



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



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 144 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 10 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 1% 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).¹ Considering all activities linked with the sector², 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.

1 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.

2 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.



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.

Contents

1	Executive Summary	1
2	Introduction	7
3	Economic Impact of Mobile Services in Bangladesh	9
3.1	Introduction	9
3.2	Contribution to the Economy	11
3.2.1	The Static Supply Side Contribution	11
3.2.2	Dynamic Demand-side Effects	18
3.3	Retail Pricing and Interconnect Rates	22
3.3.1	CPP versus RPP	22
3.3.2	Retail Pricing	23
3.3.3	Interconnect Rates	27
3.3.4	Retail Charges and Interconnect Rates: Conclusion	30
3.4	Distributional Effects	31
4	Social Benefits of Mobile Services	33
4.1	Introduction	33
4.2	Promoting Social Cohesion	33
4.3	Users with Low Education and Literacy	34



4.4	Local Content	34
4.5	Mobile Services in Natural Disasters	34
4.6	Promoting Social Responsibility	35
5	Policy Issues and Recommendations	37
5.1	Taxation	37
5.2	Interconnection Charging	38
5.3	Retail Tariffs	39
5.4	Wireless Local Loop Operators	40
5.5	International Calls	40
5.6	Local Manufacturing	41
5.7	Other Policy and Legislative Proposals	41
6	Conclusion	42

Annex 1: Retail Price Benchmarking Methodology

The OECD Mobile Baskets	43
Limitations of the Model	49
Types and Distribution of Traffic	49
Promotions and other Charging Characteristics	50
Other Costs of Ownership	50
Inputs for the Benchmark	51



Annex 2: Interconnect Rate Benchmarking Methodology

Interconnect Benchmark Methodology	53
Data Gathering	54
Standardisation of Interconnection Charges	54
Exchange Rates	55
Interconnect Basis, by Country	55
Bangladesh	55
India	55
Indonesia	56
Pakistan	56
Sri Lanka	57
Thailand	57

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 over-estimate 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 18 million by 2007 and penetration to nearly 13%. 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\$18 on each new connection. In response to strong criticism, the tax was reduced to US\$13.50 in August 2005. However, industry specific taxation - taxes applying to the mobile industry and not others - remains high. An obvious example is the US\$16 "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



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**.

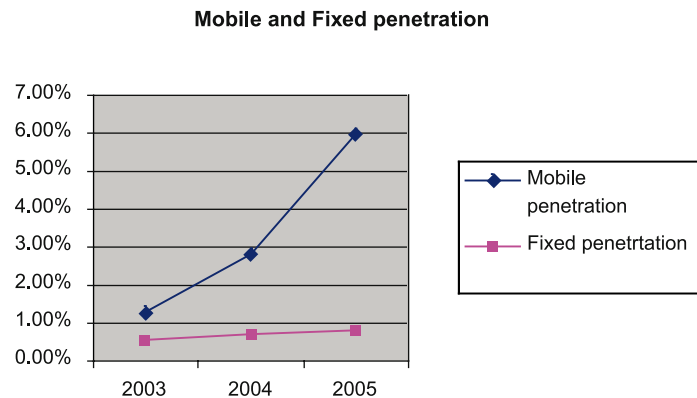
3 Economic Impact of Mobile Services in Bangladesh

3.1 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 3.1. However, in recent years mobile services have grown strongly.

Figure 3.1 Fixed and mobile teledensity in Bangladesh



Source Ovum

It is evident from Figure 3.1 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 1% of GDP⁴.

⁴ In Latin America and India mobile services also account for 1% of GDP. In the European Union (EU15) they account for 1.1% of GDP.



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 1950s to 1970s. 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).

3.2 Contribution to the Economy

3.2.1 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:

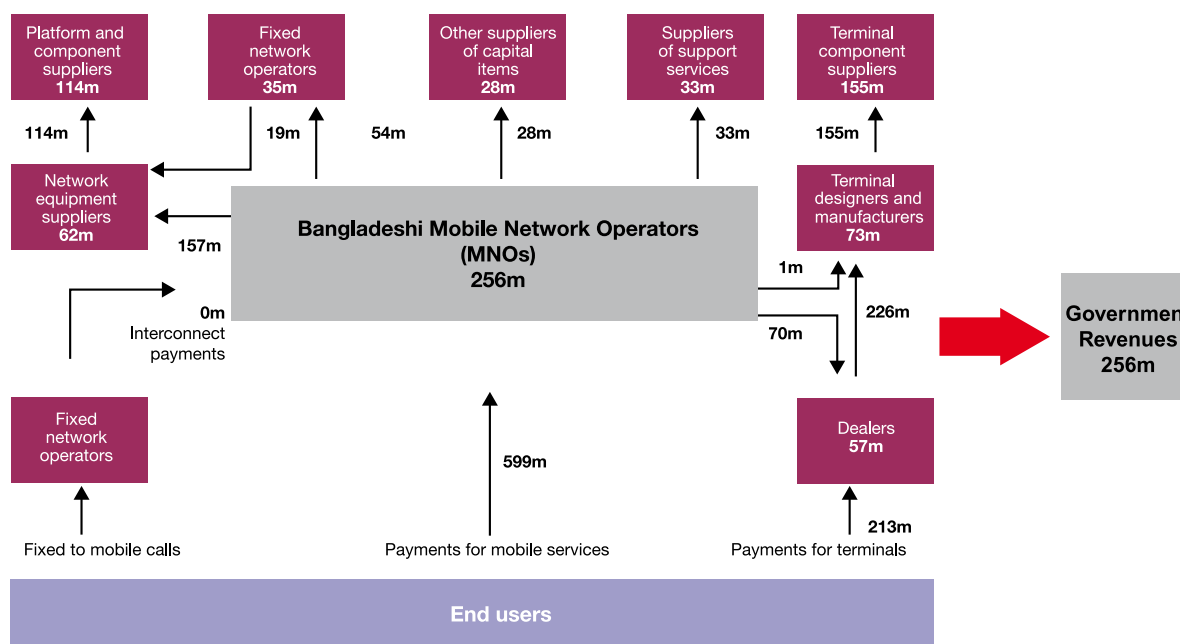
- It is a snapshot view. It does not take account of future benefits resulting from growth. It also fails to show the benefits resulting from any growth in local supply of capital equipment such as handset assembly and component manufacturing that might develop as the industry progresses.
- It fails 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.



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 BTB.

Figure 3.3 presents the same data in tabular form.

Figure 3.3 The mobile services industry value chain

Industry Role	Revenues (US\$m) per year		
	Revenues	Costs	Value Add
Dealers	283	226	57
MNOs	599	343	256
Terminal manufacturers	227	155	72
Network equipment suppliers	176	114	62
FNOs	54	19	35
Support service suppliers	33	–	33
Component suppliers to network equipment suppliers	114	–	114
Component suppliers to terminal suppliers	155	–	155
Other capex suppliers	28	–	28
Total			US\$812

Source: Ovum

We find that the mobile industry in Bangladesh created a total value-add of US\$812m 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.



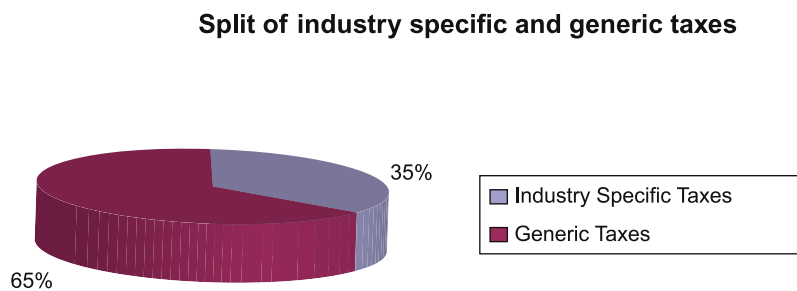
Figure 3.4 Government revenue

Government Revenue	(US\$m)
a) VAT on usage charges and handset sales	112
b) Revenue share charges	8
c) Royalty on handsets	46
d) Connections & supplementary duty	36
e) BTS royalty	1
f) BTS licence fee	0
g) Income tax	37
h) Import duty on capital machinery	5
i) Import duty on handsets (total)	11
TOTAL	256

Source: Ovum

We also estimate that the tax take from the mobile operators in 2005 amounted to US\$174m, 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. 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

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 1.6.⁷ The association Francaise des Operateurs Mobiles⁸ assumes a multiplier of 1.7 when estimating this effect in a similar study and the UK Office of National Statistics estimates a multiplier of 1.5 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 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.

8 La Filiere Mobile: quel impact sur l'economie Francaise? July 2003



Figure 3.6 Employment in Bangladesh from mobile industry

Employment from mobile services (000)	Direct	Support	Indirect	Induced	Total
Dealers	19.9	19.9	10.0	29.9	79.8
MNOs	4.4	38.2	3.8	27.9	74.3
Support services suppliers	0.0	23.0	5.8	17.3	46.0
FNOs	0.6	5.2	0.7	3.9	10.4
Other capex suppliers	6.8	6.8	3.4	10.3	27.4
Terminal suppliers	0.0	0.0	0.0	0.0	0.0
Terminal component suppliers	0.0	0.0	0.0	0.0	0.0
Network equipment manufacturers	0.0	0.0	0.0	0.0	0.0
Network equipment component suppliers	0.0	0.0	0.0	0.0	0.0
TOTAL	31.8	93.2	23.6	89.2	237.9

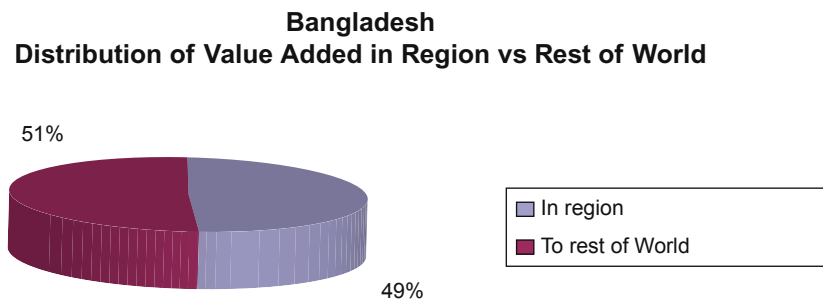
Source: Ovum

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.

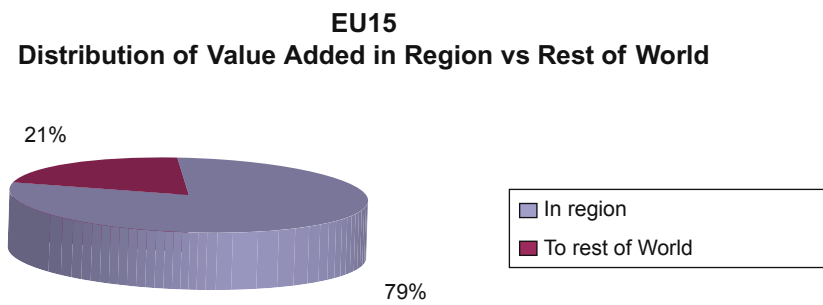
Of course, as penetration grows and demand for equipment increases, an increasing proportion of the components such as batteries, switchboxes and raw materials are starting to be manufactured in Bangladesh. The growing demand for mobile services in Bangladesh represents a major opportunity for further growth and development in the manufacturing and assembly of equipment.

Figure 3.7 Distribution of value-add: Bangladesh



Source: Ovum

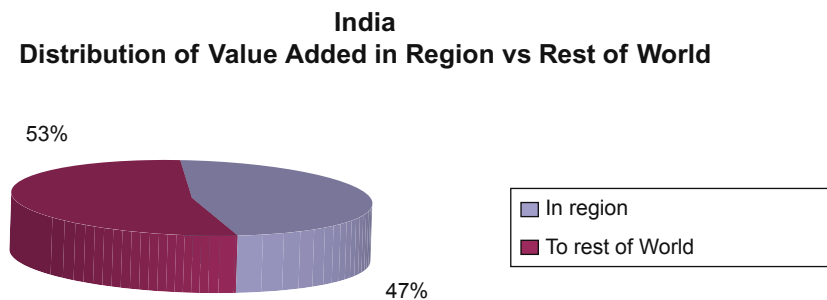
Figure 3.8 Distribution of value-add: EU15



Source: Ovum



Figure 3.9 Distribution of value-add: India



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 Tanzania¹⁰ 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.

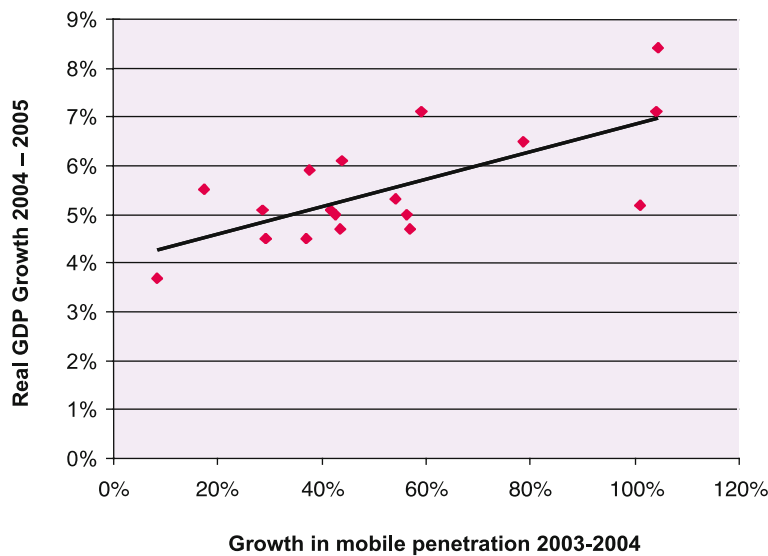
⁹ Africa: The Impact of Mobile Phones. The Vodafone Policy Paper Series Number 3 March 2005

¹⁰ Africa: the impact of mobile phones: Vodafone Policy Paper Series, Number 3 March 2005

- 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).¹¹ 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 3.10), taken from a sample of developing countries.

Figure 3.10 Relationship between growth in mobile penetration and GDP growth



Source: ITU and CIA World Fact Book.

¹¹ 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.



Figure 3.11 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.¹² 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 3.11 Relationship between growth in mobile penetration and GDP growth

	Growth Rate in Mobile Penetration 2003-2004	Real GDP Growth Rate 2004-2005
Cameroon	42%	5%
Egypt	29%	4.50%
Ethiopia	79%	6.50%
Gambia	59%	7.10%
Kenya	56%	5%
Senegal	44%	6.10%
Bangladesh	101%	5.20%
Bahrain	38%	5.90%
India	104%	7.10%
Indonesia	54%	5.30%
Jordan	17%	5.50%
South Korea	8%	3.70%
Kuwait	37%	4.50%
Malaysia	29%	5.10%
Myanmar	42%	5.10%
Pakistan	104%	8.40%
Philippines	44%	4.70%
Sri Lanka	57%	4.70%

Source: ITU and CIA World Fact Book.

¹² Although a correlation is not sufficient to establish causation, there is a 1 year time-lag between the change in mobile penetration and GDP growth. This 1 year time-lag 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.

Research

In 2005, Waverman, Meschi and Fuss estimated the impact of *mobile services* on economic growth in developing countries.¹³ 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 10 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 Economics¹⁴ 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 1 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 well-recognised 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.

13 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 (2001) 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.

14 Africa: The Impact of Mobile Phones. The Vodafone Policy Paper Series Number 3 March 2005



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.¹⁵ 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.¹⁶ 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.¹⁷

3.3.1 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 1999, the ITU commented on the impact of RPP as follows:

15 A detailed description of the construction of the tariff benchmark is provided in Annex 1.

16 In some cases the charging period is only 1 second. For example, Aktel's charging period for post-paid services is 1 second.

17 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.

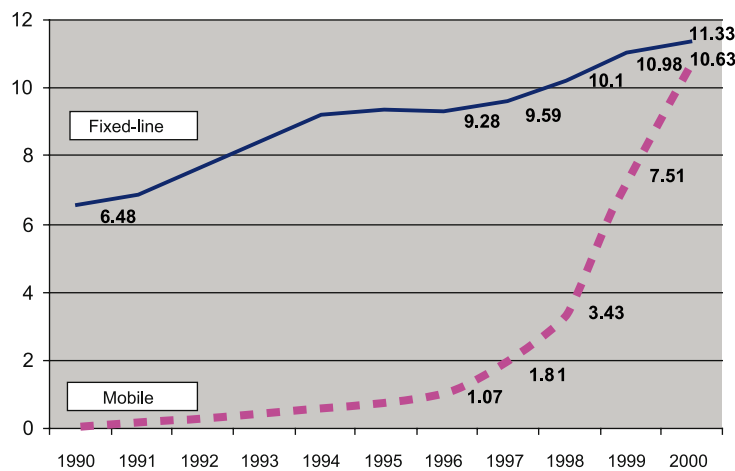
RPP results in less usage, causes mobile customers to turn their phones off, causes mobile customers not to give out their telephone numbers, and increases the cost of cellular ownership.

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 3.12 below shows the effect of introducing CPP in Mexico, in early 1999. In 1998 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 3.12 : Penetration of fixed and mobile services in Mexico (Number of lines per 100 inhabitants in December of each year)



Source : ITU, COFETEL, Telmex.

3.3.2 Retail Pricing

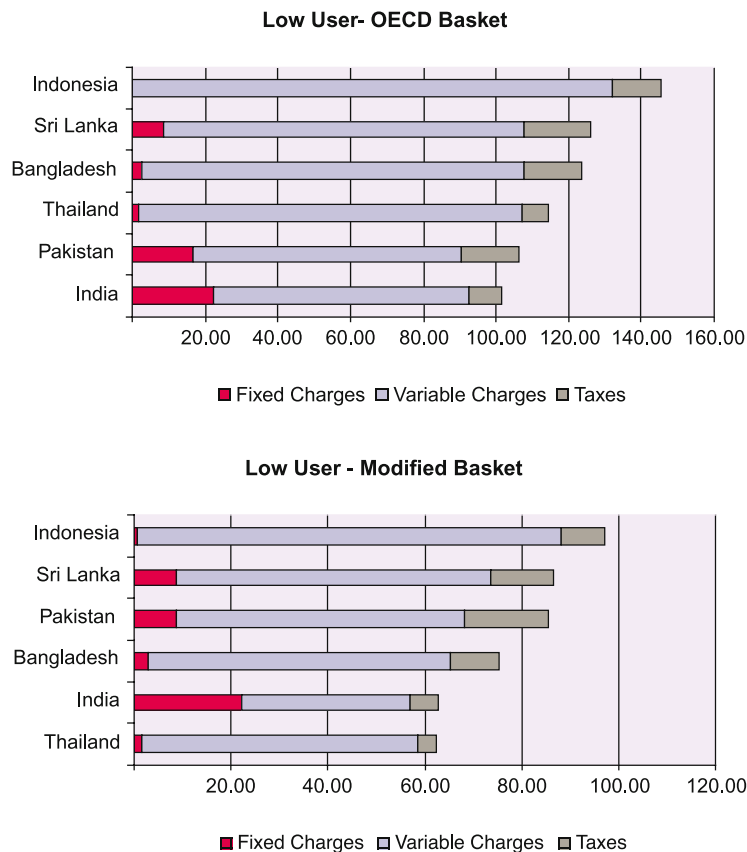
The figures in this section summarise the average cost of ownership split into fixed and variable charges and taxes. We have used the standard OECD basket and a "modified" basket, to reflect usage patterns in developing countries. Our view is that the modified basket is a more accurate basis for comparison in this case.



The overall charges for each country have been converted into US\$ using a composite of 40% exchange rate and 60% purchasing power parity (PPP)¹⁸. Using the modified basket, we see from Figures 3.13 and 3.14 that Bangladesh's low user prices are in line with the average. Moreover, fixed charges are the lowest in Bangladesh¹⁹ 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 3.13: Average Cost of Ownership for low user baskets (OECD and modified) US\$ per year



Source: Ovum, December 2005

18 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.

19 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.

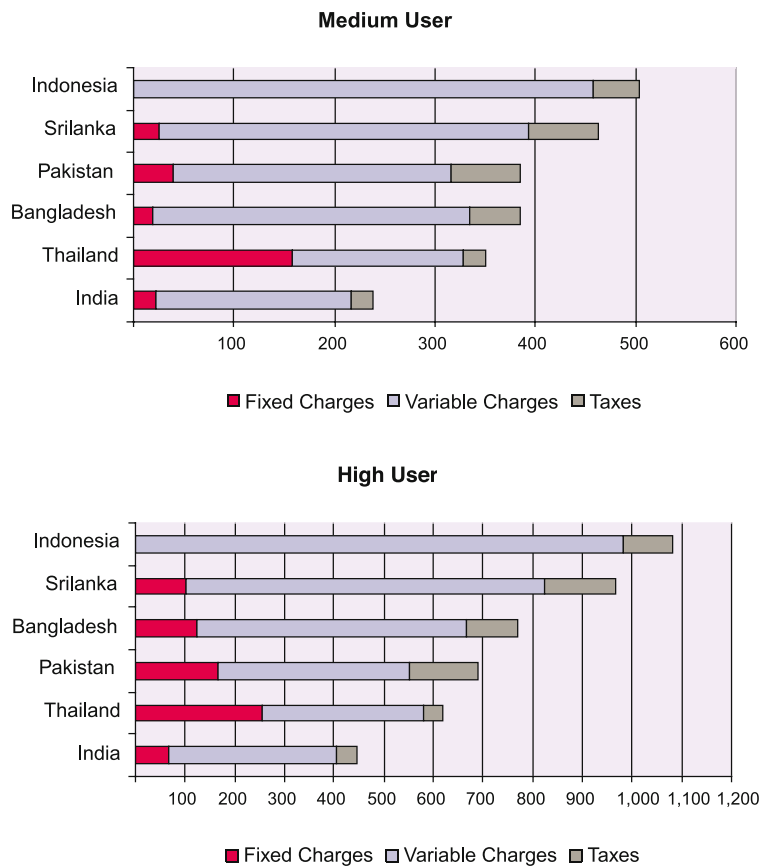
Figure 3.14 Average Cost of Ownership for low user baskets (OECD and modified) US\$ per year

Low user – OECD Basket					Low user – Modified Basket				
Country	Fixed Charges	Variable Charges	Taxes	Total Charges	Country	Fixed Charges	Variable Charges	Taxes	Total Charges
India	22.35	70.25	9.28	101.88	Thailand	1.64	56.78	4.09	62.51
Pakistan	16.90	73.48	15.82	106.21	India	22.35	34.55	5.70	62.60
Thailand	1.64	105.40	7.49	114.53	Bangladesh	2.79	62.54	9.80	75.13
Bangladesh	2.79	104.77	16.13	123.69	Pakistan	8.74	59.62	17.09	85.45
Sri Lanka	8.61	98.86	18.81	126.28	Sri Lanka	8.61	65.02	12.89	86.52
Indonesia	–	132.29	13.23	145.52	Indonesia	0.58	87.67	8.825	97.07

Source: Ovum, December 2005

Figure 3.15 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 3.15: Average Cost of Ownership for medium and high user baskets, US\$ per year



Source: Ovum, December 2005



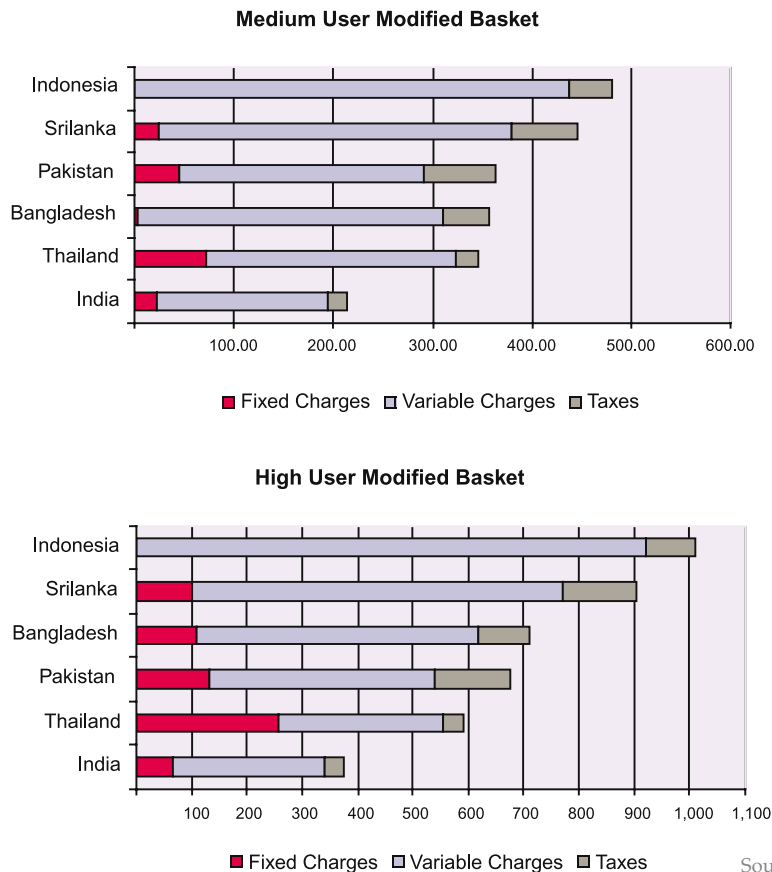
Figure 3.16: Average Cost of Ownership for medium and high user OECD baskets, (US\$ per year)

Medium User					High User				
Country	Fixed Charges	Variable Charges	Taxes	Total Charges	Country	Fixed Charges	Variable Charges	Taxes	Total Charges
India	22	195	22	239	India	66	340	41	446
Thailand	158	170	23	351	Thailand	256	323	41	620
Bangladesh	19	317	50	386	Pakistan	165	386	138	689
Pakistan	39	277	70	386	Bangladesh	124	544	100	768
Sri Lanka	25	369	69	463	Sri Lanka	102	721	144	968
Indonesia	-	457	46	503	Indonesia	1	984	98	1,083

Source: Ovum, December 2005

Figures 3.17 and 3.18 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 3.17: Average Cost of Ownership for medium and high user OECD baskets, US\$ per year



Source: Ovum, December 2005

Figure 3.18: Average Cost of Ownership for medium and high user OECD baskets, (US\$ per year)

Medium user – Modified Basket					High user – Modified Basket				
Country	Fixed Charges	Variable Charges	Taxes	Total Charges	Country	Fixed Charges	Variable Charges	Taxes	Total Charges
India	22.35	171.97	19.47	213.79	India	66.23	275.12	34.20	375.55
Thailand	72.09	251.64	22.66	346.39	Thailand	256.37	296.89	38.73	591.99
Bangladesh	2.79	308.06	44.63	357.48	Pakistan	133.76	406.16	134.98	674.90
Pakistan	44.45	246.16	72.65	363.27	Bangladesh	108.40	509.57	92.70	710.66
Sri Lanka	24.85	354.97	66.47	44.29	Sri Lanka	102.07	668.16	134.79	905.02
Indonesia	0.58	436.68	43.73	480.99	Indonesia	0.58	918.98	91.96	1,011.51

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:

1. In terms of mobile connection charges, Bangladesh is certainly comparable to India, with Pakistan and Sri Lanka having the more expensive connection charges;
2. 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
3. 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.

It is worth noting that the conclusions derived from the ITU study are similar to Ovum’s analysis presented here.

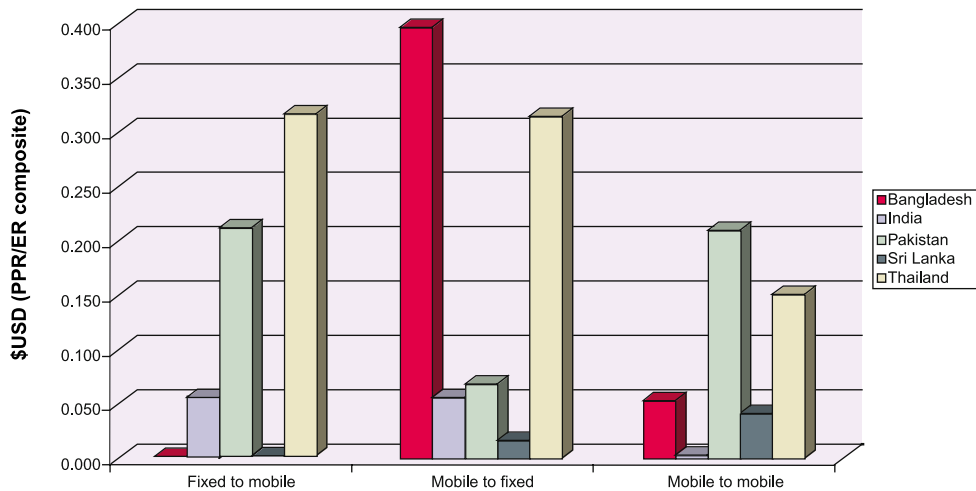
3.3.3 Interconnect Rates

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.



Figure 3.19: All interconnect rates, US\$ for a 2.5 minute call²¹



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 BTTB²², 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%.

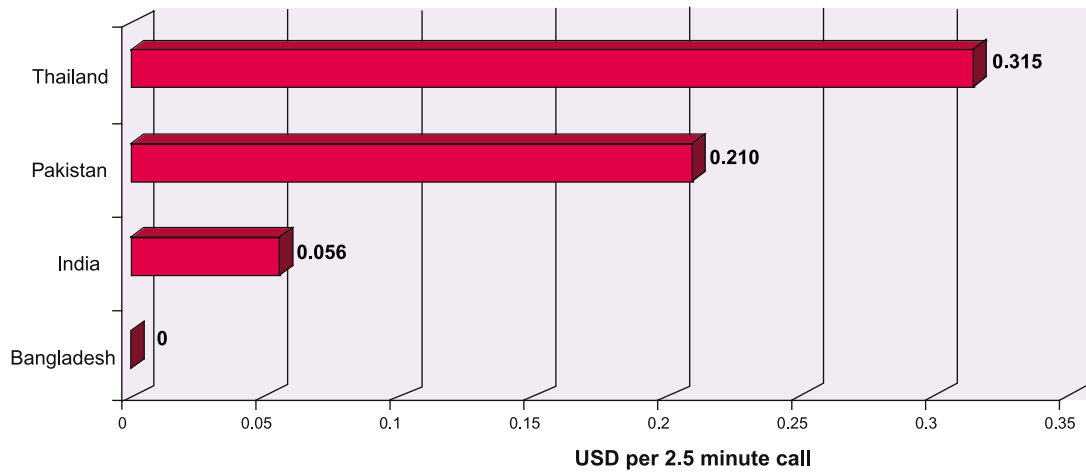
Fixed to Mobile Interconnect Benchmark

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.

²¹ Note that prices reported here may differ substantially from prices converted at market exchange rates because of the use of PPP

²² Although interconnect rates are paid by private fixed operators

Figure 3.20: Fixed to mobile interconnect rates

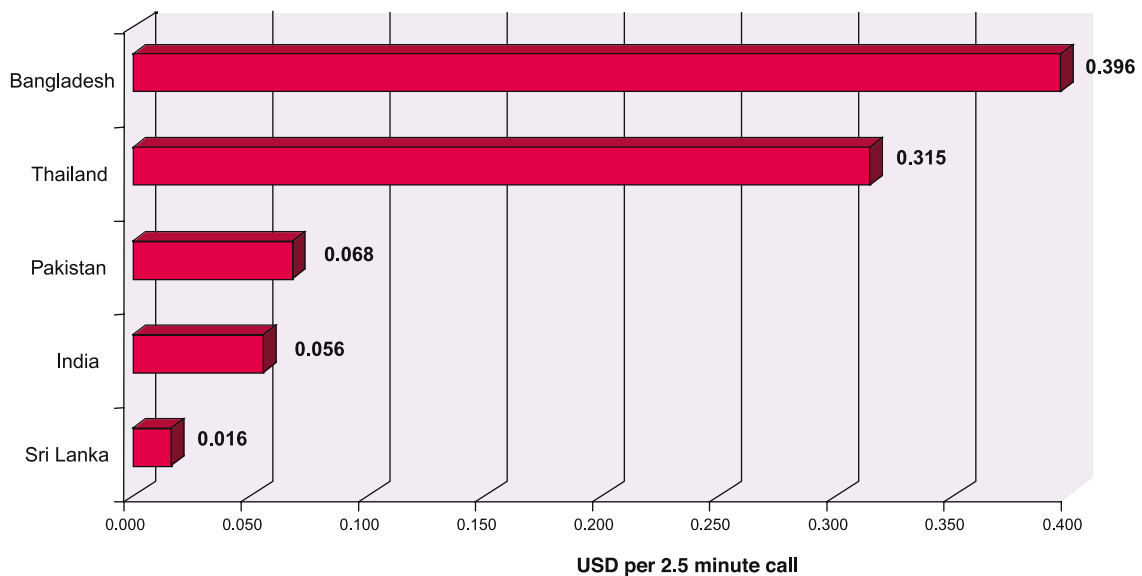


Source: Ovum, December 2005

Mobile to Fixed Interconnect Benchmark

As Figure 3.21 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 3.21: Mobile to fixed interconnect rates



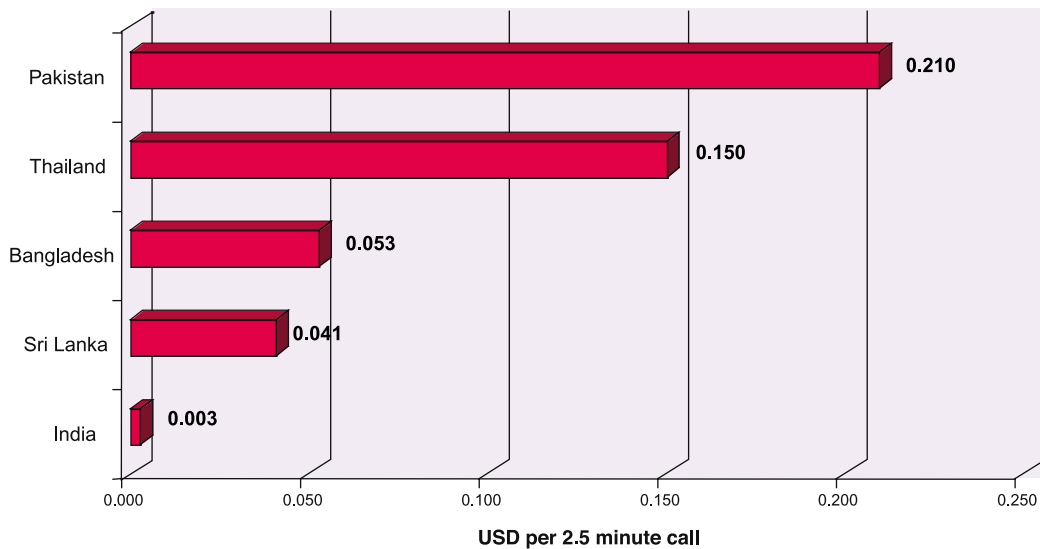
Source: Ovum, December 2005



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 1 minute, whilst in Bangladesh it is only ten seconds.

- 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 2001 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.²³ 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 suggests 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



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 Thailand²⁴, 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>

4 Social Benefits of Mobile Services

4.1 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 non-users 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:

- 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.

25 The Role of Mobiles in Disasters and Emergencies. December 2005



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"²⁶ 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.

26 GSM Association 2005

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 help rebuild the mobile network, donating 10 radio-base stations for Banda Aceh's network along with hundreds of mobile phones and technical staff. The company donated 1,300 mobile phones and a team to restore communications in Sri Lanka.

Amongst the main conclusions of the study was that using SMS (seldom available on fixed networks) rather than voice is more effective during emergencies. Text messages are more likely to get through (using less network capacity or can be queued and sent when there is free capacity) and ease congestion on the network.

This analysis shows that, in the immediate aftermath of a disaster the contribution of mobile is substantial thanks to the speed with which cellular networks can recover from damage²⁷. It is much easier to repair a wireless base station than hundreds of fixed-lines. This was strikingly demonstrated in the speed of restoration of mobile services to customers in the US after Hurricane Katrina.

4.6 Promoting Social Responsibility

As one of the fastest growing sectors of the economy, mobile operators have taken steps to promote social responsibility, the education and welfare of communities and employees.

For example, GrameenPhone has developed policies with the stated intention of ensuring that they deal with customers, employees, suppliers and the government in a socially, ethically and environmentally responsible manner. They highlight the particular importance of participating in education in ICT, economic empowerment of women, health, safety, the environment and the preservation of heritage.

Aktel has also taken steps to promote corporate citizenship by offering scholarships to meritorious and financially needy Bangladeshi students to study courses in engineering, Information technology or business administration in Multimedia University, Malaysia.²⁸

²⁷ Usually within hours or, at most, a few days

²⁸ For further details, see <http://www.aktel.com/scholar.php>



The Village Phone Programme

Through the Village Phone programme, GrameenPhone continues to play an important role in extending communications to the masses. In co-operation with Grameen Bank the Village Phone programme involves a small number of users in a particular regional community, such as a village, in possession of a mobile phone to loan the phone to all other members of the community for a small charge. The Village Phone programme allows the very poorest members of society to remain in contact with family members in the cities and abroad at very low cost. For example, it allows users with low credit-worthiness access to communications without having to pay an up-front fee for a scratch card that they may not be able to afford or a post-pay service that would otherwise not be accessible to them. Fixed-line services are generally not available in the villages and other rural communities.

Diane Coyle (2005) noted that law enforcement agencies have given GrameenPhone some credit for reducing rural crime rates in Bangladesh.²⁹

The Village Phone programme is an example of the steps that the mobile operators are taking to ensure that their services are accessible to the members of society who need it most: - those in rural communities and the least wealthy.

29 Africa: The Impact of Mobile Phones. The Vodafone Policy Paper Series Number 3 March 2005

5 Policy Issues and Recommendations

As the previous chapters demonstrate, there is substantial evidence that mobile services deliver strong benefits in terms of economic performance and social welfare. In particular, the operators in Bangladesh have been successful in:

- Delivering employment to almost a quarter of a million people.
- Extending telecommunications to citizens without fixed lines.
- Achieving very high levels of coverage in a short period of time.
- Delivering good value for money when compared with other markets with similar characteristics, despite the high tax burden, lack of economies of scale and the lack of interconnect revenues from the incumbent fixed operator.

However, further growth is in jeopardy without firm policy action. Key issues are:

- The high industry specific taxes, comprising over a third of the total.
- The interconnection regime, the most important feature of which is the lack of interconnection revenue from BTTB.
- The threat of political and regulatory pressure on the operators to reduce prices faster than is sustainable based on the false belief that mobile communications are expensive in Bangladesh.
- The inequality in the taxation/licensing regime between mobile operators and competitors using Wireless Local Loop (WLL) technology.
- The artificial restrictions on the mobile operators handling of international calls.
- Each is considered in turn.

5.1 Taxation

Figure 3.5 showed that industry specific taxes comprise 35% of total taxes. This very high level of taxation gives rise to a number of problems, specifically:

- It increases the price of and reduces the demand for mobile services. The secondary effects of this are:
 - Damage to economic and social welfare from lower mobile take-up.
 - Damage to the poor who are denied the benefits of mobile communications.
- It diverts funds from more productive sectors and into less productive sectors.
- High taxation on the mobile sector prevents it from competing effectively with fixed operators. Hence, competitive pressure on fixed operators is lower, reducing incentives to improve their efficiency, lower their prices and improve their quality of service.
- High taxation on mobile communications reduces government revenue. There are two reasons for this: one in the short term, the other in the long term:
 - In the short term, higher prices result in lower demand. Whether this reduces tax revenue depends whether tax costs are passed on to the customer and the customer's price elasticity of demand. In competitive markets, economic theory predicts that market-wide cost increases are fully passed through to the customer. Waverman, Meschi and Fuss found that the price elasticity of demand for mobile services in developing countries is high at -1.5. The implication is that higher taxes may reduce government revenue even in the short term.



- In the long term, high taxes reduce penetration preventing the benefits of high penetration fully being realised. As a result, productivity suffers leading to lower economic performance and ultimately lower tax revenues.

These conclusions are confirmed by research contained in the study "Tax and the Digital Divide" by the GSM Association. The authors concluded:

- "If low-cost handsets were made exempt from import duties and sales taxes, up to 930 million additional low-cost handsets could be sold by 2010 in the 50 countries in the study, leading to an increase in mobile phone penetration and a rise in total tax revenues in some countries."
- "If a government lowered taxes on mobile usage by *just one* percentage point, that could boost the number of mobile users by more than 2% by 2010."
- "Eliminating the special taxes could boost the numbers of mobile users in the 19 affected countries by 34 million (or 8%) by 2010."
- "The removal of all sales and customs taxes on mobile handsets and services could prompt an increase in mobile penetration of up to 20 percentage points, according to an analysis by the London Business School."

The study further notes that the Indian government has shown the benefits of lower tax to be real. It has reduced handset import duty helping to boost mobile penetration from less than 1% to more than 5%. However, the study notes that further work is still needed as other fiscal barriers to mobile usage in India remain.

The above does not necessarily imply that there should be no industry specific taxes or licence fees. It is reasonable to price spectrum at a level that encourages efficient utilisation and covers the costs of administration.

Recommendation: taxes specific to the mobile industry should be removed to encourage the development of the industry, the economy and to gradually increase government revenues. The only industry specific "taxes" should be spectrum fees. These should be set at a reasonable level to encourage efficient utilisation and to cover the costs of administration.

5.2 Interconnection Charging

As shown above, the interconnection regime in Bangladesh stands out in that it:

- Involves no fixed-to-mobile fees from BTTB to the mobile operators.
- Involves above-cost mobile-to-fixed interconnection fees.

In combination this represents a substantial cross-subsidy from the mobile to the fixed sectors, which is by implication a cross subsidy from the poor to the rich.

Mobile-to-fixed interconnection charges are high in Bangladesh compared with other countries. Mobile operators are forced to pass these costs to their own customers, limiting mobile penetration and economic growth.

Every call that terminates on a mobile operator involves a cost that needs to be recovered. The only means the operators have to recover the cost is through retail prices to their own users. The operators in Bangladesh have

to a certain extent, tried to charge for inbound calls but this has not been successful for low users because it has been found to deter usage.

Therefore, the operators have been forced to adopt a sophisticated “price-discrimination” scheme, to avoid deterring the (poorer) low users, whilst collecting the required revenue from the (richer) high users. One method is to offer the first minute free of charge, knowing that poorer users will deliberately disconnect before the first minute, possibly reconnecting thereafter.

Fixed operators’ customers benefit from mobile users. They should be required to pay for this benefit, as they do in most other countries. Mobile users represent a significant new market for BTTB as it increases their call revenues. It also represents a benefit for BTTB’s customers because it introduces new opportunities to contact customers, colleagues, suppliers, family, friends, etc. It is fair and reasonable for fixed operators to cover mobile operators’ costs in connecting calls.

After introducing fixed-to-mobile interconnection charges, call charges would fall as a result of the waterbed effect. This would allow mobile penetration to increase, improving economic and social welfare and increasing tax revenue.

Recommendation: fixed-to-mobile interconnection charges should be introduced to compensate mobile operators fairly and to increase mobile penetration. Mobile-to-fixed interconnection charges should be reduced to cost to end the inefficient subsidy from the mobile to the fixed sector. There is also a need to address the anomaly between the Bangladesh Telecommunications Act 2001 and the Interconnection Regulations 2004 with respect to charging mechanism.

5.3 Retail Tariffs

As demonstrated above, retail tariffs in Bangladesh are reasonable when compared with those in countries with similar characteristics. This is despite the:

- High taxes existing in Bangladesh.
- Substantial capital investment by mobile operators building their networks.
- Lack of fixed-to-mobile interconnect revenue.
- High mobile-to-fixed interconnect costs.
- Lack of economies of scale compared with countries with a larger user base.

It is therefore reasonable to conclude that competition is functioning effectively and consumers are receiving fair value for money. Furthermore, with the introduction of Warid in December 2005, the sector will become even more competitive.

There is therefore no need for the BTRC or the government to regulate mobile retail prices either through direct regulation or through informal pressure. Any residual concern regarding the level of mobile retail prices can be addressed by lowering taxes and removing the irregularities in interconnection charges.



Retail price controls on mobile services might:

- Push prices to a level where operators have no incentives to invest further.
- Prevent pricing innovations such as special packages for rural customers.

Recommendation: no action, formal or informal, should be taken to regulate mobile retail prices. On the other hand, the issue of fixed retail price regulation should also be seriously considered given the impending restructuring and privatisation of BTTB where tariff rebalancing may potentially be an issue.

5.4 Wireless Local Loop Operators

Currently, WLL operators offer a cellular service using CDMA that competes with the GSM mobile operators. Although such operations are small, we expect them to grow. They are prohibited from offering mobility under the terms of their licence. There are good reasons for this, most important of which is that the taxation regime they face is substantially more lenient than that faced by the mobile operators. Accordingly, competition is heavily distorted, providing WLL operators with an unearned and inefficient market advantage.

Because of the covert nature of their operations, the WLL operators are not actively bringing communications to the mass market as the GSM operators are and therefore cannot deliver comparable benefits to the economy and society.

Recommendation: while the tax disparity between the WLL and mobile operators remains, the prohibition on the former to provide mobility should be effectively enforced. It is to be noted that the failure to do so will irreparably change the structure of the industry to the detriment of the mobile operators.

5.5 International Calls

At present, BTTB has exclusive control of the international gateway. This artificial restriction has a number of adverse effects, including the following:

- A large part of the price of outbound international calls is controlled by a single operator, limiting price competition.
- The monopoly prevents the mobile operators from obtaining revenue from inbound international calls and reduces the mobile operators' benefits from customer acquisition. By selling connections, the mobile operators create opportunities for the expatriate community to call home, thereby generating revenues for Bangladesh. By denying the operators due reward, this reduces their incentives to increase penetration.
- There are serious quality-of-service problems due to lack of capacity in BTTB's network.

Recommendation: international gateway capacity should be liberalised to improve competition in international calls, give operators due reward for extending mobile communications to families of expatriates and to alleviate capacity constraints that impact on call quality. It is to be noted that the source of this exclusivity is no longer reflected in the current legislation. It only exists in Bangladesh National Telecommunications Policy 1998. As such, such policy and legislative instruments should be regularised.

5.6 Local Manufacturing

In line with India, approximately half of the value added from the mobile industry in Bangladesh is exported as dealers and operators use scarce hard currency to pay for imported handsets and network equipment. A nascent industry in components such as switchboxes, batteries and steel for base station equipment is developing. This should be encouraged. The availability of cheap labour would enable Bangladesh to become a supplier of components as well as assembling handsets and network equipment more cheaply than in other countries. As economies of scale start to develop, this industry could gain momentum and become a major employer in its own right, perhaps exporting components. Equipment manufacturing involves very strong economies of scale; a large market such as Bangladesh is able to exploit these economies of scale whilst smaller ones are not. Owing to the size of the market, Bangladesh has the opportunity to achieve regional leadership in equipment manufacturing.

To encourage this industry, the government should consider tax breaks and low-interest loans to foreign investors setting up operations to supply the mobile communications industry in Bangladesh. The introduction of foreign capital and expertise would result in a diffusion of technical know-how and technology transfer, equipping Bangladeshi workers with important new skills.

5.7 Other Policy and Legislative Proposals

As mentioned above, the policy and legislative framework is confusing and in some situations apparently inconsistent. We therefore suggest that the policy and legislative framework be thoroughly revised and rationalised. The review should consider whether the existing framework has delivered its objectives. If not, it should consider which aspects of the framework need revision and the options available to the policy makers.

In our view, the key relevant policies and legislation that need to be analysed are as follows:

- 1) **Communications Sector Policies, Policy Statements, Framework**
 - a) National Telecommunications Policy 1998
- 2) **Sector Legislation, Regulations and Directives**
 - a) The Bangladesh Telecommunications Act 2001
 - b) Licensing Procedure Regulations 2004
 - c) Interconnection Regulations 2004
 - d) Circulars and Orders – various
- 3) **Licence (Licence Agreement), Approvals, Licence Fees or Permits**
 - a) Licensing Agreement(s) between the MoPT and PSTN (or mobile operators) in relation to provision of PSTN (or digital cellular mobile radio telephone) service in Bangladesh



6 Conclusion

Mobile penetration in Bangladesh is currently very low at 6% (in 2005) but has been growing rapidly. Policy makers should not be satisfied while the vast majority of people have no means of communication outside their local community. The strong knock-on effects on other sectors in the economy demonstrate that growth would deliver great benefits to the rest of the economy. The industry with salaries many times the national average.

The rate of growth in recent years demonstrates the high demand for mobile communications. Higher mobile penetration increases employment, reduces social fragmentation, increases productivity and increases GDP. Given the right policy regime, mobile telephony will continue to grow and deliver similar benefits to Bangladesh as to many other countries. The mobile industry is highly competitive and, despite significant disadvantages compared with peer countries, delivers good value for money. This should remove any perceived need to regulate prices.

Unfortunately at present, the growth rate is being curtailed by a number of policy factors, including punitively high taxes, taxes that discriminate between competing forms of communication and the absence of CPP. To avoid the risk of substantially delaying the realisation of the benefits that mobile communications will bring, urgent action needs to be taken to correct the factors that dampen its growth.

The high industry specific levels of tax are ultimately passed on to consumers who respond by purchasing fewer connections and calls. Indeed our findings from similar studies on other developing countries indicate that consumer demand is highly price-elastic, with the result that high taxes may even reduce government revenue in the short term. More compelling, however, is the impact of high taxation on government revenue in the long term: high taxes reduce employment, growth and lost productivity results in lower economic growth. Accordingly, our recommendation is to gradually eliminate industry specific taxes.

The interconnection regime, which involves a strong cross subsidy from the mobile to the fixed sector, needs to be reformed to avoid suppressing much needed investment. We therefore recommend that cost-based interconnection prices be introduced for both mobile and fixed services in keeping with the Bangladesh Telecommunications Act 2001 and a review of the Interconnection Regulations 2004.

The provision of international services is also a concern: at present, the prohibition on competing with BTTB in international services which increases the cost of international calls and reduces revenue from inbound calls. International services should be liberalised to allow competition on price and quality. The necessary policy and legislative amendments facilitating this need to be implemented immediately. Accordingly, plans to privatise BTTB should be implemented on the basis of fair, equitable and commercial arrangements.

The growth of the mobile industry provides important opportunities for Bangladesh to develop expertise in related industries. Local manufacturing and assembly of components such as handsets and network equipment will ensure a local source of competitively priced components for the industry and its customers as well as generating the transfer of employment, education and technical knowledge to the benefit of the whole country.

Annex 1: Retail Price Benchmarking Methodology

Comparing retail tariffs involves many complexities. One common approach is to use the 'Average Revenue Per User' (ARPU) as a proxy. However, this indicator is not the best way to measure the price impact to end users. It is subject to various distortions, such as the averaging of revenue between users with very different profiles, the dilution of revenue per user because of subscribers that are not active or are bad payers, and the possible inclusion of non voice/data related revenues (e.g. insurance, merchandise, etc.). Additionally, not all operators make public information about their subscriber base and/or revenues, and this further limits comparability between countries.

For this analysis, we have based our approach on that used by OECD and calculate the cost of ownership for mobile users based on information publicly available about retail tariffs and pre-defined user profiles. This method allows us to better understand the retail price structure from the point of view of the end user. It also allows us to distinguish between fixed charges, i.e. those that subscribers need to pay as one-off or monthly payments independent of usage, variable charges that are based on the amount of traffic a user generates, and taxes. This enables us to understand what types of hurdles users will need to overcome to have access to mobile services, the cost of using the services and how taxation impacts the overall cost of ownership.

Paramount to the calculation of cost of ownership is the definition of usage profiles, i.e. how the traffic of typical classes of users is distributed. For this, we use the methodology adopted by the OECD.

The main issue with use of the OECD baskets, is the levels of assumed usage. For developing countries such as Bangladesh even the low user basket is not representative of actual usage patterns. For this reason, we have produced results based on a lower usage profile than that of the OECD low user basket. In addition to the modified low user basket, we have calculated the cost of the OECD medium user basket, as this is closer to a higher user profile in a developing country than the OECD high user basket.

The OECD Mobile Baskets

The OECD mobile baskets are based on the distribution of voice and SMS traffic in different typical categories that are usually charged at different levels. The distribution tree overleaf provides an overview of how voice traffic is split and variable voice charge is calculated according to the OECD methodology.



Figure A1: Methodology for calculation of variable voice charges

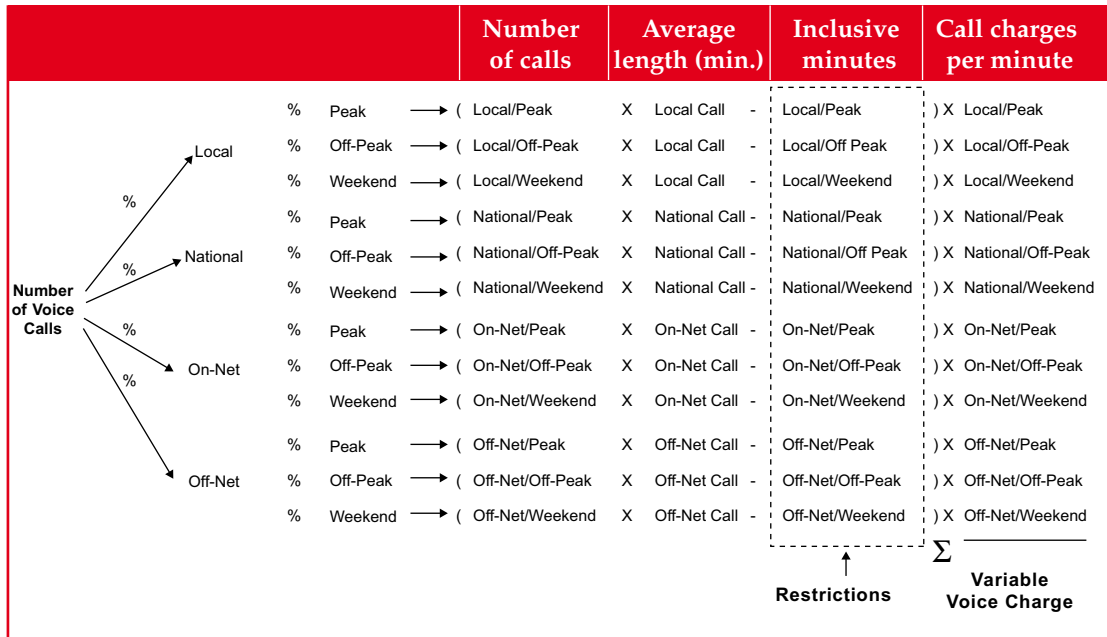
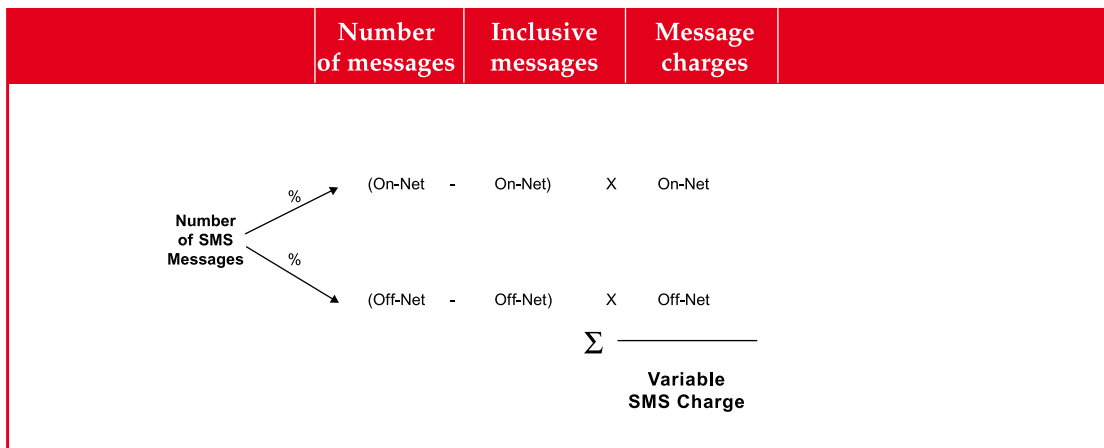


Figure A2 provides an overview of how SMS messages are split and variable SMS charge is calculated according to the OECD methodology.

Figure A2: Methodology for calculation of variable SMS charges



Both sets of variable charges (voice and SMS) are added together, and any existent call allowance is subtracted from the result. The end value is the value of the variable charge. Both inclusive minutes and call allowances have a ceiling such that the value of the variable charge is never lower than zero. The distribution of inclusive minutes and inclusive messages is proportional to the distribution of voice minutes and messages.

The fixed charge is calculated with connection charges (whose costs are spread through a period of 3 years according to OECD methodology) plus monthly subscription charges.

The charges used in the calculation are exempt from any taxes paid by the end-user, the value referent to these taxes is added at the end on top of the fixed and variable charges. All values are calculated for a period of 12 months.

The OECD methodology defines three profiles of user: a low user, a medium user and a high user. In our calculations, we have considered each of these three profiles. In addition, we have constructed an additional basket for the low user category, to take into account more representative usage in developing countries. Although we have considered 4 separate profiles, not all of the profiles are representative. For example, the OECD low user profile is not representative of a low user in a developing country such as Bangladesh. Similarly the high user profile is also unrepresentative. For the purposes of our analysis, we have assumed that the OECD medium user profile is more representative of a high user in developing countries.

Figure A3 provides the number of calls and messages and respective distribution in different types of traffic as well as average length of calls for the two low user baskets, whilst Figure A4 provides the same information but for the medium and high user basket.



Figure A3: Mobile basket definitions for low users (OECD and modified)

CALL AND MESSAGE VOLUMES				
	Outgoing calls/month	SMS per month		
LOW USER (O)OECD basket	25	30		
LOW USER (M)odified	20	10		

DISTRIBUTION OF CALLS PER DESTINATION				
	Fixed Local Area	Fixed National/Area	On-Net Mobile	Off-Net Mobile
LOW USER (O)	28%	14%	40%	18%
LOW USER (M)	13%	7%	55%	25%

DISTRIBUTION OF CALLS OVER TIME AND DAY			
	Time of Day - Peak	Time of Day - Off-Peak	Time of Day - Weekend
LOW USER (O)	38%	35%	27%
LOW USER (M)	38%	35%	27%

CALL DURATIONS			
	Duration Fixed National	Duration Mobile On-Net	Duration Mobile Off-Net
LOW USER (O)	1.6	1.4	1.4
LOW USER (M)	1.6	1.4	1.4

PROPORTION BETWEEN OUTGOING AND INCOMING CALLS		
	Outgoing	Duration Mobile On-Net
LOW USER (O)	30%	70%
LOW USER (M)	30%	70%

Figure A4: Mobile basket definitions for medium and high users

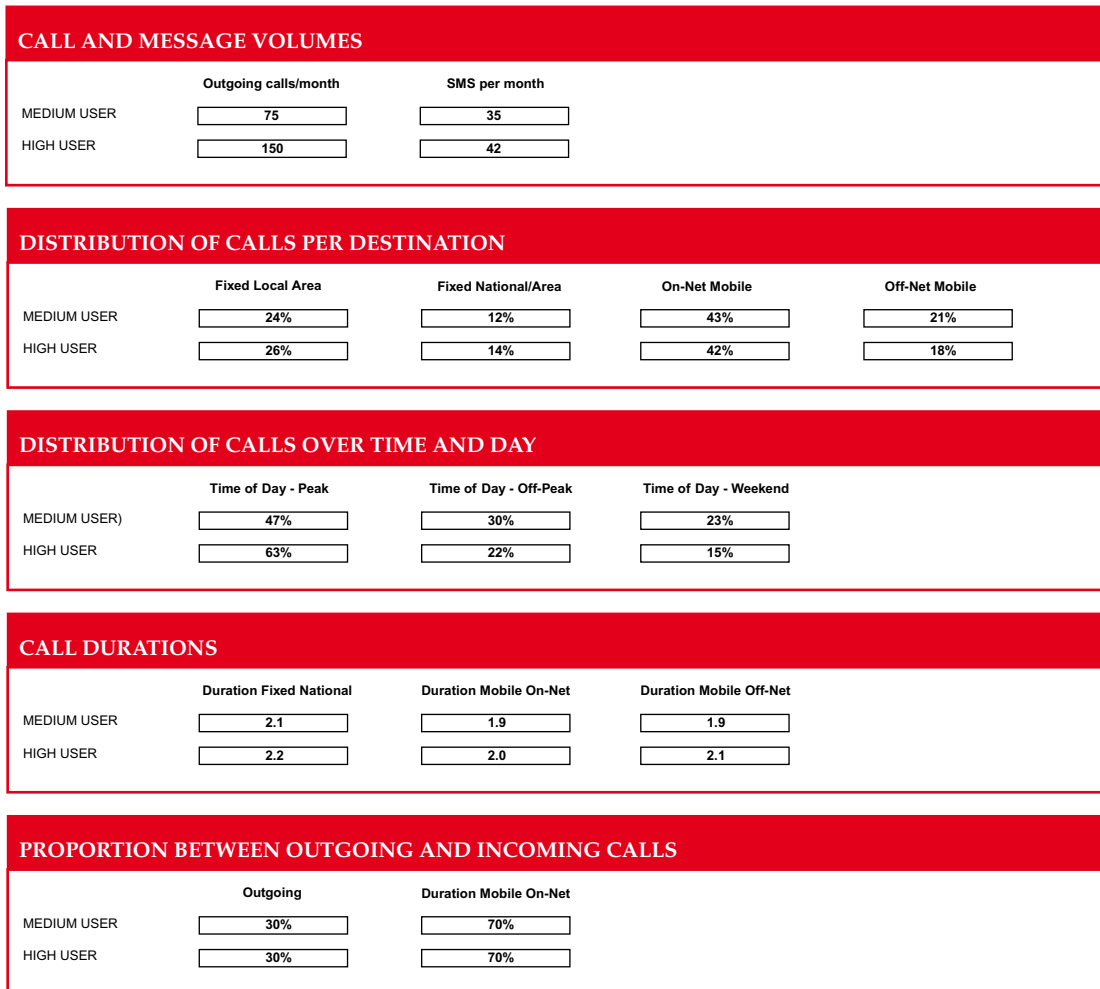




Figure A5 presents a sample of the entry tables for operator specific information.

Figure A5: Example of inputs collected for each individual operator

General Information												
COUNTRY	India											
CURRENCY USED	Indian Rupees											
VAT used	10%											
Operator	Reliance											
Tariff	Tariff 1	Tariff 2	Tariff 3	Tariff 4	Tariff 5	Tariff 6	Tariff 7	Tariff 8	Tariff 9	Tariff 10	Tariff 11	Tariff 12
Tariff group	Reliance	RCV	RCV	Joy	Joy	Joy	Joy	Joy	Joy	Joy	Power	Joy
Tariff option	Pre-paid	440	220	99	148	299	398	499	299	648ZR	148	395ZR
Tariff type	Pre-paid	Pre-paid	Pre-paid	Post-paid	Post-paid	Post-paid	Post-paid	Post-paid	Post-paid	Post-paid	Post-paid	Post-paid
Fixed Charges												
One-time charge												
Connection charge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monthly charges/allowances												
Subscription	0.00	0.00	0.00	99.00	149.00	259.00	399.00	459.00	299.00	648.00	149.00	395.00
Call allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	299.00	649.00	0.00	395.00
Inclusive SMS's	0	0	0	0	0	0	0	0	0	0	0	0
Inclusive minutes	0	0	0	0	0	0	0	0	0	0	0	0
Restrictions	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Variable Charges (Outgoing Calls)												
Local call (mobile to fixed)												
Peak	1.79	1.20	1.20	2.20	2.20	2.20	1.00	1.00	1.50	1.00	1.20	1.00
Off-Peak	1.79	1.20	1.20	2.20	2.20	2.20	1.00	1.00	1.50	1.00	1.20	1.00
Weekend	1.79	1.20	1.20	2.20	2.20	2.20	1.00	1.00	1.50	1.00	1.20	1.00
National calls (mobile to fixed)												
Peak	2.49	2.49	2.49	3.49	2.49	2.40	2.50	1.00	2.50	2.00	2.40	2.64
Off-Peak	2.49	2.49	2.49	3.49	2.49	2.40	2.50	1.00	2.50	2.00	2.40	2.64
Weekend	2.49	2.49	2.49	3.49	2.49	2.40	2.50	1.00	2.50	2.00	2.40	2.64
On-net calls (mobile to mobile)												
Peak	0.99	0.00	0.00	1.50	0.59	0.50	0.40	0.40	0.50	0.50	0.20	0.50
Off-Peak	0.99	0.00	0.00	1.50	0.59	0.50	0.40	0.40	0.50	0.50	0.20	0.50
Weekends	0.99	0.00	0.00	1.50	0.59	0.50	0.40	0.40	0.50	0.50	0.20	0.50
Off-net (mobile to mobile)												
Peak	1.79	0.80	0.80	2.20	2.20	0.50	1.00	1.00	1.50	1.00	0.80	0.50
Off-Peak	1.79	0.80	0.80	2.20	2.20	0.50	1.00	1.00	1.50	1.00	0.80	0.50
Weekend	1.79	0.80	0.80	2.20	2.20	0.50	1.00	1.00	1.50	1.00	0.80	0.50
SMS messages												
On-Net	1.50	1.50	1.50	1.00	1.00	1.00	0.50	0.50	0.50	0.50	1.00	1.00
Off-Net	1.50	1.50	1.50	1.00	1.00	1.00	0.50	0.50	0.50	0.50	1.00	1.00

The comparisons take account of VAT. The comparison should credit a country with having the lowest prices if the reason for having the lowest prices is the lowest rate of VAT. Tax rates differ from country to country. For example in India it is 10% whilst in Bangladesh it is 15%. The comparisons in section 3 identify the tax component separately

Several types of restriction were defined for inclusive minutes

- No restrictions (NA).
- On-Net only.
- Off-Peak and Weekends only.
- Off-Peak and Weekends in On-Net traffic only.

Limitations of the Model

As one would expect, to consider the different structure of tariffs and types of promotions in several countries in a single model results in high levels of complexity.

The model defined by OECD is relatively straightforward but still provides a good basis to compare the cost of ownership of mobile services for users with different profiles in different countries.

Types and Distribution of Traffic

The model only considers traffic originated from mobiles and terminated at fixed lines (local and national levels) and other mobiles (on-net and off-net).

The fact that international calls are not considered in the mobile basket is expected to have a low impact in the overall results. This type of traffic is relatively small in most of the countries and for countries in development it is expected to be even lower. The fact that international roaming is not considered is also expected to have low impact for exactly the same reasons.

The absence of national roaming has a certain impact, especially in countries where operators have coverage in different areas. However, as the user mobility is more restricted in developing countries, the lack of this type of traffic is not expected to cause big distortions when comparing between countries.

Data traffic is also excluded from the basket. In some instances, this may cause distortions, especially in the case of 3G operators with cross subsidies between data and voice services. This, however, appears not to be the case in the countries selected for the benchmark and any distortions derived from the lack of data traffic in the model may be indeed negligible.

Some countries also differentiate between local and national calls in the case of mobile to mobile traffic. We assumed only local calls for mobile to mobile traffic. This is a reasonable assumption as users (especially consumers) will avoid making long distance calls from mobile lines if these calls are perceived to be more expensive.



In many countries, there is no distinction between off-peak and weekend but in many cases there is distinction between off-peak and super off-peak or happy hour. Depending on the case, we adjusted the weekend charges to reflect the super off-peak tariffs or we simply assumed the weekend charges to be the same as off-peak.

In Bangladesh, calls to a fixed line are charged with two different charges, one for the mobile part of the call and another for the fixed part of the call. The charge for the fixed part of the call is determined by the fixed line operator and not by the mobile operator. If ignored, the lack of this extra cost would generate distortions in the results for Bangladesh. To allow for this, therefore, we estimated the fixed charges to be 1 Bangladeshi Taka for local calls and 3 Bangladeshi Taka for national calls.

The most important potential limitation of the model is that it does not consider incoming traffic. This, in theory, could cause significant distortions for countries where the receiving party pays (RPP) as is the case of Bangladesh, Indonesia, and Sri Lanka. However, in these countries the mobile operators seem to have realised that charging for incoming calls deters the adoption of mobile services. This is especially true for low users who may buy a mobile phone with the purpose of receiving calls. To address this issue, many operators have designed tariff plans that either completely exempt incoming calls from charges or provide special discounts such as first minute free for incoming calls.

Promotions and other Charging Characteristics

To target specific user group needs, mobile operators have introduced many diverse propositions changing the way users are charged. Some of these propositions, observed in the countries under analysis include:

- Usage discounts: progressive discounts depending on the amount of minutes used in a month.
- Call duration discount: minutes above a certain limit are charged at lower rates.
- Duration of billing pulse: shorter billing pulses for certain types of tariff or shorter billing pulses after a certain call duration.
- Special charges for Friends and Family.

All these special cases certainly have an impact in the benchmark. However, in most cases, the result is increased usage offsetting occasional reductions in cost. Also, these special discounts usually appear in the most expensive tariff plans and consequently fall out of the selection of tariffs for the benchmark.

Other Costs of Ownership

The model also ignores the cost of the mobile handset and any value added or ancillary services. This may cause distortions in our benchmark if operators in different countries adopt different levels of subsidies of the mobile handset.

Inputs for the Benchmark

We considered six countries in South Asia and South East Asia for our study:

- Bangladesh
- India
- Indonesia
- Pakistan
- Sri Lanka
- Thailand

The countries were selected based on their relative similarities, in terms of stage of development, and general market conditions.

For each of these countries we selected the two or three operators with the highest market shares, in terms of number of subscribers, as follows:

- **Bangladesh**
 - GrameenPhone
 - Aktel
 - Banglalink
- **India**
 - Airtel
 - Reliance
 - BSNL
- **Indonesia**
 - Indosat
 - Telkomsel
- **Pakistan**
 - Mobilink
 - Ufone
 - Telenor
- **Sri Lanka**
 - Dialog
 - Celltel
- **Thailand**
 - AIS
 - DTAC



Pricing data were provided to us by EvaluateServe, an Indian market research firm known to the GSMA for its contribution to Wireless Intelligence.

The cost of ownership was calculated for each tariff plan of each operator. For each operator and each user profile (low use and high use) we selected the two lowest costs and calculated the averages for the country.

The reason for considering more than one tariff plan per operator and more than one operator per country is due to the fact that users, in general, are not able to determine the best tariff plans at a certain point in time. Even if they know exactly what is the best plan for their usage profile, mobile operators impose restrictions/penalties for terminating plans and switching to other tariffs or tariffs from other operators.

We did not consider a weighted average according to the market share of each player as the market shares may vary amongst the different user profiles, and information at this level of detail was not available to us. For this reason, a straight average was used instead.

Annex 2: Interconnect Rate Benchmarking Methodology

Similar to the retail tariff benchmark, we considered six countries in Asia for our study:

- Bangladesh
- India
- Indonesia
- Pakistan
- Sri Lanka
- Thailand

The countries were selected based on their relative similarities, in terms of stage of development, and general market conditions.

For each of these countries we selected the two or three operators with the highest market shares, in terms of number of subscribers, as follows:

- **Bangladesh**
 - GrameenPhone
 - Aktel
 - Banglalink
- **India**
 - Airtel
 - Reliance
 - BSNL
- **Indonesia**
 - Indosat
 - Telkomsel
- **Pakistan**
 - Mobilink
 - Ufone
 - Telenor
- **Sri Lanka**
 - Dialog
 - Celltel
- **Thailand**
 - AIS
 - DTAC



As far as possible, based on the available data, the benchmarks presented cover fixed interconnection and mobile termination, as follows:

- Termination on the fixed network for mobile-to-fixed calls.
- Termination on the mobile network for fixed-to-mobile calls.
- Termination on the mobile network for mobile-to-mobile calls.

Data Gathering

Interconnect data were collected on our behalf by EvaluateServe, plus by Ovum, using public domain sources. Sources used to collect the data were regulator and operator websites.

For some operators, interconnect data were unavailable or insufficiently detailed, and therefore these operators have not been included in the benchmark. As operators are not always required to publish mobile termination rates, then these are not always readily available.

The data for Bangladesh were provided by EvaluateServe, with the exception of the fixed to mobile termination rate data (zero cost - as indicated by the operators), as data was not provided direct from the Bangladesh operators at the time of writing.

Standardisation of Interconnection Charges

To enable a comparison of interconnection charges, we have converted each country's interconnection charges to a standard format, taking into account the charging structure and the interconnect services that are offered.

For the countries covered, the charging structures are, on the whole, relatively straightforward. The main difference in the charging structure is that of flat rate vs per minute charging.

As per Ovum's standard interconnect benchmark methodology, we assume that the average duration of a call is 2.5 minutes. Set up charges do not apply for the countries covered in this benchmark, however if they did, we would incorporate this as follows:

$$(set-up\ charge / 2.5) + per-minute\ charge$$

As a rule, the interconnect rates are not distance related for national calls. However, for India, there are some variations based on distance. For this reason, we have adopted the following distance based profile, in keeping with the Ovum standard methodology. This is shown in Figure A6.

Figure A6 Traffic profile – standard distance format

Distance between point of interconnect and end user, km	Distance used in standard format km	Percentage of traffic
0–10	5	50
11–30	20	30
31–100	50	15
More than 100	200	5

Source: Ovum

Exchange Rates

Similarly to the retail tariff benchmark, the prices shown are in based on a mix of current exchange rates, and US Dollar PPP, and are shown in US dollars. The conversion rates for purchasing power parity are estimates from Euromonitor.

For the purposes of comparison, the overall charges for each country have been converted into US \$ using a composite of 40% exchange rate and 60% purchasing power parity (PPP). This reflects the fact that approximately 40% of costs incurred are through capital equipment, and 60% of costs are due to labour. An exchange rate is appropriate for comparing the cost of capital equipment, because equipment can be imported and exported. Labour costs include cost-of-living factors for each country, so it is appropriate to use PPP.

Interconnect Basis, by Country

Bangladesh

The information used for the purposes of this benchmark has been gathered by EvaluateServe, using public domain sources. EvaluateServe were unable to provide firm details on mobile to fixed interconnection charges, but stated that the rates were between Taka 1.5-4.5/minute, depending on the time of day and distance. Based on this, and in the absence of any other information, we have assumed the interconnect rate to be the average of the two extremes.

India

Based on available data, the interconnect rates in India appear the most complex in the study countries, with variations in the rates according to distance. Bangladesh rates may also have the same complexity, however we have not received sufficient data to confirm this.

The interconnection rates for India are shown in Figure A7.



Figure A7 Interconnect rates for India

Interconnection Charge (in Rs. Per minute)	Local Calls	Intra Circle Calls		Inter Circle Calls All distances	ILD Calls	
		0-50 Kms	>50 Kms		Outgoing	Incoming
Fixed – Fixed	0.00	0.00	0.30	0.30	2.50	3.25
Fixed – WLL (M)	0.30	0.30	0.30	0.30		
Fixed – Cellular	0.30	0.30	0.30	0.30		
WLL (M) – Fixed	0.30	0.30	0.30	0.30	2.50	3.25
WLL (M) – WLL (M)	0.00	0.00	0.00	0.30		
WLL (M) – Cellular	0.00	0.00	0.00	0.30		
Cellular – Fixed	0.30	0.30	0.30	0.30	2.50	3.25
Cellular – WLL (M)	0.00	0.00	0.00	0.30		
Cellular – Cellular	0.00	0.00	0.00	0.30		

Indonesia

Cost-base interconnection rates were to be implemented by January 2005. However, the Indonesian government postponed it, as further study was required before the implementation (Source: Regulatory Update Indonesia, 31st APEC TEL WORKING GROUP MEETING, April 2005).

At the time of writing, interconnection charges in Indonesia are on a revenue sharing basis, with no further information available.

Pakistan

The mobile industry in Pakistan, as in all of the study countries, has experienced phenomenal growth over the years. PTA played a vital role in the promotion and support of mobile industry by moving from a RPP (receiving party pays) regime to a calling party pays one. This move accelerated the growth of the market, which grew in that particular year by 142% as mobile essentially became more affordable.

The regulator in Pakistan set new interconnect rates in the second half of 2005 as follows:

Period	Mobile Termination Rate (Rs. per minute)*
1st August 2005 – 30th June 2006	1.60
1st July 2006 – 30th June 2007	1.25

Source: www.pta.gov.pk

*All types of calls (i.e. local, long distance and international incoming calls) terminated on mobile networks from other mobile networks or fixed networks.

The fixed termination rate for calls terminated on fixed networks from mobile networks will be **Rs. 0.52 per minute**. This charge will be effective from 1st August 2005 and shall remain in full force until revised by the Authority.

Sri Lanka

Interconnect rates in Sri Lanka are on a per call basis. No information was available for fixed-to-mobile interconnect rates. Based on other study countries, one could assume that mobile-to-fixed and fixed-to-mobile rates are reciprocal. We have not followed this approach in our analysis, however, and have omitted Sri Lanka from the fixed to mobile interconnect analysis.

The Telecommunications Regulatory Commission of Sri Lanka (TRCSL) pushed for caller party pays (CPP) implementation in place of mobile party pays (MPP) way back as early 2000. Despite mobile operators' lobby for CPP and the regional success story of the CPP system, TRCSL has decided during the latest consultation process in November 2005, to retain the MPP system for the foreseeable future on the back of political and customer pressure. Pending the CPP implementation, the interconnection regime in Sri Lanka is currently based on sender keeps all (SKA).

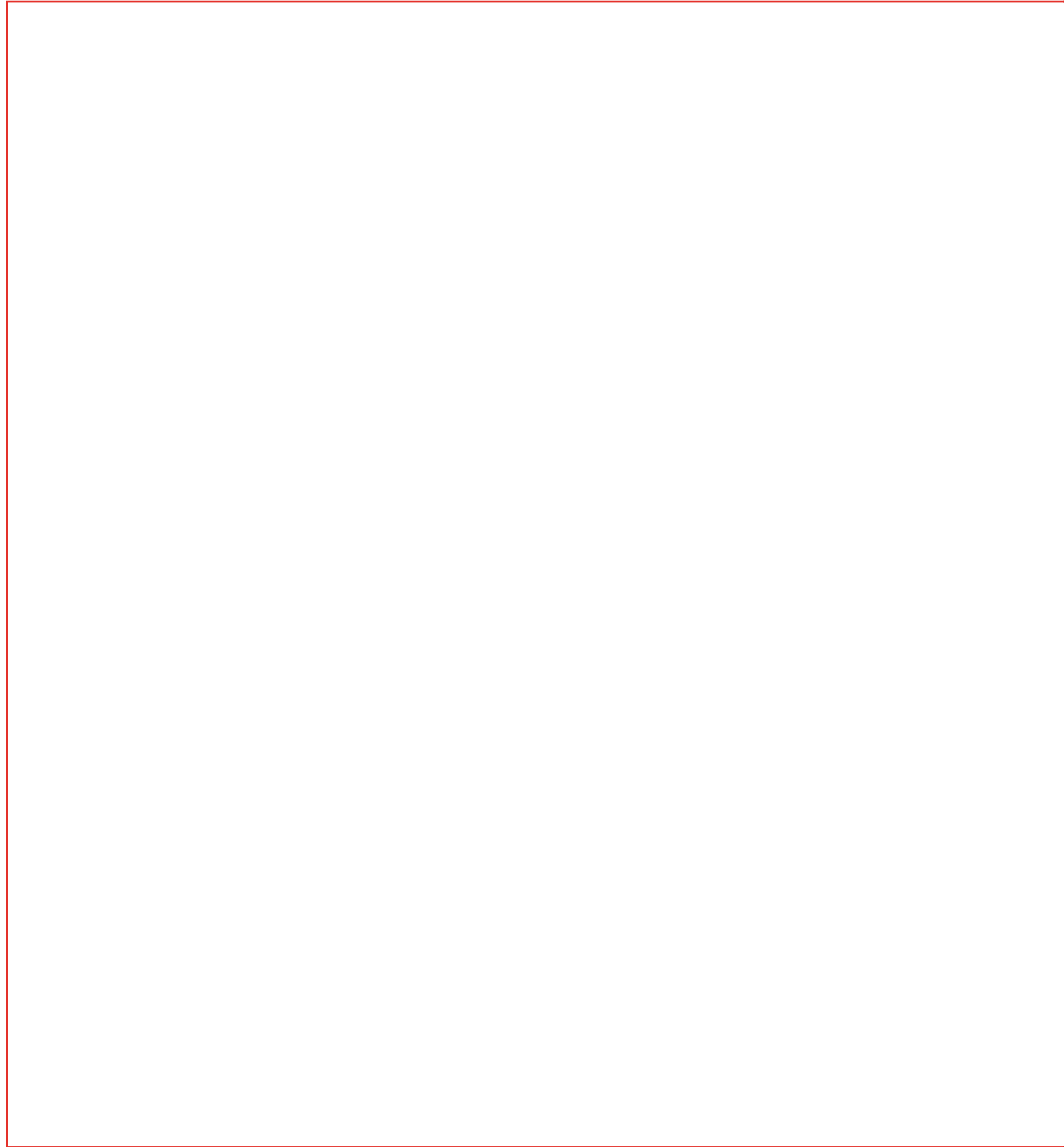
Thailand

Until early 2005, Thailand's mobile telecommunication sector was functioning on revenue sharing agreements. According to these agreements, the private mobile operators used to share revenues with the state-owned telecom bodies, CAT Telecom Plc. (The Communication Authority of Thailand) and TOT Plc. However, after the formation of regulatory body, NTC (National Telecommunication Commission), the revenue sharing agreements were replaced by per minute interconnection rates from October 2005.

According to an article on NTC's website dated November 23, 2005, both CAT and TOT have agreed on an interconnection rate of 1.07 baht/min. Subsequently, both of these bodies will also be revising their concessionary deals with the other telecom operators in the country. The interconnection rate is applicable only for mobile-to-mobile phone calls. The interconnection rates of mobile-to-fixed networks are yet to be decided.

Further, these interconnection rates are subject to implementation and have not been applied yet. Moreover, the transit rates (rates to be paid for interconnection through the intermediate networks) are still to be negotiated.

(Source: http://www.ntc.or.th/index.php?option=com_content&task=view&id=2187&Itemid=27 & http://www.ntc.or.th/index.php?option=com_content&task=view&id=1417&Itemid=27)





GSMA London Office
1st Floor, Mid City Place, 71 High Holborn, London WC1V 6EA, United Kingdom
T +44 (0) 20 7759 2300

GSMA Dublin Office
Block 2, Deansgrange Business Park, Deansgrange, Co. Dublin, Ireland
T +353 (0) 1 289 1800

www.gsmworld.com