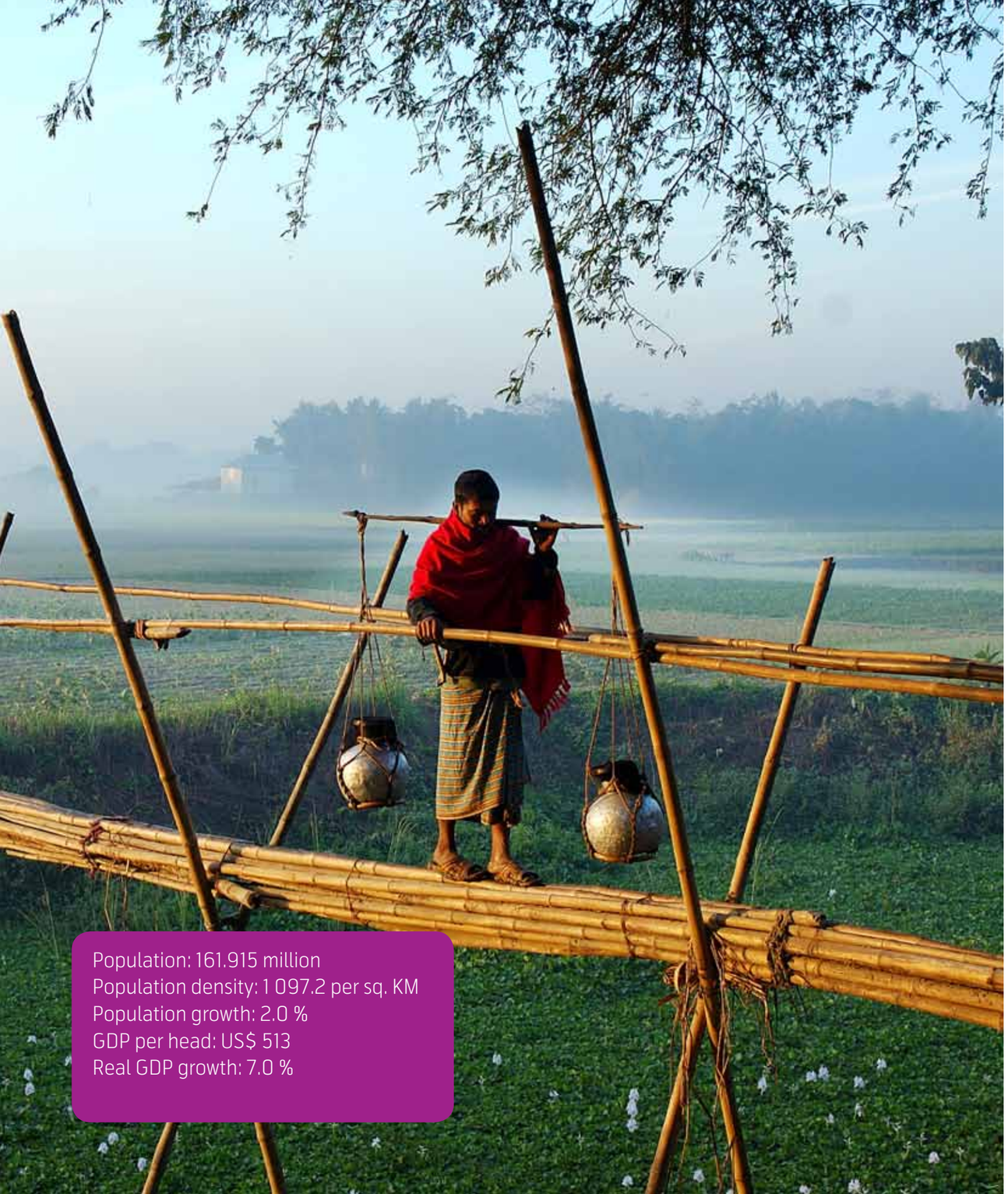


1. New business activities includes establishment of new independent businesses as well as new departments/units/business areas within existing firms.
Figures show number of additional new business activities per year
Source: BBS, NSO, Statserb; EIU; CIA World Factbook; Manobi; UNCTAD; OECD; EU; Deloitte; MIT/CMU; Expert interviews; BCG analysis

Exhibit 3 - Governments and regulators have key Governments and regulators have key roles to play
Implement and adhere to regulatory best practices and addressing local challenges



Source: Expert interviews; World Bank InfoDev; GSMA; BAH report "Towards More Effective Regulation"; BCG analysis



Population: 161.915 million
Population density: 1 097.2 per sq. KM
Population growth: 2.0 %
GDP per head: US$ 513
Real GDP growth: 7.0 %

Bangladesh

Despite rapid growth over the last 5 years, Bangladesh remains one of the countries in the world with lowest Internet penetration. The country faces some critical obstacles to widespread Internet adoption: Fixed line coverage and quality are poor, particularly outside of the core urban areas. Currently, approximately 90% of fixed lines are concentrated in the urban areas, where only 25% of the population lives. There is also low awareness of the Internet and the benefits it can bring. A fundamental challenge is the lack of literacy, particularly English literacy and proficiency, which is assumed to be well below 50%.
(Exhibit 4)

With the appropriate initiatives and policy frameworks in place, analysis suggests 18.3 million Internet subscribers in Bangladesh by 2020, equalling approximately 10 subscribers per 100 inhabitants. At a household level, 32% will have at least one Internet subscription, and business adoption will be around 66%.

The business landscape in Bangladesh is dominated by a very large number of small service firms, and the relatively low Internet density in that segment will drive the overall usage rates. Due to limited coverage and poor quality of fixed lines in Bangladesh, it is likely that the majority of Internet subscribers in Bangladesh will be using wireless technologies. Provided appropriate investments are in place, over 90% of connections could be wireless in 2020.

Economic benefits – productivity, jobs and government revenues

Significant economic benefits are projected from the Internet in Bangladesh. Overall contribution to GDP is expected to accelerate, and will reach 2.6% p.a. in 2020. The key driver of this is the productivity gains experienced by business users in all industries.
Rising Internet penetration should also drive an increase in new business activity and job creation. By

enabling people to transact across large distances, the Internet can help make up for shortages in other forms of infrastructure, such as roads, Potentially, the Internet could increase new business creation by up to 42,000 and add 129,000 jobs in 2020. Over the ten year period this is expected to amount to BDT 539 bn, approximately 4.6% of government revenues.
(Exhibit 5)

More than 90% of this tax will come from corporate taxes on the users of the Internet, while less than 10% will come from taxes and fees paid by the providers themselves. This highlights that the Internet is a capital good that enables increased production across the economy. High taxes on the provision of such services, although they may be lucrative short term, will ultimately stifle development of the Bangladesh economy.

Wide-ranging social gains

The Internet is expected to bring wide-ranging social gains in Bangladesh, with far greater impact than would be expected for a more developed country. The Internet can serve here as an alternative infrastructure backbone, making available services and processes that would otherwise have been unreachable.
(Exhibit 6)

For instance, healthcare is a fundamental concern. Bangladesh has a patient-doctor ratio of 4000:1. In comparison, India has a ratio of 1750:1. Through e-health initiatives, the Internet can help improve healthcare access, particularly in rural areas. An example is the Alokito initiative, where nurses out in the field have a wireless broadband link connecting the patients to doctors in the main city. In a country like Bangladesh, with rural areas that often affected by flooding, which makes them difficult to access, the Internet can also be a valuable instrument in tracking disease outbreaks. Field medical officers can provide accurate, real-time information from remote areas using handheld computers with Internet connections, allowing local and international health organizations to track the spread of diseases.

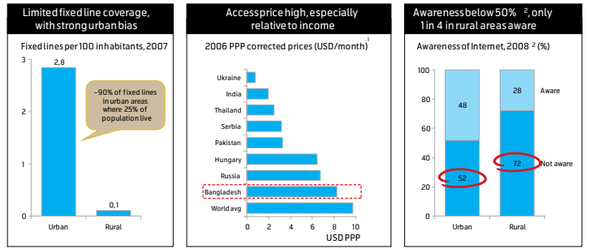
Another example concerns rural development: Most people living in rural areas in Bangladesh live on low and volatile incomes and experience lack of access to basic services and lifestyle options. The Internet can help increase and diversify sources of income, for instance in agriculture. By improving price information and reducing the reliance on middlemen, the Internet can increase considerably the prices farmers receive for their output. Access to reliable information on land registration records can also be critical for farmers seeking to protect their rights and prove ownership of their land. Improved access to information also improves transparency, reducing opportunities for corruption.

Regulatory issues at the core of maximising benefits

The materialisation of the benefits from Internet access is dependent on the level of investment into infrastructure and service development. As investment is sensitive both to the level of uncertainty and to the rate of return, regulatory actions that could adversely impact both drivers will consequently lower investment.

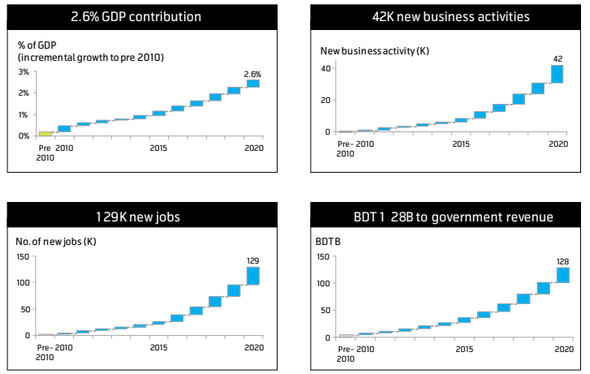
In Bangladesh, there are two priority areas on the regulatory side: First, there is an urgent need to improve transparency and predictability through better governance, thereby reducing the uncertainty faced by providers and spurring investment. This can be achieved through measures such as mandatory consultation with stakeholders before key changes, establishment of mechanisms for appeal, setting of limits to scope for amendments of licenses and other agreements, and a simplification of the licensing system to enhance transparency and reduce barriers to entry. Second, institutional arrangements should be moved towards international best practice, by establishing financial independence for the regulator, structure staff incentives to induce appropriate focus on industry development, and engage in competence building activities.

Exhibit 4 - Three issues need to be addressed if Internet is to take off in Bangladesh



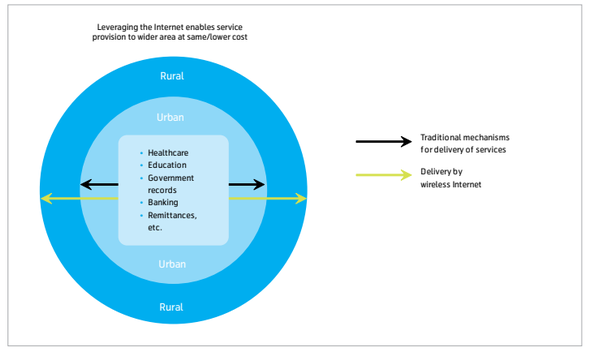
1. Price is for cheapest available tariff for Internet usage of 20 hours a month (10 hours in peak time and 10 hours in the nights)

Exhibit 5 - Significant economic benefits expected to accrue by 2020

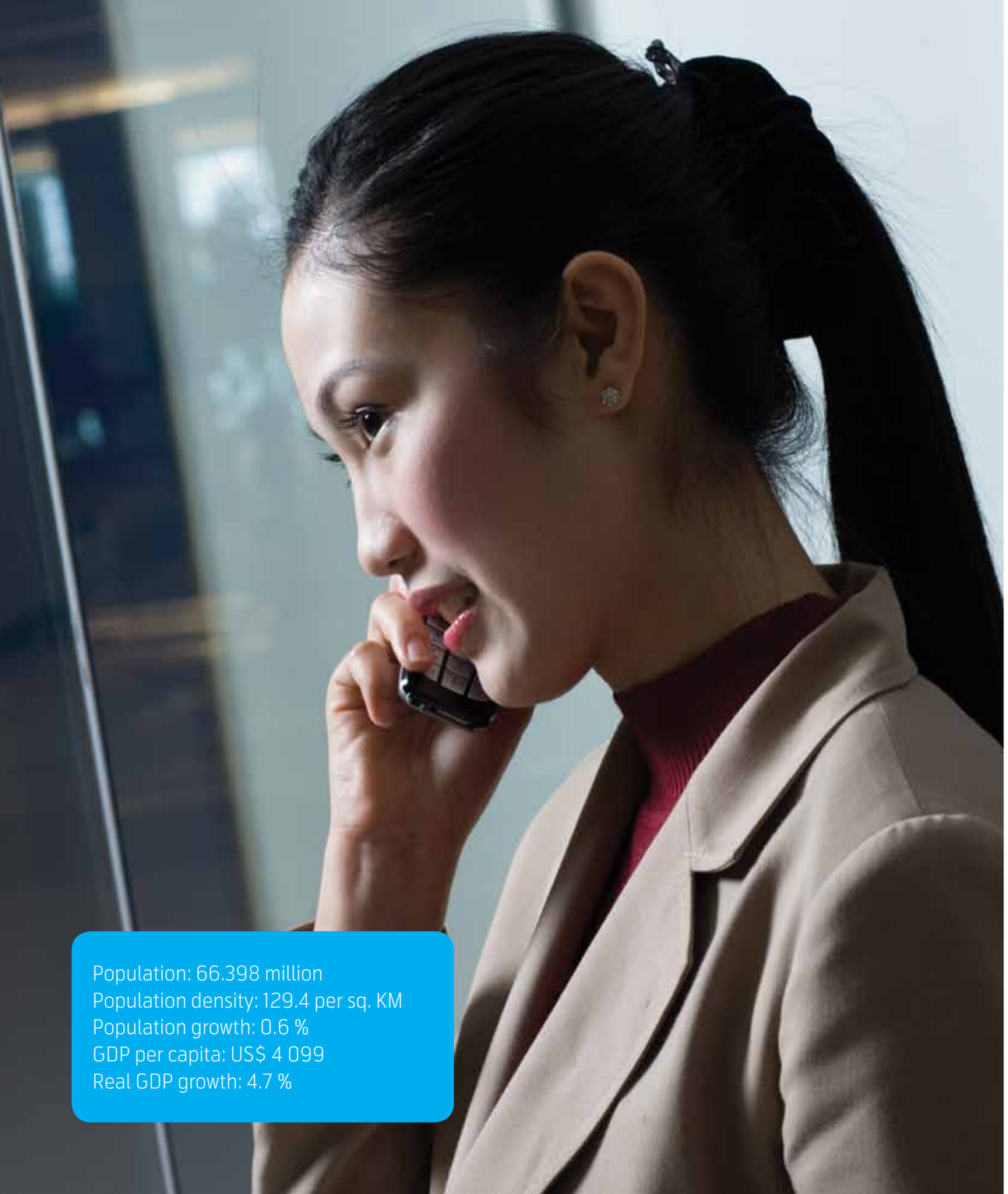


Source : BBS; EIU; CIA World Factbook; Manobi; UNCTAD; OECD; EU; Deloitte; MIT/CMU; Expert interviews; BCG analysis

Exhibit 6 - Infrastructure gaps can be cost-effectively addressed by Internet once critical mass is attained in rural areas



Source: Press search; BCG analysis



Population: 66.398 million
Population density: 129.4 per sq. KM
Population growth: 0.6 %
GDP per capita: US$ 4 099
Real GDP growth: 4.7 %

Thailand

Seen in isolation, Thailand has experienced rapid growth in Internet usage over the last 8 years. However, penetration continues to lag behind regional peers such as Malaysia and Vietnam. This has been identified by the Global Competitiveness Report* as a drag on Thailand's competitiveness
(Exhibit 7)

Under the right conditions and with the right regulatory framework in place, Thailand could have 17.9 million Internet subscribers in 2020, approximately 26 subscribers per 100 inhabitants. At the household level, 70% could have at least one Internet subscription, whilst business adoption lies on around 91%, in 2020. Experts believe that approximately 2/3 of the Internet subscriptions in Thailand will be wireless. With fixed line coverage focused on urban areas, up to 85% of rural connections are likely to be wireless, and even in the urban areas, 55% will use wireless as their primary Internet access point.

* Porter, Michael E., and Schwab, Klaus (World Economic Forum 2009)

Economic benefits – accelerating contributions to GDP

Overall contribution to GDP from the Internet in Thailand is expected to be 3.8% p.a. in 2020. The key driver of this is the productivity gains experienced by business users in all industries, which reaches 4.9% for service firms and 2.4% for manufacturing firms. This allows them to contribute 1.9% and 1.2% to GDP respectively.

The Internet could potentially increase the number of new businesses created each year by up to 52,000 in 2020, which corresponds to 114,000 new jobs, of which only 11,000 are projected to be created within the Internet value chain. All of these additional jobs are generated organically through greater Internet penetration, without the need for any government stimulus or expenditure to support their development.

All this economic activity will also generate revenues for the government, expected to amount to 4.2% of total

government revenue during the ten year period 2010-2020. Almost 90% of this tax is expected to come from corporate taxes on the users of the Internet, while only 13% will come from taxes and fees paid by the providers themselves. This highlights that the Internet is a capital good that enables increased production across the economy. High taxes on the provision of such services, althought they might seem lucrative in the short term, will ultimately stifle development of the Thai economy *(Exhibit 8)*

Social gains – addressing key issues

Thailand has made considerable progress on a range of social issues, such as literacy and poverty reduction. Nevertheless, the Internet has the potential to help push it to a higher level on key areas of concern, enabling it to compete with its South-East Asian peers. In the study, particular attention has been given to the possible environmental benefits the Internet can bring in Thailand.

Three aspects of Thailand's current education performance suggest areas for improvement: Raising the quality of its educational system, addressing the shortage of qualified specialist subject teachers, and increasing tertiary enrolment rates. The Internet can contribute in all these areas by enabling lectures and lessons to be conducted via video conferencing, and by providing affordable access to a range of online basic and advanced degrees.

Those who have been to Bangkok cannot have missed the traffic congestion that dominates its streets almost any time a day. In Bangkok alone, up to THB 192 billion is spent on fuel for passenger cars, emitting a total of 20 million tons of carbon dioxide, all in one year. By enabling for home offices and online transactions, the Internet can reduce both of these by reducing the need for car trips. It is conceivable that the number of car trips could fall by up at least 10%, triggering significant savings on fuel costs and improving the environment by reducing emissions.
(Exhibit 9)

Mitigating new challenges

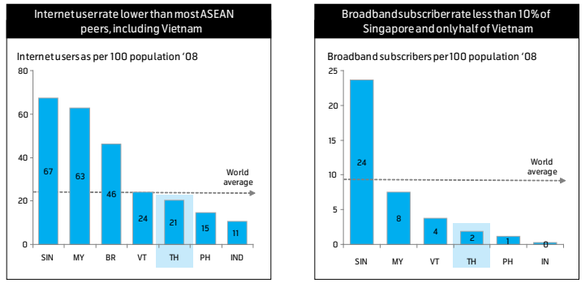
While seeking to maximize all the upsides from the Internet, care should also be taken to mitigate the potential downsides from widespread Internet usage. One key concern is access to undesirable content. This risk can be minimised by blocking selected websites, using parental control applications and initiating education and awareness building activities. Education is the key to reducing this and other risks on the Internet, such as identity theft or violation of intellectual property.

Regulatory concerns need to be addressed

Political uncertainty has afflicted Thailand over the last few years, and there are concerns that the current regulatory regime is deterring investment by lack of ability to act swiftly and decisively when necessary. This stems from a combination of concerns around the regulatory capability to analyze complex issues, and perceived political "interference".

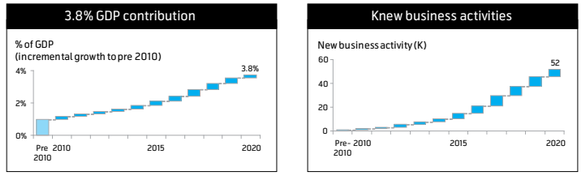
There is also the perception that clear rules and implementation guidelines have not been laid out for critical issues, such as competition regulation, and this concern is exacerbated by the tendency for legal disputes to drag on, tensions between the current concession system and the licensing regime that is expected going forward. There is a strong need to ensure a level playing field for all market participants during the transition process. It is a key priority that these concerns be addressed in order to realise the maximum benefits from investment in Internet infrastructure.

Exhibit 7 - Internet usage in Thailand continues to lag peers



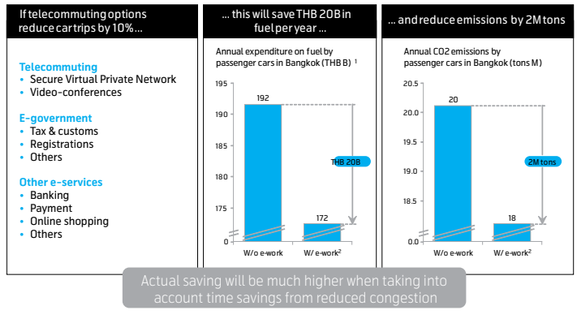
Source: Internet stats 2008; EIU, WEF, EuroMonitor, BCG analysis

Exhibit 8 - Significant economic benefits expected to accrue by 2020

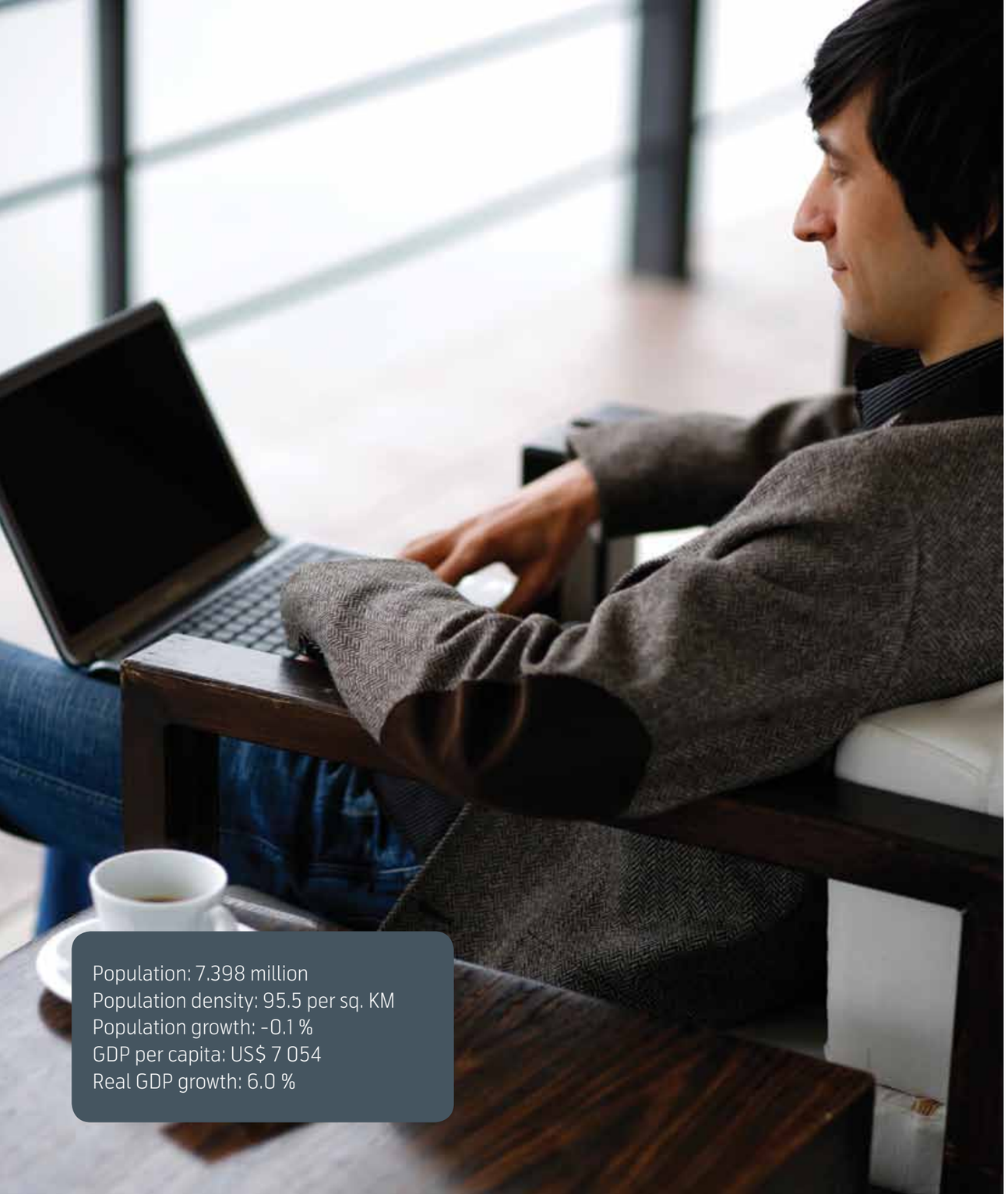


Source: NSO; EIU; CIA World Factbook; Manobi; UNCTAD; OECD; EU; Deloitte; MIT/CMU; Expert interviews; BCG analysis

Exhibit 9 - Telecommuting could help Bangkok reduce fuel costs by THB 20B and CO2 emissions by 2M tons a year



1. Based on 14 May 2009 prices and for passenger cars only; 2. Assume 10% of passenger car traveler can work from home
Source: Thai traffic police statistic 2005; BMA action plan on global warming 2007 – 2012; Press search; BCG analysis



Population: 7.398 million
Population density: 95.5 per sq. KM
Population growth: -0.1 %
GDP per capita: US$ 7 054
Real GDP growth: 6.0 %

Serbia

Serbia has seen rapid Internet growth over the last few years. However, the annual growth rate fell from 43% in 2007 to 26% in 2008. With 32% of the population using the Internet, Serbia is broadly in line with regional peers such as Bosnia, Romania and Bulgaria, but behind regional leaders Slovenia, Croatia and Macedonia. The country is also significantly below the European average of 49%.

With appropriate infrastructure in place for mass adoption, Serbia could have 3 million subscribers, equalling 42% of the population, in 2020. By the end of the ten year period 2010-2020, it is believed that the Serbian market will reach saturation in key segments, leading to a slower growth pace. 81% of households and 95% of businesses will have at least one Internet subscription.

With full wireless rollout, 38% of all subscriptions could be wireless, up from 9% today. Given the limitations of fixed line infrastructure, up to 60% of rural connections are projected to be wireless. With mobile workers and consumers on the move, it is expected that the total number of wireless connections in Serbia will reach 1.2 million in 2020. Although the download speeds are limited relative to fixed line technologies, wireless compensates for this with its lower construction cost, shorter timeline for rollout, and lower costs for end users.

Economic benefits – creating jobs without government stimulus

Overall contribution to GDP is expected to reach 5.2% p.a. in 2020. The key driver of this is the productivity gains experienced by business users in all industries. It is projected that service firms will experience a gradual, continual increase in productivity gains (defined as gross value added per worker, or gross profit per employee). The total productivity gains for service firms will reach 5.6% in 2020, and manufacturing firms will

gain up to 2.8%. Agriculture is projected to contribute up to 0.25%, with output rising by up to RSD 10.5 billion from today's level. This might not seem like such a big number, but particularly for small household farms in rural areas, there is significant scope for the use of Internet to increase value added through providing better information on planting times, methods, use of fertilizers etc.

Rising Internet penetration should also drive an increase in new business activity. Apart from using the Internet as a platform to reach customers, businesses are expected to spring up to support the Internet, e.g. by providing payments processing services, web hosting, website design and so on.

This could potentially increase the number of new businesses in Serbia each year by up to 17,000 in 2020, creating 94,000 new jobs. These added jobs could mean employment for 1 in 5 of the 500,000 who are unemployed in Serbia today, without need of any government stimulus. On the other side, new economic activity will create revenues for the government amounting to RSD 54 billion.
(Exhibit 10) - (Exhibit 11)

Social benefits – Addressing job concerns and giving the youth new aspirations

Serbia suffers from high unemployment rates. In addition, there is large disparity between urban and rural areas, and especially between Belgrade and the rest of the country, in terms of income, opportunities and quality of life. This has lead to negative population growth in many communities and increased the risk of social unrest because of spreading dissatisfaction and disaffection among the people. While the Internet is not a miracle panacea for all these issues, it can mitigate the concerns by creating jobs and stimulating entrepreneurship across Serbia, giving communities outside of the capital grounds on which to flourish.

Surveys suggest that only 1 in 3 Serbian youths think that their country is moving in the right direction. Only 1 in 5 would not consider leaving Serbia. Tertiary enrolment is low, and youth unemployment is high. Nor are young people showing much interest to follow the news or keeping up with what is happening in the world around them. The Internet can play a facilitating role in attaining several goals in the National Youth Strategy, for instance encouraging young people to participate actively in society, improving options for quality leisure time, and encouraging and stimulating employment opportunities.

By providing access to a broader range of information, and allowing people to follow lectures and lessons by vidoe conferencing without having to move away from their home towns, the Internet can also contribute to enhancing the quality of education in Serbia.
(Exhibit 12)

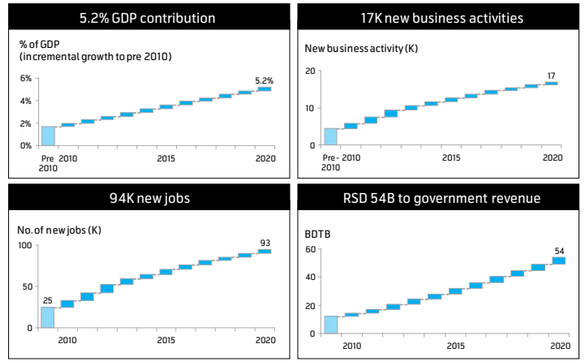
Regulatory issues – Barriers still exist

Serbia has made considerable progress towards EU best practices, but a perceived lack of level playing field together with the threat of sector-specific taxation remain sources for concern.

Going forward, three priority regulatory issues need to be addressed: The first is to enhance rules and procedures by improving clarity of guidelines and streamlining procedures. The second issue is ensuring equal access to backbone, as improved access to infrastructure will be required to stimulate investment and improve quality of service and coverage. The third issue is the efficient management of spectrum, in order to maximise the benefits for Serbia.

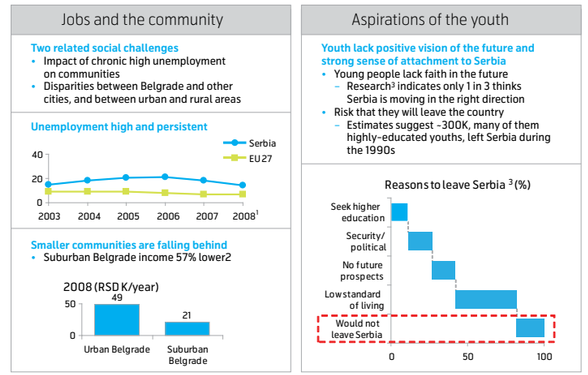
A technology-neutral licensing regime will also allow operators to optimise, e.g. between GSM and UMTS operations at particular frequency, which international experience has shown to be more efficient than a centrally-mandated approach.

Exhibit 10 - Significant economic benefits expected to accrue by 2020



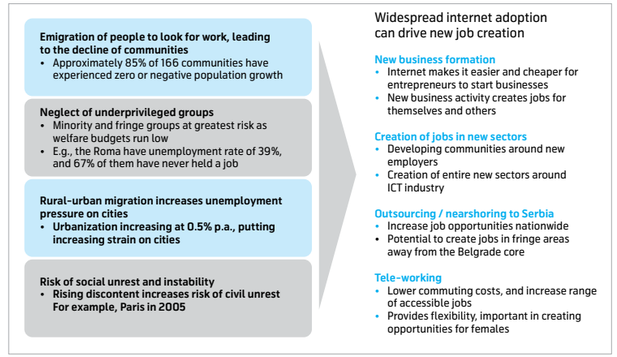
Source: Statserb; EIU; CIA World Factbook; Manobi; UNCTAD; OECD; EU; Deloitte; MIT/CMU; Expert interviews; BCG analysis

Exhibit 11 - Two key social concerns in Serbia that the Internet could help address



1.Number for Serbia October 2008 2. Numbers from 2008 3. Numbers from 2002 survey
Source: SerbStat; Ethnologia Balkanica 12 (2008); National Youth Strategy; The Global Competitiveness Report 2008-2009; Eurostat; Young people in Serbia - attitudes, moral values and perspectives; BCG analysis

Exhibit 12 - Internet can help mitigate the problems associated with chronic high unemployment and unequal development



Source: UNDP (2006); National Youth Strategy; Press search; BCG analysis

Methodology

Adoption has been modelled with a bottom-up cost-benefit analysis to estimate the number of subscribers in each segment for each year. Adoption has been modelled separately for businesses and households. All modelling is based on proven methods, which have been applied in other comparable markets. In all assumptions, the most conservative line has been followed.
(Exhibit 13) - (Exhibit 14)

Business adoption was modelled in three steps: 1) defining the addressable market, 2) segmentation of addressable firms, and 3) estimating adoption based on a cost-benefit analysis.

The primary driver of benefit is the increased productivity that accrues to the firm because of the Internet. Productivity in this case is defined as gross value added per worker, or in accounting terms, gross benefit per employee. The number of firms and the revenue of firms are assumed to each constitute 50% of real GDP growth. From a value added perspective, GDP is equal to the sum of value add for all firms, and hence, in aggregate, the number of firms and their revenue should track real GDP over time.

The methodology for household adoption is broadly similar to business adoption. Households which are below the poverty line are excluded from the addressable market. In terms of segmentation, households are segmented along two axes: location and income. Consumer research suggests that location (urban vs rural) is a primary driver of likely adoption behaviour. For each location, the population is divided in “high” and “low” income based on their potential to be early adopters. Adoption is estimated by analysing the cost and benefits of Internet adoption for households within each segment.

Benefits are divided into two categories: “Needs, which are expressed as a percentage of household income, and “wants”, which have a fixed dollar value for each segment. “Needs” are comprised of the following: 1) Productivity

gains from household businesses, 2) productivity gains from agriculture, 3) cost savings from online procurement/shopping, and 4) time savings for urban segments. "Wants" capture the perceived benefits of Internet use, e.g.: 1) Information search, 2) entertainment, 3) social networking, and 4) "sophistication", by which is meant the ability to keep up with global trends.

Recognising that these elements are inherently difficult to quantify, the approach taken is to express a consumer's wilingness to pay as a multiple of Average Revenue per User (ARPU) for mobile voice. This is based on the assumption that mobile voice can provide many similar functions, and hence provides us with a starting point for estimating what consumers might be willing to pay. Each consumer segment is assessed based on the value that they are likely to place on each of these elements, which also contributes to the generation of new jobs.

The total cost of ownership for household comprises the cost of subscription and the cost of device. In order to get the estimates realistic, the possibility that households could have more than one connection is addressed in the model, together with possible double counting in cases where family businesses could use the same subscription for business and household use.

Estimating economic impact

The demand-side impact of Internet adoption is defined as the GDP contribution generated by firms using the Internet. Productivity gains at the individual firms level is calculated by multiplying the productivity gain at the firm level by the weighted penetration and the total GDP contribution for the sector in mind. Based on analysis of a broad dataset of countries, the study assumes that a 10 percentage point (pp) increase in overall internet penetration will increase the rate of new business formation by 1%.
(Exhibit 15)

The supply side impact captures the GDP contribution of economic activities that are undertaken to produce or consume Internet services. It comprises three elements: infrastructure, employment, and others. Only locally retained expenditure is included in the multiplier.

Although not a component of GDP, contribution to government revenues, in the form of taxes and regulatory fees, is an area of keen interest, and is therefore reported alongside the other economic metrics. The main components are value added taxes, regulatory fees, corporate taxes from the service providers and their value chain, corporate taxes from increased productivity, and corporate taxes from profits of new business activities. The model assumes that the current rates of taxation remain in force for the duration of the projection.

Exhibit 13 – Introduction to methodology
Anchored on rigorous cost-benefit analysis of drivers of adoption

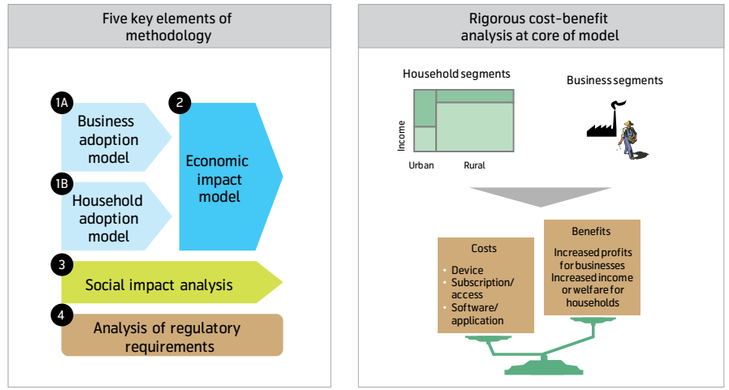
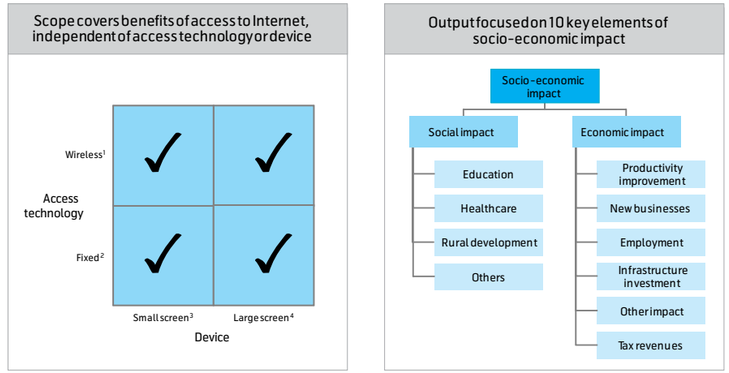


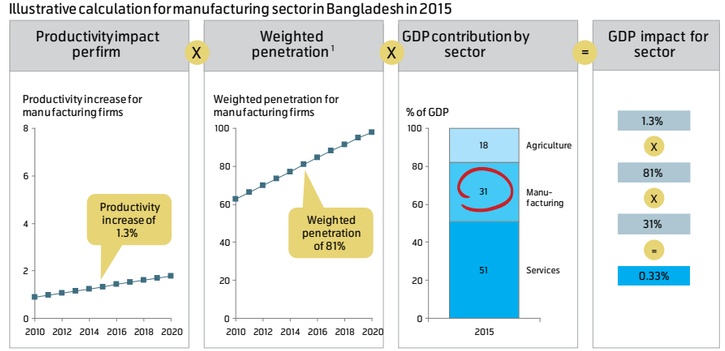
Exhibit 14 – Benefits of all Internet usage captured in 10 impact areas



1. WiMAX, GSM, etc. 2. Fixed technologies include fibre, xDSL, etc. 3. Internet-enabled phones, smartphones 4. PCs, laptops, netbooks
Source: BCG analysis

Exhibit 15 – Productivity impact at firm level is rolled up to GDP impact for the country

Illustrative calculation for manufacturing sector in Bangladesh in 2015



1. Weighted by GDP contribution, to take into account differential adoption by large and small firms
Note: Assumes that on average, firms hold their level of employment constant, hence productivity increase is translated into additional output, not into reduced employment.
Source: EU; UNCTAD; EIU; BCG analysis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