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GLOBAL MOBILE TAX REVIEW 2006-2007

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GSM ASSOCIATION

Global Mobile Tax Review

2006–2007

Tax regimes that recognise mobile phones
as a need not a luxury benefit all stakeholders



Full Report

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1 Introduction

In 2005, the GSM Association (GSMA) developed its first study on tax and the digital divide, seeking to understand more fully the tax rates affecting telecommunications in developing countries and the impact that cutting taxes may have on mobile handsets and new services.

The study's key findings showed that telecommunication taxes were disproportionately high in many developing countries and that even small cuts in taxes many attract significantly more mobile users.

In this second report, the analysis is extended to include a larger set of countries – in particular adding the transitional Eastern European countries. The report also investigates more fully the link between lower taxes and revenue opportunities for governments in the long term, showing that cutting taxes may lead to increased economic growth in the least developed countries.

1.1 Tackling the digital divide

How can governments tackle the digital divide and bring universal communications access to businesses and communities? The continued technical advances in developed countries including 3G, on-the-go digital devices and, in the near future, mobile broadband, promise to ease still further access to information through the internet, e-mail and telephony in the developed world. However, whilst benefiting a privileged minority, these advances threaten to widen even further the economic gap between rich and poor countries. Information access rates in developing countries are often more than 20 years behind those in the developed world.

There is little doubt amongst academics, business leaders, governments and citizens that access to reliable communication services aids in the economic development and social welfare of countries. Increasing access to communications is an aim of virtually all governments and is central to the philosophy of leading global development organisations such as the World Bank.

Academic studies have traditionally sought to quantify the impact of fixed line telephony investment on growth. However, as mobile technology has evolved and shown itself to often be a more cost effective solution to universal access, particularly in rural and isolated areas, attention has turned to the role of mobile communications in promoting growth. Investment in mobile communications and increasing penetration rates can promote economic growth, with the greatest impacts being in those countries with the lowest levels of GDP.

Government has a key role in supporting communication advancements, as mobile penetration varies dramatically across countries. Consumers, particularly in developing countries, are price sensitive in relation to their uptake and usage. Government actions, such as taxation levels and regulatory fees, are a key variable cost impacting upon the total cost of mobile ownership and use. Indeed, this report shows that an average of 17.4% of the total cost of mobile ownership is formed of consumer and import taxes.

It is widely forecast that by 2010 the worldwide penetration of mobile telephony will have doubled. This provides the potential for the mobile industry to reduce and eventually eliminate the digital divide. In order to capitalise upon, or increase, this growth the challenge to Governments and the mobile industry is to work together more effectively to make mobile phones and usage affordable.

The mobile industry is already taking steps in this direction and the impact of such actions is being felt. Mobile operators in emerging markets are extending their

coverage rapidly and over 80% of the world's population now live in areas covered by mobile technology. However, at present over 60% of the world's population do not have a mobile phone. The implication of this is that Governments, particularly in developing countries, may choose to consider providing a greater focus to their taxation strategies to increase economic development.

1.2 This report

The aim of this study is to investigate the impact of mobile taxation on consumer behaviour and government revenues. This report:

- Provides an initial benchmarking and analysis of taxation rates across the 101 countries in our sample. The report highlights those countries whose taxation policies may provide a positive example to others and also those where taxation may be considered a hindrance to mobile penetration and, ultimately, economic growth;
- Details the methodology adopted to calculate the impact upon consumer behaviour and government revenues. This report develops last years analyses:
    - Taking into account the corporate tax impact of all changes to the taxation of mobile operators; and
    - Providing an initial quantitative analysis of knock on effects across the economy.
- Provides the results of the study. The results of our quantitative investigation of 101 countries is initially presented at continental level but then disaggregated further in subsequent regional sections. A series of interviews and case studies are provided focusing on countries of particular interest to support the quantitative analysis.

2 Analysing taxation rates across the sample

This section of the report provides a consideration of the taxation structures that apply to the cost of ownership and usage of mobile services. Our analysis considers the position in 86 developing countries and 15 developed (EU) markets. This report provides an explicit analysis of the:

- The role of tax relative to the total cost of mobile ownership (TCMO), the total cost of mobile services (TCMS), and the cost of handsets;
- Telecom specific taxes, i.e. taxes where the telecoms sector is treated in an inconsistent manner relative to the remainder of the economy; and
- Other tax related issues, including the treatment of mobile vis-à-vis fixed networks and the role of corporation tax (excluded from above) and license fees.

This analysis has been conducted by Deloitte based on taxation data collected by Deloitte offices internationally and third party market data.

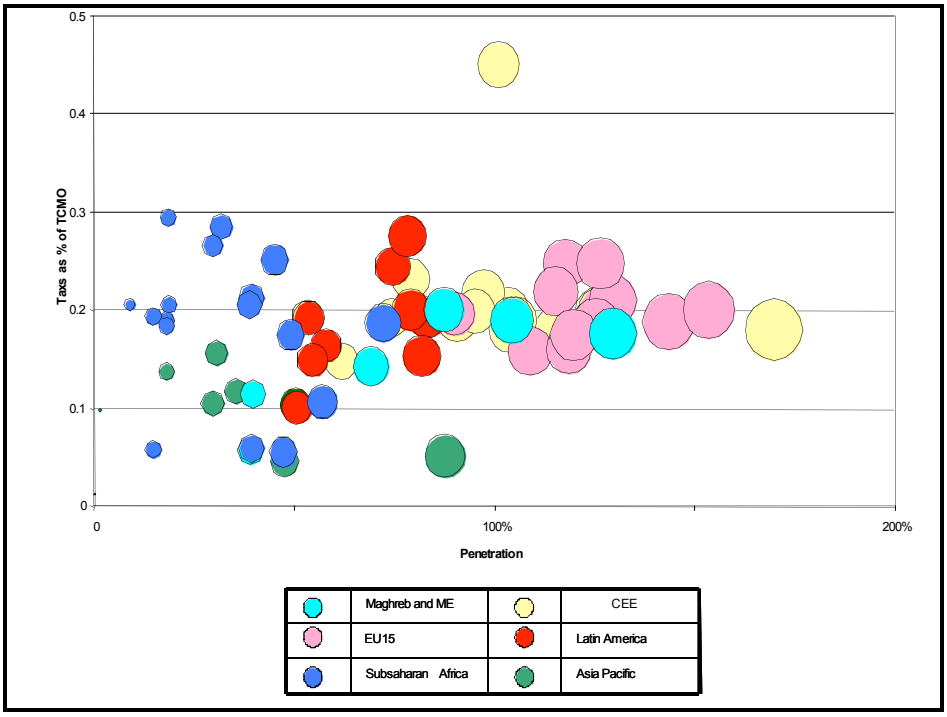
2.1 Tax as a percentage of the total cost of mobile ownership

The initial comparison is the percentage of the TCMO that is made up of taxes on handsets, subscription and airtime[1]. In order to calculate the TCMO with taxes, VAT and custom duties have been added to the handset cost, fixed subscription taxes have been added to connection charges, VAT and other telecom specific taxes have been added to rental and usage and fixed taxes have been added to the total[2]. There appears to be no direct relationship between the percentage of tax in the TCMO and penetration.

[1] The proportion of tax in the TCMO was calculated by comparing the TCMO inclusive of tax with the TCMO excluding taxes, i.e. (TCMO with tax/TCMO with no tax)-1.

[2] Calculation used average handset prices and blended ARPU data collected in the 101 markets, and assume the life cycle of each handset and subscription is three years. The ARPU was calculated from tariffs data provided by Tarifica for over 120 operators and minutes of use data collected from Wireless Intelligence and Pyramid Research. Where data was not available for a particular country then assumptions were made (see Section 3 for details). It is important to note that this analysis did not include those taxes which are payable by the company rather than directly by the consumer.

Figure 1: Tax as a percentage of TCMO and penetration



Source: Deloitte analysis based on Wireless Intelligence, Tarifica and Deloitte Tax data.

The following figures provide a further disaggregation of the tax burden, splitting taxes between handsets, connection, rental and usage. These results suggest that there is broad overall similarity in the role of taxation (vis-à-vis the TCMO) across:

- Pre-pay and post-pay platforms, and
- The different regions of the world.

Figure 2: Tax as proportion of the TCMO for post-pay services

Type of tax	Africa	Middle East	Asia Pacific	Latin America	CEE	EU15
Handset	0.8%	0.68%	0.73%	0.4%	0.7%	0.5%
Connection	0.01%	0.12%	0.53%	0.01%	0.2%	0.01%
Rental	4.31%	2.6%	2.8%	4.85%	3%	4.7%
Usage	10.8%	10.2%	7.7%	13.4%	16.5%	14.4%
Total	16%	13.6%	12%	18.6%	20.4%	19.6%

Source: Deloitte

Figure 3: Tax as proportion of the TCMO for pre-pay services

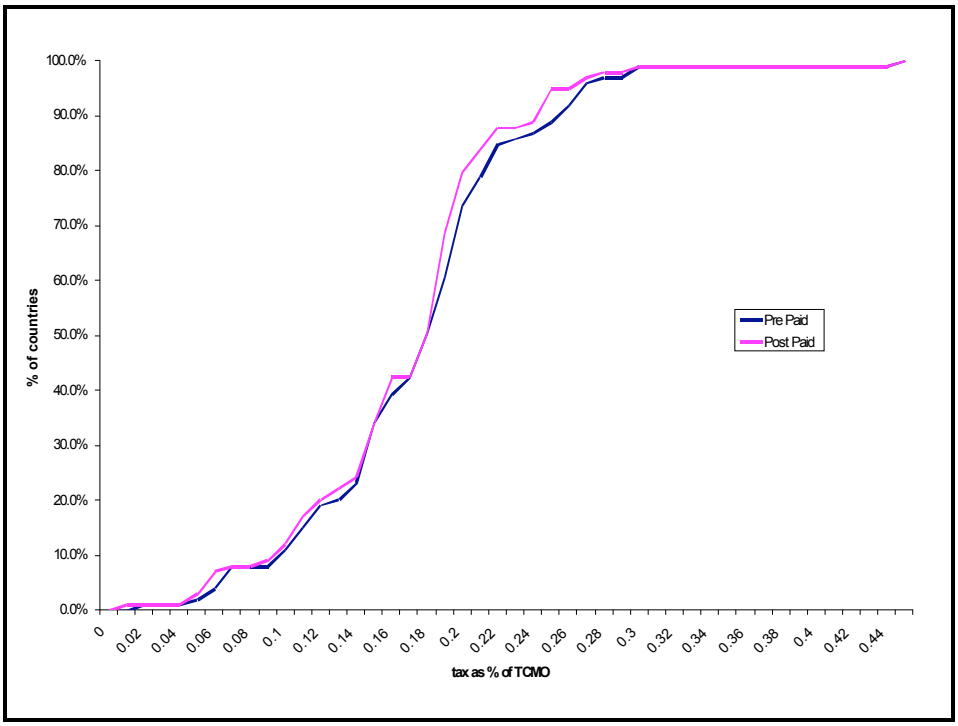
Type of tax	Africa	Middle East	Asia Pacific	Latin America	CEE	EU15
Handset	3.15%	1.6%	2.25%	1.4%	1.6%	1.6%
Connection	0.05%	0.3%	0.7%	0.04%	0.4%	0.02%
Usage	14.11%	12%	9.4%	17.3%	18.4%	18%
Total	17.3%	14.1%	12.4%	18.7%	20.6%	19.6%

Source: Deloitte

This point is further illustrated by the cumulative distribution of tax as a proportion of TCMO for pre and post paid platforms. The lack of difference between taxation policy adopted across the two platforms is somewhat surprising given the increasingly differing roles undertaken by the two platforms across most developing countries:

- Pre-pay is now regarded as the provider of universal service across developing countries[3], i.e. communications as a social good; and
- Post-pay provides a greater business focus and possibly more focus on communications as a driver of economic activity.

Figure 4: Tax as proportion of TCMO for Pre-paid and post paid, cumulative distribution

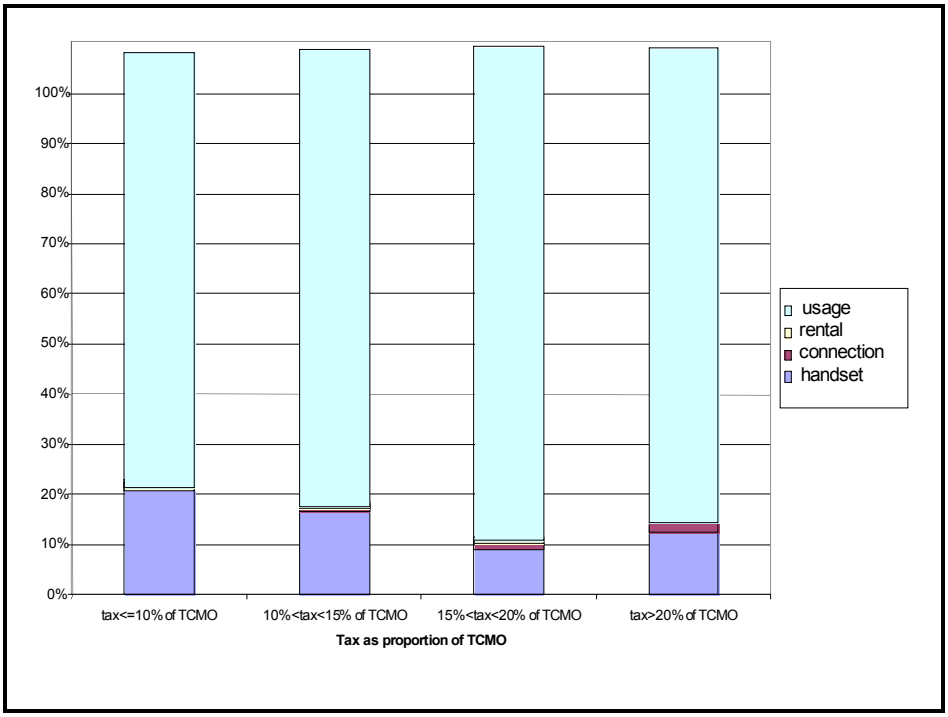


Source: Deloitte

Further disaggregation of tax charges for pre-paid platforms suggests that usage and connection taxes are proportionately higher in those countries where tax is a higher percentage of the TCMO. However, no similar pattern exists for handset taxes.

[3] GSMA, Universal Access, 2006.

Figure 5: Tax charges: Pre paid

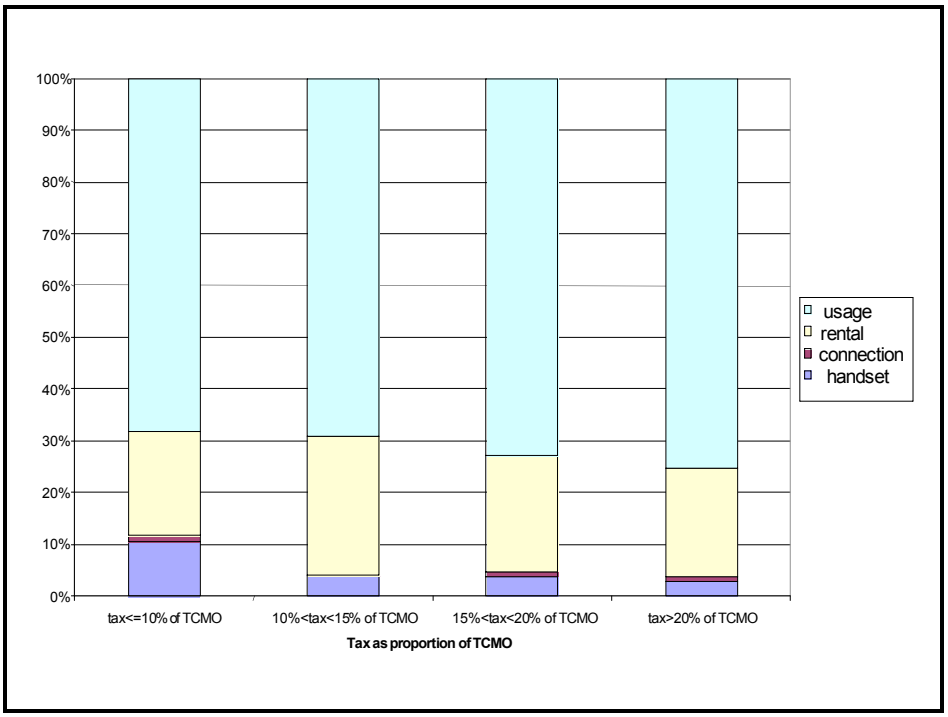


Source: Deloitte

For post-paid platforms:

- Usage taxes are proportionately higher in those countries where tax forms a higher percentage of the TCMO; and
- Handsets taxes are proportionally higher in countries where tax forms a lower proportion of TCMO.

Figure 6: Tax charges: Post-paid



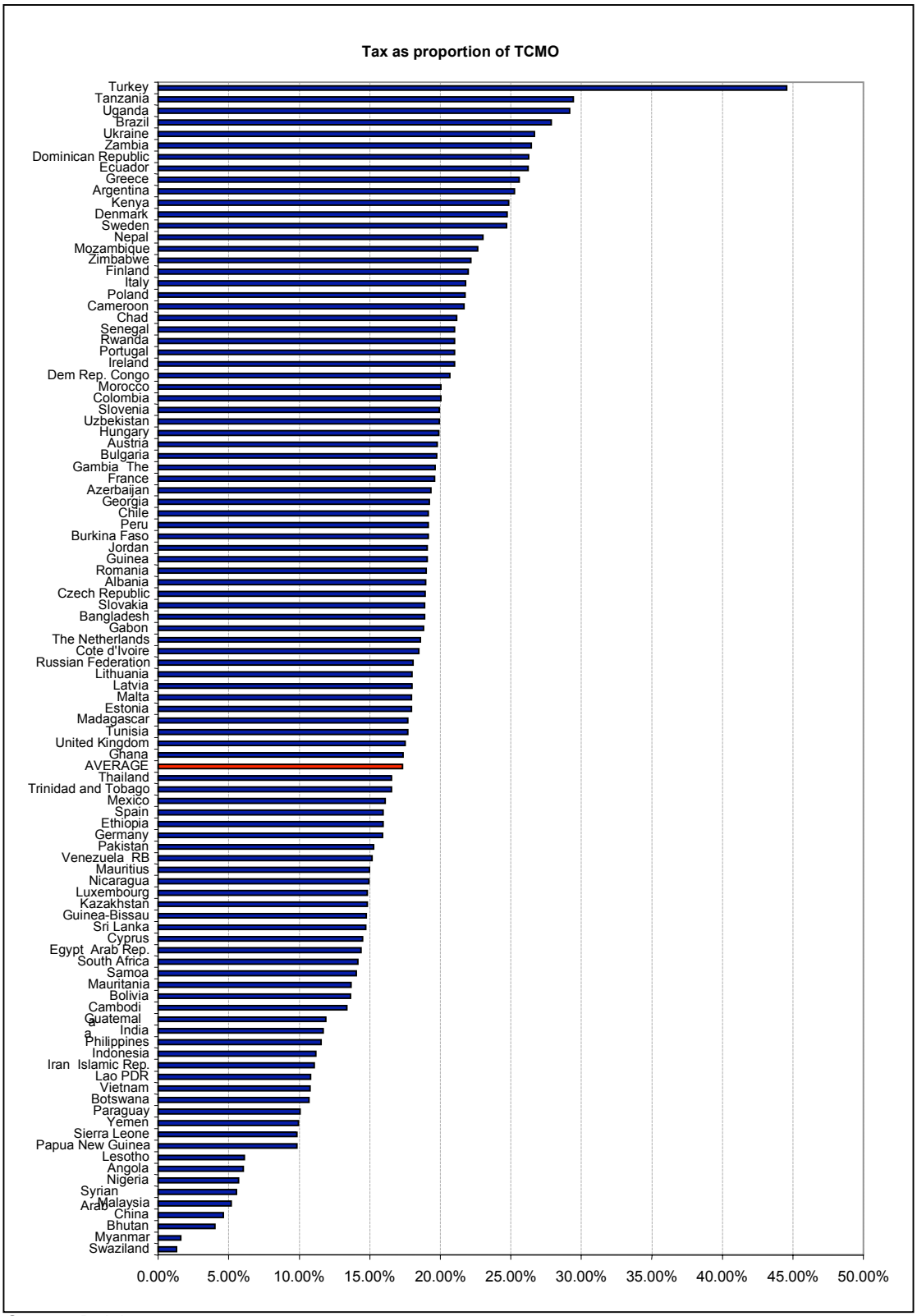
Source: Deloitte

2.2 Country specific results

The figure below ranks the 101 jurisdictions in our sample by the percentage of TCMO that is accounted for by tax and demonstrates differences across countries:

- The jurisdictions where tax forms the highest proportion of TCMO are Turkey, Uganda, Tanzania, Ukraine, Dominican Republic, Zambia, Brazil, Ecuador, Sweden, and Denmark;
- Three of the five jurisdictions (China, Malaysia and Bhutan) where tax forms the lowest proportion of TCMO are in the Asia Pacific region; and
- On average, 17.4% of end user spend is kept by the Government in tax revenues. This result is consistent with that found in the previous Tax and the Digital Divide survey.

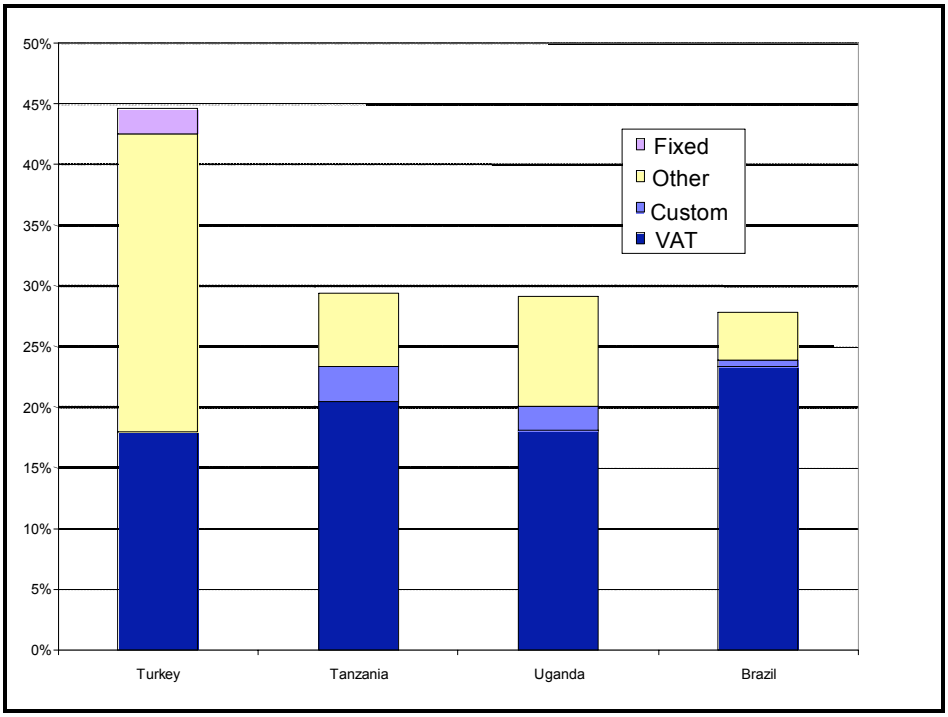
Figure 7: Tax as a share of total cost of mobile ownership



Source: Deloitte

Further analysis demonstrates that, when applied, telecom specific and special taxes are the main contributors to the heavy burden of taxes on the TCMO.

Figure 8: Tax as proportion of TCMO, top 4 countries in the ranking



Source: Deloitte analysis based on Tarifica, Wireless Intelligence and Deloitte tax data

Turkey stands out as the market with the highest cost of tax as a percentage of TCMO; the tax burden of 44.6% is one and a half times as much as that of the nearest country. Whilst Turkey imposes a VAT rate on telecommunications services that is relatively similar to VAT applied in other countries in the study, it charges the most extreme telecom specific taxes:

- A special communication tax of US$16.87;
- A wireless license fee of US $6.99 at subscription; and
- A wireless usage fee of US$6.99 annually on top of 25% special communication tax (apart from 18% VAT).

2.3 Tax and the cost of mobile services

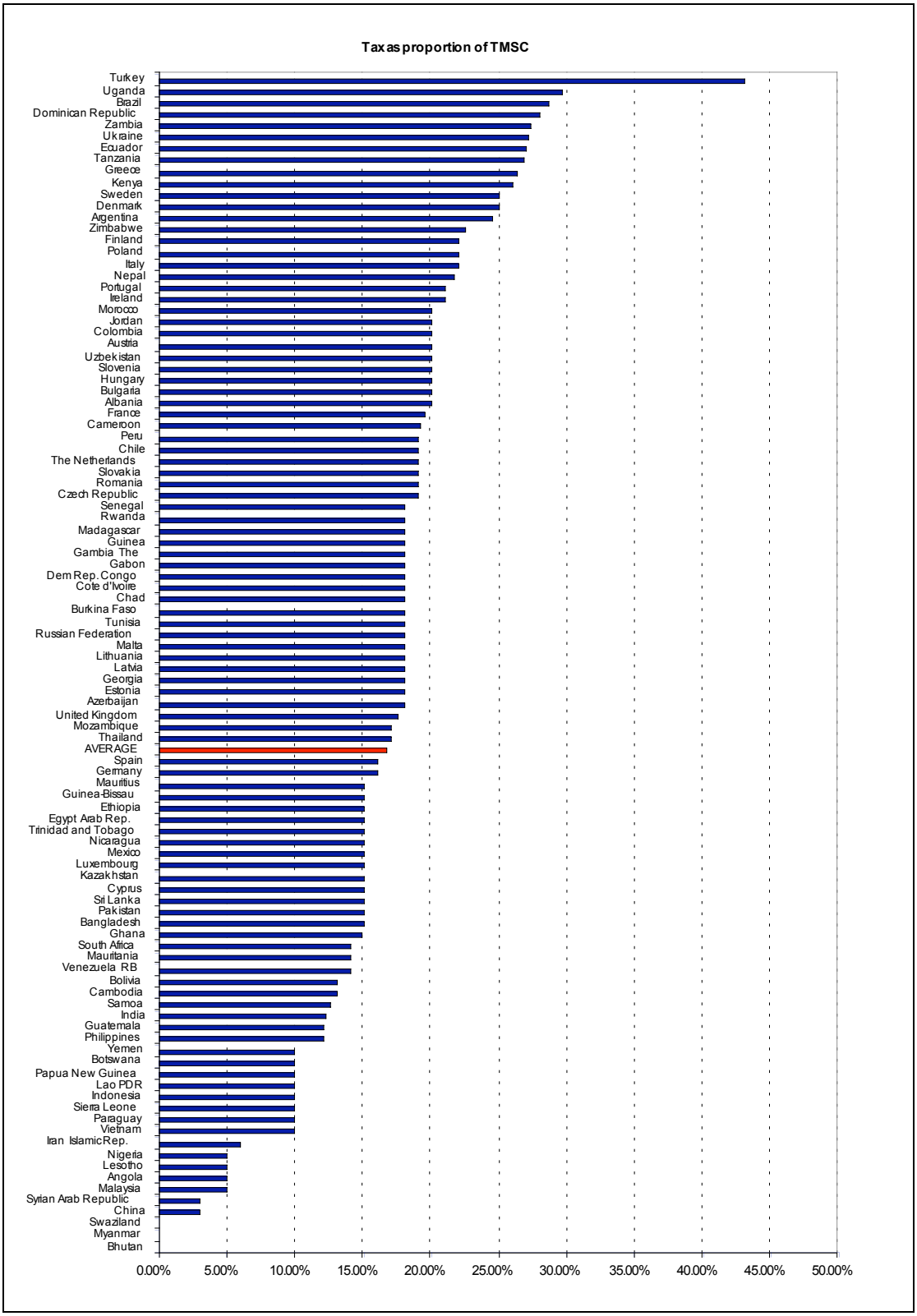
It may be argued that consumers are more sensitive to the cost of mobile services as the cost of handsets and connection are often discounted when they receive their service[4]. As such, this section provides a focus on the role of tax in relation to the total cost of mobile services (TCMS).

Taxes on mobile services account for a substantial portion of the overall tax burden on mobile phone ownership. These taxes include consumption taxes and any tax charges on mobile rental charges and usage:

- All the countries bar two (Bhutan and Swaziland) impose some form of VAT, general sales tax (GST) or similar taxes on mobile phone usage; and
- 74 countries of the countries considered impose rates between 10% and 20%, while 5 charge a VAT of 20% or above.

[4] Handsets are not, typically, subsidised in the Middle East and Africa.

Figure 9: Tax as percentage of Total Mobile Service Cost



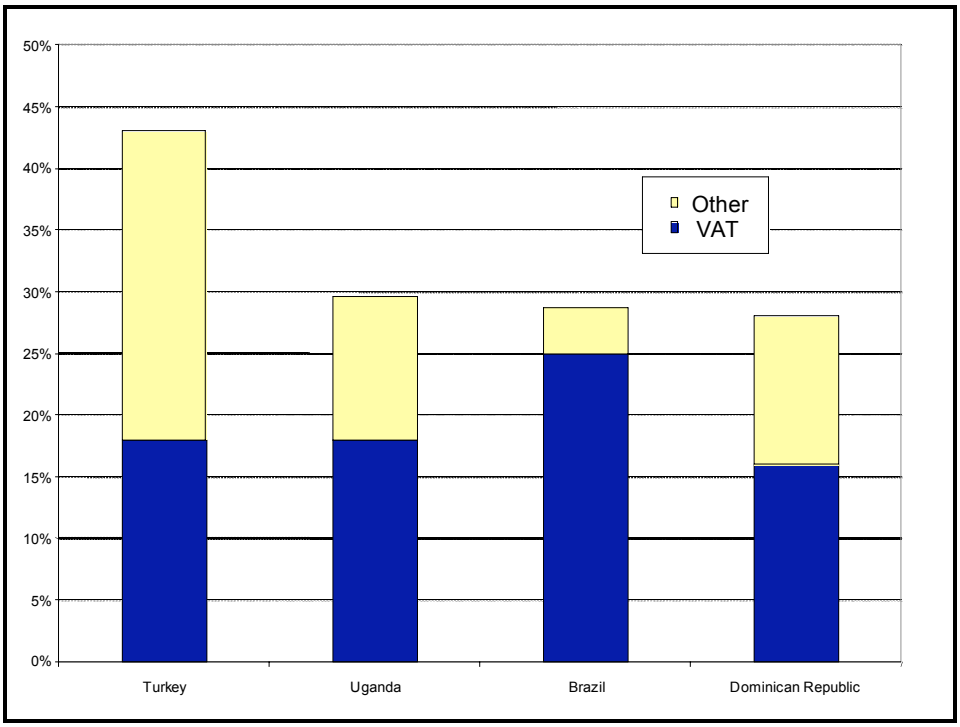
Source: Deloitte analysis based on Tarifica, Wireless Intelligence and Deloitte tax data

As with TCMO, Turkey has the highest taxes as a proportion of TCMS, a position unchanged from the 2005 report. Uganda, Brazil, Dominican Republic, Zambia and Ukraine are additional markets which have overall service taxes above 25%.

At the low end of the range are Angola, Malaysia, Syria and China, which all have VAT rates of 5% or less. The majority of Asia Pacific countries have VAT (or equivalent) tax rates that are lower than 10% and the least taxed jurisdictions are Myanmar and Bhutan.

The figure below shows the split of the burden of taxation as a percentage of the TCMS between VAT and other tax charges on mobile rental charges and usage.

Figure 10: Tax as proportion of TMSC, top 4 countries in the ranking



Source: Deloitte analysis based on Tarifica, Wireless Intelligence and Deloitte tax data

2.4 Taxes on Mobile Handsets

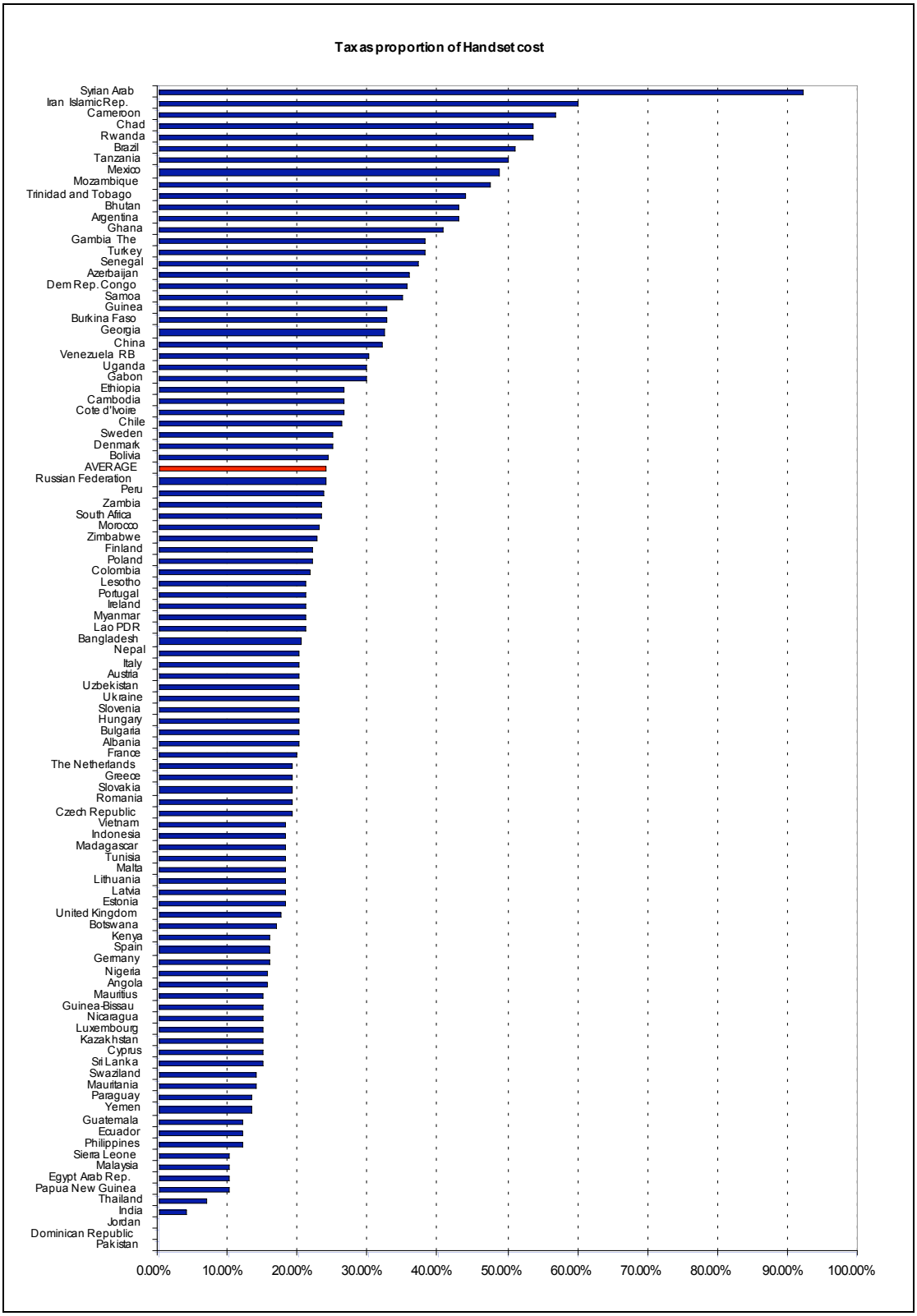
Taxes on mobile handsets are another significant component of the TCMO. Taxes on handsets typically consist of:

- Import duties, included already into the retail price of a handset; plus
- The sum of sales and VAT taxes and handling taxes which are paid directly by the consumer.

Investigation demonstrates that, for our sample:

- On average, tax accounts for 24.8% of total handset costs; and
- 45% of countries imposed import duties on handsets.

Figure 11: Tax as a percentage of handset cost

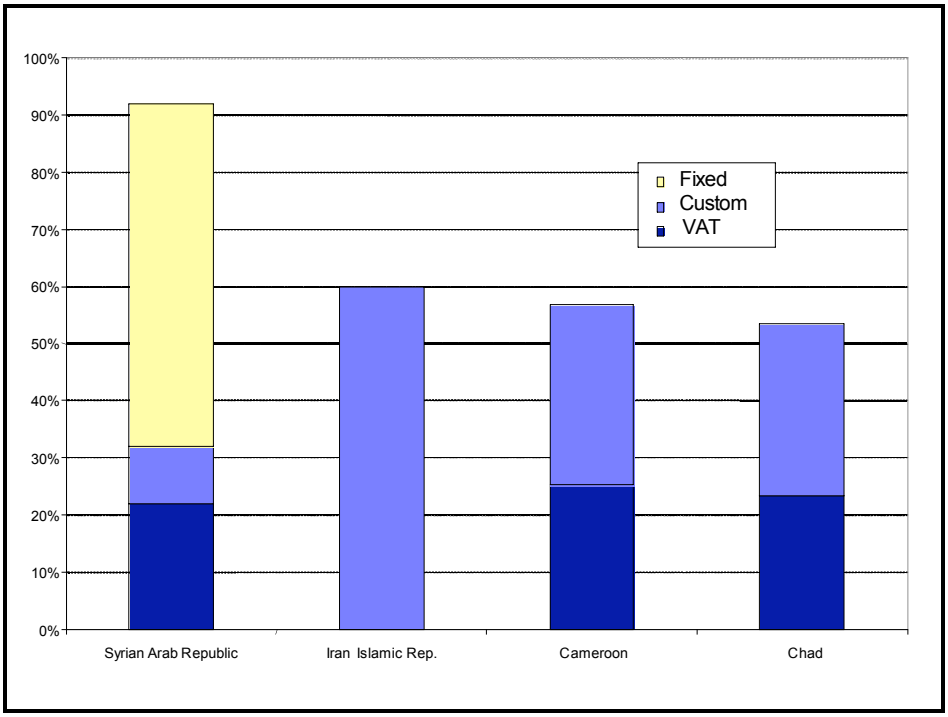


Source: Deloitte analysis based on Tarifica, Wireless Intelligence and Deloitte tax data

The jurisdictions with the highest tax as a proportion of total handset cost are Syria, Iran, Cameroon, Chad and Rwanda. Syria charges on average $24 in fixed taxes on top of 20% VAT and 10% custom duty (reduced from the previous rate of 45.6%). Iran's custom duties are 60%, by far the highest custom duties on mobile handset of

all the countries in our sample, whilst Cameroon has also some of the highest custom duty charges (32%), which are additional to a VAT rate of 19%.

Figure 12: Tax as a percentage of handset cost, selected countries



Source: Deloitte analysis based on Tarifica, Wireless Intelligence and Deloitte tax data

At the low end of the taxation spectrum are 17 jurisdictions, whose governments do not impose any non-recoverable taxes (such as customs duties) on the importation of mobile handsets. The majority of European jurisdictions have a zero-rate, as do countries such as Egypt, Madagascar, Pakistan, Thailand, Guatemala and Ukraine. The jurisdictions at the very bottom of the ranking are Philippines, Sierra Leone, Egypt and Papua New Guinea. None of these jurisdictions charge custom duties or fixed taxes on handsets and charge VAT between 10% and 12%. It should be noted that Kenya recently removed import taxes on handsets in June 2006.

2.5 Telecom specific taxes

Most countries do not impose specific taxes on mobile telephony, recognising that it is important not to discriminate against a sector of the economy that is recognised as a driver of economic growth. However, a minority of jurisdictions in our sample did levy such taxes which place a greater taxation burden on the telecommunications sector than the rest of the economy. Whilst mobile specific taxes are generally established for social purposes, they are generally regressive in nature in developing countries (proportionally more costly to poorer consumers) and hinder mobile take-up amongst the poorer sections of society and so often harm exactly those people that they are intended to aid. Examples of key mobile specific taxes are detailed below.

Figure 13: Telecoms specific taxes

Country	Telecommunications specific taxes
Tunisia	• 5% Telecom Royalties: mobile and fixed • 5% Telecoms Royalties: calculated on cost of handset plus VAT
Iran	• Fixed charges at subscription of: $4.44 for pre-pay / $135 for post-paid / $0.33 on fixed line. This comprises of subscription tax for pre-pay/post-paid and fixed line. In addition there is Rural Areas Development tax for post-paid
Jordan	• 4% special VAT due on telecoms services: charged on mobile and fixed
Turkey	• 25% Special communication tax - on overall usage and fees for mobile phones. Fixed telephony has a 15% rate of Special communication tax. • Fixed Taxes at subscription: $23.86 Wireless usage and new subscription special communication tax (mobile telephony only).
Bangladesh	• $11.76 Paid at subscription: mobile and fixed • $3 Fixed charge on import of mobile and fixed handsets
Nepal	• 10% Telephone services charges - paid on usage only. Not applicable to subscription and applies to both mobile and fixed • $20.15 Telephone ownership fee: fixed and mobile
Pakistan	• $8.30 Fixed activation charges: mobile only
Sri Lanka	• 2.5% Mobile Subscription Levy paid on total value of monthly charges: mobile and fixed
Dominican Republic	• 2% Communications development tax - paid on usage and subscription on mobile only
Venezuela	• $1.56-6.25 Subscription Tax on mobiles and fixed
Albania	• Post pay $59 / Prepay $7 / Fixed $146 : registration and subscription charges
Greece	• $1.92 - $5.75 Subscriber's special duty. Varies based on the monthly invoice total
Italy	• $6.82 Mobile specific stamp duty on bills issued. Applies only on post-paid services
Kenya	• 10% Telecommunications Tax on usage: fixed and mobile
Tanzania	• 7% Telecommunications Tax on usage: fixed and mobile
Uganda	• 12% Telecommunications Tax on usage: fixed and mobile

Source. Deloitte

2.6 Other tax related issues

2.6.1 Taxes on Mobile vs. Taxes on Fixed

While mobile is widely recognised as equivalent to fixed communications in terms of providing connectivity, there appear to still be significant difference in some countries in the tax treatment of these two communication platforms. 20 markets demonstrated lower taxes on fixed telephony, the key differences being as follows:

- A lower VAT rate or no VAT rate on fixed telephony services e.g. Senegal, Mauritania and Pakistan;

- Lower 'other taxes' due on fixed telephony, such as lower or no excise tax due on services e.g. Thailand, Kenya, Tanzania, Uganda, Zambia and Argentina; and
- Different levels of subscription / connection charges e.g. Albania.

The indirect tax burden with respect to mobile telephony appears to be less than that in the fixed line business only in India (higher rate of VAT on fixed telephony handset purchases) and Columbia (subscription tax for the installation of fixed telephony).

2.6.2 Corporate taxation

The focus of this study is on the impact of consumer taxes. However, governments clearly receive telecoms related revenues from corporation tax. Whilst this project has not sought to explicitly consider the impact of corporation tax, any reduction in consumer taxes on mobile handsets / services can be expected to lead to higher penetration / usage.

All countries in our study levy a corporate tax charge on telecoms profits. These rates were collected by Deloitte offices worldwide and are used to model the offsetting impact of corporation tax receipts. The following table provides a summary of the rates of corporation tax in our sample by region of the world.

Figure 14: Corporation tax in our sample, average rates by region

Region	Average corporate tax rate
Asia Pacific	31%
CEE	20%
EU15	28%
Latin America	24%
Maghreb and ME	29%
SubSaharan Africa	32%

Source. Deloitte

The lowest corporate tax rates are found, on average, in East European countries, with the highest rates in Sub Saharan Africa and Asia Pacific. This has an important and significant impact on the relative counterbalancing of the impacts of reductions in consumer taxes.

2.6.3 Licence fees

License fees are charged in many countries as a proportion of the revenue created under that licence. As such, it can have a similar counter balancing impact on total Government revenues (albeit often paid to the regulatory authority rather than directly to the Government) following a reduction in consumer taxation, i.e. increased penetration / usage leading to increased revenue from operation of the license.

Information on the percentage of revenue that is paid as a licence fee is often confidential and was not available for each country for this project. However, rates were provided by a leading global mobile operator and based upon this we have adopted an informed estimate for regulatory fees of:

- 2% in licence fees in EU15 countries; and
- 7.5% in developing countries.

3 Modelling the impact of alternative tax policies

3.1 Overall modelling approach

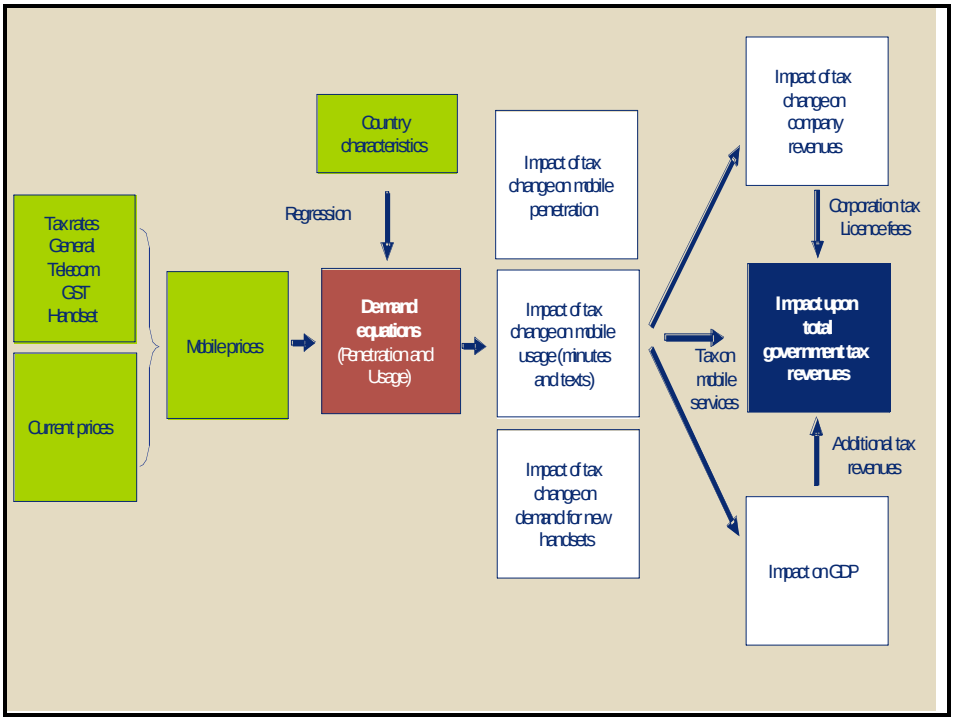
The previous section of this report demonstrated that both taxation rates and structures vary considerably across countries, but that they form a substantial portion of the cost of mobile ownership and usage.

The overall aim of this report is to quantitatively consider the impact of reducing / removing consumer and import taxes on mobile penetration and mobile usage. To achieve this we model:

- A reduction in the price charged to the end customer [5];
- The impact this change will have on mobile penetration and usage; and
- The subsequent impact on tax revenues and GDP.

The overall modelling approach adopted for this report is set out diagrammatically below.

Figure 15: Approach to modelling the impact of taxation changes



This model was constructed by Deloitte using taxation information collected by Deloitte practices internationally alongside market and forecast information from third parties. The economic modelling conducted as part of this project relies on a number of assumptions as to the development of markets, population levels and the continuation of existing economic relationships[6]. As with all such models the results

[5] Specifically, the following consumer and import taxes were included in our analysis: fixed taxes paid at the time of subscription for mobile users; fixed taxes paid after subscription for mobile users; traditional sales and variable taxes levied on mobile telephone use (e.g. VAT); telecom specific variable taxes levied on mobile usage; and fixed and variable taxes due on the importation and sale of mobile handsets e.g. VAT or customs duties.

[6] Our analysis depends significantly on data provided by third parties and that we have no responsibility for this, we have not reviewed or audited it in any way and that errors in this data would affect the outcomes/conclusions.

should therefore be regarded as indicative rather than definitive. All assumptions have been discussed with representatives of major mobile operators.

The model was estimated at the jurisdiction level for 101 jurisdictions across the world and then aggregated for presentational purposes. In order to compare the impact of various taxes:

- A base case scenario was created for all 101 jurisdictions, which projects for 5 years market development and tax revenue collection, assuming application of the current taxation structure. The jurisdictions included in the study are detailed below.[7]. External market projections and an econometric model are used to forecast penetration rates, population, GDP growth, mobile usage and handset sales; and
- All changes in penetration, handset sales, mobile usage and Government tax revenue collection are compared to a base case scenario and calculated for each period.

The initial basis of our model is that the decision of an individual to purchase a mobile handset and to demand mobile services is based upon the total cost of mobile ownership (TCMO). As such, the annual cost of mobile ownership can be expressed as:

$$TCMO = (H/3) + (C/3) + TCMU \qquad (1)$$

Where:

TCMO	Total Cost of Mobile Ownership
H	Cost of handset. It is assumed that handsets have a three year lifetime and are replaced at the end of that lifetime. The handset cost is therefore spread across the three years equally. This may be a conservative assumption, with the lifetime of a handset in many developed countries now believed to be below 2 years[8]
C	Connection fee. It is assumed that the connection fee mimics the lifetime of the handset and that the connection fee is spread across the three years equally. This assumption may be conservative. For post pay customers in developed markets this appears appropriate. However, the assumption may under reflect the churn in developing countries with a high pre pay market share although we have no basis for an alternative assumption
TCMU	Total cost of mobile usage. The TCMU is defined as twelve times the monthly rental, plus twelve times the monthly minutes times the rate, plus twelve times the monthly texts times the rate per text. The issue of free texts has been addressed as part of this construction

This framework is then used to consider the impact of changes to consumer taxes. A number of key assumptions were required to model the "direct" impact upon penetration, usage and government revenues from these consumer taxes, notably:

- Any reduction in the tax rate is fully reflected in prices faced by consumers[9];
- The reaction of the penetration and usage levels to a change in price is determined by the value of the elasticity of demands for usage and penetration (see below for details);

[7] The tax rates were collected by Deloitte member firms from across the Deloitte network.

[8] The analysis does not consider the impact on the black market due to a lack of available data. Discussions with handset vendors suggest that a significant proportion of new handsets come from black market sources, suggesting that this estimate would provide a potential overstatement of the total impact on handset sales. For example, in many African countries with import taxes black market handsets are regarded as the norm by operators. However, no reliable data was available on this issue.

[9] This assumes note the competitive nature of international mobile markets and simplifies to the point where no additional tax revenue is kept as producer surplus. Relaxation of this assumption would reduce the positive impact of any taxation changes.

- Total penetration is capped at 130% and can never increase beyond this point as this is taken as representing market saturation; and
- Total mobile usage is assumed to increase by the number of new subscribers multiplied by the average number of minutes per subscriber. It is assumed that average minutes of use will remain constant over the next 5 years in the base case assumption[10].

The change in penetration and usage levels drive the direct change in government revenue that results from a change in consumer taxes. However, this reduction in consumer taxes is, at least, partly offset by an increase in corporation tax and licence fee revenues that result from the high penetration and usage. Modelling this impact of this "indirect" impact required the following additional key assumptions:

- An assumed profit margin on new revenue was multiplied by the country specific corporate tax rate to provide the increase in corporate tax[11]; and
- Multiplying the additional revenue by the assumed license fee percentage provided the increase in the licence fee rate[12].

Finally, the relationship between mobile penetration, economic activity and hence GDP is considered via an econometric calculation of the "growth" impact before inputting it into the model. This is discussed below.

One final simplifying assumption was required to allow the comparison of different scenarios: all tax change measures are introduced in early 2006[13].

3.2 Usage and penetration elasticities

Core to the approach outlined above is the need to estimate the impact of changes in process caused by a reduction in taxation on the demand for mobile services. There are two key relationships that, jointly, need consideration:

- Demand for new connections, i.e. how penetration is affected by price of access both in terms of handsets and usage; and
- Demand for usage, i.e. how minutes of use is linked to the price charged for the call.

The following key sources of data were used to model these relationships:

- Mobile usage prices. Tarifica provided call and text rates by destination, connection and rental prices for nearly all operators in each jurisdiction. An average cost per minute was calculated using average tariffs across call plans for all operators in each jurisdiction. The calculated average cost per minute required several further assumptions including the proportion of calls by destination[14]. For countries for which data was not available a regional average of each of a selection of tariffs (on-net, off-net, fixed and

[10] This reflects two contrasting trends. Firstly, new subscribers are more likely to be prepaid and will therefore drive usage down. At the same time, in a number of countries with higher penetration levels the minutes of use have started to grow over the last two years due to steep price declines and fixed mobile substitution. Average usage in these markets is expected to continue to grow during the forecast period.

[11] The assumed profit before tax (PBT) was based on actual information from a leading worldwide mobile operator. PBT is set at the following levels in each region of the world: Asia Pacific (26%); EU 15 (28%); CEE (41%); Sub Saharan Africa (46%); Latin America (46%) and Margreb and ME (67%)

[12] A simplifying assumption was required to model license and related fees as this information is not publicly available for many markets. We assume that these fees are 2.5% of revenue in the EU 15, and 7.5% elsewhere. These assumptions are based on the views of a leading worldwide mobile operator.

[13] In reality different budgetary processes would clearly apply internationally.

[14] Assumptions were required on the proportion of calls going to on-net, off-net, fixed and international numbers. These assumptions have been made on a regional basis, on the basis of data provided by a leading worldwide mobile operator

international, for both the pre and post pay platforms) was adopted. Finally, an allowance was made to allow for the provision of free texts as part of a bundle offered to consumers;

- Penetration. Wireless Intelligence provided data for the number of pre and post pay connections by jurisdiction. The number of connections was divided by population, taken from the World Bank database, to obtain penetration. Forecasts were then developed for penetration until 2010 based on market intelligence and a statistical forecasting model;
- Usage. Wireless Intelligence provided data for usage for pre and post paid, both separately and as an average. Pyramid Research provided similar average usage data for a number of additional countries. Average usage was split between pre and post pay platforms and where no data was available a regional average was used; and
- Handset prices. An international survey was conducted in 2004 and 2005. Initially, a regional average change in price was calculated, based on those countries for which data from both years was available. This change was then applied to countries for which 2004 data was available. For countries where no data was available, a regional average from 2005 data was used.

We sought to estimate subscription and usage elasticities at the market level, i.e. through combining data for individual operators in each jurisdiction[15].

The analysis indicated that there is a linear relationship between the price of handset and the level of penetration in the different countries[16].

Figure 16: Regression results for the level of penetration

	Dependent variable: Number of connections divided by
Explanatory variables	**Coefficient**	**t-statistic**
Handsets adjusted for purchasing power parity	-0.0006	3.22
Percentage of population that is urban	0.0044	3.68
GDP per capita	00.0093	2.16

Source. Deloitte

In particular, the statistically significant linear relationship between handset prices, adjusted for purchasing power parity, and mobile penetration. The estimated linear relationship suggests that the elasticity will:

- Differ between jurisdictions;
- Increase with the increase in price of the handset; and
- Decrease with the growth in penetration.

The following figure uses the results for Ghana to demonstrate the procedure through which elasticity estimates on the relationship between the price of handsets and penetration are calculated.

Figure 16: Calculation of the relationship between the price of handsets and penetration, example for Ghana

[15] This approach appears consistent with that adopted in the previous GSMA "Tax and the Digital Divide" report

[16] The impact was statistically significant at the 5% level and passed the standard econometric diagnostic tests. In the 2006 report no significant elasticity was identified. For ease of presentation a statistically significant constant and regional dummy variables are not reported

	Factor	Result
A	Regression co-efficient for Ghana	-0.00064
B	Handset price for Ghana adjusted for PPP ratio	302
C	Penetration rate for Ghana	0.126
D	Eventual elasticity impact, calculated as (A*B) / C	-1.53

Source. Deloitte

However, it was not possible to collect data for handset prices for every country and as such regional averages were assumed for the countries for which data was not available. Given this simplification, we believe that the data has greater integrity at the regional level and therefore we have chosen to adopt regional averages of the elasticities calculated. This provided the following elasticities, which whilst more consistent still show some considerable variation across the regions of the world.

Figure 17: Penetration elasticity by region

Region	Elasticity
Asia Pacific	-1.42
CEE	-0.46
EU15	-0.04
Latin America	-0.16
Maghreb and ME	-0.83
Sub Saharan Africa	-2.44

Source. Deloitte

In most cases the results reflect a-priori expectations as to the relative elasticity, except Latin America where the results are lower than may have been expected[17].

For usage no statistically significant relationship with penetration was apparent within our data. However, the data available was only available as a one year cross section. It was concluded that the data was insufficient to allow a full investigation of this impact which is better estimated on a time series. As such, the elasticity estimated in the previous GSMA Digital Divide (2005) report of -0.5 was adopted. This elasticity is held consistent for all countries.

Finally, the two elasticities are then combined based on a weighting calculated based on the regional relative share of the TCMO.

For the model of minutes of use we identified an isoelastic relationship, i.e. a relationship characterised by constant elasticity[18], between usage and the cost per minute.

Figure 18: Regression results explaining minutes of use

	Dependent variable: log (average minutes of use per year)	
Explanatory variables	**Coefficient**	**t-statistic**
GDP per capita	0.17	2.13
Total penetration	0.12	0.88
Average cost of usage per minute	-0.72	6.14

Source. Deloitte

[17] Further investigation of the results for this region suggested the relatively low elasticity was a factor of low handset costs reported and PPP values.

[18] The impact was statistically significant at the 5% level and passed the standard econometric diagnostic tests. For ease of presentation a significant positive constant is not reported

Finally, it is noted that in none of the above regressions was it possible to identify a statistically significant difference in the coefficients for pre- paid and post-paid. As such, total penetration and average minutes of use across pre and post pay platforms have been applied.

3.3 Mobile communications and GDP

The penetration of telecommunications has been found to have a significant positive impact on growth[19]. Mobile penetration in particular, being easier and cheaper to supply than fixed telephony, can be expected to play a crucial role in the economic growth of African and other developing countries.

In order to consider this issue for our sample, the specification of Waverman et al (2005) [20] was adopted to estimate a model in averages over 24 years[21] for two groups:

- Developing countries (57 developing countries from our data set from SubSahran Africa, Latin America, Maghreb and ME and Asia Pacific); and
- A fuller data set including higher GDP capita countries from the EU 15 and CEE.

A statistically positive relation between average GDP per capita growth and mobile penetration was found in both cases[22].

Figure 19: Regression results explaining average GDP growth

Explanatory variables	Dependent variable: average GDP growth			
	Developing country set		Full data set	
	Coefficient	t-statistic	Coefficient	t-statistic
Average mobile penetration per 1,000 people	0.0012	2.42	0.00069	2.62
Average investment as a percentage of GDP	0.00208	5.78	0.00204	5.77
Literacy rate at the beginning of the period	-0.00011	-0.96	-0.00160	1.79
GDP per capita at the beginning of the period	-0.0036	-2.15	-0.00215	1.52

Source. Deloitte

The result of the developing country set was applied to developing countries (SubSahran Africa, Latin America, Maghreb and ME and Asia Pacific). For this

[19] Waverman L., Meschi M., Fuss M., (2005), "The Impact of Telecoms on Economic Growth in Developing Countries", *Africa: The Impact of Mobile Phones*, The Vodafone Policy Paper Series, Number 2, find a 10% increase in penetration leads to a 0.6% increase in GDP. Further evidence is available from Sridhar K.S. and Sridhar V., (2004), "Telecommunications Infrastructure and Economic Growth: Evidence from Developing Countries", available at http://ideas.repec.org

[20] Following Waverman et al. (2005) we have estimated a growth model following the Endogenous Growth approach. This is a cross-section estimation of the relation between average GDP per capita growth over a period of time (1980 to 2003 in our case, as in Waverman at al. (2005)) and the initial level of GDP per capita, literacy rate at the beginning of the period as proxy for initial human capital, average investment as a proportion of GDP and average mobile phone penetration.

[21] The choice of a model in averages is driven by the fact that mobile penetration is expected to have an impact on long term economic growth, rather than year-to-year growth. However, similar results are found when the regression is estimated using a panel data approach

[22] The results reported pass standard econometric diagnostic tests. For ease of presentation, a significant constant term is omitted.

group, a 10% increase in mobile penetration leads to a 1.2% increase in GDP. As there was insufficient data to allow a separate developed country regression, the full data set results were applied to the EU 15 and the CEE, i.e. a 10% increase in mobile penetration leads to a 0.6% increase in GDP [23].

Whilst not considered in this report, a further positive impact of the mobile industry is the additional value add created by the mobile communications industry across the economy. This is, where measured, captured by multiplier that captures expenditure in subsequent rounds. The following figure shows the values of multipliers that have been calculated in other studies.

[23] This may potentially overstate the results for developed countries and results should be interpreted considering this point.

Figure 20: Various multiplier benchmark studies

Title of study	Multiplier
The contribution of mobile phones to the UK economy, 02 for ONS	1.13
Ovum studies on economic impact of mobile telephony in Bangladesh and USA based on review of various other studies*	1.6
Association Française des Opérateurs Mobiles *	1.7
Economic impact of spectrum use in the UK, Europe economics, based on ONS	1.1
Sicrana, R., and de Bonis, R.: "The Multiplier Effects of Telecommunications Investments on Economic Growth and Restructuring**	1.5
Radio authority, UK 1995, Economic impact of radio	1.4

*Notes. * On employment, ** On GDP*

These results suggest a range of 1.1 to 1.7 may exist, i.e. the value added created by network operators and other parts of the value chain is multiplied by this number to capture the total impact of this expenditure. It is not possible to include this factor for this study as:

- No information has been collected on value added created by mobile operators or their value chain in each jurisdiction; and
- Leakages from the economy in each jurisdiction will vary, i.e. differing levels of imports.

As such, it is important to note that the estimates included in this study are likely to be an underestimate of the total impact of the mobile sector.

3.4 Jurisdictions included in the study

The following table identifies all jurisdictions included within this study. Our country list makes up about 83% of the global population. The final selection of countries was determined by data availability.

Figure 21: Jurisdictions within the study

Sub Saharan Africa	Maghreb and ME	Latin America	Asia Pacific	CEE	EU15
Angola	Egypt Arab Rep.	Argentina	Bangladesh	Albania	Austria
Botswana	Iran Islamic Rep.	Bolivia	Bhutan	Azerbaijan	Denmark
Burkina Faso	Jordan	Brazil	Cambodia	Bulgaria	Finland
Cameroon	Mauritania	Chile	China	Cyprus	France
Chad	Morocco	Colombia	India	Czech Republic	Germany
Cote d'Ivoire	Syrian Arab Republic	Dominica	Indonesia	Estonia	Greece
Dem Rep. Congo	Tunisia	Ecuador	Lao PDR	Georgia	Ireland
Ethiopia	Yemen	Guatemala	Malaysia	Hungary	Italy
Gabon		Mexico	Myanmar	Kazakhstan	Luxembourg
Gambia The		Nicaragua	Nepal	Latvia	Portugal
Ghana		Paraguay	Pakistan	Lithuania	Spain
Guinea		Peru	Papua New Guinea	Malta	Sweden
Guinea-Bissau		Trinidad and Tobago	Philippines	Poland	Netherlands
Kenya		Venezuela RB	Samoa	Romania	United Kingdom
Lesotho			Sri Lanka	Russian Federation	
Madagascar			Thailand	Slovakia	
Mauritius			Vietnam	Slovenia	
Mozambique				Turkey	
Nigeria				Ukraine	
Rwanda				Uzbekistan	
Senegal					
Seychelles					
Sierra Leone					
South Africa					
Sudan					
Swaziland					
Tanzania					
Uganda					
Zambia					
Zimbabwe					

4 Impact of tax changes on the mobile sector and Government revenues

4.1 Overall approach

This section reports results from using the methodological framework discussed above to investigate the impact of changing various taxes on the take up / usage of mobile technology and thereafter Government revenues. In particular, the report considers the impact of:

- Reducing telecommunications specific taxes, i.e. those which place a burden on the telecommunications sector over and above the remainder of the economy; and
- Reducing general VAT / GST (hereafter VAT) and customs / related taxes which, typically, apply to telecommunications services in the same manner as other goods across the economy. Whilst these taxes also apply to much of the remainder of each jurisdiction's economies, these scenarios only reduce taxation on the mobile sector as it is a key driver of economic growth.

All tax reductions are based on a proportional reduction of 10% of the prior year tax rate or level in order to allow effective comparison of impacts across jurisdictions. The alternative would have been to reduce the total VAT rate by an arbitrary number, say 1%[24], which would have lead to dramatically different impacts countries / regions with the differing rates. For each scenario the report:

- Estimates the impacts upon penetration, usage, handset sales and Government tax receipts using the approach outlined above; and
- Compares the results to the base forecast for 2006-10.

4.2 Base forecasts

The sample of 101 jurisdictions has an aggregate population of 5.6 billion, which represents 84% of the worldwide population. In order to compare the impact of various taxes, a base case scenario was created for all 101 markets, which projects market development and tax revenue collection for the next five years, assuming a constant tax structure.

The base case scenario projects real market developments in all jurisdictions, alongside a number of assumptions used to forecast mobile penetration rates, usage and handset sales as documented above.

As noted above, these forecasts are indicative and based on Deloitte analysis using the above methodology and data collected by Deloitte international practices, third party data and assumptions. All assumptions have been discussed with representatives of major mobile operators.

4.3 Removing all telecommunications specific taxes

This section considers a scenario where mobile services and equipment are treated, from a taxation perspective, comparably to other goods and services across the economies of our sample. In order to represent this, the report estimates the impacts of removing all telecom specific taxes whilst leaving VAT and custom / related duties

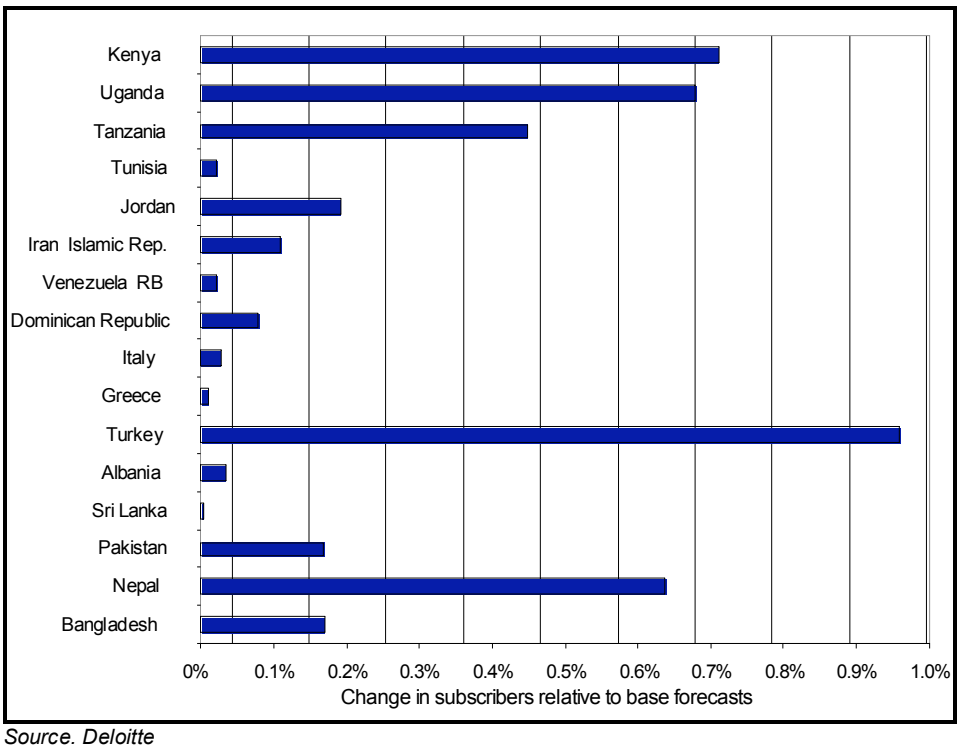
[24] As adopted in the GSMA (2005) Tax and the Digital Divide. For example, VAT is 3% in China and 17.5% in the UK. A 10% reduction in the rate charged would lead to a 0.3% reduction in China and 1.75% in the UK. The alternative approach of a 1% overall cut would lead to 33.3% reduction in VAT in China and a 5.7% cut in VAT in the UK

unchanged. Of the sample, 16 jurisdictions had at least some telecoms specific taxes, which are discussed above.

4.3.1 Impact of tax changes on penetration, handset sales and usage

Analysis suggests that changes to mobile specific taxation can have a significant impact on penetration. The following figure shows the percentage increase in subscribers in 2010 from the base forecast by reducing such mobile specific taxes to 90% of their prior year value.

Figure 21: Percentage change in subscribers from base case in 2010 following the removal of telecoms specific taxes



Source. Deloitte

The level of impact is driven by the size of the mobile specific taxation burden and the impact upon the TCMO through the various elasticities discussed above. Turkey has the highest impact, reflecting its reliance on mobile specific taxation. Also of note are the high impacts on penetration in East Africa, where the countries impose excise duties on mobile usage.

It is assumed that new subscribers will purchase a new handset in both the year of purchase and every three years thereafter. As such, the new cohort in 2006 will also purchase a new handset in 2009, and the new cohort in 2007 will purchase a new handset in 2010. The model therefore suggests that the removal of all mobile specific taxes will also have a significant effect on handset sales over the five year period, and that this will be broadly double the percentage impact on penetration.

4.3.2 Impact of tax changes on Government revenues

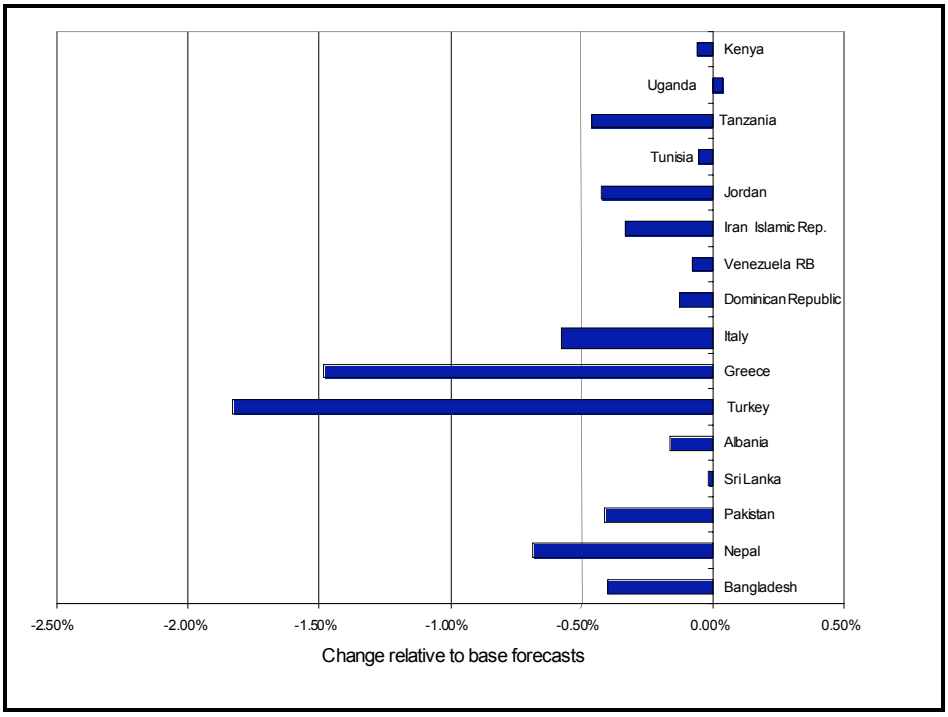
The approach adopted to model the impact of tax changes on Government revenues has been described in some detail above. The key conclusion from the investigation is that in 14 of the 16 countries, the impact of reducing mobile specific taxes to 90% of their prior level leads to a loss of taxation revenue relative to the base case forecasts of less than 0.6% and in many cases considerably less. This result is driven by the positive impacts of indirect impacts of higher penetration / usage

(notably additional corporation tax) and the growth caused to the remainder of the economy as a result of higher penetration.

In only three countries would the model suggest a higher adverse impact of reducing mobile specific taxation to be felt:

- Turkey, where the relative importance of mobile specific taxation is large relative to other economy wide taxes (VAT and corporate tax). The net impact of this is that economy wide taxes will never be able to counter balance the lost direct taxation revenue[25]. It may be argued that taxation models that are inherently biased towards particular sources of revenue may have inefficient allocation properties and as such run the risk of misleading investment decisions across the economy; and
- Greece, where there is limited increase in penetration to counter balance the loss of direct taxation revenue. This is due to the model capping penetration growth in response to reductions in taxation, as these markets are assumed to have reached a saturation level before 2010.

Figure 22: Percentage change in government revenues from base case in 2010 following the removal of telecoms specific taxes



Source. Deloitte

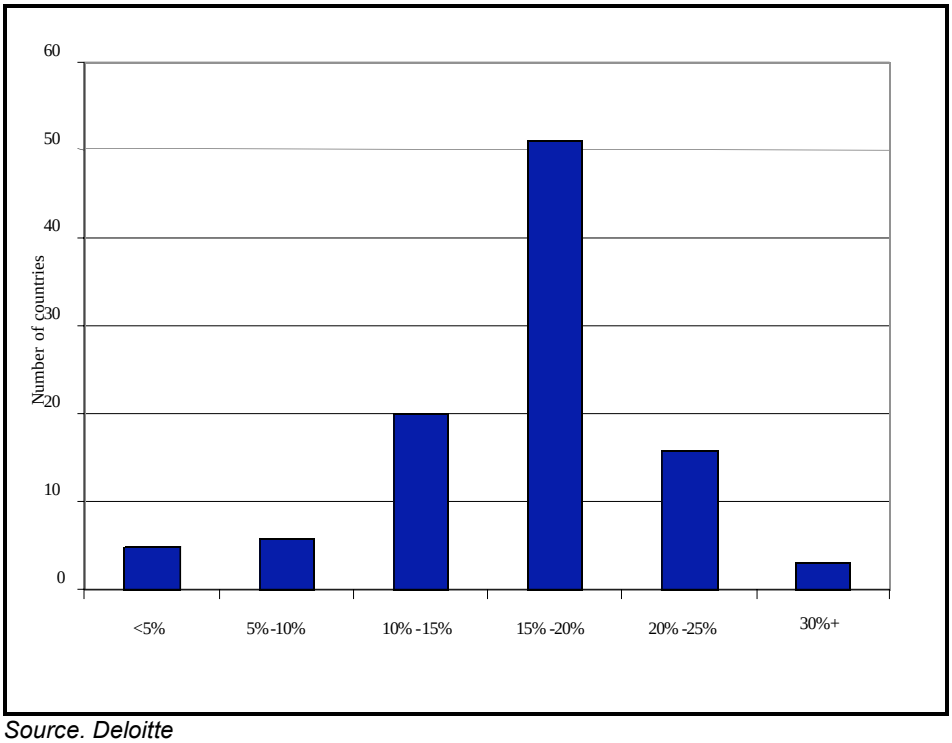
4.4 Reducing sales taxes

This section of the study considers a scenario where indirect taxation in the form of VAT on mobile services and handsets are reduced. All jurisdictions within the sample had imposed some form of VAT on mobile operators. There are nineteen jurisdictions for which VAT on handset and services differ, a similar pattern exists for VAT on handsets[26]. The majority of jurisdictions within our sample have a VAT between 15-20%, although some considerable variation is apparent.

25 It may be that additional latent demand and a higher economic impact exist for Turkey than can allowed for in a multi national model

26 Six jurisdictions have a higher VAT rate on handsets than services and thirteen have a higher rate of services than handsets.

Figure 23: Levels of VAT on services across sample, frequency by group



Source. Deloitte

Given this variation in rates investigation of the impact of reducing VAT is conducted by reducing rates to 90% of their prior year value, i.e. a 10% reduction of the current rate in each jurisdiction. This scenario also assumes that this reduction in VAT rates is only made on mobile usage and handsets and that VAT rates for the remainder of the economy remain constant.

4.4.1 Impact of tax changes on penetration, handset sales and usage

The results suggest that reducing VAT to 90% of its prior year value in each jurisdiction would have a significant impact on penetration relative to our base case, but that this impact varies significantly across regions of the world. These results primarily reflect the elasticity impacts discussed above and hence the fundamental nature of the markets themselves[27].

Dennis Knowles - Partner and Indirect Tax TMT Leader, Deloitte & Touche LLP

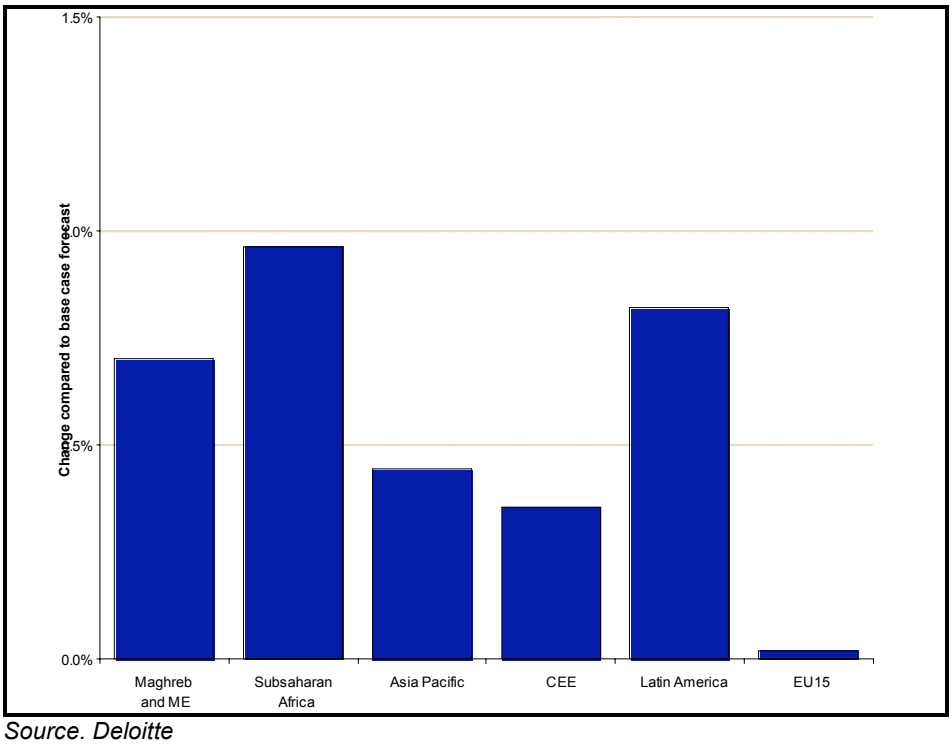
In an ideal global market, VAT (which also encompasses sales tax and GST) should not be a material cost component of roaming charges. Transactions between Telco's internationally should not attract VAT and should only be taxable where the customer, private or business, belongs. This survey demonstrates that many emerging economies charge VAT to Telco's outside their own country which is often not recoverable. This, therefore, increases the cost of roaming and arguably does not mean that VAT accrues to the country of consumption.

The OECD has a technical working group looking at the future of international services generally. It is likely to recommend that no VAT should be charged internationally between businesses, unless the services fall with a limited number of exceptions. It can only be hoped that once the OECD has finalised its deliberations that countries follow the international trading model which should reduce the overall

[27] Many of the EU 15 and several of the CEE jurisdictions reach our assumed level of market saturation and, as such, no further penetration growth is allowed

cost of roaming and reducing much of the administration caused by charging VAT internationally.

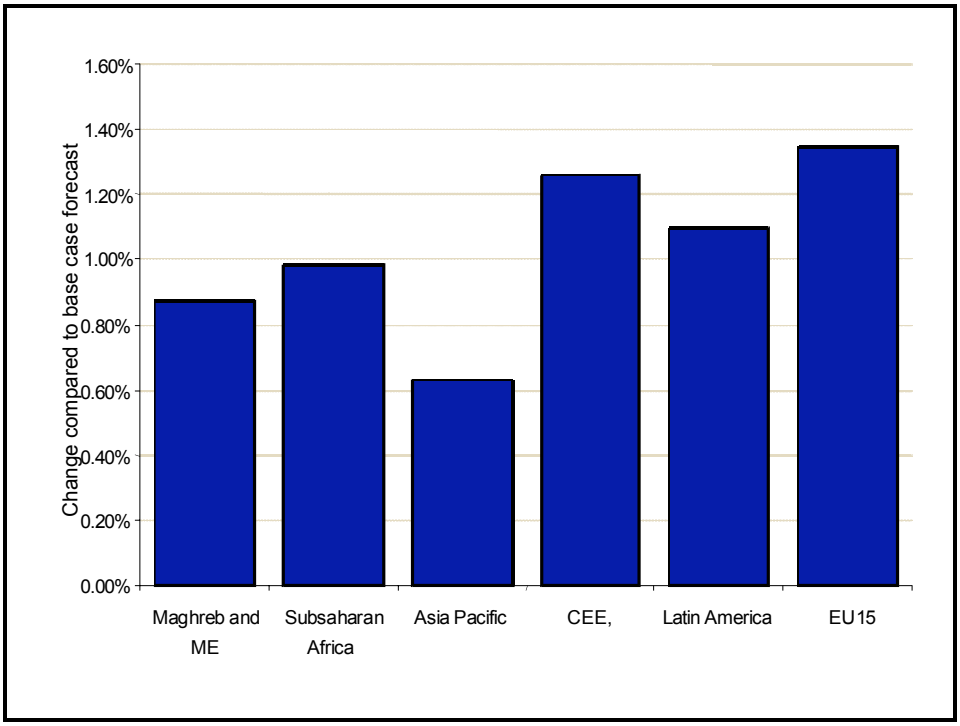
Figure 24: Percentage change in subscribers from base case in 2010 following a 10% reduction in the value of VAT on usage and handset sales



Source. Deloitte

In terms of impact on handset sales over the five year period, the same relationship holds as discussed above. Average minutes of use vary, with the scale of increases reflecting differences in VAT rates internationally, where Asia Pacific has the lowest average rates.

Figure 25: Percentage change in minutes of use in 2010 following a 10% reduction in the value of VAT on usage



Source. Deloitte

4.4.2 Impact of tax changes on Government revenues

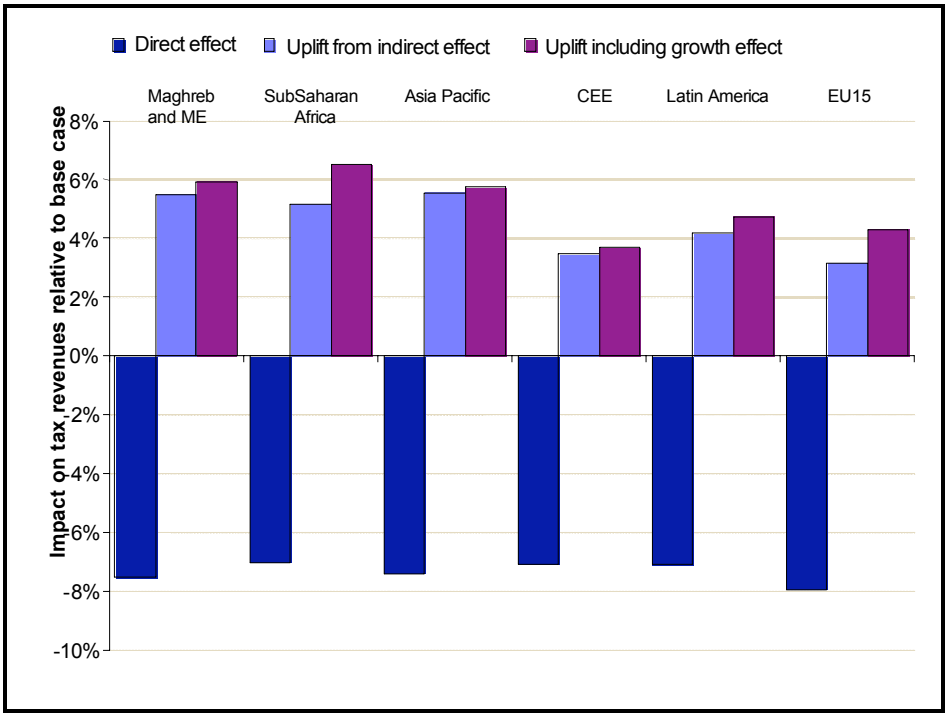
The approach follows the same approach for direct, indirect and growth impacts as noted above:

- The direct impact of reducing mobile specific taxes upon Government revenues, i.e. the foregone revenue;
- Adding the indirect impact of greater usage and penetration on corporate revenue / VAT and hence corporation tax and regulatory fees; and
- Adding the growth impact of greater economic activity on corporation tax revenues.

The results suggest that reducing VAT on mobile usage and handset sales only leads to limited reduction in Government revenue vis-à-vis the base case forecast. The model suggests a total impact of between 1-3%, depending upon region of the world, after allowing for the indirect and growth impacts. The indirect and growth impacts have a substantial impact upon this result, counterbalancing a direct impact of c.7% vis-a-vis Government revenues in the base case forecast.

There is some variance in the results obtained between regions of the world, mainly reflecting the different levels of additional penetration created by reducing VAT.

Figure 26: Percentage change in government revenues from base case in 2010 following a 10% reduction in the value of VAT on usage and handset sales

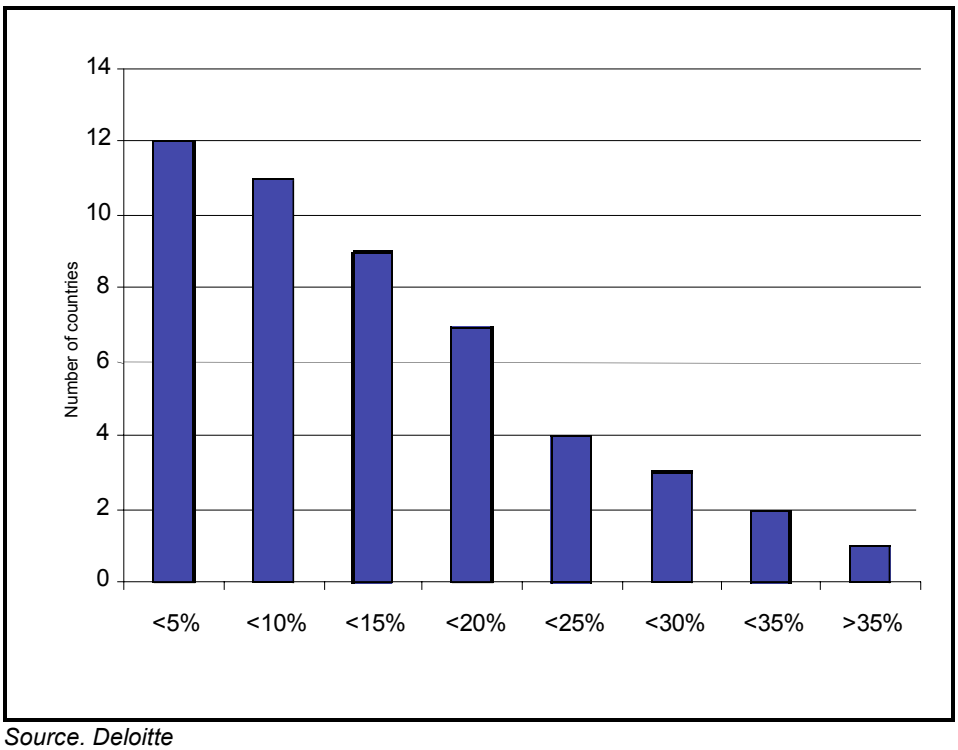


Source. Deloitte

4.5 Reducing general customs taxes

This section of the study considers a scenario where general customs and related taxes are reduced to 90% of their prior year value. Of the sample of 202 jurisdictions, 46 had a customs tax on handsets.

Figure 27: Levels of customs tax across sample, frequency by group



Source. Deloitte

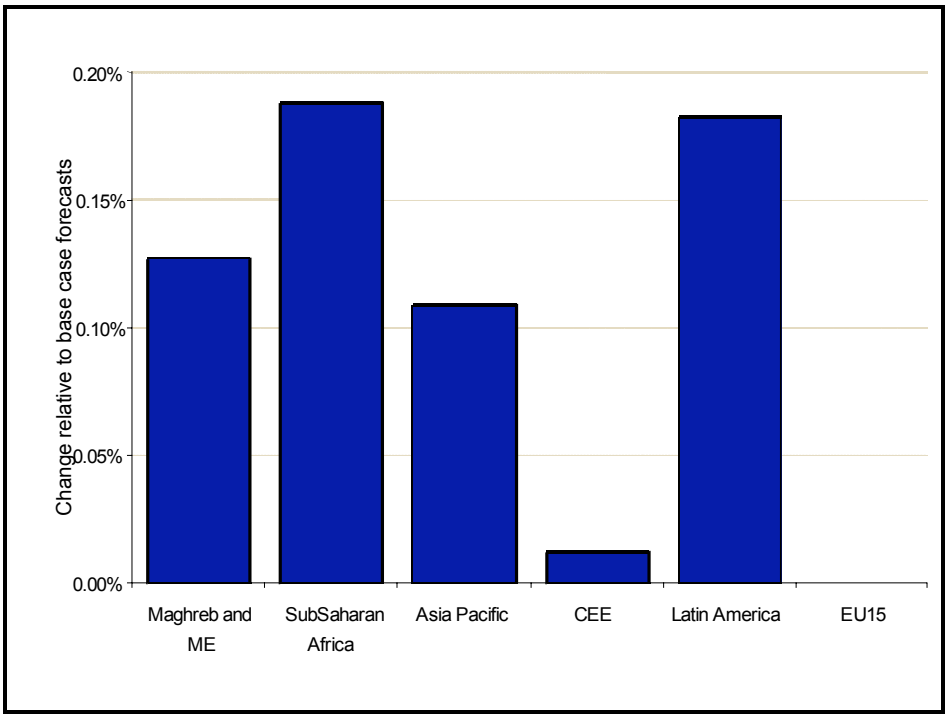
The customs tax rates levied varied considerably across jurisdictions and are demonstrated in the above figure, which demonstrates a long tail in the taxation rate, i.e. Iran has a customs rate of 60%.

As with VAT, it has been assumed that customs taxes are only charged on the importation of mobile handsets and they remain unchanged in other sectors of the economy.

4.5.1 Impact of tax changes on penetration, handset sales and usage

The following figure considers the impact of reducing customs charges on handset sales, which is proportionate to the change in penetration.

Figure 28: Percentage change in handset sales 2006-2010 following a 10% reduction in the value of customs tax



Source. Deloitte

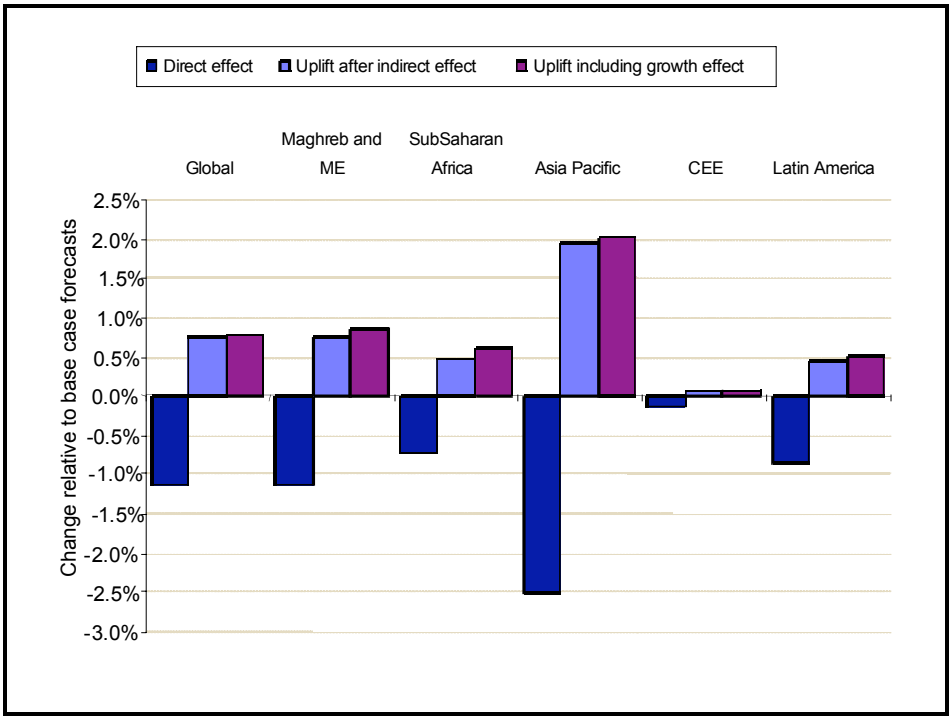
It is noted that:

- The suggested impact of a reduction of 10% of the rate of customs taxes is significantly lower than that recorded for VAT, as these taxes only apply to handset costs and not services. Handset costs only form 8.6% of the TCMO on average; and
- Regional differences are quite clear, reflecting the high levels of customs taxes across Sub Sahran Africa and Latin America, and the lack of such taxes in other regions such as the EU.

4.5.2 Impact of tax changes on Government revenues

The impact on Government taxation revenues follows the same approach for direct, indirect and growth impacts as noted above. The key conclusion suggested by the model is that reducing customs taxes by 1% of their current value has a slightly negative impact upon Government revenues. However, within this impact, there are larger negative direct impacts counterbalanced in the main by the indirect and growth impacts.

Figure 29: Percentage change in government revenues from base case in 2010 following a 10% reduction in the value of customs tax



Source. Deloitte

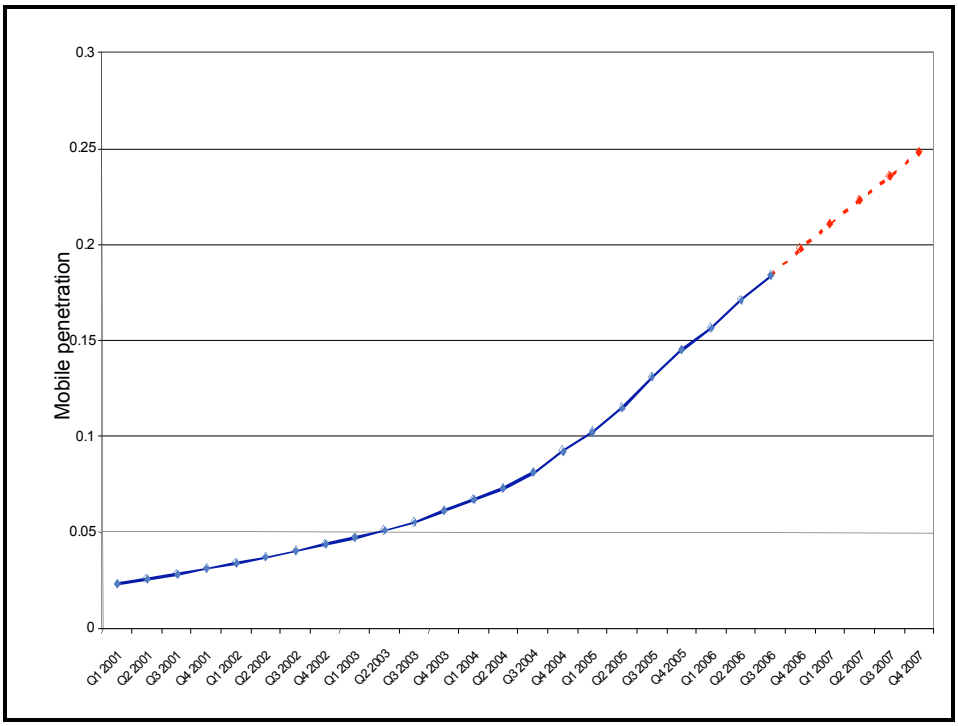
5 Africa

5.1 Summarised market overview

This study included 35 jurisdictions across Africa, who had a total population of about 600m accounting for more than 80% of the region's total population.

The penetration rate in these jurisdictions is the lowest of all the regions analysed in this study. However, penetration has increased dramatically in the past year and at the end of 2005 the mobile subscriber base in these jurisdictions was c.84m. The following figure shows the rapid increases that have been recorded and are forecast for the near future.

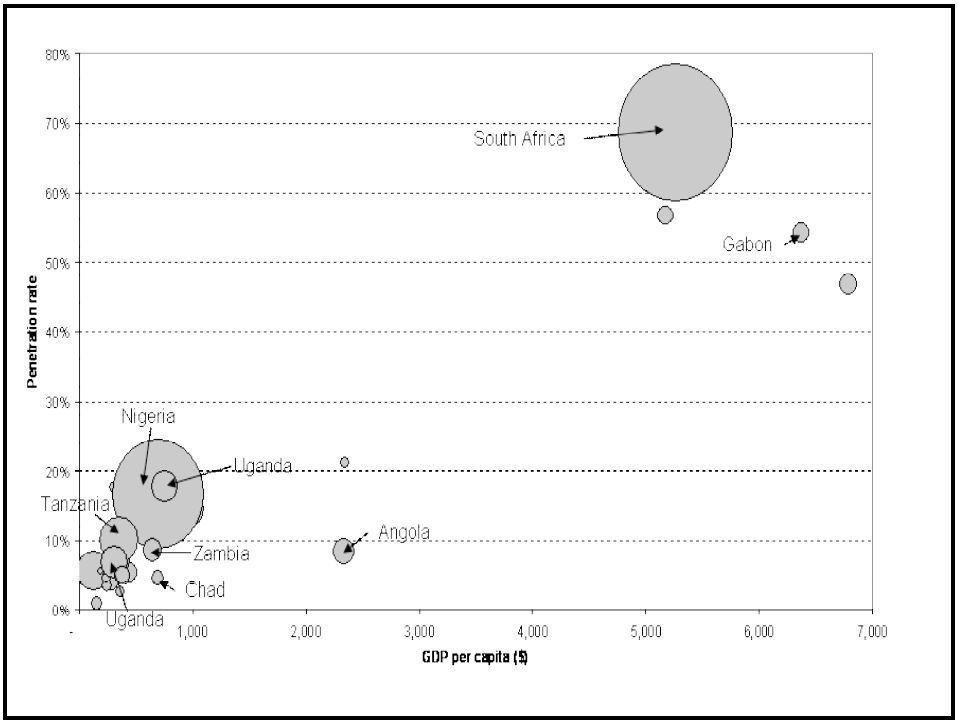
Figure 30: Average penetration rates in African sample markets



Source: Wireless Intelligence

There are large variations in penetration rates across the region, with a high correlation between GDP per capita and penetration rates. For example, penetration in South Africa now stands at almost 60% whilst in Zambia penetration is less than 10%.

Figure 31: Penetration and GDP per capita for selected African markets, 2005[28]



Source: Deloitte analysis based on Wireless Intelligence and the World Bank database

The average monthly minutes of use per person is only just over 60 minutes across the region. However, this result varies considerably across the region with Kenya having the highest usage and the Democratic Republic of Congo the lowest at c. 30 minutes of usage per user per month.

Mobile tariffs in the region are notable for two conclusions:

- Whilst tariffs are the second lowest in the sample, tariffs are lower in Asia Pacific, despite the lower ability to pay in Africa; and
- The difference between pre-pay and post-pay call charges is far less pronounced in Africa than in the other areas. This reflects the strong proportion of prepaid customers in the sample, more than 90%, and the role of prepaid mobile as the source of universal service in Africa.

5.2 Taxation regime

The 35 African jurisdictions in this sample have an average GDP of around $19b and 26 markets have GDP below the sample average and are reflected in the mobile penetration across the region. However, these conditions provide the greatest potential for a reduction in taxation. The elasticity of demand is estimated to be higher in Africa than elsewhere, reflecting the potential for further marginal consumers, and hence to increase penetration greatly by a reduction in the TCMO. Any such increase in penetration is also magnified through the growth impact across the economy.

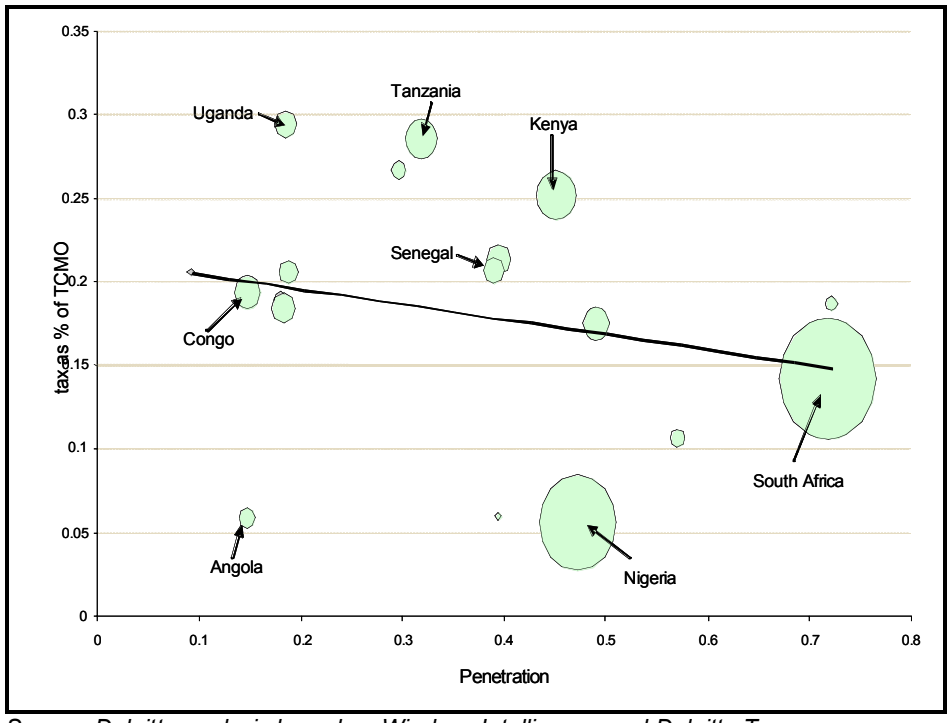
Although the average tax burden on mobile ownership in the region is 17.2%, slightly lower than the global average, the tax regime in Africa varies considerably from country to country. Of the 16 jurisdictions in out sample that charge some sort of

[28] The size of circles in this (and subsequent similar) figures represent the number of connections for a jurisdiction divided by the average number of connections for the region

telecom specific taxes, 3 are in SubSaharan Africa: the East African jurisdictions (Kenya, Tanzania and Uganda all impose an excise tax on usage at varying rates.

This is also reflected in the proportion of tax in the TCMO, where the East African jurisdictions are at the top of this comparison.

Figure 32: Tax share in TCMO and penetration



Source: Deloitte analysis based on Wireless Intelligence and Deloitte Tax

There have been some changes in taxation levels that impact mobile operators since the GSMA 2005 study on this issue, with taxation increases in:

- Tanzania: Excise duty on services / use has increased from 5% to 7%; and
- Ghana: An additional national insurance levy due on the import of handsets of 2.5% has been introduced.

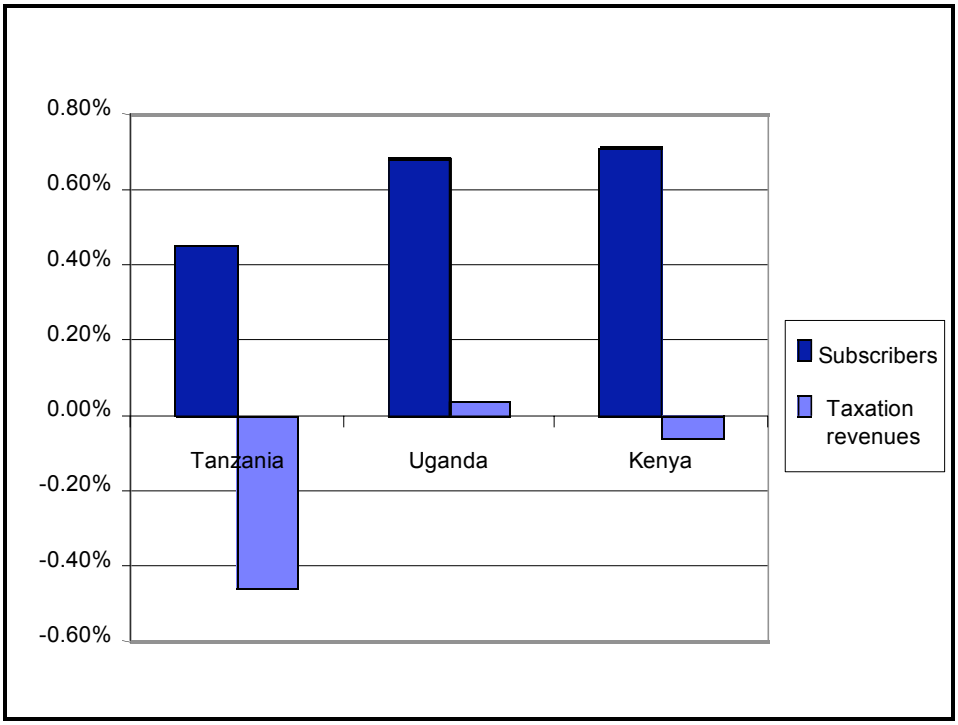
There have, however, been some reductions in mobile specific taxes in the region within the last year:

- Uganda: Customs duties due on handsets have fallen from 25% to 10%; and
- Kenya: After 3 years of lobbying by operators, the government gradually reduced the 10% custom tax on handset and since June 2006 handsets have been made exempt to import taxes. This decisions was made was in recognition of the importance of the price of a handset in the mobile take-up decision

5.3 Reducing mobile specific taxes

The following figure summarises the overall effects of the removal of all mobile specific taxes on penetration and tax revenues in the 3countries that levy such taxes. The results suggest that reducing such taxes would have a positive impact upon subscribers and only a marginally negative impact upon overall Government taxation revenues.

Figure 33: Overall impact by 2010 of reducing mobile specific taxes for SubSahran African countries with those taxes to 90% of current level



Source: Deloitte

Mr Phuthuma Nhleko, Group President and Chief Executive Officer - MTN Group Limited

Are there particular taxes your company faces that differ from those paid by fixed line operators, the mobile industry in other countries, or companies in other parts of the economy?

For corporate taxes and transactional taxes like customs duties and VAT, generally no, although the manner in which the laws governing these taxes is applied is not always in line with internationally accepted best practice. The license fees in some territories are imposed in the form of a revenue share, which is similar to a tax, as these funds are paid to governments or their agencies. Some countries also impose an excise tax on the sale of airtime.

To what extent do you believe that taxes lead to lower mobile ownership or reduce mobile usage?

I do not believe that taxes on handsets generally lead to lower mobile ownership as handsets tend to be subsidized in one form or another. What is clear, however, is that the absence of a specific tax on the industry or its products will lead to higher levels of usage by consumers, as consumer's disposable income levels tend to be limited. The more expensive calls are, the less calls will be made, the less revenue is earned and the more future growth becomes limited.

In countries where taxation levels are above average, would setting them at 'standard' levels increase penetration and usage to such an extent that it would have the potential to make the impact revenue neutral or positive for governments over time?

Possibly, but this has to be balanced against other relief that the governments sometimes give, such as tax holidays, customs duty relief and accelerated or enhanced depreciation allowances.

Do the national governments of your operating jurisdictions understand the total economic impact of the mobile industry on the national economy and factor this into the design of any prohibitive taxation structures for the sector?

Other than the revenue share and excise duties imposed in some jurisdictions, we are not aware of any prohibitive structure that is imposed on the industry in any of our operating jurisdictions. Where the revenue share due to the local government is high, it may be accompanied by a compensating measure like a lower corporate tax rate or a tax holiday, or perhaps some customs duty relief.

Are there any particular issues in relation to taxation on mobile operators in general, or your operations in particular, that you would like to highlight?

With respect to transactional taxes like VAT, governments should be encouraged to follow internationally accepted best practice in their VAT legislation and enforcement. It would also be encouraging if governments followed the OECD guidelines on withholding tax on payments to non-residents – only withholding tax if the amount in question is sourced in the country from which the payment is made, and not on a blanket basis where all payments to non-residents are subject to a withholding tax.

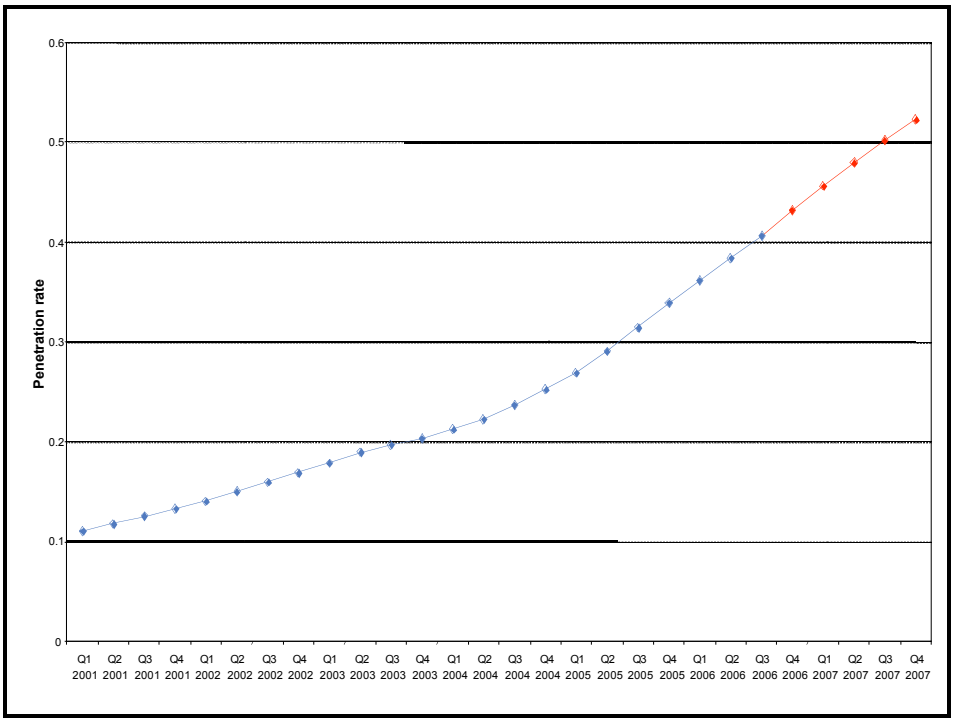
It would also benefit the industry tremendously if foreign governments were rewarded by external funding bodies (i.e. the IMF) to negotiate double taxation agreements. These agreements clarify each government's taxing right with respect to a cross border transaction that may take place between two taxpayers situated in each country.

6 Magreb and the Middle East

6.1 Summarised market overview

This study included 5 Middle Eastern jurisdictions and a further 3 from Magreb. Together, these countries have a population of 238m. The average penetration rate in the region is 38%, although this does vary within the region. The following figure shows the increases in penetration in the region over recent years and a forecast or continued steady growth.

Figure 34: Average penetration rates in Middle Eastern and Magreb sample markets

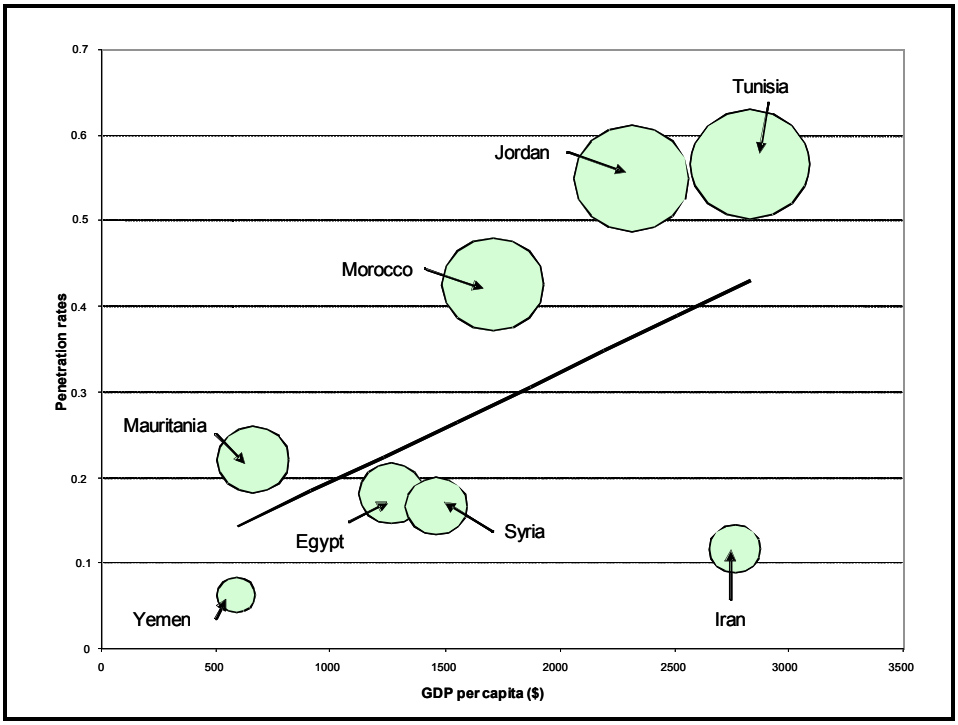


Source: Wireless Intelligence

Penetration in the region, however, varies considerably. For example, in 2005 Jordan and Tunisia had a penetration rate of 53% and 67% respectively, while other countries such as Yemen and Iran still display very low penetration rates of around 10%[29]. As is internationally the case, the relationship between penetration and GDP per capita is very strong.

[29] Forecasts for these markets, such as those from Wireless Intellegence, suggest that penetration is expected to growth much faster in Jordan and Tunisia than in the other countries in the sample. For example, Jordan is estimated to have reached a penetration rate of 85% by the end of 2006.

Figure 35: Penetration and GDP per capita for selected Maghreb and Middle East markets, 2005



Source: Deloitte analysis based on Wireless Intelligence and the World Bank database

6.2 Taxation Regime

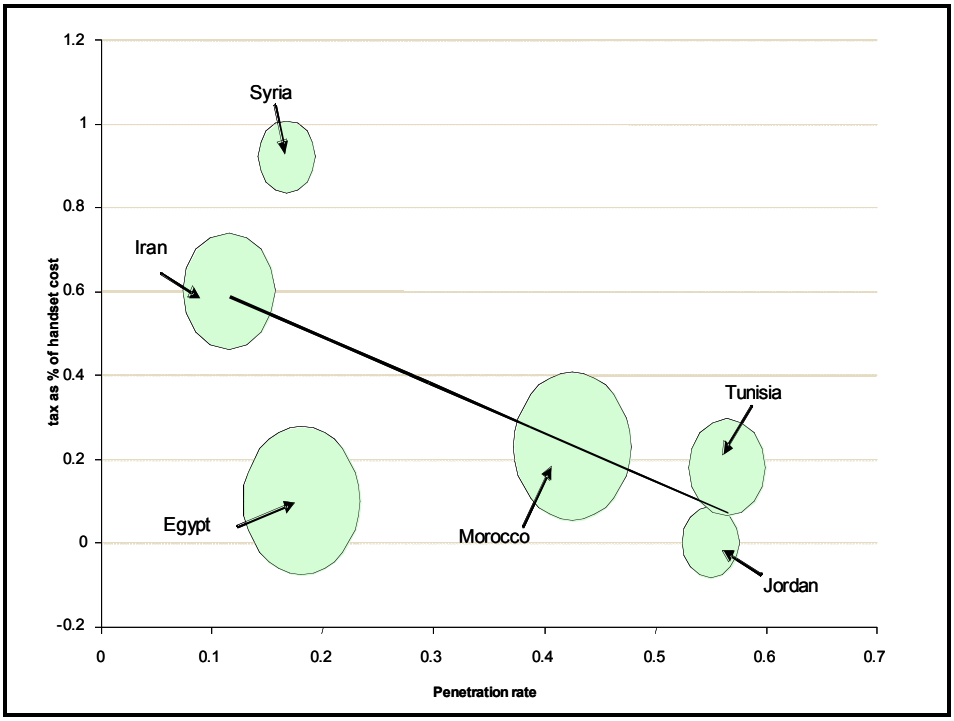
The structure of the taxation regime imposed on mobile services and handsets in the countries in this region differs from the remainder of the sample.

Whilst none of the countries in the Maghreb and Middle East region have a high tax as a proportion of TCMO, the two countries with the highest proportion of tax in the cost of handset are:

- Syria: total tax burden of c.90% due to the fixed tax which is imposed on top of VAT and custom duties; and
- Iran: total tax burden of c.60% due to the highest level of custom duties (60%) within our total sample.

The following figure shows the relation between mobile penetration and tax burden on the total cost of handset in this region, showing a strong negative relationship.

Figure 36: Tax share in TCMO and penetration



Source: Deloitte analysis based on Wireless Intelligence and Deloitte Tax

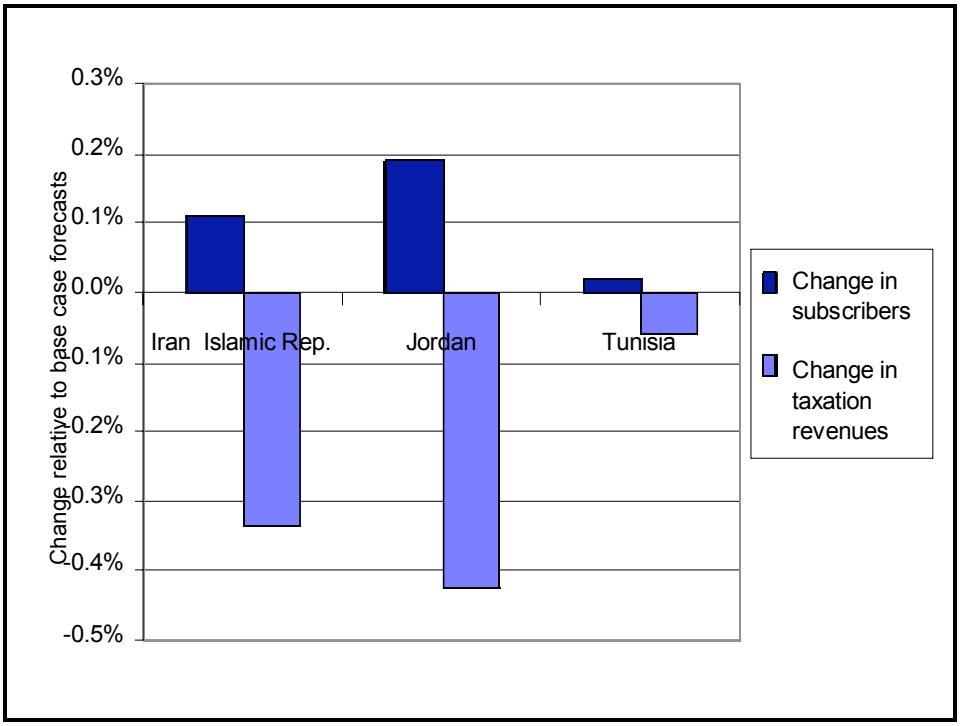
Syria and Iran are also the only two countries in this region which have changed their mobile related taxation regime since the GSMA 2005 study on this issue:

- Iran: Customs duties on the import of handsets have increased from 4% to 60%; and
- Syria: Customs duties due on handsets have fallen from 45.59% to 10%.

6.3 Reducing mobile specific taxes

The following figure summarises the overall effects of reducing mobile specific taxes to 90% of their current level in the 3 jurisdictions that levy such taxes. The results suggest that a reduction of such taxes would have a positive impact upon penetration relative to the base case forecasts and that the loss in tax revenue is limited.

Figure 37: Overall impact by 2010 of reducing mobile specific taxes for Magreb and Middle Eastern jurisdictions with those taxes to 90% of current level



Source: Deloitte

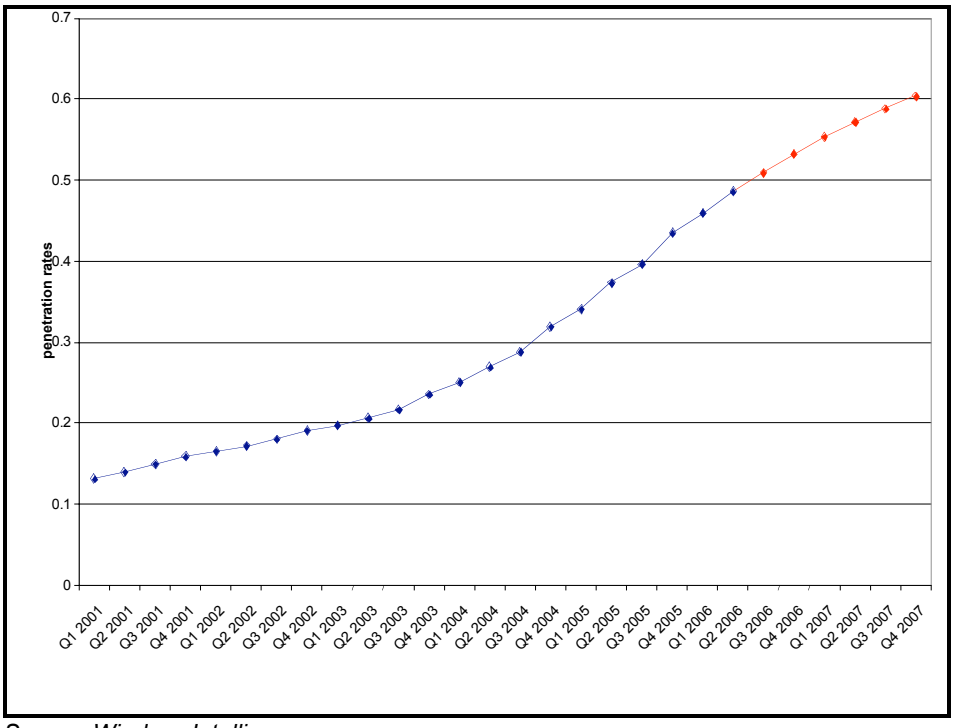
7 Latin America

7.1 Summary market overview

In this study we have analysed 14 countries from the Latin America region, with a total population of 508m, representing over 90% of the total population of the region. The subscriber base in this area is around 230m.

The average penetration for our sample is 30%, one of the lower regions in the study. Forecasts from Wireless Intelligence suggest that penetration in the region may slow down on average in the next year.

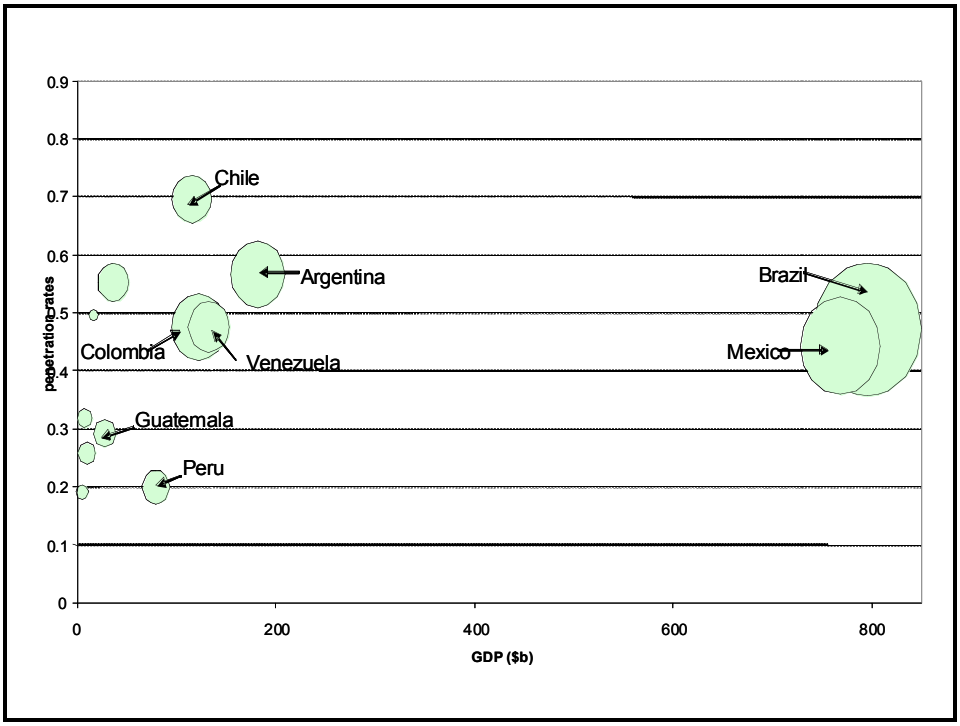
Figure 38: Average penetration rates in Latin American sample markets



Source: Wireless Intelligence

There is considerable variation in penetration across the sample, with Chile having a penetration rate of over 60% and Nicaragua and Peru being nearer 15%. Interestingly, there is little evidence of a relationship between GDP and penetration, unlike with the most regions within the sample.

Figure 39: Penetration and GDP for selected Latin American markets, 2005



Source: Deloitte analysis based on Wireless Intelligence and the World Bank database

Average pre tax tariffs in this region are relatively high compared with other countries with similar penetration and macroeconomic characteristics. Prepay dominates in all Latin American markets although post pay is stronger in a majority of countries, including Argentina and Chile.

7.2 Taxation regime

The average burden of taxation in the total cost of mobile ownership in the region is 19%, just above the global average. However, there is considerable variation in rates across the region. For example, Brazil and Argentina are among the ten countries with the highest tax as proportion of TCMO, while other jurisdictions, e.g. Guatemala, rank well below the global average.

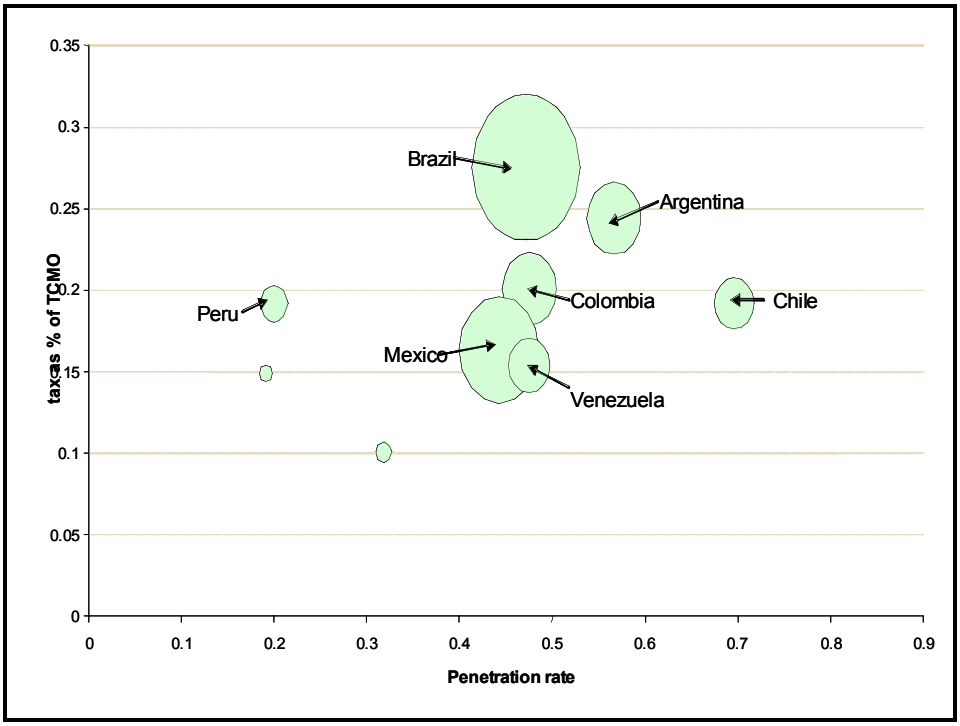
The results for handsets are particularly of note:

- The tax burden on handsets in Brazil and Mexico are among the ten countries with the highest tax costs imposed on handsets; and
- Handset prices in Latin America are among the lowest in our sample of countries.

These two findings combine to suggest that even though the proportion of tax in the total cost of handset is considerable, the handset itself forms a smaller proportion of the TCMO[30]. Interestingly, the Latin American countries in our sample do not demonstrate any relationship between tax as a percentage of TCMO and penetration, as per the majority of regions in this study.

[30] This, together with the elasticity impact identified above, is one of the main determinants of the relatively low impact on penetration of reducing taxation

Figure 40: Tax share in TCMO and penetration



Source: Deloitte analysis based on Wireless Intelligence and Deloitte Tax

Several Latin American jurisdictions have lowered the mobile specific taxes since the GSMA 2005 study on this issue:

- Venezuela: VAT on services has decreased from 15% to 14%;
- Brazil: Customs duties on import of handsets have decreased from 20% to 16%; and
- Mexico: “General Import duties" have fallen from 15% to 0% on the import of handsets.

María del Rosario Guerra de la Espriella - Ministra de Comunicaciones, Colombia

How successful has mobile communications been in Colombia, and how does taxation affect the mobile industry?

Mobile penetration has been growing due to greater competition from the entrance of a third mobile operator—Colombia Movil (OLA, now called TIGO) in January 2003. This generated a very steep increase in subscriber growth between 2003 and 2006, reaching almost 70% market penetration by the end of September 2006.

Mobile telephony in Colombia has not benefited from special reductions in the tax system. On the contrary, mobile communications is considered a luxury good and has a special VAT rate of 20%, compared to common goods and services which are charged at 16%. These four percentage points are used to support sports and culture in Colombia. As yet, the government has not introduced any specific tax-reducing measure for the mobile industry.

What impact would you expect a reduction in mobile taxes to have on Government taxation revenue over time?

Taking into account data for 2005, mobile telephony revenues have been US $2340 million based on 21.8 million users and an average ARPU of US $9 per month, with total VAT collection of US $390 million (equivalent to 0.32% of the GDP). If we had reduced VAT to 16% during 2006, keeping the same ARPU levels, we could have seen VAT collection of US $431 million, equivalent to 0.33% of the GDP reported as of September 2006.

In general terms, therefore, a VAT rate reduction could have kept constant the sector's level of collection as a % of the GDP.

Does the Government regard mobile penetration and usage as a driver of economic development across the economy as a whole?

It is this administration's vision to generate a massive mobile telephony expansion, as stated in the IT Government Plan for 2006-2010 with the slogan "Every Colombian connected and informed".

In light of the fact that teledensity and infrastructure development levels are very high, the Colombian Government considers that mobile telephony is a fundamental driving force to access the Society of Information. To that end, the Ministry of Communications of Colombia is planning to have 90% geographical mobile coverage over the 1098 municipalities that are part of the national territory. This could be the best alternative to connecting country villages that are far away from high-populated areas and promote universal service policies.

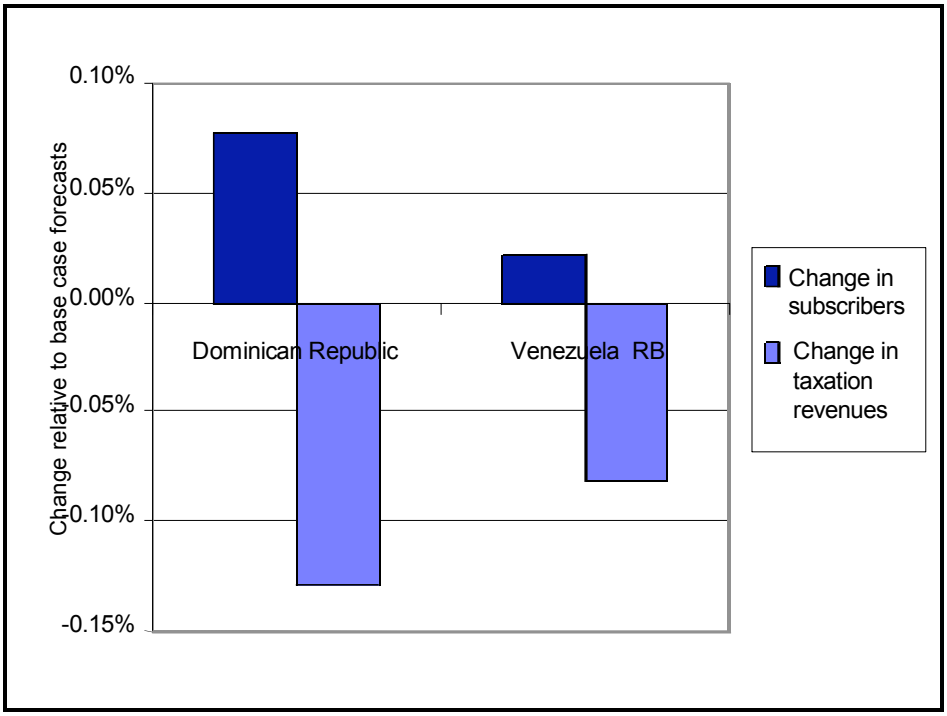
Would you encourage other countries to reduce mobile specific taxations?

As mobile telephony reaches higher levels of market penetration, the service becomes a very important instrument for spreading IT and consolidating the Information Society. Once this is recognised by a government as a means to reduce the digital divide, it could be appropriate to consider the reduction of certain specific taxes that can favour access conditions to this service. Today in Colombia, because of its high level of use and penetration, mobile telephony is now a basic consumer good, but it is taxed as a luxury good.

7.3 Reducing mobile specific taxes

Of the 16 countries in our sample that impose mobile specific taxation, 2 of them are in Latin America. The following figure summarises the overall effects of reducing mobile specific taxes to 90% of their current level. The suggested impact on penetration is positive, but limited by the relatively low penetration on handsets (see section 3), whilst the impact on overall government revenues is only mildly negative.

Figure 41: Overall impact by 2010 of reducing mobile specific taxes for Latin American jurisdictions with those taxes to 90% of current level



Source: Deloitte

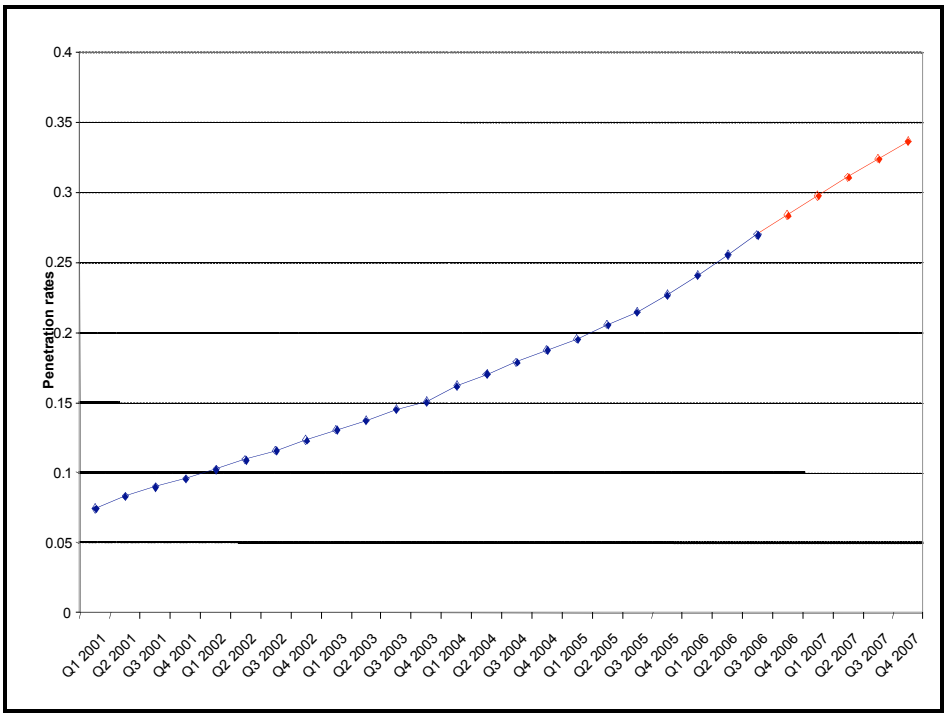
8 Asia Pacific

8.1 Summary market overview

In this study we have analysed 17 countries from the Asia Pacific region, with an overall population of 3.3 billion, equivalent to 50% of the world population. The mobile subscriber base of our sample of countries is low at 14%, only 3% higher than in Subsaharan Africa.

The figure below shows the historical and forecasted average penetration rate for the region. The recent growth path for this region is more stable than other developing country regions and is forecast to remain so in the near future.

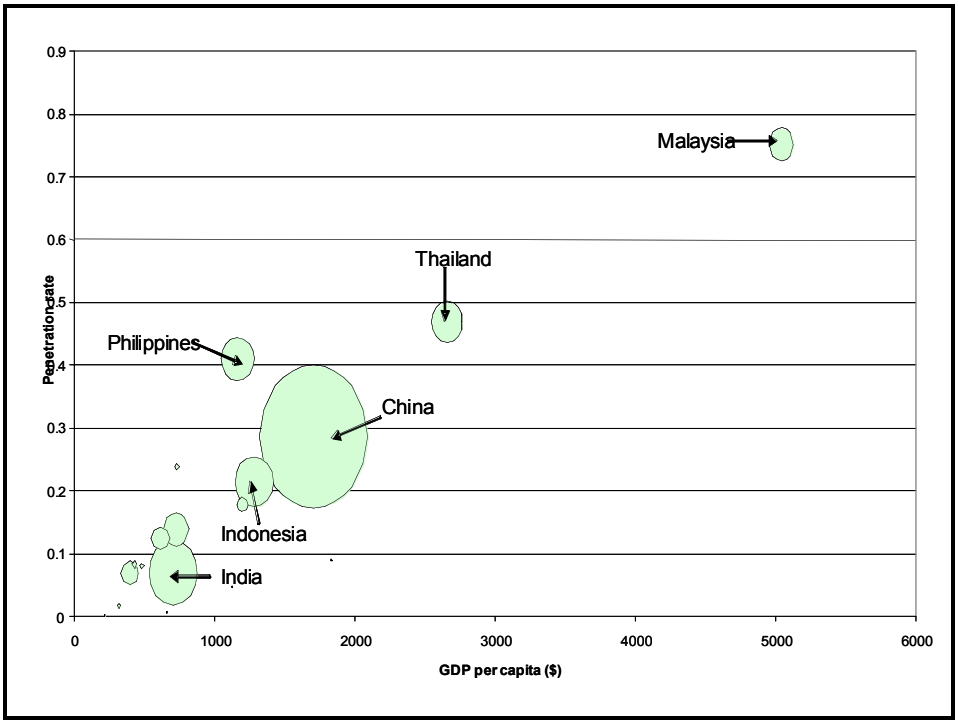
Figure 42: Average penetration rates in Latin American sample markets



Source: Wireless Intelligence

Similarly to most other regions a strong correlation exists between GDP and penetration. As such, there is a significant difference in penetration levels across the sample, e.g. Malaysia has a penetration rate of 57%, while countries such as Nepal and Papua New Guinea have rates of around 1%.

Figure 43: GDP per capita and penetration - Asia Pacific



Source: Deloitte analysis based on Wireless Intelligence and the World Bank database

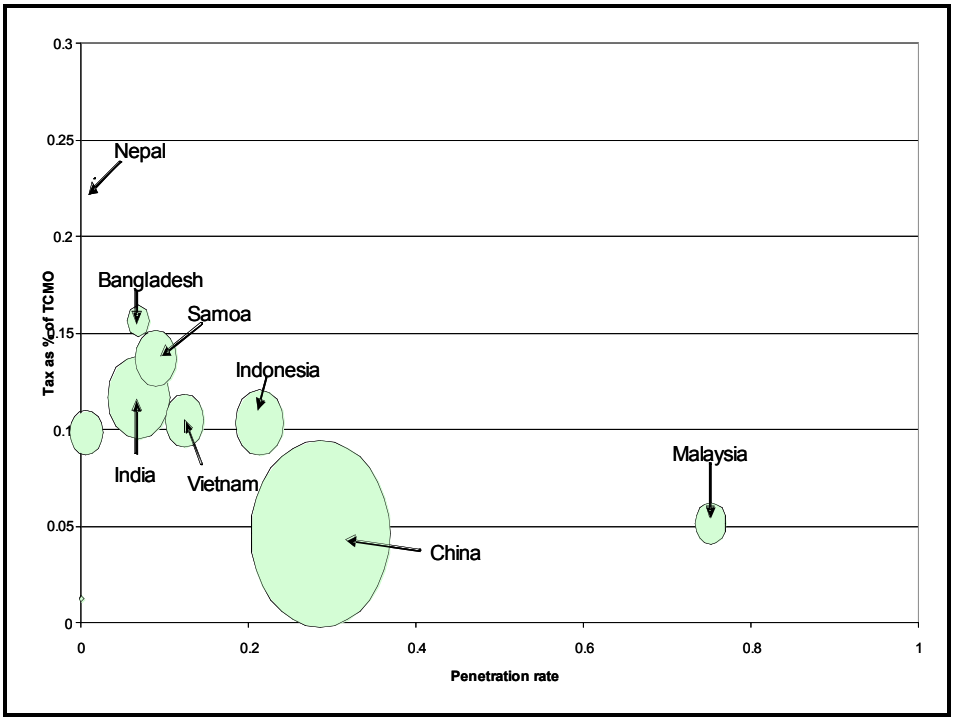
Tariffs pre tax in this region are the lowest of all those considered in our sample: the weighted average cost of a call per minute is estimated to be less than half than in Subsaharan Africa.

8.2 Taxation regime

The average share of tax in total cost of mobile ownership in the region is 11.2%; the lowest in our sample. Indeed for 15 of the 17 jurisdictions in the region the share of tax of TCMO is below the average for all jurisdictions in the sample. The two exceptions to this are Nepal and Bangladesh, which have at present a share of tax equivalent to 23% and 19% respectively.

The following figure shows this, but does not demonstrate any relationship between tax as percentage of TCMO and penetration.

Figure 44: Tax as a percentage of TCMO - Asia Pacific



Source: Deloitte analysis based on Wireless Intelligence and Deloitte tax

There have been considerable changes in the taxation regime since the GSMA 2005 study into this issue. The following jurisdictions have increased their taxation structure as it impacts mobile:

- Bangladesh: there has been the introduction in 2006 of a supplementary duty due on SIM cards of 35%;
- India: service tax on use has increased from 10.2% to 12.24%;
- Philippines: VAT on services and handsets has increased from 10% to 12%; and
- Cambodia: new specific tax of 10% applied to handsets.

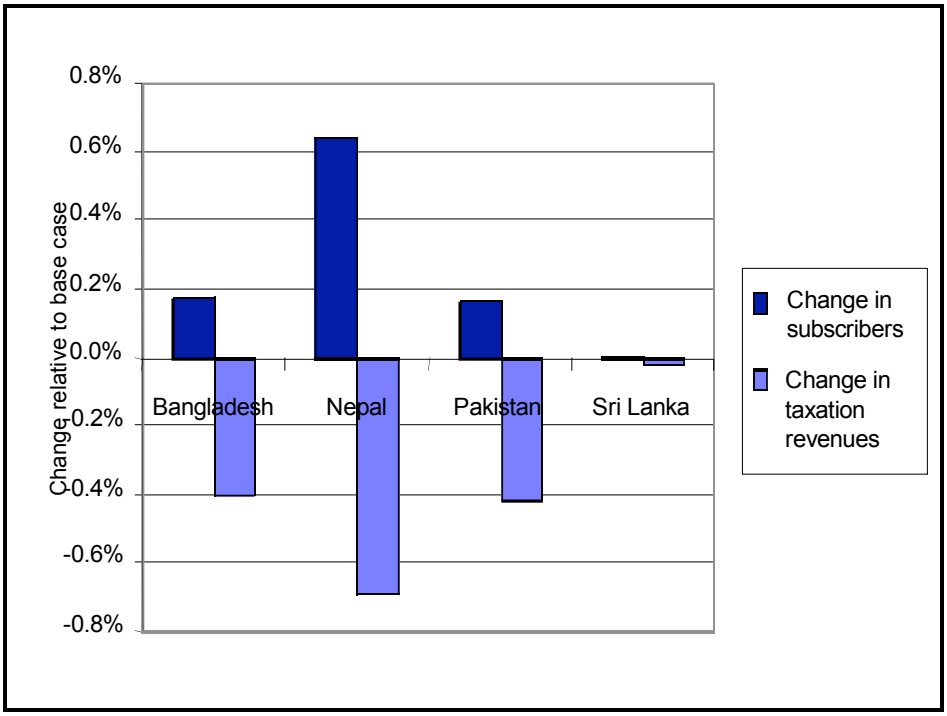
Conversely, there has been a decrease in taxes in the following jurisdictions:

- Bangladesh: the fixed subscription has decreased from US$13.80 to US$11.76. Fixed customs duty has also been reduced from US$4.60 to US$3;
- Cambodia: specific tax on services reduced from 10% to 3%; and
- Vietnam: customs duties have fallen from 15% to 7.5% on import of handsets.

8.3 Reducing mobile specific taxes

Of the 17 countries in this region considered, 4 impose mobile specific taxes: Bangladesh, Nepal, Pakistan and Sri Lanka. The following figure summarise the suggested overall effects of reducing mobile specific taxes to 90% of their current level. In aggregate this has a positive impact on penetration and a marginally negative impact on overall Government revenues.

Figure 45: Overall impact by 2010 of reducing mobile specific taxes for Asian Pacific jurisdictions with those taxes to 90% of current level



Source: Deloitte

As suggested above, these results do not capture the full impact on the remainder of the economy and the intangible benefits for users of mobile technology

General Malik, Chairman of Pakistan Telecoms Regulatory Authority

General Shazada Alam Malik, Chairman of the Pakistan Telecoms Authority, has played an instrumental role in transforming the mobile communications sector in his country in a very short period of time. He introduced much greater competition into the mobile market, established clear rules distinguishing between mobile and wireless local loop networks, and – perhaps most critical of all – oversaw a reduction of import duties on mobile handsets to zero.

"Five years ago the Government used to charge approximately 2000 Pak rupees ($35) SIM tax activation on every handset sold, and the regulators charged a 4% regulatory fee for operators, based on gross revenue. At the same time, I realised that countries with a similar GDP per capita and income level had mobile penetration ten times higher than Pakistan. I determined that this low mobile penetration rate in Pakistan – around 1% - was mainly due to the high taxation levels. So I started to work towards reducing the taxes in one form or another."

Malik successfully convinced the Government to reduce the $35 SIM activation tax by half to $17.5. He then managed to reduce this by 50% again, lowering it to approximately $8. In addition, Malik cut the regulatory fee on operators to 1.5%.

"I believe that taxation can have a very negative impact on the growth of mobile. The aim was to reduce the barriers to entry for people who could not afford the $35 access fee. This was too much – after all, we are not a tax collecting agency. We reduced that entry barrier substantially."

This work has had a huge effect on access to mobile communications in Pakistan. The proportion of Pakistanis with a mobile phone has grown from under 1% in 2000 to over 20% in 2006, with mobile network coverage in the country having increased from 40% 3 years ago to around 80% today. "Pakistan is a text book example," says

Malik. “Reduce the taxes or the duties and there is tremendous growth. The operators are now investing heavily because they think there is huge potential, and the market now has confidence in the regulators.”

“I am a firm believer that taxes should be reduced. When the Government was charging $35 SIM activation tax the total tax collected by the Government was much less than it is today as so many more customers are now able to enjoy the benefits of mobile communications and pay the $8 activation fee. In addition, the Government collects 5% GST (General Sales Tax) on mobile operator revenue, so the more people that are able to enjoy the benefits of mobile communications, the more revenue the Government collects in this format. Governments will not be the loser in the reduction of taxes – there will be many more people able to use mobile technology and this will have a tremendous social and economic benefit for all. Lower taxes have also reduced the threat from the black market as there is no incentive to create such a situation.”

Looking ahead, Malik aims to cut taxes even further, targeting a SIM activation tax of $4. “We are confident we can convince the budget financiers to reduce taxes next June. This will surely increase the growth of mobile in Pakistan.”

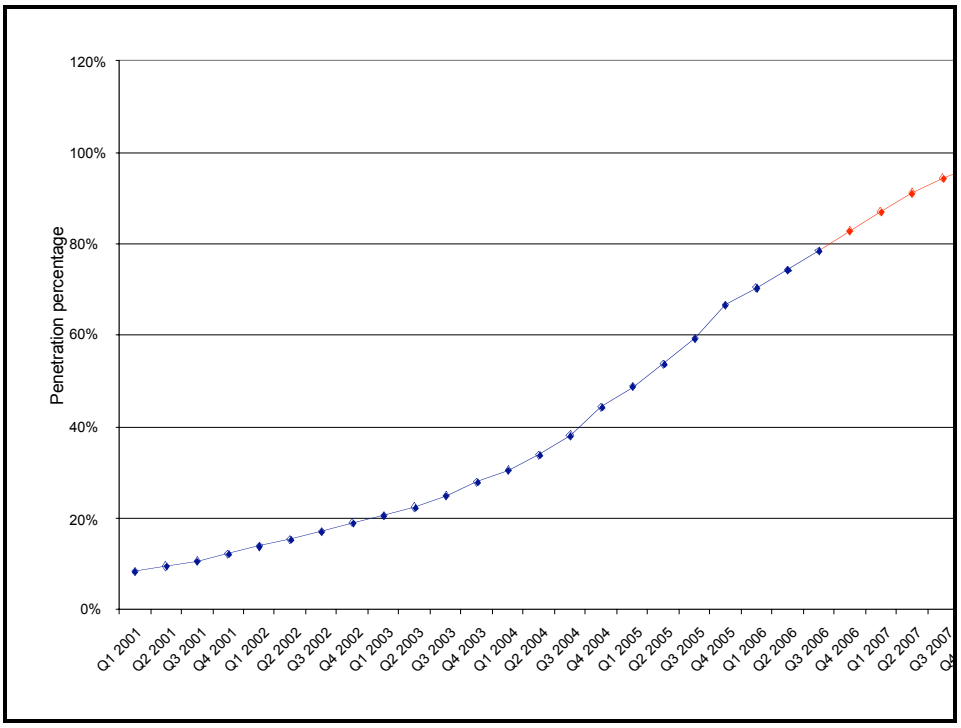
9 Central and Eastern Europe

9.1 Summary market overview

In this study we have included 20 jurisdictions, including the EU transition economies, i.e. those outside of the EU 15, in a broad Central and Eastern Europe (CEE) region. The total population of the countries in our sample in this region is almost 470 million. The average penetration rate in this region is 77%. In particular, a number of jurisdictions have a penetration rate above 100%, i.e. Lithuania, Estonia and the Czech Republic.

The following figure demonstrates the historical and forecasted penetration rates for the region. Given the level of saturation in a number of the more populous countries within the region the growth in penetration is forecast to slow over the next year.

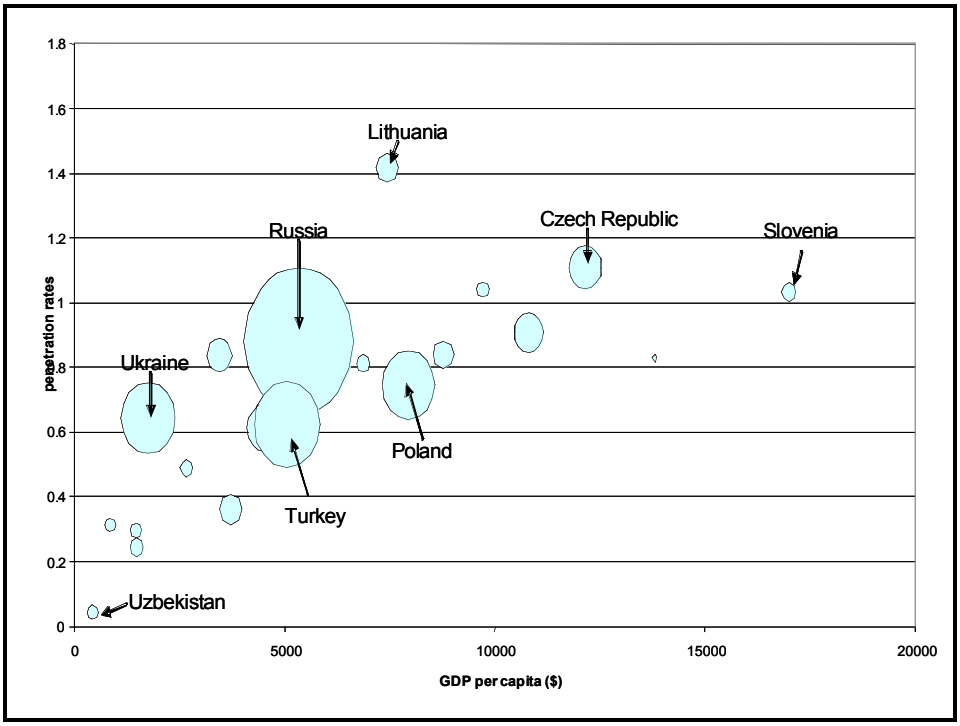
Figure 46: Average penetration rates in CEE sample markets



Source: Wireless Intelligence

A positive relationship between GDP per capita and penetration exists and is the key driver of remaining divergences in penetration rates across the region.

Figure 47: GDP per capita and penetration - Asia Pacific

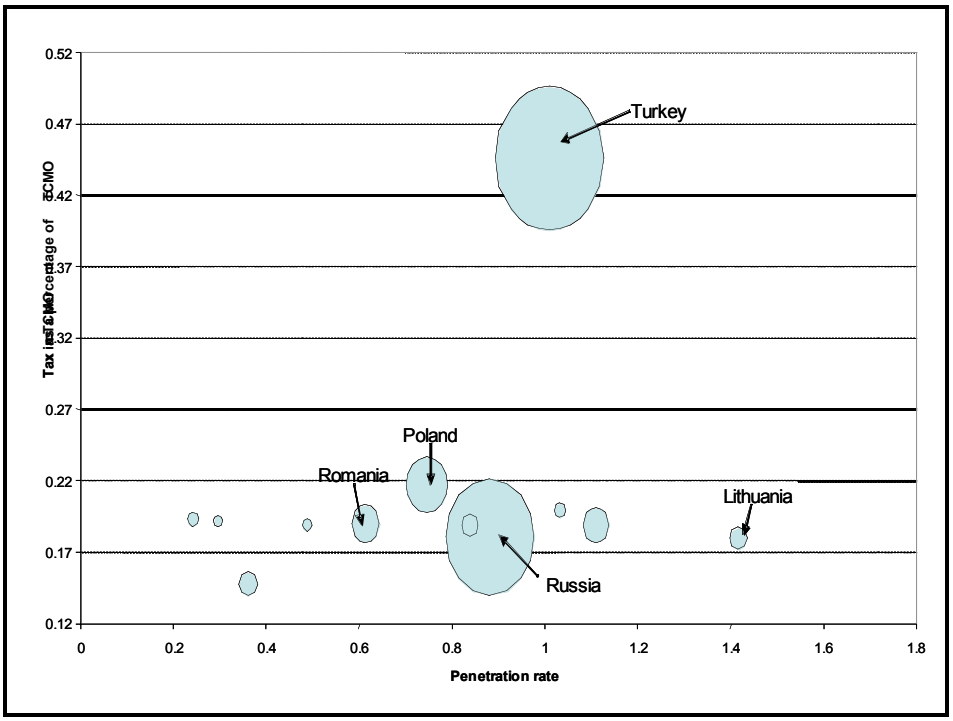


Source: Deloitte analysis based on Wireless Intelligence and the World Bank database

9.2 Taxation regime

The majority of countries in this region have high taxes as a proportion of the TCMO. In particular, Turkey has the highest percentage across our sample, driven by a series of very high mobile specific taxes.

Figure 48: Tax as a percentage of TCMO - CEE



Source: Deloitte analysis based on Wireless Intelligence and Deloitte tax

Binali YILDIRIM, Minister of Transport and Communications, Republic of Turkey

What is the current state of the mobile market in Turkey and its levels of taxation?

"The number of mobile telephone subscribers is approximately 50 million. The increasing trend in the number of GSM subscribers gained momentum particularly after liberalisation of the sector in 1998 and this number has doubled over the last three years. Penetration with respect to population is around 70 %. The number of base stations naturally increased in parallel with this rise and efforts were ramped up to ensure service quality.

The total rate of taxes on communication services in our country has reached 56 percent in GSM and 43-44 percent in fixed lines. In Uganda, which is the second highest taxed country in mobile phone services, the rate is 30 percent, and it has dropped to even 3 percent in some countries. Besides the excessive magnitude of rates, there is also a sheer multitude of taxes. While there is only one tax in other countries, there are five or six different types in Turkey. Given this situation, there comes a point where investors feel reluctant to move ahead. The investors' path must be cleared."

Why does Turkey have such high taxation rates?

"These taxes were imposed for the purpose of overcoming the hardships encountered in our country after the Marmara earthquake in August 1999. Everyone agrees that taxes on communications are high in Turkey. It's also said that this state of affairs encourages off-the-record business practices. High taxes certainly push investment costs higher, which both slows down investments and affects the users in the form of costly service, blocking the mechanism of competition. There is no doubt that this is not a desirable situation.

Intensive efforts are being spent in our country in the fields of telecommunications, information technologies, and communication services under the influence of liberalisation, among other factors. The industry's liberalisation has been completed by the handover of Türk Telekom shares. Consequently, competition conditions became far more challenging. Also, prices continue to decrease. Campaigns and promotions are being offered in both mobile and fixed telephones. These price cuts eventually ended up in an impasse. They cannot go lower because the tax rates are too high. It has therefore become necessary to lower taxes.

Providing access to information in an effective, faster, and more reliable manner at reasonable prices and offering alternative infrastructure and services are the issues we dwell upon most. Our goal is to make sure that more telecommunication services are made available to individual or corporate users."

What steps are you taking to reduce such rates?

"We have initiated efforts to bring about a gradual reduction of the tax burden in order to ensure that the high tax rates on electronic communication services in Turkey do not constitute an obstacle to our goal of transformation into an information society. We gave a comprehensive presentation on this issue to the Council of Ministers several months ago. We should continue this study in 2007 in coordination with the Ministry of Finance in order to determine the discount rates and schedules. That is what we are going to do in 2007. Our work will focus on both the rates and the implementation. One thing worth mentioning is that if one tax is to be discontinued, another source has to be found to replace it.

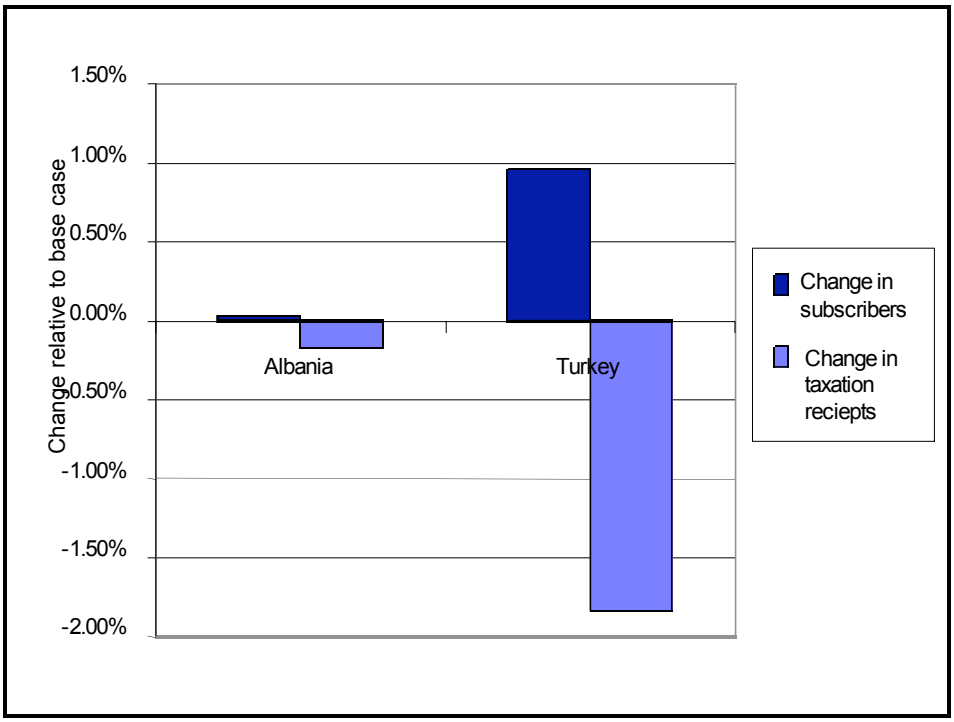
With regard to communication tax, the ideal figure in our minds is the Value Added Tax (VAT). The world's developed countries in the information/communication industry have only VAT. And its rate is low. Our final goal is to reach that point. It's an ambitious goal but unfortunately we are unable to take large strides to match it due to the circumstances prevailing in our country. We have to take small but firm steps.

Our government lowered the corporation tax so that entrepreneurs could invest more. We dropped the VAT on food and textiles. We accomplished the same in the civil aviation sector, where we removed taxes with the aim of developing the aviation industry so that the state could collect more taxes from the resulting turnover. We were proven right. There was a huge growth in turnover and in the number of air passengers. The Finance Ministry (The Ministry of Finance) derived revenue in aviation, from VAT. Corporation tax was generated. 15,000 to 20,000 people have been employed. In conclusion, this was a profitable and successful implementation in every respect. I'm sure the same will happen in mobile too."

9.3 Reducing mobile specific taxes

Of the 20 jurisdictions in this region considered, 2 impose mobile specific taxes: Albania and Turkey. The results suggest that reducing such taxes to 90% of their current level will only have a limited impact in Albania but is much more significant in Turkey.

Figure 49: Overall impact of removing mobile specific taxes on Asian Pacific countries with those taxes



Source: Deloitte

The result for Turkey is unsurprising given the higher reliance on mobile specific taxes in Turkey. The results suggest that the positive taxation levers (VAT and corporate tax) are set at too low a rate to counterbalance the large direct losses from the removal of the high level of mobile specific taxes. In a static analysis it could be argued that this makes a case against tax reform. However, a more dynamic conclusion is that this suggests the need for a larger general reform of taxation in order to create appropriate and fair incentives for providers of goods and services across the economy and hence encourage appropriate allocative efficiency. Clearly,

the taxation structure in Turkey differs from the remainder of our sample set and a more detailed investigation of these issues would be required.

10 Conclusions and policy implications

Mobile phones have the potential to link together communities within and between countries, driving social welfare, investment and growth. Where fixed line networks have traditionally been considered the provider of universal service, developments in mobile technology (particularly in terms of speed and bandwidth) mean that mobile services now provide a cost effective method for providing general communications access. In effect universal service is now provided by mobile technology in many developing countries where mobile penetration dominates that of fixed line by 10:1. Governments play a crucial role in determining both the speed of both mobile roll-out and the take-up of services. The ongoing challenge is to continue working with the mobile industry to increase this trend through reducing the total cost of owning and using a mobile phone.

Previous studies have shown that mobile phones are beneficial in reducing the cost of doing business and driving entrepreneurialism and growth. This is particularly the case in the many developing countries that do not have an extensive fixed line telecommunications infrastructure where mobile phones make conducting business easier. Mobile phones also directly increase social welfare, connecting families and providing simpler and easier access to educational and health resources in rural communities. This report shows a positive link between mobile communications and economic welfare, with a 10% increase in mobile penetration increasing GDP growth by 1.2% in developing countries.

The mobile industry has made considerable strides towards driving down the cost of mobile services to consumers. As noted in the 2005 report, the GSMA challenged the manufacturing sector to respond to the cost of a mobile phone being a significant barrier to entry and to produce an “ultra low cost” handset for developing markets. Initially this was achieved at $40 cost, although though further innovation the cost was reduced to $30. This has been instrumental in increasing take-up and driving forward the benefits of increasing communications access.

However, whilst the global mobile penetration level now stands at 40% there remain large differences between developed countries and many developing countries where penetration lies below 25%. More still needs to be done to increase these low rates, particularly in those countries where mobile, as opposed to fixed line, is the main source of access technology. To achieve the maximum possible economic and social growth, Governments and mobile operators need to work together to determine the optimal tax mix and level for their particular countries.

High taxes on mobile services run counter to government’s commitments to improving access to communications. At the World Summit on the Information Society in 2003, 175 countries signed up to a commitment to give more than half the world’s population access to information and communications technologies by 2015. Taking the optimal approach to taxation is a clear route to achieving this goal and recognising the huge benefits to developing countries and their people. This study has provided support for this rationale. In particular, it finds that:

- Taxes are higher in many developing countries relative to developing countries;
- 16 countries levy telecom specific taxes on top of standard sales and import taxes on mobile phone users;
- Removing mobile specific taxes would increase penetration, usage and handset sales in the poorest regions of the world, with its strongest impacts felt in SubSahran Africa; and

- The direct impact of reducing mobile specific taxation is, in most cases, almost fully counterbalanced through indirect taxation and growth impacts. The relatively limited reduction in Government taxation revenues by 2010 need to be contrasted with the additional economic and social impacts that can not be captured that can be obtained over and above those allowed for in this study.

Acknowledgements

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Encompassing technical, commercial and public policy initiatives, the GSMA focuses on ensuring wireless services work globally; thereby enhancing the value of mobile services to individual customers and national economies while creating new businesses opportunities for operators and their suppliers.

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Acknowledgements



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Wireless Intelligence is a comprehensive database on the global mobile market. It covers all mobile technologies and includes over a million individual data points across 600 operators, 1,100 networks in 220 countries. Because of a need for an up-to-date and accurate view of the global mobile markets, the GSM Association formed a unique partnership with Ovum, the leading industry analyst firm.

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