

# The economic and social benefits of mobile services in bangladesh

[Technology](#), [Mobile Phone](#)



The Economic and Social Benefits of Mobile Services in Bangladesh A case study for the GSM Association Barney Lane Susan Sweet David Lewin Josie Sephton Ioanna Petini April 2006 LEGAL NOTICE: Neither the GSM Association nor their Members or Associate Members are responsible for the use that might be made of this publication. The views expressed in this publication are the sole responsibility of the author(s) and do not necessarily reflect the views of the GSM Association, their Members or Associate Members

The Economic and Social Benefits of Mobile Services in Bangladesh

1 Executive Summary The GSM Association commissioned Ovum to conduct a study into the economic and social benefits of mobile services in Bangladesh. We were asked to examine whether there were any policy barriers that may prevent the full extent of any benefits of mobile services from being realised. In the event that policy and legislative barriers were found, we were asked to identify recommendations for change. In recent years, the mobile industry in Bangladesh has developed at an extraordinary rate. Today there are approximately ten million mobile customers and coverage extends to 90% of the population. With a population of 44 million (2005 figures), Bangladesh is the seventh most populous country in the world. Our key findings from the study are as follows: - - - - - Almost a quarter of a million Bangladeshi depend on the mobile industry, directly and indirectly. Mobile services contribute US\$650 million to the economy every year. Mobile services are good value for money when compared with other countries. Mobile communications allow businesses to operate with greater efficiency. For every additional 0 percentage points of mobile penetration, the annual GDP growth rate is increased by approximately 0. 6%. Higher

mobile penetration will assist Foreign Direct Investment (FDI). Increasing penetration by % increases FDI as a proportion of GDP by 0. 5%. The poorest citizens benefit most from mobile services. Mobile services improve social cohesion, assist in reducing the digital divide, improve access to healthcare and can help improve users' quality of life. However the full realisation of these benefits is in jeopardy unless firm policy and legislative action is taken. The key concerns that need to be addressed are: - High taxes. Of particular concern is the very high burden of industry specific taxes (taxes levied on this industry only but not others). Considering all activities linked with the sector<sup>2</sup>, these comprise 35% of the total tax generated by the industry. This diverts resources away from the mobile communications sector and towards less productive sectors. The tax policy is likely to be counter-productive for the Government as it reduces total tax revenue. Ultimately, the consumer pays as the operators have no option but to pass the taxes through to their customers. Worse still, the tax regime makes mobile services much more expensive for those who need them most: the poor and those living in rural areas. The interconnection regime. The interconnection regime — the system that controls payments between operators for connecting calls — is fundamentally flawed and in need of reform. Currently, the interconnection system subsidises the less productive and more expensive fixed-line services, whilst harming the more productive and cheaper mobile industry. Industry specific taxes include revenue share charges, royalties on handsets, connections and supplementary duty and BTS licence fees. Generic taxes include VAT on usage charges, income tax, import duty on capital machinery and corporation tax. <sup>2</sup> This includes income tax (which in Bangladesh is not

actually paid by employers). To allow the tax burden to be compared between different countries, we have included income tax in the denominator. - - © Ovum April 2006 | GSM Association | Like the tax regime, the interconnection regime increases the cost of services to members of the population who need it most — the poor and those living in rural areas. - The threat of political and regulatory pressure on the operators to reduce prices faster than is sustainable, based on the false belief that services in Bangladesh are more expensive than in similar countries. In fact, our analysis shows that the mobile operators in Bangladesh deliver good value for money and do not make excessive profits. This also addresses the argument that excessive profits are repatriated. The (limited) profits are mostly reinvested. The artificial restrictions on the mobile operators handling of international calls. Currently only BTTB is allowed to operate an international gateway. - We offer the following recommendations to address these problems: - - Industry specific taxes should be gradually reduced and, in the medium term, removed entirely. This will encourage the development of the industry, the economy and increase government revenues. Currently, mobile-to-mobile interconnection is based on reciprocity. Likewise, fixed-to-mobile interconnection charges should be introduced on a reciprocity basis to increase mobile penetration and generate greater economic and social benefits. Mobile-to-fixed interconnection charges should be brought down towards cost to bring an end to this inefficient subsidy from the mobile to the fixed sector. Competition is the best regulator: the government should allow competition between the mobile operators to determine mobile retail prices. No action, formal or informal, should be taken to regulate mobile retail

prices. Price controls are well recognised to be a very blunt instrument: they are costly to design and implement and prevent operators structuring their prices in ways necessary to maximise customer welfare. However, in the case of fixed retail prices, the argument for retail price regulation is very much an open debate especially in the light of BTTB's impending restructuring and privatisation. The prohibition on competitors using WLL technology to provide mobility should be effectively enforced. International gateways should be liberalised to improve competition in the provision of outbound international calls. Measures should be introduced to encourage local equipment assembly and manufacturing of components such as switch boxes, batteries and raw materials to ensure a reliable and low-cost source of supply to the industry and to ensure that more of the benefits of mobile services remain within Bangladesh. - - - - 2 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh Contents 1 2 3 3. 3. 2 3. 2. 3. 2. 2 3. 3 3. 3. 3. 3. 2 3. 3. 3 3. 3. 4 3. 4 4 4. 4. 2 4. 3 Executive Summary Introduction Economic Impact of Mobile Services in Bangladesh Introduction Contribution to the Economy The Static Supply Side Contribution Dynamic Demand-side Effects Retail Pricing and Interconnect Rates CPP versus RPP Retail Pricing Interconnect Rates Retail Charges and Interconnect Rates: Conclusion Distributional Effects Social Benefits of Mobile Services Introduction Promoting Social Cohesion Users with Low Education and Literacy 1 7 9 9 8 22 22 23 27 30 3 33 33 33 34 © Ovum April 2006 | GSM Association | 3 4. 4 4. 5 4. 6 5 5. 5. 2 5. 3 5. 4 5. 5 5. 6 5. 7 6 Local Content Mobile Services in Natural Disasters Promoting Social Responsibility Policy Issues and Recommendations Taxation

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Social Benefits of Mobile Services in Bangladesh 2 Introduction The purpose  
of this study is to evaluate the impact of mobile services on Bangladesh's  
economy and society, assess the impact of government policy on the  
performance of the sector and to present conclusions and recommendations  
on areas in which policy can be improved. The reality of policy making is that  
decisions must be based upon balancing priorities. How many jobs are at  
stake? Does society benefit from mobile services? How do they affect the  
economic and social lives of disadvantaged groups? Will the availability of  
mobile services improve economic growth? We address all these questions.  
We also consider whether Bangladeshi customers receive good value for  
money by comparison with other countries and if necessary, what action can  
be taken to improve value for money. The first cellular operator was

Bangladesh Telecom (Pvt) Limited (BTL), which received permission to provide service in 1989. The permission transferred initially to Pacific Bangladesh Telecom Limited (PBTL) who started their operation in 1993. Later in 2004 most of the share was purchased by Singtel. PBTL operates under the brand name CityCell. GrameenPhone, Aktel and Sheba were awarded licences in 1997. GrameenPhone quickly established market leadership, owing to its relationship with the not-for-profit Grameen Bank. This enabled it to conduct the necessary credit-checks to develop the Village Phone concept whereby a credit worthy village dweller would, for a small fee, loan their mobile phone to other residents. It is difficult to overestimate the importance of the Village Phone in making mobile services more accessible to poor and rural societies in Bangladesh. It also provides women with another form of employment and empowerment. After a period of declining market share, Banglalink purchased Sheba's licence in 2004. CityCell entered the market in 2004, followed by Warid in December 2005. The incumbent fixed line operator, BTTB also entered the market via Teletalk. Recently, the industry has experienced explosive growth. Penetration stood at just 0.2% in 2000 but this rose to 6% by the end of 2005. Forecasters expect this to continue, bringing the subscriber base to 8 million by 2007 and penetration to nearly 3%. Factors contributing to this growth are low levels of teledensity, the limited performance of fixed-line operators, considerable foreign direct investment (FDI), and lower prices driven by increased competition and economies of scale. In 2004 the success of the industry, signalled by high rates of revenue growth attracted the attention of the government, who sought to cash in by imposing a controversial tax of US\$8 on each new

connection. In response to strong criticism, the tax was reduced to US\$3. 50 in August 2005. However, industry specific taxation - taxes applying to the mobile industry and not others - remains high. An obvious example is the US\$6 "royalty" charge, paid annually per connection, which applies only to mobile subscriptions and not fixed subscriptions. The size of the grey market for mobile handsets - in which up to 70% of all new handsets were entering the country informally - forced the government's hand to reduce tax on handset imports from US\$22. 50 to US\$4. 50. 3 3 The royalty charge was amended in March 2006 © Ovum April 2006 | GSM Association | 7 In terms of the economic impact of mobile services in Bangladesh, Ovum's analysis focuses on the static supply side contribution of mobile services on the one hand, and dynamic demand-side contributions on the other. For the static analysis, we construct a value chain, which quantifies the contribution, or "value-add" of the mobile sector to adjacent sectors such as dealerships, fixed operators (FNOs) and the government. We also estimate the employment impact of mobile services in terms of the number of jobs resulting directly and indirectly from the sector. The estimates are based on data obtained through publicly available sources such as audited accounts and interviews with the operators. Collecting data is an intensive exercise and as always, where data are not available, we have had to make estimates and approximations. However, it is Ovum's view that the results presented in this report provide an accurate estimate of the contribution of mobile services to the economy. A healthy communications sector has extensive knock-on benefits for the economy at large. So a static analysis, though relatively easily quantified, does not provide a complete picture of the



impact of the sector on the economy. To address this shortcoming, we consider the dynamic demand-side impacts of the mobile sector, including its impact on productivity and economic growth. Estimating the impact of mobile communications on economic growth is a difficult task, principally because of the difficulty in establishing the direction of causation. It is obvious that richer countries have higher levels of penetration, but which is the cause and which is the effect? We review the findings of economic research to cast some light on this. The social impact of mobile services is even harder to quantify. In assessing the (non-economic) impact of mobile services, we examine some of the ways in which mobile services might be expected to affect the lives of users and their associates. We also review some survey data taken from Africa on how the use of mobile phones has affected the lives of users there. The remainder of the paper is structured as follows: - Section 3 examines the economic impact of mobile services in Bangladesh, taking into consideration the supply-side static impact, the dynamic impacts, the distributional impacts, and whether or not mobile services are delivering value for money to users. Section 4 examines the social impact of mobile services. Section 5 considers the key policy issues affecting the performance of mobile services in all the dimensions described above and makes policy recommendations. Finally we draw together our conclusions in Section 6. - - - 8 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh 3 Economic Impact of Mobile Services in Bangladesh 3. Introduction The impact of mobile services on the economy of Bangladesh, as everywhere, is potentially far-reaching. A high-quality communications infrastructure is widely held to

allow human capital to be deployed more effectively and more productively. For these benefits to be realised in Bangladesh and distributed evenly throughout society, it is crucial to have a mobile telephony service that is cheap, widely available and of high quality. Currently, fixed and mobile teledensity in Bangladesh is very low, as illustrated by Figure 3.. However, in recent years mobile services have grown strongly. Figure 3. Fixed and mobile teledensity in Bangladesh Source Ovum It is evident from Figure 3. that, despite the best efforts of the operators to grow, the vast majority of the population does not have access to telecommunications. We estimate that the contribution GDP in 2005 was relatively small, owing to the industry's youth, at approximately % of GDP<sup>4</sup>. <sup>4</sup> In Latin America and India mobile services also account for % of GDP. In the European Union (EU5) they account for .% of GDP. © Ovum April 2006 | GSM Association | 9 These figures substantially under-state the true contribution of mobile services to the economy. The ICT sector, of which telecommunications is a crucial component, is broadly understood to be a key driver for productivity and economic growth (this is explored in Section 3. 2. 2). In addition to comprising an important and growing component of output, mobile services play an important role in allowing individuals and businesses to improve their productivity. Mobile telephony is not, as is sometimes claimed, a "frivolous luxury" or "a rich man's toy" but an important business and social tool, allowing users to conduct their affairs with greater efficiency and lower cost, whilst allowing families to stay in touch more easily. Typically in developing countries, mobile services now take the role that fixed communications played in developed countries in the 950s to 970s. However, countries

developing today have the advantage that mobile communications are far cheaper and easier to deploy than fixed communications. The lower cost of installing mobile services compared with fixed services, particularly in rural areas, allows disadvantaged groups to gain access to communications more quickly. Mobile is therefore a more "egalitarian" mode of communications than fixed. By improving the communications infrastructure of Bangladesh, mobile communications may also have a role to play in improving the flow of foreign direct investment (FDI) as investors are far more likely to invest in a country with a well established communications infrastructure. Because of the relative ease with which mobile communications networks can be deployed and the replicability of the business models from country to country, mobile communications is usually one of the very first technology related sectors to enjoy the benefits of (FDI). Potential investors in other sectors watch the performance of the mobile sector closely to establish whether the policy environment is "friendly" or "hostile" to foreign investment. A regime that is seen to apply taxes opportunistically using industry as a "cash cow", or one that uses successful industries to prop up less successful ones, is likely to deter FDI. Despite its encouraging growth to date, the mobile sector in Bangladesh faces some severe challenges ahead. Chief among these concerns are: - The dramatic increase in taxation. This raises the price of mobile services, slows its development and harms the industry, its customers, employees and all the sectors that depend on it. Paradoxically, these taxes prevent the very people who need them most from gaining access to services. An interconnect environment that favours the incumbent fixed operator. The uneven treatment of mobile operators and

Wireless Local Loop (WLL) operators who provide competing services but enjoy a much more favourable taxation/licensing framework. - - Together, these issues threaten to stall the development of the mobile industry and prevent the benefits of mobile services in Bangladesh being fully realised.

The remainder of this section is structured as follows: - - - Section 3. 2

quantifies the supply side contribution of the mobile industry to the economy using 2005 data. It also examines the dynamic demand-side effects of mobile communications on productivity and economic growth. Section 3. 3 looks at retail and interconnect prices in Bangladesh. Finally Section 3. 4 considers how the benefits of mobile services are distributed across geo-demographic categories (wealthy and poor, urban and rural). 0 | GSM

Association | © Ovum April 2006 The Economic and Social Benefits of Mobile

Services in Bangladesh 3. 2 Contribution to the Economy 3. 2. The static

supply side contribution In this section, we quantify the contribution of the mobile industry to the economy, covering the industry and its adjacent sectors. Of course, such analysis cannot provide a complete picture of economic impact of mobile services. In particular: - It is a snapshot view. It does not take account of future benefits resulting from growth. It also fails to show the benefits resulting from any growth in local supply of capital equipment such as handset assembly and component manufacturing that might develop as the industry progresses. It fails to take account of the important demand-side benefits that mobile communications provides to all commercial enterprises in terms of reducing their costs and improving their efficiency. This is considered in Section 3. 2. 2. Third, it takes no account of the social benefits of mobile communications, which are considered in

qualitative terms in Section 4. - - © Ovum April 2006 | GSM Association | The Value Chain Figure 3. 2 shows how end user spend on mobile services and terminals flows along the value chain to the various players which make up the industry. Figure 3. 2 The mobile services industry value chain. All figures in US\$5 Source: Ovum The figures next to the arrows represent flows of money from one group to another. The figures inside the boxes represent the value add "retained" by each group. The sums "retained" are used to pay wages, taxes and other costs. The government revenues of US\$256 million come from all groups identified and covers all types of taxes, for example import duty, VAT, corporation tax and income tax. Our estimates are based on: - - discussions with three mobile operators. analysis of the operators' published accounts. 5 Note: the figure for fixed to mobile interconnection payments is an approximation. Some interconnect revenue is available from the private fixed operators but the vast majority of fixed to mobile calls originate from BTTB. 2 | GSM Association | © Ovum April 2006

The Economic and Social Benefits of Mobile Services in Bangladesh Figure 3. 3 presents the same data in tabular form. Figure 3. 3 The mobile services industry value chain

Revenues (US\$m) per year	Industry	Role	Revenues	Costs	Value Add
283	599	227	76	54	33
4	55	28	226	343	55
4	9	—	—	—	—
57	256	72	62	35	33
4	55	28	US\$812	Source: Ovum	Total

We find that the mobile industry in Bangladesh created a total value-add of US\$82m in 2005. US\$256m of this was retained by the mobile operators and was used to pay

employee wages and taxes. The remainder was retained by the dealers (US\$57m), terminal manufacturers (US\$63m), equipment suppliers (US\$62m), fixed operators (US\$35m), support services (US\$33m) and a total of US\$297m to equipment suppliers. Contribution to Government Revenue

One of the major beneficiaries of the mobile industry is the government. Tax revenue is generated in many ways. A large proportion of the value-add “retained” by the mobile operators is used to pay taxes such as VAT, import duty, handset royalty and supplementary duty. Wage income accruing to employees is subject to income tax. 6 Value-add flowing to other sectors also generates tax revenue. We find that the flows of funds created total revenue of US\$256m in 2005 for the government. The breakdown of tax revenue is shown in Figure 3. 4. It includes tax revenue derived from all components of the value chain. 6 We assume in our estimations that the government is successful in collecting all the income tax due. © Ovum April 2006 | GSM

Association | 3 Figure 3. 4 Government revenue Government Revenue a) VAT on usage charges and handset sales b) Revenue share charges c) Royalty on handsets d) Connections & supplementary duty e) BTS royalty f) BTS licence fee g) Income tax h) Import duty on capital machinery i) Import duty on handsets (total) TOTAL (US\$m) 2 8 46 36 0 37 5 256 Source: Ovum We also

estimate that the tax take from the mobile operators in 2005 amounted to US\$74m, or 27% of their revenues. Importantly, as shown in Figure 3. 5, 35% of these taxes are industry specific. These are startling figures, the more so because the denominator includes tax taken from all adjacent sectors sector.

One reason the industry is taxed so heavily is to compensate for an inefficient income tax system. Making employees responsible for their own

income tax makes it difficult to monitor whether all taxes are being paid as due. The mobile industry, however, is a very easy tax target because the inputs (handsets and network equipment) and outputs (connections and airtime) are easily monitored. Figure 3. 5 Split of taxes between mobile industry and generic tax Source: Ovum 4 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh In a previous report on the mobile industry in India, Ovum recommended the Indian government reduced taxes on its mobile industry because they were abnormally high. However, by any measure, industry specific taxes in Bangladesh are far higher than in India. In India, industry specific taxes account for 20% of the industry's cost base, whilst in Bangladesh, industry specific taxes account for 29% of the industry's cost base. Also, in India, industry specific taxes account for 30% of government revenue generated by all sectors related to the mobile industry. In Bangladesh, the comparable figure is 35%. Contribution to Employment The contribution of mobile services to employment comprises four components. First, there is the "direct" employment of the industry or workers directly employed by the players in the value chain. Second, there is the "support" employment, which is created by outsourced work and taxes that the government subsequently spends on employment generating activities. Third, there is the "indirect" category, which covers other costs as well as profit generated, which is subsequently spent on employment generating activities. Finally, there is the "induced employment" category which refers to jobs created as employees and other beneficiaries spend their earnings, thereby creating extra employment. The induced employment is estimated using a multiplier,

in this case . 6. 7 The association Francaise des Operateurs Mobiles<sup>8</sup> assumes a multiplier of . 7 when estimating this effect in a similar study and the UK Office of National Statistics estimates a multiplier of . 5 for telecommunications. We have chosen a value between these two. As shown in Figure 3. 6, we estimate that the mobile industry in Bangladesh created 237, 900 jobs in Bangladesh in 2005. 7 8 The multiplier is intended to reflect the second-order economic activity created by the sector. This refers to the spending and earnings from the sector that are subsequently spent on other activities, creating more employment and economic activity, and so on. La Filiere Mobile: quel impact sur l'economie Francaise? July 2003 © Ovum April 2006 | GSM Association | 5

Figure 3. 6 Employment in Bangladesh from mobile industry

Employment from mobile services (000)	Dealers	MNOs	Support services suppliers	FNOs	Other capex suppliers	Terminal suppliers	Terminal component suppliers	Network equipment manufacturers	Network equipment component suppliers	TOTAL
Direct	9. 9	4. 4	0. 0	0. 0	6. 6	6. 8	0. 0	0. 0	0. 0	31. 8
Support	9. 9	38. 2	23. 0	5. 2	6. 8	0. 0	0. 0	0. 0	0. 0	93. 2
Indirect	0. 0	3. 8	5. 8	0. 7	3. 4	0. 0	0. 0	0. 0	0. 0	23. 6
Induced	29. 9	27. 9	7. 3	3. 9	0. 3	0. 0	0. 0	0. 0	0. 0	89. 2
Total	79. 8	74. 3	46. 0	0. 4	27. 4	0. 0	0. 0	0. 0	0. 0	237. 9

Source: Ovum Distribution of Value Add by Geography As shown in Figure 3. 7, approximately half of the value added remains within Bangladesh. The other half is exported to the rest of the world. The proportion retained in developed regions like the EU is much higher as shown in Figure 3. 8. This demonstrates the benefit of having indigenous upstream inputs (e. g. handsets and network equipment) for retaining value-add within the region. Figure 3. 9 shows the same comparison in the case of



India. The proportion of value-add retained within India is very similar to that in Bangladesh. The Indian government is taking steps to help the development of an indigenous component supply industry to allow a greater proportion of the value-add to be retained. Of course, as penetration grows and demand for equipment increases, an increasing proportion of the components such as batteries, switchboxes and raw materials are starting to be manufactured in Bangladesh. The growing demand for mobile services in Bangladesh represents a major opportunity for further growth and development in the manufacturing and assembly of equipment. 6 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh Figure 3. 7 Distribution of value-add: Bangladesh Bangladesh Distribution of Value Added in Region vs Rest of World 51% In region To rest of World 49% Source: Ovum Figure 3. 8 Distribution of value-add: EU5 EU15 Distribution of Value Added in Region vs Rest of World 21% In region To rest of World 79% Source: Ovum © Ovum April 2006 | GSM Association | 7 Figure 3. 9 Distribution of value-add: India India Distribution of Value Added in Region vs Rest of World 53% In region To rest of World 47% Source: Ovum 3. 2. 2 Dynamic demand-side effects The estimates provided above significantly understate the full economic impact of mobile services. Here, we identify some of the ways in which mobile services can affect productivity and growth as reported in economic literature, particularly: - - Waverman, Meschi and Fuss (2005)9. Ovum/Indepen: The economic impact of mobile services in Latin America. This research indicates that increasing mobile penetration by ten percentage points in a developing country adds 0. 6 percentage points to the annual GDP growth rate,

approximately double the effect on GDP growth as in a developed economy. These results reflect "New Economy" effects, a term used to describe the ability of information and communications technology to generate competition, new distribution and production methods and ultimately, non-inflationary growth. Mobile telephony is an important part of the "new economy" having the potential to improve economic performance through many channels, for example by: - Reducing costs by enabling companies and workers to trade without travelling. A study from South Africa and Tanzania<sup>0</sup> found that 52% of South African users and 67% in Tanzania said mobile phones greatly reduce travel time. 58% of users in South Africa and 65% in Tanzania said mobile phones greatly reduce travel costs. 9 0 Africa: The Impact of Mobile Phones. The Vodafone Policy Paper Series Number 3 March 2005 Africa: the impact of mobile phones: Vodafone Policy Paper Series, Number 3 March 2005 8 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh - Mobile services can improve the dissemination of information to allow markets to operate more efficiently (for example allowing farmers to check agricultural prices without travelling). Farmers without telephony have difficulty discovering commodity prices and inputs, such as fertilisers. Mobile services raise efficiency by allowing workers to be in touch when away. Mobile services allow workers better access to information on where their services are required (for example a plumber can act more quickly and efficiently when accessible via telephone rather than relying on word of mouth). There is some evidence that mobile services assist countries in attracting Foreign Direct Investment (FDI). - - - It is easy to see that economic growth and

growth in mobile penetration are positively correlated, (Figure 3.0), taken from a sample of developing countries. Figure 3.0 Relationship between growth in mobile penetration and GDP growth Source: ITU and CIA World Fact Book. See Vodafone Policy Paper Series, Number 3 March 2005 page 9 for references to studies showing the improvement in agricultural prices available to farmers and fishermen with access to telephony in Asia, Africa and Latin America. © Ovum April 2006 | GSM Association | 9 Figure 3. shows the same data in tabular form. Of course, evidence of a correlation is not sufficient to establish a causal link with variables that are likely to be interdependent such as mobile penetration and economic growth. As people grow richer, they are more likely to purchase mobile services.<sup>2</sup> But the econometric work done by Waverman and Ovum/Indepen indicate that such endogenous effects are, at best, limited and that increased mobile penetration does indeed lead to increased economic growth. Figure 3.

Relationship between growth in mobile penetration and GDP growth

Country	Mobile Penetration Rate 2003-2004	Real GDP Growth Rate 2004-2005
Cameroon	42%	5%
Egypt	29%	4.5%
Ethiopia	79%	50%
Gambia	59%	7.0%
Kenya	56%	5%
Senegal	44%	6.0%
Bangladesh	101%	5.2%
Bahrain	38%	20%
India	04%	5.9%
Indonesia	54%	7.0%
Jordan	7%	5.0%
South Korea	8%	5.0%
Kuwait	37%	8.4%
Malaysia	29%	4.7%
Myanmar	42%	4.7%
Pakistan	04%	4.7%
Philippines	44%	7.0%
Sri Lanka	57%	7.0%

Source: ITU and CIA World Fact Book. <sup>2</sup> Although a correlation is not sufficient to establish causation, there is a year time-lag between the change in mobile penetration and GDP growth. This year timelag resulted from a lack of more recent data availability for mobile penetration but could

be interpreted as strengthening the argument that an increase in mobile penetration is at least in part, a contributor to GDP growth. 20 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh Research In 2005, Waverman, Meschi and Fuss estimated the impact of mobile services on economic growth in developing countries.<sup>3</sup> Amongst their findings were that: - " Mobile phones in less developed economies are playing the same crucial role that fixed telephony played in the richer economies in the 1970s and 1980s... Many countries with under-developed fixed-line networks have achieved rapid mobile telephony growth with much less investment than fixed-line networks would have needed". " Mobile telephony has a positive and significant impact on economic growth and this impact may be twice as large in developing countries compared to developed countries... In developing countries, we find that the growth dividend is far larger because here mobile phones provide by and large, the main communications networks; hence they supplant the information-gathering role of fixed-line systems". " A developing country which had an average of 0 more mobile phones per 100 population between 1996 and 2003 would have enjoyed [annual] per capita GDP growth that was 0.59 percent higher than an otherwise identical country. " - - Given the low penetration of both fixed and mobile services in Bangladesh, the pay-off from increasing penetration there is likely to be greater than in many other countries. Former developing countries such as Singapore, Hong Kong and Malaysia prioritised investment in telecommunications as a key part of their development strategy, with considerable success. There is some evidence that mobile services positively

impact Foreign Direct Investment (FDI). Mark Williams of Frontier Economics<sup>4</sup> found a statistically significant positive relationship between mobile penetration and FDI flows. Williams notes that higher investment is central to achieving long-term sustainable economic growth and poverty reduction in developing countries, that foreign investors are an important source of capital finance and that some types of foreign investment may bring spill-over benefits to the recipient country in the form of transfer of skills, tax revenues and formal employment. The author examined the relationship between FDI and the characteristics of the recipient countries, focusing particularly on the relationship between FDI flows into developing countries and the penetration of mobile telecommunications networks in the recipient country. Williams found that both fixed and mobile communications networks, in addition to other characteristics including openness of the economy, GDP and infrastructure, are positively linked with inward FDI. Based on an analysis of a range of developing countries, Williams found that a per cent increase in mobile penetration was associated with a 0.5% to 0.6% increase in FDI as a proportion of GDP. He noted the wellrecognised benefits of FDI, which include improved employment opportunities, skills and technology transfer, and access to capital. Data presented in the same report show Bangladesh as having one of the lowest ratios of FDI to GDP in the world, indicating that improvements in this area could yield large dividends. <sup>3</sup> There is a significant body of research suggests that attempts to identify a link between teledensity and economic growth. Hardy (1980) found that the impact of telecoms investment was greatest in the least developed economies. Although this study is old and concerned with fixed networks, it

is reasonable to suggest mobile communications in developing countries are capable of performing the same role as that performed by fixed communications in developed countries in previous decades. More recently, a study by Roeller and Waverman (200) suggested that in the OECD, the spread of modern fixed-line telecoms networks was responsible for one third of GDP growth between 1970 and 1990. Africa: The Impact of Mobile Phones.

The Vodafone Policy Paper Series Number 3 March 2005 4 © Ovum April 2006 | GSM Association | 2 3. 3 Retail Pricing and Interconnect Rates

Understanding whether mobile communications in Bangladesh are delivering good value for money to consumers is an important part of understanding their economic and social benefits. Here, we compared retail tariffs and interconnect rates in a number of countries with similarities to Bangladesh.<sup>5</sup> There are many complications in such comparisons. One of them is the tax regime. It is difficult to take full account of the taxes when comparing prices and we do not attempt to do so here. However, high taxes, which are ultimately borne by consumers, should be taken into account when considering the comparisons shown below. The interconnection regime should also be taken into account, given the interactions between the retail market and interconnection markets. In Bangladesh, the interconnection regime is characterised by high fixed-to-mobile interconnect costs and (abnormally compared with other countries) zero interconnection revenues from the incumbent fixed operator. Taken together, the high taxes (which do not apply to the fixed sector) and the interconnection regime created involve a strong cross subsidy to the fixed sector (mostly rich and middle-class customers) from the mobile sector (mostly poor customers). Another factor

that needs to be taken into consideration (but which the benchmarks do not reflect) is the charging period. In some of the countries considered here, India for example, the charging period is one minute, meaning that a one second call costs the same as a one minute call. In Bangladesh the charging period is ten seconds.<sup>6</sup> The benchmarks therefore flatter India relative to Bangladesh, showing the former to be relatively cheaper than it actually is. Finally, the size of the pre-pay vouchers should be taken into account when comparing retail tariffs. Large vouchers require significant amounts of cash, which deters poorer users and may expire after a certain time. In Bangladesh, voucher sizes are small compared with the other countries considered.<sup>7</sup>

### 3. 3. CPP versus RPP

In Bangladesh subscribers pay to cover the mobile operators' costs in terminating some inbound as well as outbound calls (Receiving Party Pays or RPP). The absence of interconnection revenue from fixed-to-mobile calls from BTTB forces the mobile operators to charge their customers for receiving calls. Therefore, CPP has only been partially implemented in Bangladesh. This complicates the benchmarking process. In India the calling party pays fully for each call (Calling Party Pays or CPP). In our benchmarks, we exclude payments mobile subscribers make for inbound calls. We discuss the significance of this exclusion below. India introduced CPP in 2003 to reduce the negative impact on growth of RPP. As a result, customers buy mobile prepaid services for as little as Rs200 per month (\$5). Some do not pay for calls at all, using the 'missed call' feature to let (richer) acquaintances know that they should call back. The significance of RPP in Bangladesh goes far beyond its role in complicating the benchmarking process: it also gives rise to serious policy questions for the government. In

999, the ITU commented on the impact of RPP as follows: 5 6 7 A detailed description of the construction of the tariff benchmark is provided in Annex . In some cases the charging period is only second. For example, Aktel's charging period for post-paid services is second. The importance of small voucher sizes, or " micro pre-pay" is discussed in " Telecoms demand: measures for improving affordability in developing countries", London School of Economics 2006. 22 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh RPP results in less usage, causes mobile customers to turn their phones off, causes mobile customers not to give out their telephone numbers, and increases the cost of cellular ownership. In a calling party pays (CPP) regime.... there is no charge for calls received, so mobile phones become attractive to more people (including those on low/fixed incomes); mobile customers leave their phones switched on, increasing completion rates for incoming calls, thus increasing traffic. In developing countries, the mobile phone is the communication device of the low income segments — hence cost relief should be targeted at them. E. g.: via CPP where incoming calls become free while the mobile operator is fully compensated for termination costs. Figure 3.2 below shows the effect of introducing CPP in Mexico, in early 999. In 998 the operators started introducing CPP tariff plans in anticipation of the forthcoming changes in the interconnect regime. The figure shows a dramatic acceleration in penetration following the introduction of CPP. Figure 3.2 : Penetration of fixed and mobile services in Mexico (Number of lines per 00 inhabitants in December of each year) Source : ITU, COFETEL, Telmex. 3. 3. 2 Retail Pricing The figures in this section summarise the average cost of



ownership split into fixed and variable charges and taxes. We have used the standard OECD basket and a “modified” basket, to reflect usage patterns in developing countries. Our view is that the modified basket is a more accurate basis for comparison in this case. © Ovum April 2006 | GSM Association | 23 The overall charges for each country have been converted into US\$ using a composite of 40% exchange rate and 60% purchasing power parity (PPP)<sup>8</sup>. Using the modified basket, we see from Figures 3.3 and 3.4 that Bangladesh’s low user prices are in line with the average. Moreover, fixed charges are the lowest in Bangladesh<sup>9</sup> and significantly lower than India, Pakistan and Sri Lanka. This tells us that a key barrier to entry in owning a mobile — fixed costs — is small in Bangladesh. Mobile ownership is a much more attractive prospect when users can control spending through usage rather than facing fixed charges. The taxation identified in the basket is the level of VAT on usage charges. It does not take account of additional taxes, such as handset royalty, import duties and supplementary duty. These also raise the cost of ownership of mobile services. Figure 3.3: Average Cost of Ownership for low user baskets (OECD and modified) US\$ per year Source: Ovum, December 2005 <sup>8</sup> <sup>9</sup> This reflects the fact that approximately 40% of costs incurred are through investment in capital equipment and 60% of costs are due to labour charges. The fixed charges incorporate a portion of the connection charges and the monthly charge. We use a composite basket, in which pre-paid services do not necessarily come out cheapest. 24 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh Figure 3.4 Average Cost of Ownership for low user baskets (OECD and modified) US\$ per year Low user — OECD Basket Country

India Pakistan Thailand Bangladesh Sri Lanka Indonesia Fixed Charges 22. 35  
6. 90 . 64 2. 79 8. 6 — Variable Charges 70. 25 73. 48 05. 40 04. 77 98. 86  
32. 29 Taxes 9. 28 5. 82 7. 49 6.3 8. 8 3. 23 Total Charges 0. 88 06. 2 4. 53

23. 69 26. 28 45. 52 Low user — Modified Basket Country Thailand India  
Bangladesh Pakistan Sri Lanka Indonesia Fixed Charges . 64 22. 35 2. 79 8.  
74 8. 6 0. 58 Variable Charges 56. 78 34. 55 62. 54 59. 62 65. 02 87. 67  
Taxes 4. 09 5. 70 9. 80 7. 09 2. 89 8. 825 Total Charges 62. 5 62. 60 75.3 85.

45 86. 52 97. 07 Source: Ovum, December 2005 Figure 3.5 shows the  
average cost of ownership for the medium and high user OECD baskets. We  
can see that Bangladesh is still in line with the average. Figure 3.5: Average  
Cost of Ownership for medium and high user baskets, US\$ per year Source:  
Ovum, December 2005 © Ovum April 2006 | GSM Association | 25 Figure 3.6:

Average Cost of Ownership for medium and high user OECD baskets, (US\$  
per year) Medium User Country India Thailand Bangladesh Pakistan Sri Lanka  
Indonesia Fixed Charges 22 58 9 39 25 — Variable Charges 95 70 37 277  
369 457 Taxes 22 23 50 70 69 46 Total Charges 239 35 386 386 463 503

High User Country India Thailand Pakistan Bangladesh Sri Lanka Indonesia  
Fixed Charges 66 256 65 24 02 Variable Charges 340 323 386 544 72 984  
Taxes 4 4 38 00 44 98 Total Charges 446 620 689 768 968 , 083 Source:

Ovum, December 2005 Figures 3.7 and 3.8 show the average cost of  
ownership for the medium and high user modified baskets (based on a  
distribution of 80% calls to mobile and 20% calls to fixed line). There is no  
effect in the relative position of Bangladesh. Figure 3.7: Average Cost of  
Ownership for medium and high user OECD baskets, US\$ per year Source:  
Ovum, December 2005 26 | GSM Association | © Ovum April 2006 The

Economic and Social Benefits of Mobile Services in Bangladesh Figure 3.8: Average Cost of Ownership for medium and high user OECD baskets, (US\$ per year)

Country	India	Thailand	Bangladesh	Pakistan	Sri Lanka	Indonesia
Medium user — Modified Basket						
Fixed Charges	22.35	72.09	2.79	44.45	24.85	0.58
Variable Charges	7.97	25.64	308.06	246.6	354.97	436.68
Taxes	9.47	22.66	44.63	72.65	66.47	43.73
Total Charges	23.79	346.39	357.48	363.27	44.29	480.99
High user — Modified Basket						
Fixed Charges	66.23	256.37	33.76	08.40	02.07	0.58
Variable Charges	275.2	296.89	406.6	509.57	668.6	98.98
Taxes	34.20	38.73	34.98	92.70	34.79	9.96
Total Charges	375.55	59.99	674.90	70.66	905.02	, 0.5

Source: Ovum, December 2005 ITU

Benchmarking Study The ITU recently published a report in November 2005 entitled “ ITU Internet Reports 2005: The Internet of Things”, which inter alia, provides global comparison on mobile tariffs involving 206 countries. In the report, the ITU has classified the countries according to income categories — Low Income, Lower Middle Income, Upper Middle Income and High Income. Bangladesh is listed in the Low Income category. Among the conclusion that can be drawn from the report are as follows: . In terms of mobile connection charges, Bangladesh is certainly comparable to India, with Pakistan and Sri Lanka having the more expensive connection charges; In terms of mobile service charges, Bangladesh may be slightly more expensive than its South Asian counterparts for local call (peak) charges but almost the same for local call (off-peak) charges. SMS charges also appear to be almost similar; and In terms of the monthly cost of the basket of mobile services for low users, Bangladesh however appears to be slightly higher than the rest of its South

Asian counterparts. 2. 3. It is worth noting that the conclusions derived from the ITU study are similar to Ovum's analysis presented here. 3. 3. 3

Interconnect Rates Setting interconnection charges at the right level for competition and investment is the primary role of telecommunications regulators. Setting charges too low discourages investment, whilst excessive charges increase retail prices. This section compares interconnect prices between Bangladesh and other countries. It is worth noting that the comparison is not entirely "apples-to-apples" because interconnection charges in the countries considered are set using a variety of methodologies, including cost-orientation and sender keeps all. 20 20 The methodology used in constructing the interconnect benchmarks is described in detail in Annex 2. © Ovum April 2006 | GSM Association | 27 Figure 3.9: All interconnect rates, US\$ for a 2. 5 minute call<sup>2</sup> Source: Ovum, December 2005 Fixed to mobile and mobile to fixed rates are typically reciprocal. The two exceptions to this are: - - Bangladesh, where mobile operators are not paid to terminate fixed traffic on their network by BTTB<sup>22</sup>, and, at the same time, suffer the highest fixed termination rates in the study countries Pakistan, where mobile operators receive a higher rate than the mobile to fixed. This fixed to mobile rate will be reduced from July 2006 by 22%. Fixed to Mobile Interconnect Benchmark As Figure 3. 20 shows, the highest fixed to mobile termination rate is for Thailand, followed by Pakistan and India, and finally, Bangladesh. These results need to be considered alongside the mobile to fixed rates, where the same rates apply in reverse. The one exception to this is, of course, Bangladesh, where for the reverse situation, Bangladesh becomes the most expensive country in the study. 2 22 Note that prices reported here

may differ substantially from prices converted at market exchange rates because of the use of PPP. Although interconnect rates are paid by private fixed operators (28 | GSM Association | © Ovum April 2006). The Economic and Social Benefits of Mobile Services in Bangladesh. Figure 3. 20: Fixed to mobile interconnect rates. Source: Ovum, December 2005. Mobile to Fixed Interconnect Benchmark. As Figure 3. 2 shows, the outstanding feature of the mobile to fixed interconnect benchmark is the price in Bangladesh - particularly given that fixed to mobile termination rates are zero. Thailand is also expensive, but reciprocity applies, meaning that fixed to mobile interconnect rates are also high and mobile retail tariffs are generally amongst the lowest in our retail analysis. Figure 3. 2: Mobile to fixed interconnect rates. Source: Ovum, December 2005. © Ovum April 2006 | GSM Association | 29. Mobile to Mobile Interconnect Benchmark. Figure 3. 22 shows that Bangladesh has one of the lowest mobile to mobile termination rates in our analysis, with Pakistan the highest. The rates for Pakistan are as determined by the Pakistan Regulatory Authority. However operators may mutually agree on lower interconnection charges, if they wish. Figure 3. 22: Mobile to mobile interconnect rates. 3. 3. 4 Retail Charges and Interconnect Rates: Conclusion. Retail tariffs in Bangladesh are in line with the average for the countries considered here. What conclusions should we draw from this? The main points are as follows: - The mobile phone industry in Bangladesh is considerably smaller than that in some of the other countries considered, particularly India. Countries with larger mobile industries will enjoy stronger economies of scale. It is therefore impressive that Bangladesh delivers tariffs in line with the average considering the lack of economies of scale. No

analysis of retail charges can be conducted in isolation from interconnect rates because of the linkages between the two. This is sometimes referred to as "the waterbed effect". The waterbed effect refers to the phenomenon where competition forces operators to pass through their interconnect revenues into retail prices. In a competitive market, it is reasonable to expect interconnect revenue to be passed through dollar-for-dollar.

Operators in Bangladesh face very high mobile-to-fixed interconnect rates, resulting in a high cost-base. This creates a substantial disadvantage for Bangladesh when comparing with other countries. The retail benchmarks flatter India versus Bangladesh because the charging period in India is minute, whilst in Bangladesh it is only ten seconds. - - - 30 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh - - The high industry specific taxes applying to mobile operators in Bangladesh must also be recovered by the mobile operators in retail charges in order to ensure an adequate return on capital. The cost of ownership of mobile services in Bangladesh could be substantially reduced if the country allowed fixed to mobile interconnection charges, as India did in 2003. The comparison used here is sensitive to the exchange rate used. In Bangladesh the market exchange rate is low compared with the PPP value. Therefore, if pure market exchange rates were used, the prices in Bangladesh would appear much lower and possibly the lowest in the comparison. On the basis of the above, we conclude that mobile retail prices in Bangladesh are fair. There is no evidence that the operators profiteer at the expense of the consumer and therefore, there is no case for mobile retail price regulation, formal or informal. Interconnection rates are significantly

out of line with peer countries. Fixed-to-mobile charges do not exist in Bangladesh (except from the small, private fixed operators). Most countries do allow fixed-to-mobile interconnection fees. Meanwhile, mobile-to-fixed interconnection rates in Bangladesh are very high in relation to peer countries. There is a strong case for reducing mobile-to-fixed interconnection charges and allowing fixed-to-mobile interconnection charges. In Bangladesh the law is confusing. The Telecommunications Act 200 stipulates cost-based interconnection whilst the Interconnection Regulation 2004 provides for several options from sender keeps all to cost orientation. The apparent inconsistency between these two needs to be resolved.

### 3.4 Distributional Effects

Some have claimed that mobile communications increase the digital divide because they are only accessible to rich people. This ignores fundamental differences between rich and poor countries. In rich countries, most users own their phones. In poor countries, most regard their phones as family or communal assets. Research into use of mobile phones in South Africa and Tanzania found that mobile users reduce costs by “beeping” the call recipient. <sup>23</sup> Not surprisingly, the same study found that the number of calls made and text messages sent increases with income. Previous work by Ovum demonstrates that mobile services allow communications to reach poor and rural areas much more easily than fixed services. The cost of adding a fixed line is approximately \$800, whilst the cost of an additional mobile user is that of a second-hand handset: about \$20. To obtain the full benefits of the Internet and messaging services with a fixed network, the user requires a computer. Most cheap mobile handsets allow SMS, email and WAP based Internet services. The dramatic growth in mobile services can

therefore play an important role in reducing the "digital divide". Mobile services play a key role in helping members of society to be connected and gain access to information and services that improve their standard of living. The availability of mobile services also allows "technology transfer": by improving the level of technical knowledge and understanding of digital communications. These findings suggest that policy should be directed towards improving accessibility. Taxes, for example, that increase the cost of supplying mobile services should as far as possible be avoided. 23 Calling and hanging up before the call is connected. The receiving party calls back at their own expense © Ovum April 2006 | GSM Association | 3 Moreover, research examining the impact of mobile communications in developing countries on the welfare of the poor identifies the following important effects: - Mobile communications improve the chances of the unemployed of finding employment. There are several means by which this may occur: - Enabling users to call for opportunities rather than rely on word of mouth. Taking advantage of the Internet for seeking job opportunities. Improving employability. Employees with mobile phones are more productive as they are easier to contact when away. "Cutting out the middleman". For certain occupations such as trading in commodities and agriculture, where the centres of supply and demand are widely dispersed, it is typical for "middlemen" to buy produce from centres of supply and sell it where the demand is located. They specialise in knowing where there are imbalances of supply and demand and often extract most of the profit from trade. With mobile telephony, traders can obtain information on prices directly, enabling them to trade more profitably. This improves incomes of producers and helps



reduce wastage and shortages. Improving the efficiency of all workers in the economy. The effect will be felt particularly for workers with unpredictable schedules. Examples are any workers involved in repair and maintenance and collection and delivery, plumbers and electricians. Mobile communications allows them greater accessibility and therefore superior knowledge of demand. Mobile communications can increase the productivity of all workers who, for any reason, need to be away from their main location of work. - There is some evidence that the availability of telecommunications in rural communities can enable the development of non agricultural economic activity. Studies in Thailand<sup>24</sup>, show that villages with telecommunications develop small scale manufacturing businesses first. 24 Bruns, Bryan et al, Village Telephones: Socio-economic Impact and Implications for Rural Futures, paper presented at 6th International Conference on Thai Studies, October 1996. [http://www. cm. ksc. co. th/~bruns/rurtel. html](http://www.cm.ksc.co.th/~bruns/rurtel.html) 32 | GSM Association | © Ovum April 2006 The Economic and Social Benefits of Mobile Services in Bangladesh 4 Social Benefits of Mobile Services 4. Introduction The benefits of telecommunications in enhancing the welfare of families and society are well recognised. Whilst economic necessity requires people to be increasingly mobile, affordable communications helps avoid the social fragmentation that can occur as a result. Telecommunications also allows better access to services that enhance a society's health and wellbeing such as healthcare and social services. Amongst the many implications of research is that poor and rural populations benefit most from mobile telephony because they are least likely to have alternatives. In view of this, the cross subsidies in

Bangladesh from mobile to fixed users, from the poor to the rich, are especially damaging. Some recent research from Tanzania is instructive for the present purposes because of various similarities with Bangladesh, in particular: - - Both are low income countries (although Tanzania is significantly poorer than Bangladesh). Similarly to Bangladesh, in Tanzania most low income families see a mobile phone more as a household asset rather than as a personal or individual one. The research in Tanzania (which also covered South Africa) was based on a survey of mobile users and nonusers into how and why they use their phones (or why they do not). We also reviewed some literature published by the GSM Association on the role played by mobile communications in disasters and emergencies. 25 The most important findings in the research were that mobile services: - - - - Promote cohesion in families and society. Extend communications to members of society with poor education and literacy. Stimulate local content, for example, information on healthcare availability. Assist in disaster relief. 4. 2 Promoting Social Cohesion There are a number of ways that mobile services can promote cohesion in families and society. For example, a cheap mobile service allows families and communities to remain as a coherent unit when family members are away for long periods. In cases where a family member is abroad either temporarily or permanently it allows the family unit to remain intact as well as generating inbound international call revenues. The study into mobile use in South Africa and Tanzania found: - - 25 79% of those surveyed in South Africa and 85% in Tanzania stated that using a mobile phone improved relationships. 72% of those surveyed in South Africa and 85% in Tanzania stated that using a mobile phone allowed

easier communication with family and friends. The Role of Mobiles in Disasters and Emergencies. December 2005 © Ovum April 2006 | GSM Association | 33

4. 3 Users with Low Education and Literacy In Bangladesh, it is common for mobile phone owners to use them for the benefit of those with low levels of education and literacy, for example, by relaying SMS messages. This is similar to the findings in Tanzania, which found that 60% of owners have secondary education or higher, whilst over 60% of users have only primary education. The same study found that owners are more likely to have higher incomes whilst users are more likely to have lower incomes. The operators in Bangladesh recognise the importance of broadening the accessibility of their services. For example, Aktel has recently pioneered and launched a Bengali language SMS service.

4. 4 Local Content Access to data services encourages local content, allowing users to learn about local services such as healthcare, as well as their general standard of education and knowledge in current affairs. Access to data services allows organisations to provide basic information such as protection against dangerous conditions such as avian influenza and other diseases, surgery times and how to obtain vaccinations. Mobile communications provide these capabilities to all sectors of society, whilst fixed services do not. In developing countries, fixed services are generally only available to wealthy individuals and corporations. Given an appropriate policy regime, mobile services can be extended to all the whole population.

4. 5 Mobile Services in Natural Disasters Mobile services dramatically improve access to emergency services, which would otherwise only be available the wealthy. It also allows families to stay in touch with each other in the event of natural disasters,

communicate with relief providers and obtain information that will allow them to obtain more rapid relief. A recent study “ The Roles of Mobiles in Disasters and Emergencies”<sup>26</sup> into the use of mobile phones in disaster relief used network data and other evidence to try to understand how people used mobile phones in extreme circumstances. The research identified that mobile phones are used in the following situations: - - - - Early warnings. Disaster impact. Immediate aftermath. Recovery and rebuilding. <sup>26</sup> GSM Association 2005 34 | GSM Association | © Ovum April 2006

The Economic and Social Benefits of Mobile Services in Bangladesh One of the most consistent messages to emerge was the benefit of the timely spread of information in response to a disaster. The research found that while mobiles are only one element of a whole array of communications, they are especially effective at diffusing information rapidly to where it is most urgently needed. Particularly important is the superior resilience of mobile compared with fixed networks and the ability to install new capacity very quickly where needed. For example, in the aftermath of the Asian Tsunami: - Within a day of the disaster, Nokia flew in crews to start the reconstruction of the mobile network. In another day it had rerouted base stations on their way to other destinations, and reconfigured them to fit the pre-existing network. Also on the first day after the tsunami struck, Nokia delivered the first phones and technical support to relief agencies, primarily the Red Cross/Red Crescent. Sweden’s Ericsson AB was also present within a day to he