

# Mobile telephony and taxation in Croatia



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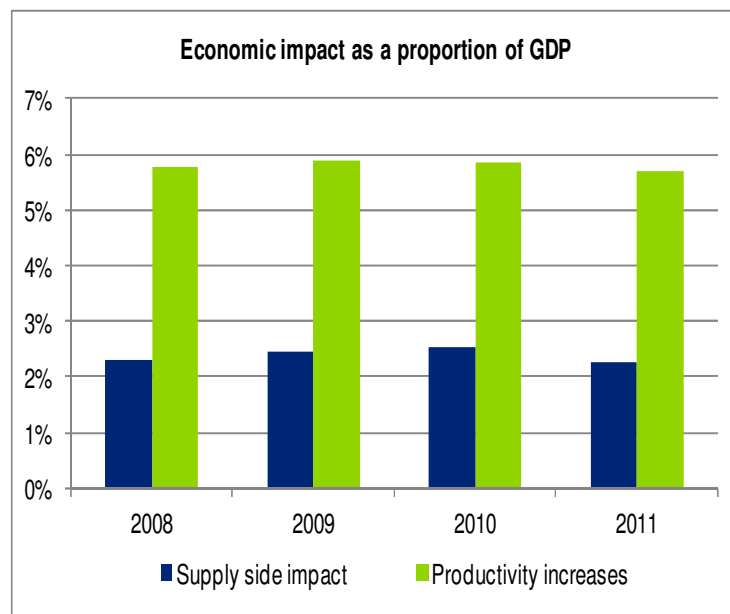
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## Executive summary

Croatia has a well established mobile market, characterised by very high penetration rates and high levels of competition among the three mobile network operators (“MNOs”), T-Mobile, VIPnet and Tele2. Penetration of 3G services is similar to other Eastern European markets. As such, Croatians increasingly have access to advanced wireless data, and 16% of users now own a smartphone. As a result of these factors, in Croatia, consumers, businesses and the government continue to benefit from the positive developments in the mobile sector.

***“The contribution of the mobile sector to the Croatian economy has represented over 2% of GDP in each of the last four years, in addition to a 5% further contribution from productivity impacts.”***



In 2011, it is estimated that the mobile communications industry will contribute in the region of HRK 28 billion to the economy.

This is made up of direct supply side impacts, which represent 2% of GDP, and productivity increases, which represent 5% of GDP, highlighting the importance of mobile telephony to the productivity of the economy as a whole. Additionally, in 2011 the whole industry employs almost 24,000 people in Croatia.

However, over the last four years, the Croatian economy has suffered a strong recession, with GDP falling by 3% in 2009 alone. As a result, all businesses, including MNOs, have seen a reduction in economic activity. Despite this, mobile telephony's contribution to the economy has remained strong, growing faster than GDP in 2009 and 2010.

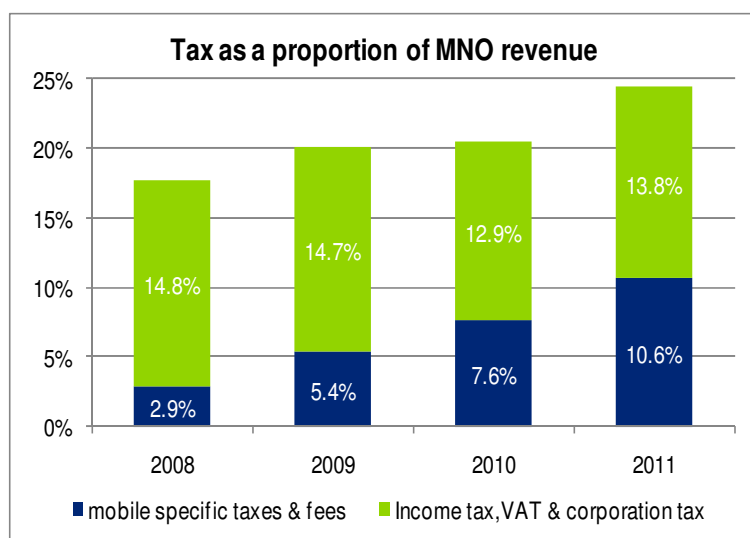
***“MNOs in Croatia suffer from unequal taxation as a result of a mobile specific tax imposed by the government on MNOs’ revenues over the recent recession.”***

Mobile specific taxation on MNOs in Croatia takes the form of a 6% tax on the gross revenues that MNOs obtain from calls and SMS/MMS.

This tax structure has a number of potential negative consequences, including increasing the cost to MNOs of providing mobile services, with flow on impacts on prices. Additionally, unlike VAT,

this tax cannot be itemised in prices/receipts, and is therefore not transparent to consumers.

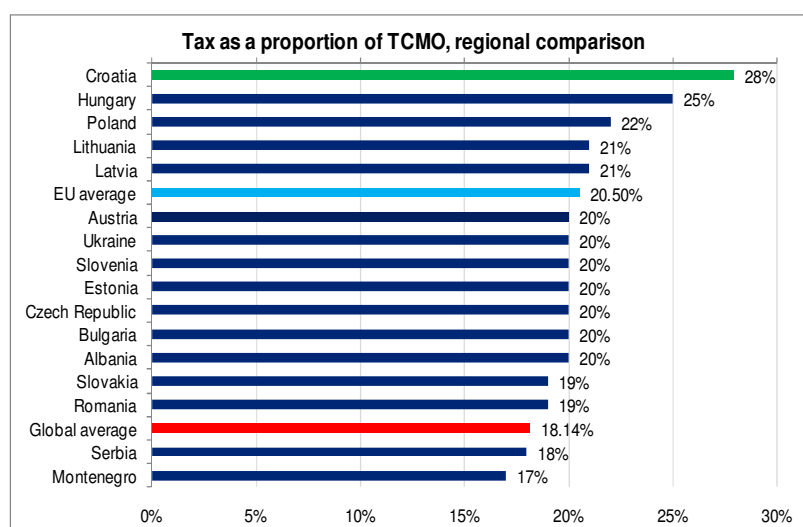
As a result of this tax, in 2011 it is estimated that MNOs in Croatia will pay approximately HRK1.5 billion to the government in taxes and regulatory fees. Mobile specific taxation has increased significantly as a proportion of MNOs’



revenue since 2008. Taxes grew 2% in 2009 and 10% in 2010 as a result of the introduction of this mobile specific tax.

***“Mobile consumers in Croatia pay the highest tax as a proportion of mobile telephony cost services in the region.”***

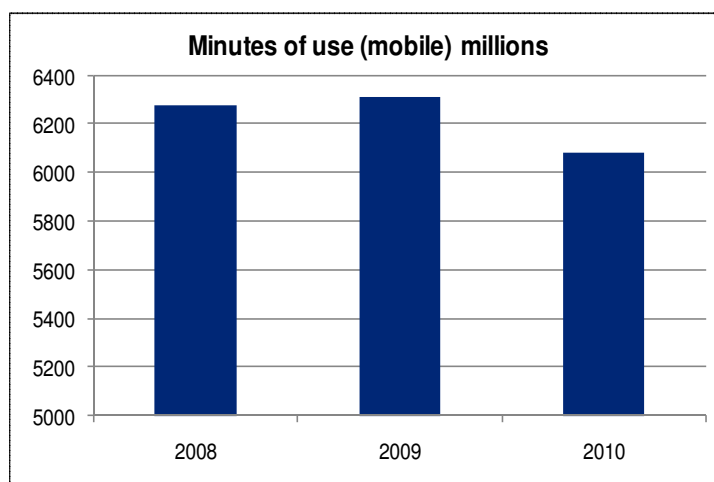
Including the mobile specific tax, taxes represent 28% of the total cost of mobile ownership (“TCMO”) for the average consumer. Tax as a proportion of TCMO is the highest in the region and above the global average of 18% and the EU average of



21%. This has potential negative implications for consumer demand of mobile services.

***“In the year after mobile specific taxation was introduced, usage of mobile services decreased for the first time in Croatia.”***

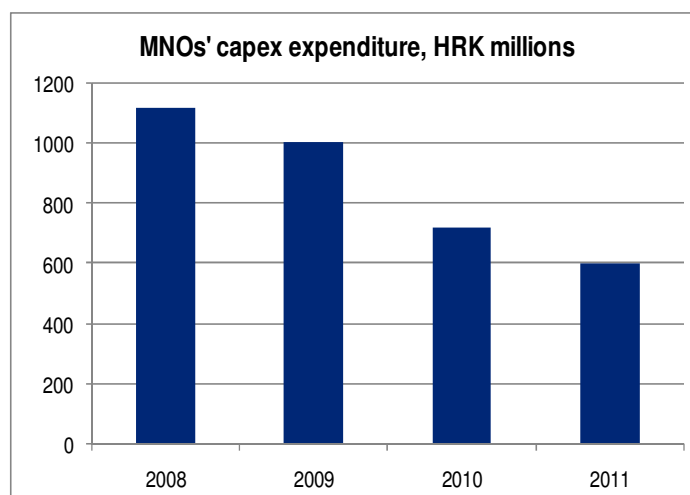
Usage of voice calls and SMS decreased between 2009 and 2010 for the first time since the introduction of mobile telephony in Croatia. Whilst it is not possible to isolate the impact of the mobile specific tax from the impact of the economic downturn, operators believe that the effect of the tax, including some substitution to fixed services, has contributed to this fall in demand.



Total MNOs' revenue has fallen significantly each year since 2008 and is expected to be below 2006 levels in 2011, a reduction of almost 30% from the 2008 levels.

***“Mobile specific taxation and regulatory pressures faced by MNOs in Croatia risk constraining mobile network investment and negatively impacting the economy.”***

Additional investment is necessary to facilitate the positive impact of mobile telephony on consumers and the economy, including the provision of new 4G services. However, falling revenues and reduced demand have led to a reduction in investment in network expansion and other capex items. This could have long term implications for the industry.



Croatia's economy has now returned to positive GDP growth. However, while other special taxation imposed during the recession was removed in 2011, mobile specific taxation still stands.

Continuing the differential treatment of MNOs, by taxing them at a higher rate than other businesses in Croatia, risks reducing productivity and consumer benefits.



# 1 Introduction

This paper was commissioned by the GSM Association (“the GSMA”) and is part of a wider Deloitte/GSMA study on global mobile taxation trends.<sup>1</sup> This is the first Deloitte/GSMA report on the economic impact of mobile telephony in Croatia. Previous studies analysing mobile telephony in other eastern European countries have found significant economic impact generated by this industry through effects on the supply side of the economy, employment, increases in productivity and benefits gained by consumers.<sup>2</sup>

This paper provides an analysis of the impact of mobile telephony on Croatian citizens and the economy in the last four years. It also describes the level of taxation applying to mobile consumers and MNOs in Croatia, and considers the effects that the introduction of additional mobile specific taxes in 2009 has had on the mobile industry and the economy.

## 1.1 Mobile communications in Croatia

Croatia has a well established mobile market, characterised by high penetration rates, three Mobile Network Operators (“MNOs”) and consumer switching applications such as mobile number portability.

The three MNOs that have launched services in Croatia include T-Mobile and VIPnet, which are the more established operators with market shares of approximately 45% and 43% respectively, and Tele2, whose market share is currently at 12%.<sup>3</sup>

Mobile penetration in Croatia has grown steadily over the last 10 years, as shown in Figure 1. Penetration reached the 100% milestone 5 years ago, and is continuing to grow as consumers increasingly own multiple SIMs.

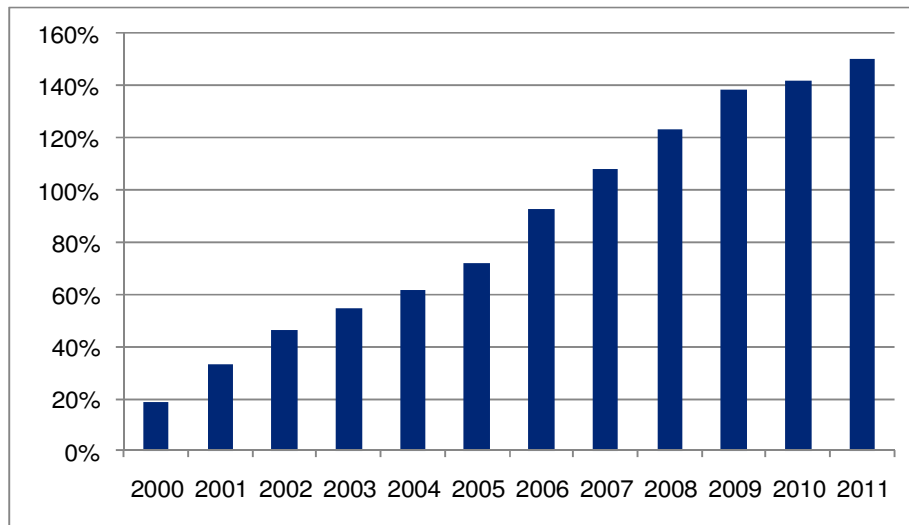
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<sup>1</sup> Separate Deloitte/GSMA reports on the Global Mobile Tax Review 2011, Surcharge on International Inbound Termination and taxation and economic impact in Kenya and Bangladesh will be published in parallel to this report.

<sup>2</sup> For example, the Deloitte/GSMA report ‘Tax and the digital divide’ 2006, and the Deloitte report for Telenor ASA on the ‘Economic Impact of Mobile communications in Serbia, Ukraine, Malaysia, Thailand, Bangladesh and Pakistan’ 2008.

<sup>3</sup> As of April 2011, the Croatian regulator introduced a new methodology for counting subscriber numbers. Therefore, the new regulator numbers might differ from the wireless intelligence data used in this report.

**Figure 1: Mobile penetration levels in Croatia, 2000 to 2011<sup>4</sup>**



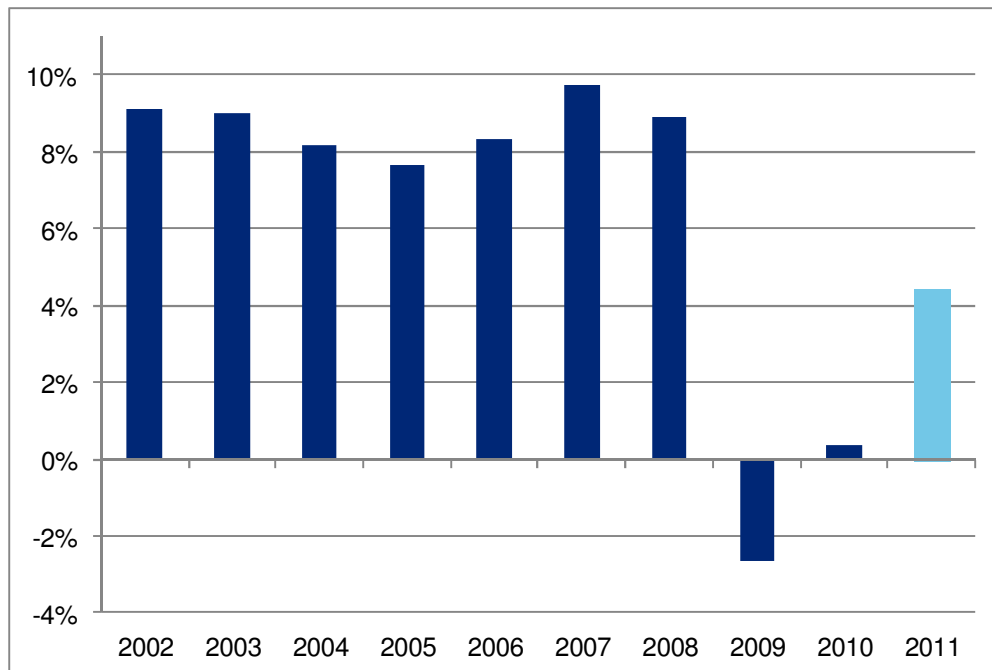
*Source: Wireless intelligence & operator data*

3G services are also widely available, providing wireless data and broadband to consumers, and MNOs expect to begin tests for the future roll out of LTE by the end of this year.

After many years of solid economic growth, Croatia suffered from a strong recession in 2009 following the global financial crisis, as shown in Figure 2, and has struggled to return to pre-crisis growth levels in the last two years.

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<sup>4</sup> As of April 2011, the Croatian regulator introduced a new methodology for counting subscriber numbers. Therefore, the new regulator numbers might differ from the wireless intelligence data used in this report.

**Figure 2: Growth of GDP in Croatia, 2001 to 2011**

Source: IMF econ stats (<http://www.econstats.com/weo/CHRV.htm>), forecast for 2011

This recession has had a negative impact on businesses and consumers in Croatia, including those in the mobile industry. In addition to the direct impact of the recessionary environment on the mobile industry, in 2009 the Government introduced an additional 6% tax on MNOs' gross revenue from mobile calls and SMS/MMS to raise funds as part of its response to the financial crisis. Following this, for the first time since the introduction of mobile services, volumes of mobile calls and SMS decreased in 2010 by 4%<sup>5</sup> and 14%<sup>6</sup> respectively. This has contributed to falling revenues for the MNOs, has generated uncertainty for the industry and has impacted levels of investment as well as consumer benefits.

## 1.2 This report

This report presents the results of the analysis on the economic impact of mobile telephony and the impact of mobile specific taxation in Croatia, and is structured as follows:

- Section 2 presents the impact of mobile telephony in Croatia on Gross Domestic Product ("GDP"), productivity, employment and consumer benefits.
- Section 3 analyses taxation on the mobile telephony industry in Croatia and its impact on consumers.

<sup>5</sup> *Wireless intelligence*

<sup>6</sup> Hakom, Croatian post and electronic communications agency, <http://www.hakom.hr/default.aspx?id=264>

Appendix A describes in more detail the methodology used to calculate the economic impact of mobile telephony and the data and assumptions employed in this study.

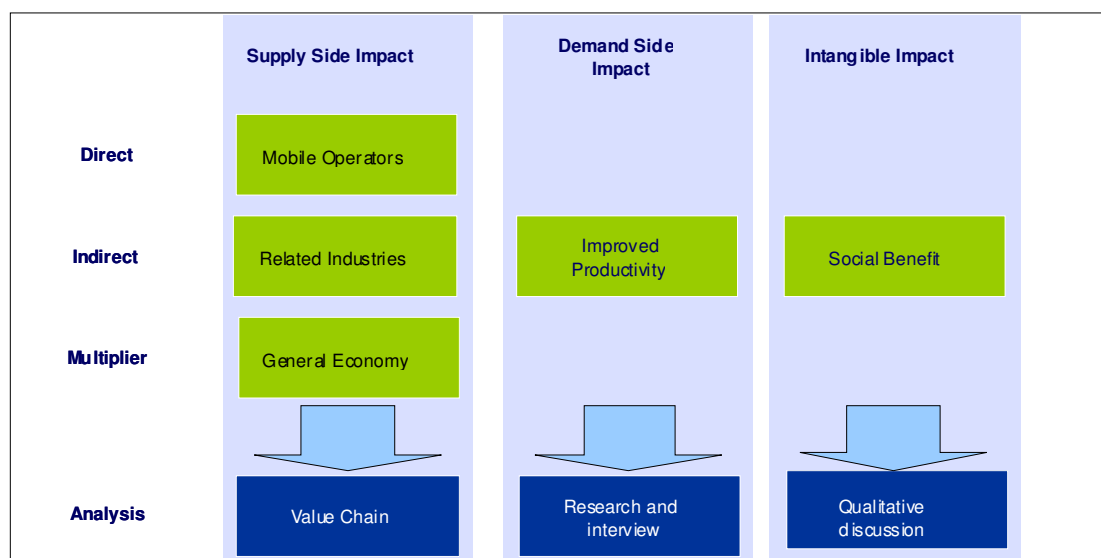
## **2 The economic impact of mobile telephony in Croatia**

Mobile telephony in Croatia generates significant economic impact through effects on the supply side of the economy, employment, increases in productivity and benefits gained by Croatian consumers. This section describes these impacts in the last four years.

### **2.1 Approach to estimating the economic impact**

The economic impact of mobile telephony in Croatia is estimated by quantifying both the supply and demand side impacts:

- For the supply side impact, the analysis focuses on the flow of funds across the mobile supply chain, by estimating the value-add created by the MNOs and other participants in the mobile supply chain. An economic multiplier was used in this analysis to this to capture the 'knock-on' impact to the wider economy.
- For the demand side impact, the increase in productivity that occurred through the use of mobile telephony for business purposes was estimated.
- Intangible and social benefits are also an important aspect of the impact of mobile telephony. Many economic impact studies consider such impacts through willingness to pay methodologies. However, such approaches are more appropriate in analysing markets in developing countries. As such, only a qualitative discussion of the social impacts of mobile is provided for Croatia.

**Figure 3: Structure of the analysis of economic impact on GDP and employment**

Source: Deloitte

This analysis was undertaken using publicly available statistics, company accounts and interviews with T-Mobile and VIPnet. By combining supply-side and demand-side analysis, it is possible to estimate the GDP contribution, employment created and taxation paid in Croatia over the period 2008 to 2011 by the mobile industry.

The data for 2011 was based on half year data provided by the MNOs and should therefore be viewed as an estimate.

## 2.2 Benefits to the supply side of the economy

To calculate the benefits to the supply side of the economy, the value add created by the mobile communications industry has been estimated. In addition, the 'leakages' from the system have been estimated, i.e. what percentage of any amount spent will remain within the national economy to be spent in the next round. This was used to isolate the impact on the Croatian economy from the total international impact of the mobile communications industry.

It is estimated that the value add of the MNOs in Croatia will provide a direct contribution of HRK 3.3million to the Croatian economy in 2011.<sup>7</sup> The breakdown by category is provided in Table 1 below.

<sup>7</sup> The financial data for 2011 is based on half year results and scaled up, so these estimates might not be equivalent to the final year end results.



**Table 1: Value add of MNOs (excluding multiplier effect), HRK millions**

Value add	2008	2009	2010	2011
Employee wages and benefits	463	465	454	530
Contractors	50	47	463	258
Taxes and regulatory fees	1,575	1,611	1,776	1,529
CSR	50	42	44	27
Dividends	491	662	662	913
<b>Total</b>	<b>2,629</b>	<b>2,827</b>	<b>3,398</b>	<b>3,257</b>

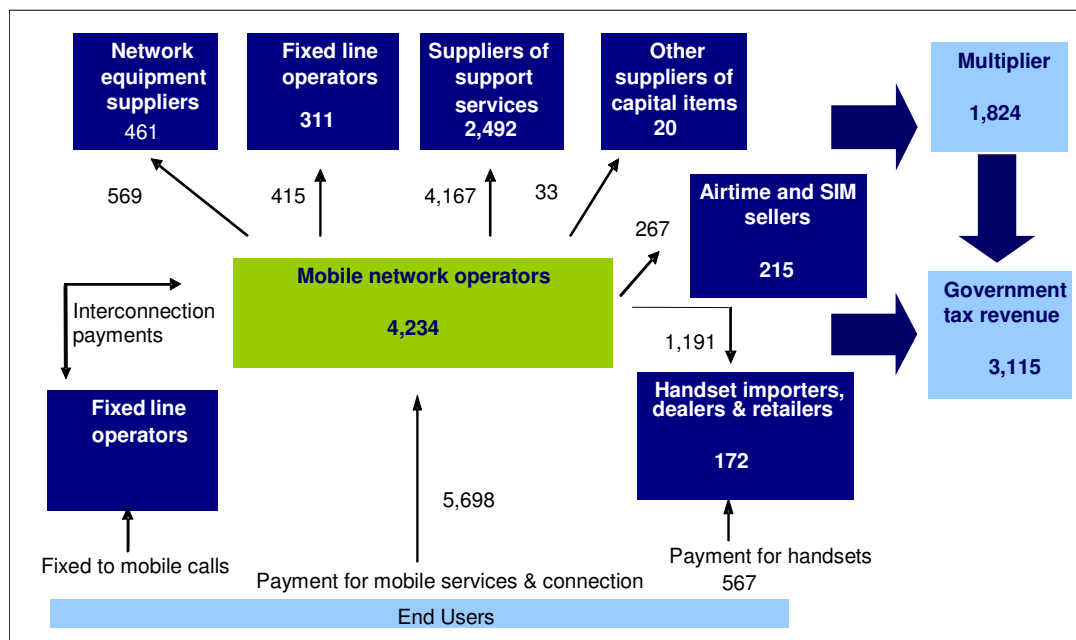
*Source: Deloitte analysis based on data provided by MNOs, interviews and analysis of company accounts*

Tax and regulatory fees are the highest element of value add generated by the industry in the country, representing 47% of the total value add. In 2011, MNOs in Croatia will pay approximately HRK1.5 billion to the government in taxes and regulatory fees. Taxes grew 2% from 2008 to 2009 and 10% from 2009 to 2010. However taxes fell by 14% between 2010 and 2011 due to an expected decrease in MNOs' revenues in 2011. Taxation results are discussed in more detail in Section 1.

Revenue flows from MNOs to other players in the industry were then analysed, and the quantity translated into further value add<sup>8</sup>. The estimates of value add include the multiplier effect on the wider-economy which is assumed to be 30% of value-add<sup>9</sup>. The result of this calculation is shown in Figure 4.

<sup>8</sup> Details on value add margins, percentage of revenue translated into value add, are contained in the assumptions appendix.

<sup>9</sup> The value of multiplier chosen for Croatia is discussed in Appendix A.1.1.3.

**Figure 4: Mobile value chain in Croatia in 2011, HRK millions**

Source: Deloitte analysis

The figures next to the arrows represent the flow of money from one group to another. The figures inside the boxes represent the value retained by each group. The figures shown relate solely to domestic flows and domestic value add. Table 2 shows the calculation of value add.

**Table 2: Calculation of value add from mobile communications in Croatia in 2011, HRK millions**

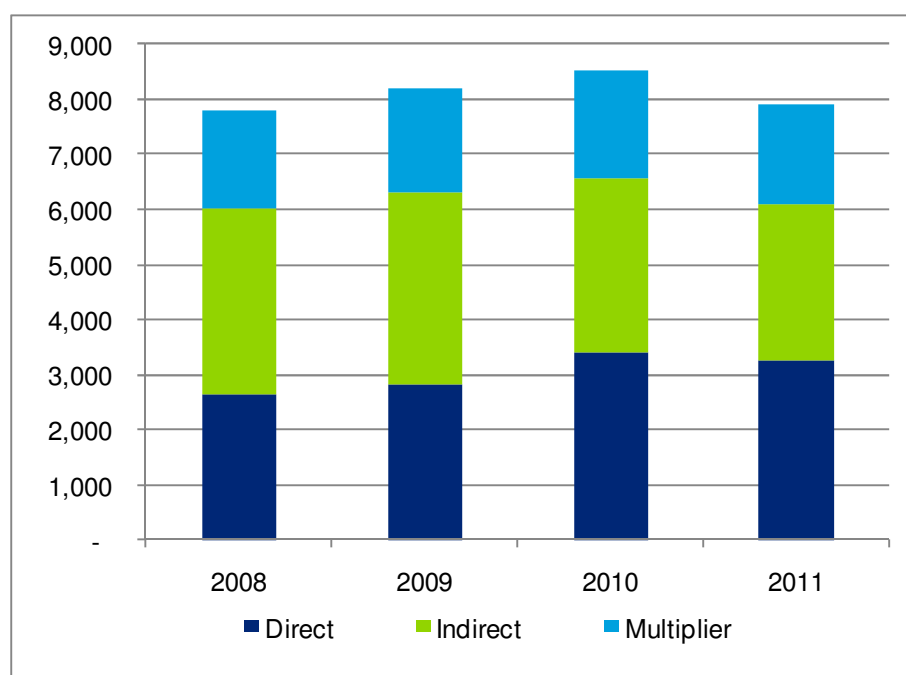
Domestic value add in 2011	Total revenue	Domestic revenue	Domestic cost	Domestic value add	Value add with multiplier
MNOs	6,265	6,265	3,009	3,257	4,234
Fixed telecom operators	415	415	176	239	311
Network equipment suppliers	569	522	168	354	461
Handset designers and dealers	1,191	211	79	132	172
Other suppliers of capital items	33	30	15	15	20
Suppliers of support services	4,167	3,012	1,095	1,917	2,492
Airtime & payphone commission	267	267	102	165	215
<b>Total</b>	<b>12,908</b>	<b>10,723</b>	<b>4,643</b>	<b>6,080</b>	<b>7,904</b>

Source: Deloitte analysis

Based on the data provided by MNOs, 83% of the revenue flows from the MNOs are estimated to remain in Croatia. Of this, a large portion relates to network and non-network support services. It is estimated that only 18% of handset design and dealer expenditure is domestic. This has fallen from 44% since 2008, as MNOs increasingly source handsets from other European countries and Asia directly rather than from Croatian branches acting as an intermediary.

The contribution of mobile telephony to the supply side of the economy in Croatia in years 2008 to 2011 is summarised in Figure 5.

**Figure 5: Supply side value add from mobile communications, HRK millions**



*Source: Deloitte analysis. 2011 figures are based on scaled up data from the first half of the year*

In addition to the negative effect on call and SMS volumes generated by the recession, reductions in capex contribute to the decrease in the indirect impact of mobile telephony observed above in 2010 and 2011. This is discussed in more detail in section 3.4.

## 2.3 Impact on employment

Mobile services contribute to employment in several ways. These include direct employment in the industry and related industries, the support employment created by outsourced work and taxes that the government subsequently spends on employment generating activities. It also includes the induced employment resulting from the above employees and beneficiaries spending their

earnings, and creating more employment<sup>10</sup>. It is estimated that in 2011 the mobile communication industry employs almost 24,000 people in Croatia, as shown in Table 3.

**Table 3: Contribution to employment from the mobile value chain in 2011**

Employment Impact	Number of employees	Number of employees including multiplier
MNOs	3,103	4,033
Fixed telecommunications operators	875	1,137
Network equipment suppliers	1,679	2,183
Handset designers and dealers	619	805
Other suppliers of capital items	41	53
Suppliers of support services	8,411	10,935
Airtime commission, payphone commission	3,689	4,796
Total	<b>18,418</b>	<b>23,943</b>

Source: Operator data, interviews and Deloitte analysis on average wage rates<sup>11</sup>.

Of the almost 24,000 FTEs in 2011, the largest category of employment is suppliers of support services. This high value reflects the fact that the MNOs have been increasingly outsourcing their IT and other support services, resulting in lower direct employment by the MNOs and higher indirect impact generated through engagement of IT companies, consultants, and other support services.

Employment by handset designers and dealers as well as employment by network equipment suppliers generated by the mobile industry have seen a downward trend over recent years, reflecting a trend towards purchasing an increased amount of inputs from abroad.

## 2.4 Impact on Croatian productivity

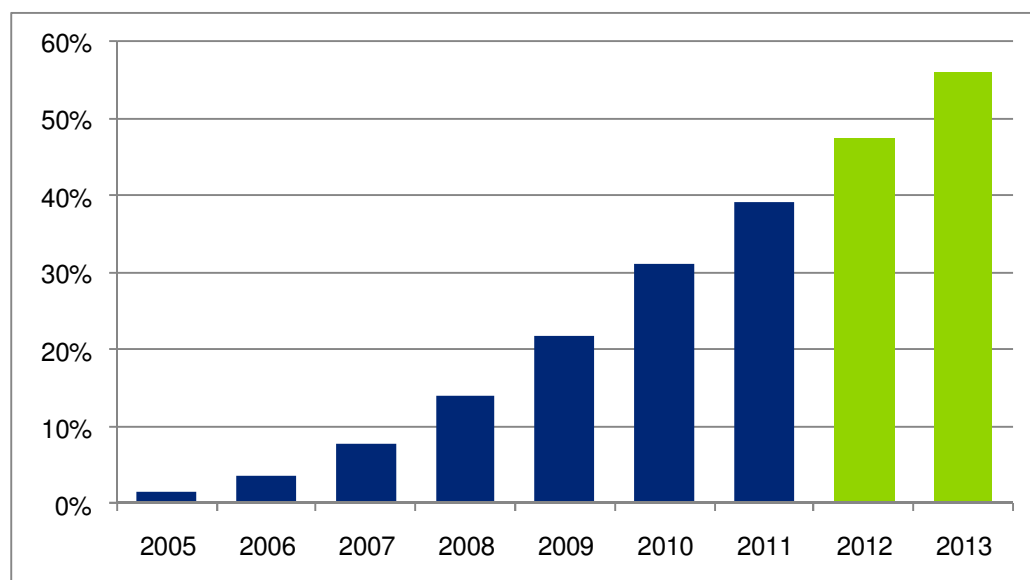
Mobile operations in Croatia have been well established for over 15 years and the Croatian market is in this sense similar to the most developed markets in Europe.

<sup>10</sup> The first effect is obtained directly from MNOs. The support and induced employment is estimated using a multiplier of 1.3 as discussed in Appendix A.1.2. For MNOs, no multiplier was applied as the majority of induced employment will be captured by the first round flows.

<sup>11</sup> These figures represent only employment directly created by revenue flows from the MNOs and do not represent total employment in the whole industry for each section of the value chain.

Therefore, changes in impacts on productivity provided by mobile telephony in the latest years are related to provision of 3G and other high-value services such as wireless data, and are enhanced by the proliferation of smartphones. As discussed in section 1.1, mobile penetration rates have reached saturation point in recent years. However, the penetration of 3G services is still growing, as shown in Figure 6.

**Figure 6: Penetration of 3G mobile services in Croatia**



Source: Wireless intelligence. 2012 and 2013 are forecasts.

In addition to the well established benefits that mobile services provide to workers and businesses<sup>12</sup>, there are numerous ways in which mobile services have led to productivity increases in Croatia. The following additional recent positive impacts have been identified in Croatia:

- Advanced data services providing connectivity to mobile workers: it is estimated that 23% of mobile phone users have internet access and 16% of Croatia's population currently own a smartphone.<sup>13</sup> This number is predicted to grow significantly, with MNOs estimating that an extra 20,000 Blackberries, 80,000 I-Phones, and 10,000 I-Pads will be sold in Croatia in 2011. These benefits will be enhanced by development of the LTE technology, which will be tested by MNOs at the end of 2011.
- M-commerce has enhanced productivity in the payments sector: micropayment services are available which allow subscribers to pay for a variety of services, such services including invoice and car park payments which were launched in 2001 through the use of SMS messages. MNOs also offer SMS-based micropayment services in partnership with a

<sup>12</sup> These are discussed in section A.1.3

<sup>13</sup> GfK market research, August 28, 2011

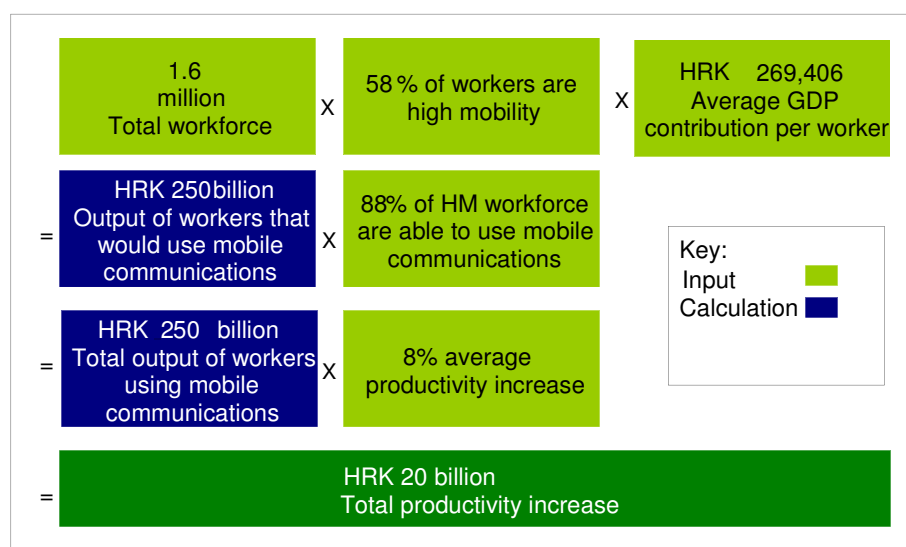
number of banks. T-Mobile provides a micropayment and mobile banking service under the m-Pay brand in partnership with PBZ, as well as SMS-based services such as SMS kupovina (shopping), SMS bon (coupon) and SMS parking.

- M-Health has benefitted productivity in the healthcare sector: VIPnet has established a technical solution to finding donors when blood supplies are short, known as the 'digital blood bank'. This service sends text messages to people recorded as having the relevant blood type when supply of that blood type is running low. This saves time by targeting only those who can be of help in the circumstance and saves money on more broad advertising such as television advertisements.

To calculate the impact on productivity, in line with previous studies of other countries in the region, it is assumed that a productivity gain of 8% has been experienced by high mobility workers who own a mobile phone, or more recently a phone with advanced features such as emails and data access. This number is consistent with studies previously carried out; however this could underestimate the value generated by data services due to the potential value add of wireless broadband and other applications. Using the economic value concept set out in Figure 7, the incremental impact on the economy was estimated to be HRK 20billion 2011. This calculation is set out below, and no impact on low mobility workers has been considered.

The productivity impact of mobile represents up to 5.7% of GDP in 2011. This highlights the importance of the mobile sector to the productivity of the Croatian economy.

**Figure 7: Economic impact in 2011 of increased productivity amongst high mobility workers**



Source: Deloitte analysis based on Deloitte assumptions, interviews and Croatia Bureau of Statistics. 2011 figures are based on scaled up data from the first half of the year



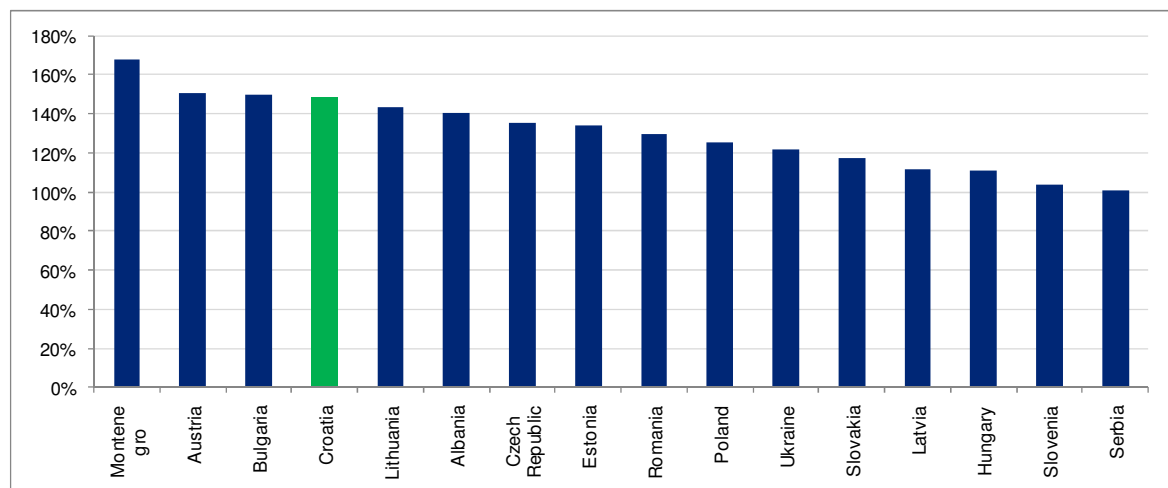
As a result of the advanced development of mobile services in Croatia, the productivity impact of mobile services has remained stable over the last four years. When the Croatian economic environment improves, and as proliferation of smartphones and tablets increases, further benefits are expected on the Croatian productivity from mobile services. However, to support the growth in these benefits, further investment in the network is required.

## 2.5 Benefits to consumers

Consumer benefits of mobile telephony are widely recognised in social and economic papers and have been highlighted in previous economic impact studies<sup>14</sup>.

Competition, price reductions and a number of high-value services provided by MNOs have contributed to Croatia benefitting from one of the highest penetration rates in the region, as shown in Figure 8.

**Figure 8: Mobile penetration in a sample of countries in central and Eastern Europe**



Source: Wireless Intelligence

As a universal service in Croatia, access to mobile telephony has provided numerous benefits to consumers. Mobile services promote social cohesion, contribute to extending communications, especially to users with low education and literacy, stimulate local content, and contribute to providing technology knowledge to the less educated. In addition, wireless data and broadband allow these benefits to be amplified and coupled with those given by access to the internet.

In studies for countries where the mobile industry is still developing, it is possible to estimate these intangible benefits using a 'willingness to pay' measurement based on new subscribers, usage increase and price trends. However, as Croatia's mobile market is more mature and similar to the

<sup>14</sup> Typical positive impacts of mobile telephony are reported in Appendix A.1.3 to this paper.

most developed markets, it is not possible to employ this methodology to quantify these significant benefits in the same way for this report.

### 2.5.1 MNOs' contribution to community projects

MNOs have identified a number of Corporate Social Responsibility projects and services they provide in Croatia that deliver significant tangible and intangible benefits to consumers and to businesses. These include:

- Donations to a number of charitable and health organisations: T-Mobile and VIPnet provide donations to Unicef, the children's hospital, ambulance services and a number of other health organisations. VIPnet also has a commitment to contributing to demining efforts. Land mines were extensively used throughout the former Yugoslavia during the 1990s and some of these mines still remain in Croatia today.
- Contributions to environmental causes and sustainable energy: VIPnet has installed the first green base station in Croatia, which is powered by wind, hydrogen and solar power, and is based on a Croatian design. T-Mobile contributes through its 'low carbon society' initiative as well as making donations to a reforestation and a fire prevention organisation. VIPnet promotes sustainable energy through 'green business' initiatives such as installing solar panels at its offices which are then able to sell left over power to the electricity grid.
- Contributions to education projects: T-Mobile finances a number 'T-scholarships', which provide financial support for high achieving students at university or technical college in their education. VIPnet provides kindergartens which can be used by their staff and general the public, projects to repair damaged or dangerous play equipment in parks and schools and have also developed a 'parent guide' which gives advice on how to protect children in use of mobile and broadband technology.
- Sponsorships for events, including sporting events, music events, summer festivals and other cultural activities, as well as clean-ups/maintenance of national park and cultural centres.

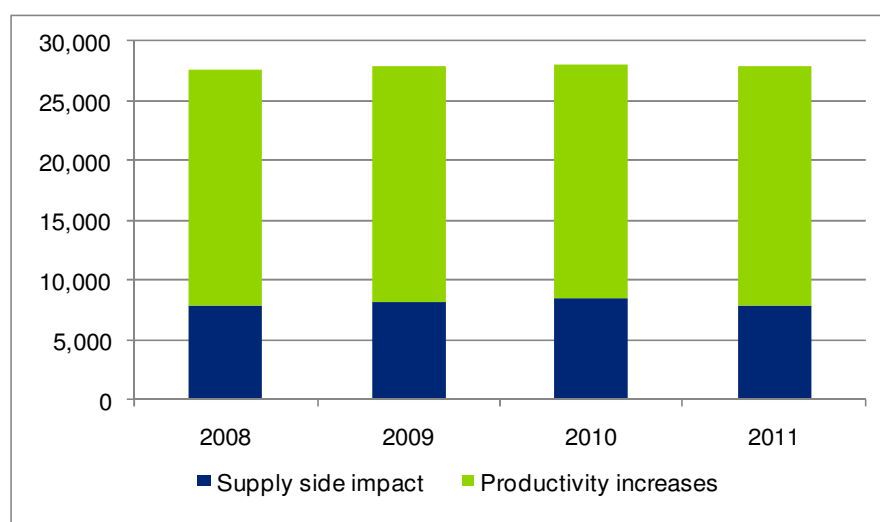
## 2.6 Overall benefits to the economy

In summary, this study of the economic impact of mobile telephony in Croatia finds that in 2011 the mobile communications industry will contribute HRK 8 billion from the supply side impact in addition to HRK 20 billion from the productivity impact, with additional intangible consumer benefits.

This amounts to a total of HRK 28 billion in 2011. This impact increased slightly each year in 2009 and 2010, and is expected to fall slightly (by 1.7%) in 2011 as shown in Figure 9 due to a reduction in MNOs' revenues and investment.

Overall, despite the recession, this impact has remained stable in recent years from HRK 28 billion in 2008, suggesting that MNOs have outperformed the country's overall economic performance in 2009 and 2010. However, in 2011, decreased consumer demand due to aftermath of the recession, combined with increases in mobile specific taxation in recent years, may slow down increases in productivity from adoption of new mobile services.

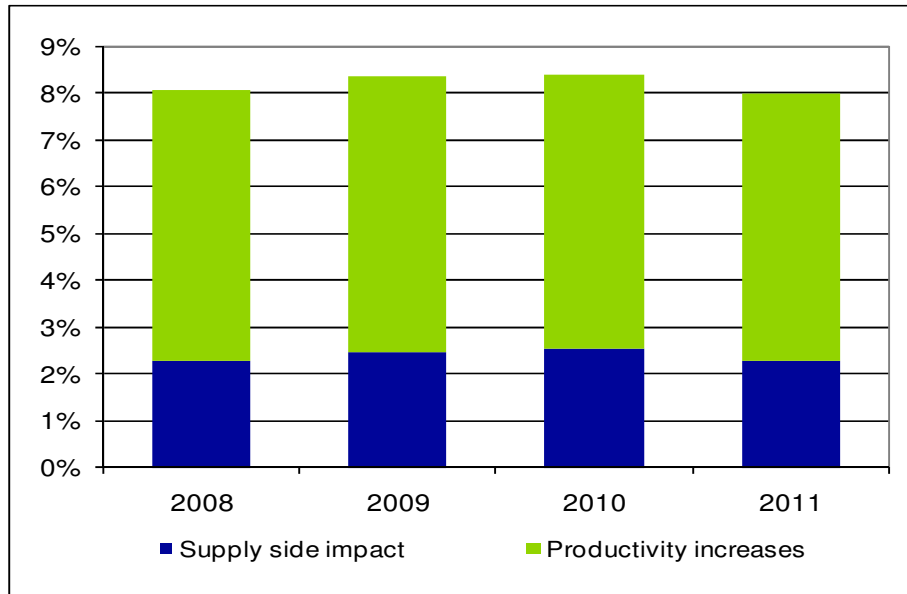
**Figure 9: Economic impact of mobile HRK millions**



*Source: Deloitte analysis. 2011 figures are based on scaled up data from the first half of the year*

As illustrated in Figure 10, relative to GDP this contribution in recent years has represented more than 2% from the supply side and over 5.5% from productivity increases. This highlights the importance of the mobile sector to the productivity of the economy as a whole.

**Figure 10: Economic impact as a proportion of GDP**



*Source: Deloitte analysis. 2011 figures are based on scaled up data from the first half of the year*

## 3 Taxation on MNOs and consumers in Croatia

As discussed above, MNOs deliver significant benefits to the Croatian economy. However, they operate in a challenging investment environment and are subject to a number of market and regulatory pressures:

- Economic uncertainty and decreased consumer demand due to the recession that has impacted Croatia significantly in the last 4 years.
- Unequal taxation treatment compared to other industries including fixed telephony, through the imposition of a 6% mobile specific tax on operator revenues from SMS and call charges.
- A range of additional taxes on their revenues, turnover and inputs.
- Regulatory uncertainty, for example around the glide path for adoption of EU regulation and the possibility of the mandating of SIM registration.

The previous section of this report showed that tax is the biggest element of the value add generated by MNOs in Croatia, making up almost 50% of the total value add generated by the industry in 2011. This section outlines the implications of this taxation for MNOs and consumers in Croatia.

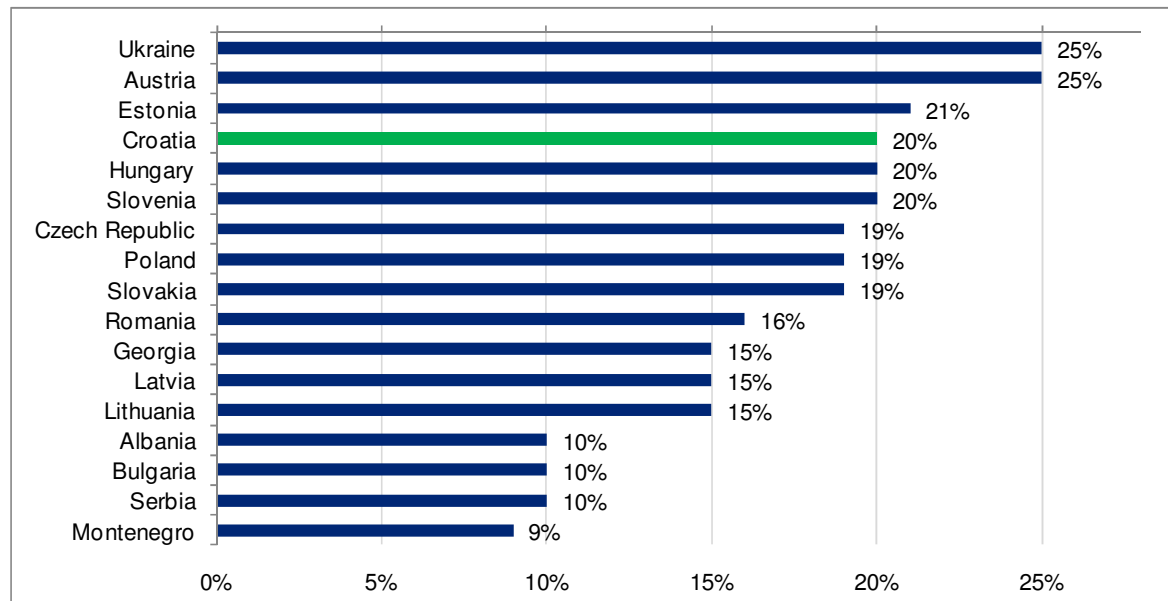
### 3.1 Taxation on MNOs

MNOs in Croatia are subject to corporate tax, a mobile specific taxation on revenues from airtime, SMS and MMS and a range of additional taxes and regulatory fees. These are discussed in detail below.

#### 3.1.1 Corporate tax rate

Croatian businesses face a corporate tax rate of 20%. Based on findings from Deloitte's 2011 Global Mobile Tax Review (forthcoming), this is one of the highest in the region, with only Estonia, Austria and the Ukraine imposing higher corporate tax rates, as shown in Figure 11.

**Figure 11: Corporate tax rates in the region**



Source: Deloitte Global Mobile tax review 2011 (forthcoming)

### 3.1.2 Mobile specific taxation on MNOs' revenue

As part of its response to the economic crisis, Croatia's government introduced a mobile specific tax in June 2009. This tax applies to mobile telephony only and is levied on MNOs, and calculated as 6% of the gross revenues received from voice, SMS and MMS.

The implementation of this tax has raised a number of concerns for MNOs:

- Unlike VAT, which is collected from consumers by producers/retailers on behalf of the government, this tax is levied on MNOs directly, cannot be itemised in prices/receipts and is therefore not transparent to consumers.
- Although the tax was introduced as a reaction to the economic downturn, it does not have a sunset clause and still remains in place after the economy has began to recover. This is despite the fact that other special taxes on citizens and other industries introduced in reaction to the economic downturn were removed in 2010.
- This tax represents a discriminatory treatment of mobile telephony relative to other industries, including fixed telephony with which mobile directly competes in regards to some services and therefore might have a distortionary impact on the market. .
- As all three MNOs are foreign owned, the imposition of this tax might be seen as an indication of investment risk for foreign investors in telecommunications and other industries.



- Such tax appears misaligned with the EU telecom framework. This raises questions as to whether the Croatian government intends to adopt the EU regulations in full. MNOs feel that they are disadvantaged as they are preparing to adopt EU consistent regulations but remain burdened by taxation that is not consistent with EU best practice.

This main consequence of this mobile-specific tax for MNOs is to increase the cost of providing voice, SMS and MMS services for MNOs. MNOs in Croatia operate in a competitive environment and as such it is unlikely that they are able to fully absorb the increased costs, particularly given the difficult economic climate. As a result, MNOs risk having to pass some or all of these higher costs onto consumers or alternatively reducing expenditure in other areas of the business.

If this tax is passed on to consumers, service prices could increase or fall at a lower rate than they would have, as a result of competition, absent the tax, thus affecting consumer demand. If MNOs choose to subsidise some or all of the tax instead, they will need to reduce spending in other areas, such as customer acquisition and retention and/or infrastructure investment, including LTE rollout.

The Serbian government introduced a similar 'economic crisis' tax on mobile services of 10% in June 2009. However, the tax in Serbia was implemented differently to the Croatian tax in that it was presented transparently to consumers through an addition to the VAT level. Additionally, acknowledging the fact that the tax was originally introduced as a temporary measure, and in recognition of the detrimental effects on the industry and consumers the Serbian government removed this tax on 1 January 2011.

### 3.1.3 Other taxation

In addition to corporation tax and the mobile specific tax on gross revenues from voice, SMS and MMS, Croatian MNOs have listed a number of other taxes and regulatory fees they are subject to, including:

- Payment to the Croatian chamber of commerce: 0.056% of revenues plus a HRK 5,500 fixed monthly amount.
- Payment to Croatia forests: 0.0525% of revenues.
- Touristic community fees: approximately 0.12% of revenues.
- Indirect Monumental fees: 0.05% of revenues.

Combined with the 6% mobile specific tax, these taxes represent a significant burden for MNOs, particularly as they are predominantly calculated from revenues rather than profits.

## 3.2 Value add from taxation

MNOs paid 2% more tax in 2009 than in 2008 and 10% more tax in 2010 than in 2009. This is due to the introduction of the 6% tax on revenue from airtime and SMS, which contributed to a 41% (HRK 329 million) increase in the amount of sales and mobile specific tax paid between 2008 and 2010.

In 2011, it is estimated that MNOs in Croatia will pay approximately HRK 1.5 billion to the government in taxes and regulatory fees. This expected reduction is driven by a lower corporation tax payment due to an expected fall in profits, and by a decrease in mobile specific and sales taxes payments due to an expected reduction in volumes compared to the previous year.<sup>15</sup>

The total amount of corporation tax, sales and mobile specific taxes, income tax paid by employees and regulatory fees paid by the industry since 2008 is shown in Figure 12.

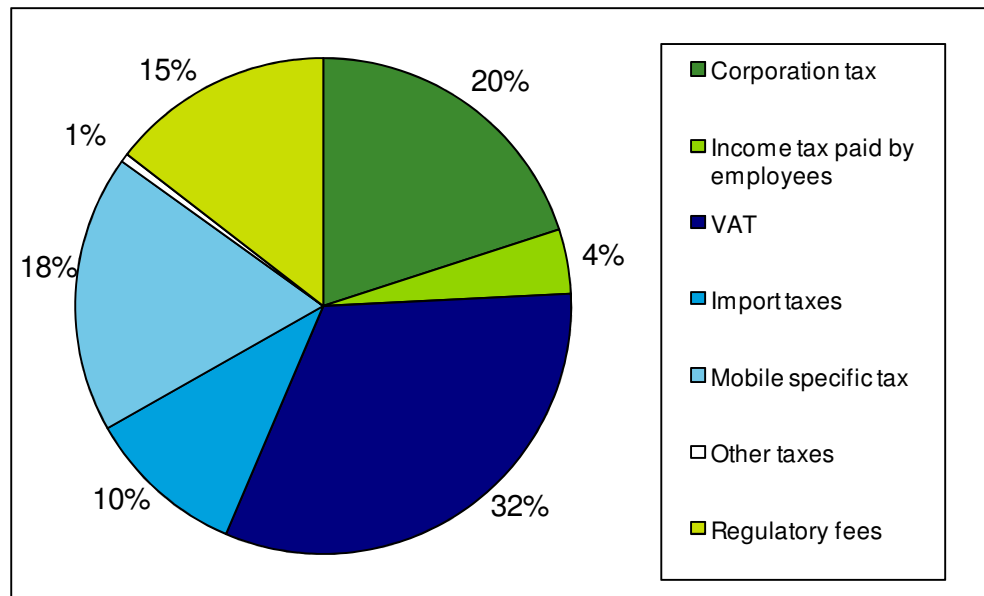
**Figure 12: Tax and regulatory payments in Croatia from MNOs, HRK millions**

Taxes from MNOs	2008	2009	2010	2011
Corporation tax	573	463	376	306
Income tax paid by employees	67	71	63	64
Sales and mobile specific taxes	801	887	1,130	937
Regulatory fees	135	191	207	222
<b>Total taxes and fees</b>	<b>1,575</b>	<b>1,611</b>	<b>1,776</b>	<b>1,529</b>

*Source: Deloitte analysis based on operator data. 2011 figures are based on scaled up data from the first half of the year*

It is expected that tax and regulatory fees will represent 24% of company revenues for Croatian MNOs in 2011. The largest proportion of tax revenue is raised through mobile specific and sales taxes which account for 61% of tax paid in 2011, and of these the mobile specific tax makes up around 30% of total tax paid. The breakdown for 2011 is illustrated in Figure 13.

<sup>15</sup> As mentioned in section 2.2, the financial data for 2011 is based on half year results.

**Figure 13: Breakdown of 2011 tax revenues from MNOs by source**

Source: Deloitte analysis based on operator data

In addition to the direct tax revenue received from MNOs, other players in the mobile industry value chain are expected to generate another HRK 1.6 billion for the government in 2011. The largest payers of tax in the mobile supply chain, aside from the MNOs, are the suppliers of support services, network equipment suppliers and fixed telecommunication operators. The estimated tax revenue from each stage of the value chain is shown in Figure 14.

**Figure 14: Total tax revenues from the mobile value chain in 2011, HRK millions**

Tax Revenue	Tax revenue	Tax revenue with multiplier
MNOs	1,529	1,529
Fixed telecommunications operators	119	154
Network equipment suppliers	145	189
Handset designers and dealers	58	75
Other suppliers of capital items	8	11
Suppliers of support services	817	1,063
Airtime commission, payphone commission	72	93
<b>Total</b>	<b>2,749</b>	<b>3,115</b>

Source: Deloitte analysis based on company accounts and interviews. Note this represents tax revenues directly created by revenue flows from the MNOs and not total tax revenues from the sector. 2011 figures are based on scaled up data from the first half of the year

### 3.3 Other regulatory pressures

In addition to fees and taxes, MNOs in Croatia face a number of additional challenges which impact their growth and investment capabilities:

- Base station planning approvals: MNOs reported that difficulties in obtaining planning approval from local authorities often constrains increasing coverage and service quality. They suggested that the problems might be mitigated if central guidelines or processes were established.
- Adoption of the EU regulatory framework: The Croatian government has been working to align its telecommunications framework with the EU's since 2009. While they are increasingly subject to the EU consistent regulations, the regulator is still operating without similar EU governance processes. Croatian MNOs have therefore limited protection from taxation or regulation that is inconsistent with EU recommendations.
- Uncertainty and a potential lack of consistency in the application of the EU regulations: glide paths for the introduction of new regulations are being applied inconsistently. For example, in order to reduce disruption, they have been applied to mobile termination rates. They will not however be applied to roaming prices, thus risking a revenue shock to the industry.

MNOs are also concerned that the Government might consider mandating the registration of SIM cards in Croatia. MNOs reported the following key concerns regarding compulsory SIM registration:

- The process would impose a high cost on MNOs due to the expense involved in developing and maintaining a storage system for the registration data as well as advertising the need to register and encouraging consumers to register with rewards.
- 'Switching off' access to those who fail to register by the due date would be detrimental to those consumers and to their family, friends and associates who will no longer be able to contact them as easily.
- Linking SIM cards with identities might create opportunities for the development of 'fake identities' through the sale, theft or loss of identification information. According to MNOs, this has been reported as a problem in other countries, such as Bulgaria, who have adopted this policy.

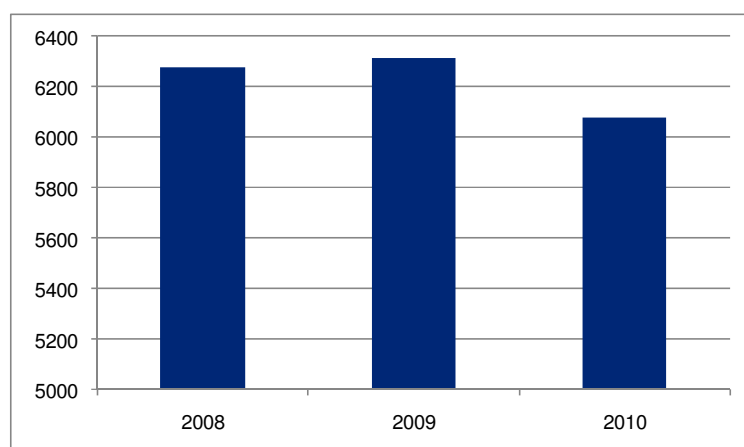
### 3.4 Implications for MNOs

As discussed in section 2.4, the MNOs' contribution to the economy has remained strong through Croatia's recession. However, the challenging market conditions and regulatory pressures under which MNOs operate in Croatia, including the existing mobile specific taxation, have had a number of detrimental impacts on this performance in recent years:

- Usage of both voice calls and SMS decreased between 2009 and 2010.
- MNOs' revenue has fallen significantly since 2008.
- Investment in network expansion and other capex items has fallen each year since 2008.

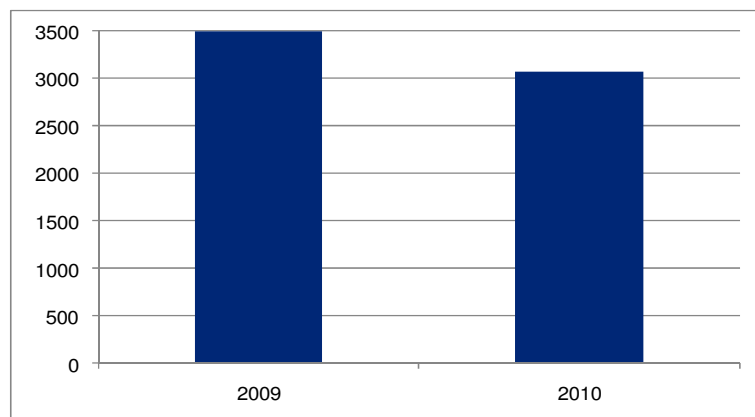
For the first time since the introduction of mobile telephony in Croatia, usage of both voice calls and SMS decreased between 2009 and 2010, as shown in Figure 15 and Figure 16 respectively. This was driven by a combination of the impact on mobile prices of the 6% tax on revenues from airtime and SMS/MMS, the application of the tax leading to substitution with respect to fixed telephony, as well as the difficult economic climate, which is likely to have led to a general decrease in consumer demand in Croatia.

**Figure 15: Total mobile minutes of use in Croatia, millions**



Source: Wireless intelligence

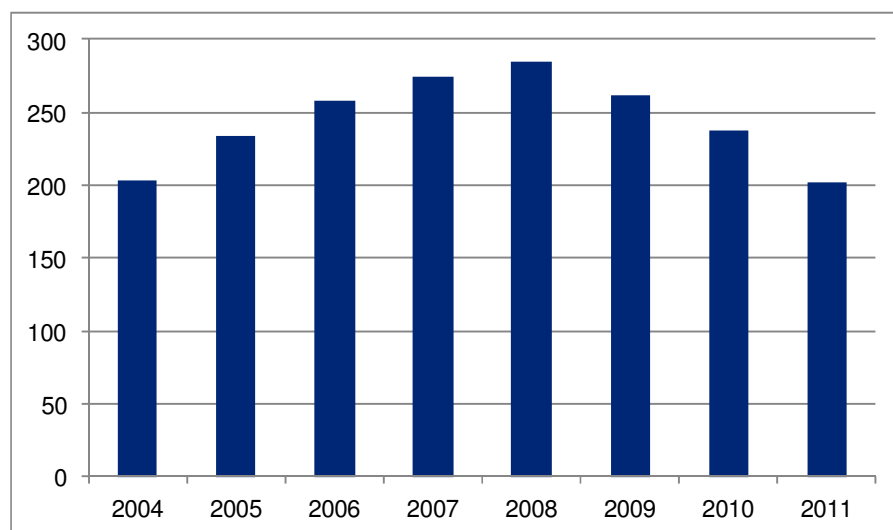
**Figure 16: Total SMS sent, millions**



Source: Croatian electronic communications agency <http://www.hakom.hr/default.aspx?id=264>

Figure 17 shows that, as a result of these impacts on demand for mobile services, total MNOs' revenue has fallen significantly each year since 2008 and is expected to be below 2006 levels in 2011, representing a reduction of almost 30% (83.5 million Euros) from the 2008 levels.

**Figure 17: Total MNOs' revenues, Euro millions**

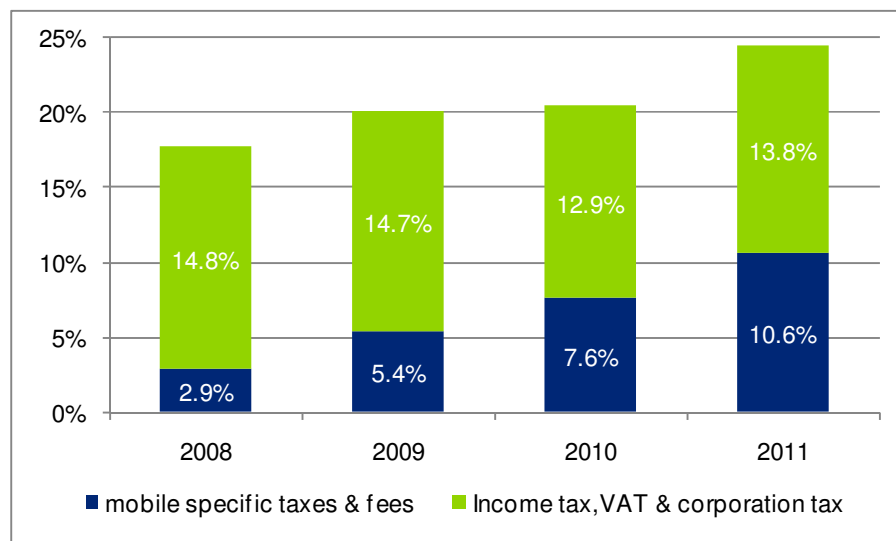


Source: Wireless intelligence

The unequal taxation treatment of MNOs relative to fixed telephony and other goods has led to taxation having increased significantly as a proportion of MNOs' revenue over the last three years, as shown in Figure 18



**Figure 18: Taxation as a proportion of MNOs' revenues**

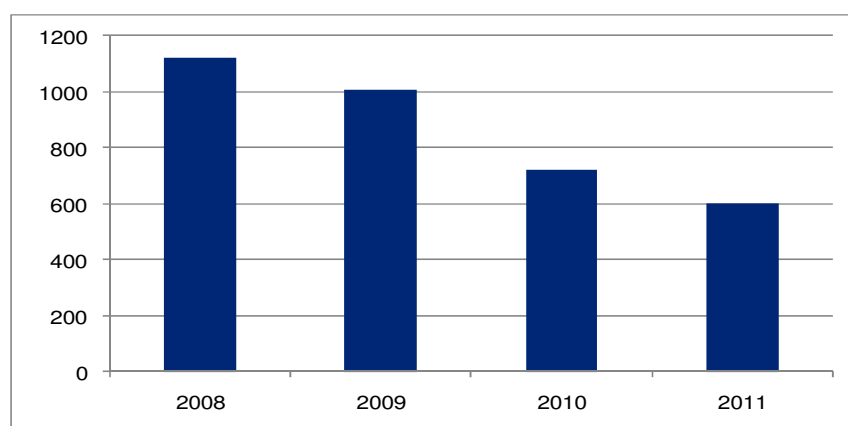


Source: Deloitte analysis. 2011 figures are based on scaled up data from the first half of the year

The decreases in demand and revenue, Croatia's economic situation and the difficult taxation and regulatory environment, appear to have discouraged investment for MNOs.

As such, investment in network expansion and other capex items has fallen each year since 2008, as illustrated in Figure 19, indicating that these pressures have already impacted investment in mobile telephony in Croatia.

**Figure 19: MNOs' expenditure on capex, HRK millions**



Source: operator data. 2011 figures are based on scaled up data from the first half of the year

Uncertainties regarding future financial outlays, such as those involved in the mobile specific tax and compulsory SIM registration, and revenues might lead MNOs to further postpone any large investment decisions to ensure adequate liquidity to meet these possible cost burdens.

In the long term, lower investment and reduced incentives for existing MNOs could slow Croatia's mobile industry in comparison to other countries. In turn, this could potentially reduce the productivity and value add benefits provided by the mobile industry.

### 3.5 Implications for mobile consumers

The complex taxation and regulatory environment that MNOs face also has significant implications for consumers.

The 6% mobile specific tax on usage is likely to directly or indirectly impact mobile prices with negative consequences for Croatian consumers. Although this tax is levied on MNOs' revenues rather than directly from consumers at the point of sale like VAT, it increases the cost to MNOs of providing the affected services by 6%. As noted above, in a competitive market, increased costs are likely to be passed onto consumers through either price increases for affected services or for other services the MNOs provide. As competition is putting downward pressure on prices, this impact might be reflected in slower price decreases rather than price increases. This appears to have been a factor in the reduction in demand identified above.

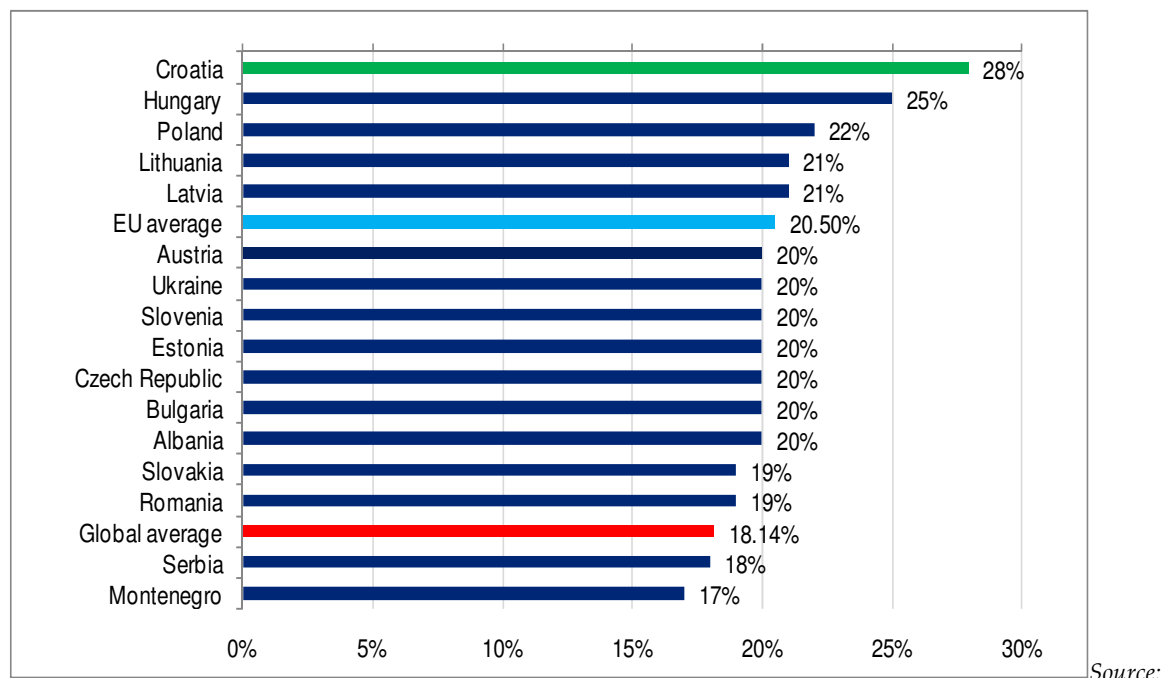
In addition, the mobile specific taxation may have a number of other negative consequences for mobile consumers. This tax, by affecting prices, is regressive in nature and contributes to reduce usage of mobile services. By acting regressively, this tax can generate perverse consequences on the poorer sectors of the population. Finally, as governments sometimes increase the consumption tax on goods for which they wish to discourage consumption, the imposition of this tax may be interpreted as a signal that the government wishes to discourage usage of mobile services.

As a result of this taxation, in 2011 tax for the average Croatian consumer will make up approximately 28% of the total cost of mobile ownership in Croatia<sup>16</sup>. This figure is a measure of what percentage of a consumer's Total Cost of Mobile Ownership ("TCMO", consisting of handset, connection, rental and usage costs) is made up of taxes. In Croatia, tax as a proportion of TCMO is the highest in the region and in the EU and is higher than both the global average of 18% and the EU average of 21%. Figure 20 compares tax as a percentage of mobile phone ownership in Croatia with other countries in the region.

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<sup>16</sup> *Deloitte Global Mobile Tax Review 2011 (forthcoming)*

**Figure 20: Tax as a proportion of TCMO**



*Deloitte Global Mobile tax review 2011 (forthcoming)*

When compared to the Croatian Gross National Income per capita \$US18,710 (HRK 102,505)<sup>17</sup>, mobile telephony costs represent a non trivial proportion (1.8%) of the average income, and may disproportionately impact poorer sectors of the population.

## 3.6 Conclusions

Since the recession and the introduction of mobile specific taxation on MNOs' gross revenues from voice and SMS/MMS services, MNOs and consumers have suffered a number of negative consequences. Mobile usage has decreased, MNOs' revenues have fallen and investment in mobile network has slowed.

Croatia's economy has now returned to positive GDP growth. However, while special taxation imposed on citizens and other industries during the recession was removed in 2011, mobile specific taxation still stands. Continuing the differential treatment of MNOs by taxing them at a higher rate than other businesses in Croatia risks reducing productivity and consumer benefits, thus leading to a potential negative impact on the Croatian economy.

<sup>17</sup> <http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>

## Appendix A Methodology and assumptions

This section outlines the approach taken in estimating the impacts of the economic contribution of the mobile industry in Croatia.

### A.1 Static analysis

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

Publicly available and operator data was employed together with interviews and assumptions based on economic literature to estimate the value of the mobile communications to the economy in terms of employment and GDP, both direct and indirect. The total economic impact is defined as consisting of the following elements<sup>18</sup>:

- The direct impact from the MNOs.
- The indirect impact from other industries related to mobile services.
- The indirect impact due to the surplus enjoyed by end users in terms of productivity improvements.
- The indirect impact due to more qualitative social benefits enjoyed by the population, defined as 'intangible benefits'. For Croatia, this has not been quantified.

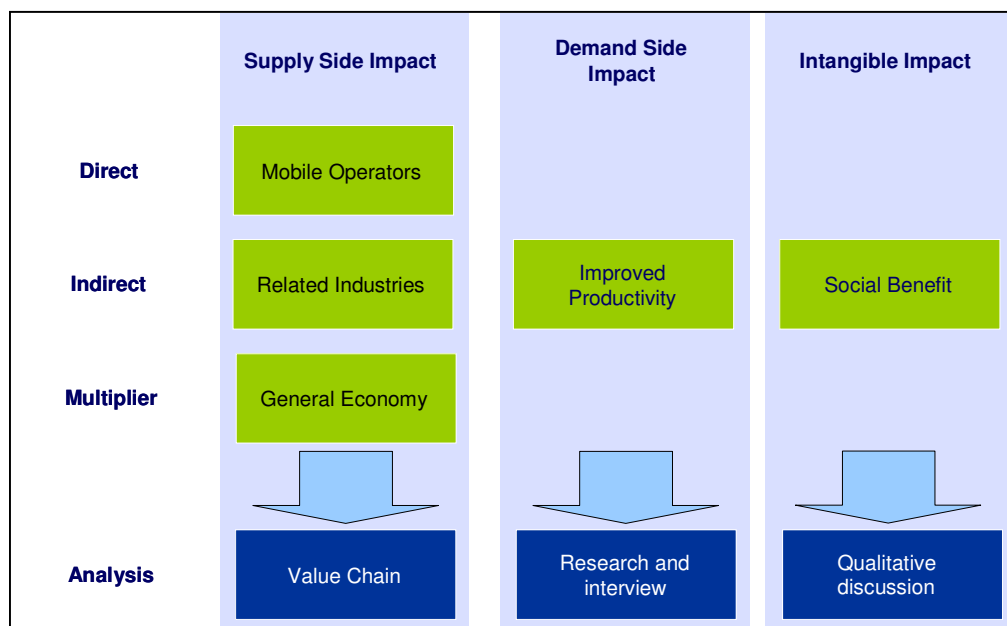
The static analysis has been structured as illustrated by the following figure. The different impacts are summed together to give the total economic impact<sup>19</sup>.

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<sup>18</sup> The approach adopted is consistent with that adopted across the economic literature, see for example: McKinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone*.

<sup>19</sup> To obtain the total economic impact, it is necessary to sum together the supply side, demand side and intangible impacts. Whilst these are intended to capture different impacts of mobile telephony, there is a potential for limited double counting.

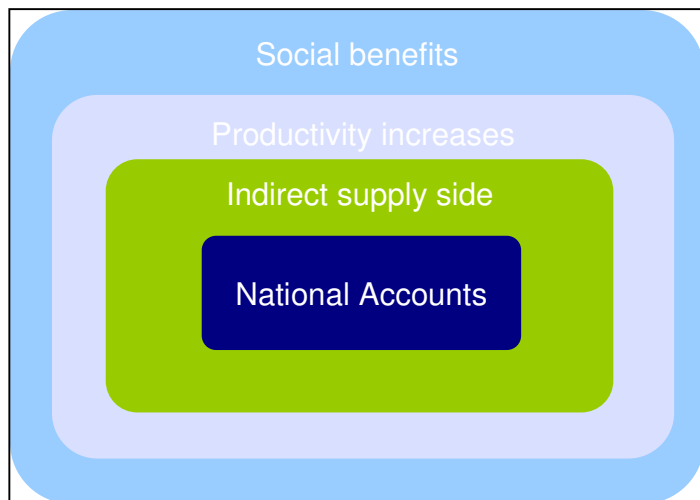
**Figure 21: Structure of the analysis of economic impact on GDP and employment**



Source: Deloitte

The methodology estimates the contribution of the sector on the basis of a wider definition than that commonly cited in national accounts. The adopted definition captures the ‘economic footprint’ of the mobile sector.

**Figure 22: This methodology and national accounts**

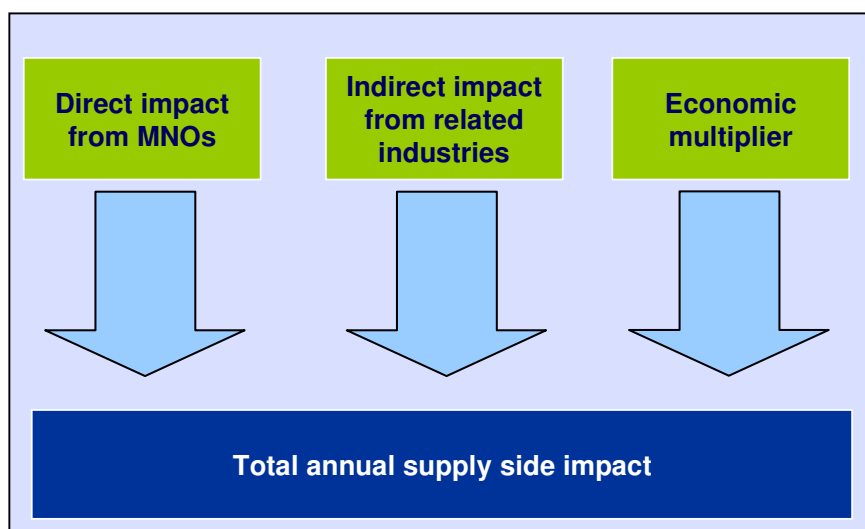


Source: Deloitte

### A.1.1 Supply-side impact

The contribution of the mobile industry to the economy was quantified, covering the industry and its adjacent sectors. This is calculated by aggregating the direct, indirect and economy wide (multiplier) effects that have occurred in each year.

**Figure 23: Structure of the supply side analysis**



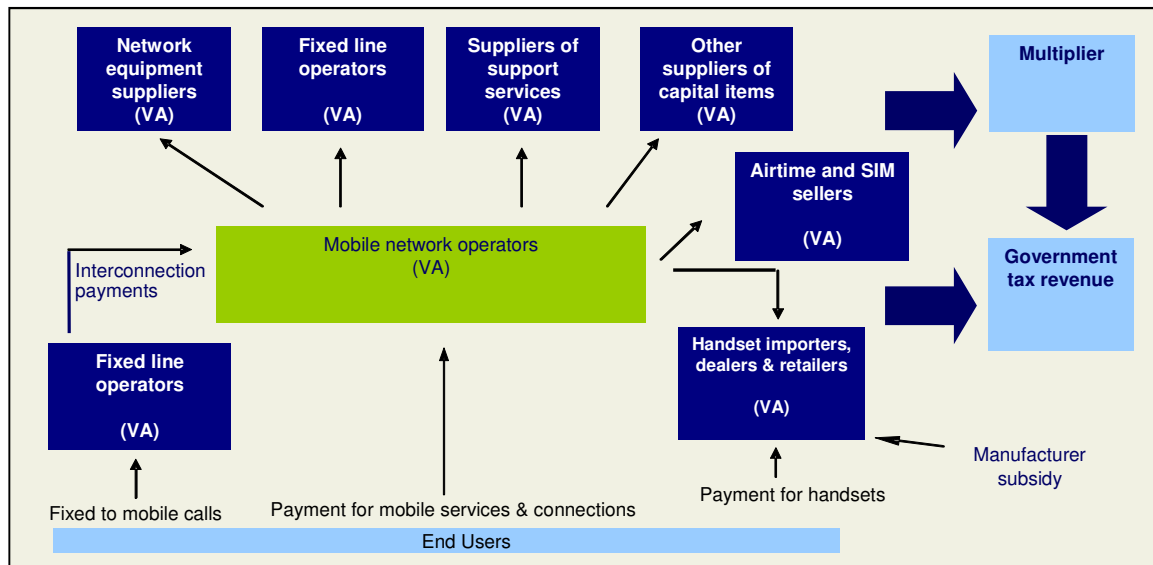
Source: Deloitte

This gives a snapshot view but does not take into account the future benefits to the economy resulting from growth. A customer's spend on mobile services flows along the value chain to the players within the industry: MNOs, suppliers, distributors and others. Money flows between these economic agents and the amounts retained are used to pay wages, taxes, buy inputs and other

costs. Finally, the Government collects tax revenues from all MNOs within its jurisdiction. In this assessment, the focus is limited to the economy of the country in question and ignores international impacts.

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

**Figure 24: Mobile value chain**



Source: Deloitte

Estimates of the flows are based on:

- Discussions with MNOs.
- Interviews with handset dealers and equipment suppliers.
- Discussions with other stakeholders (suppliers, chamber of commerce, etc).
- Analysis of Government taxation statistics.
- Analysis of accounts and billing information.

Following the identification of the revenue flows, the proportion of these flows that remain within the domestic economy was estimated and are translated into a positive economic benefit, referred to in this report as value add.

#### **A.1.1.1 Direct value add from MNOs**

Five categories of economic value which are directly created by the MNOs have been determined:

- Wages and employee benefits.
- Contractor costs.
- Taxes and regulatory fees.
- Corporate social responsibility.
- Dividends.

For each of these categories, the proportion of value add which relates to the domestic economy was identified. This analysis is based upon operator management accounts interviewing which identify the final destination of monetary flows.

#### **A.1.1.2 Indirect value add**

The revenues that flow directly from the MNOs to other domestic industry players have been identified. The proportion of revenues that are value add was then estimated, using the five categories of value add used in the mobile network operator analysis above. These proportions for each country are outlined in Appendix A.

#### **A.1.1.3 The multiplier**

The value add created by the mobile communications industry will have a subsequent positive impact on the economy. These effects are generated by further rounds of expenditure. For example, the indirect domestic industry players will additionally incur operating expenses paid to additional players. These players will then create value as they pay wages and taxes etc. The economic literature quantifies these effects by applying an 'economic multiplier' to the initial rounds of value generated. The table below shows the values of multipliers that have been calculated in other studies.



**Figure 25: Multiplier benchmarks**

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
Deloitte for Telenor. 2008. 'Economic Impact of mobile telephony in Ukraine, Malaysia, Thailand, Ukraine and Pakistan'.	1.2 - 1.4
Deloitte for Telenor. 2008. 'Economic Impact of mobile telephony in Serbia'	1.3
Zain/Ericsson 2009. 'Economic impact of Mobile Communications in Sudan'	1.2
Aloyce R. Kaliba et al 2004 multiplier estimates 'Multipliers for Tanzania: implications on developing poverty reduction programs' (transport and communication multiplier estimate)	1.63

Source: Deloitte

An economic multiplier of 1.3 was utilised to estimate the knock-on impact on the rest of the economy of the direct and indirect effects of mobile telephony on GDP and employment. This was assumed following a literature review, considering benchmark used for countries in the region with similar characteristics for previous studies, and using the data provided by MNOs about the proportion of expenditure by key players which remains in Croatia.

#### **A.1.1.4 Calculating tax revenues**

Tax revenues to the Government are raised through taxes specific to mobile services, corporation tax, income tax and regulatory fees. Tax revenues are collected from the Government from all components in the value chain. However, based on interviews with parties, a degree of leakage from the informal sector has been assumed.<sup>20</sup>

Information on revenues for various taxes was collected as follows:

<sup>20</sup> Assumptions are made on the percentage of money flows that are subject to the national tax regime. For example, it is assumed that legitimate registered businesses pay sales, import, employee and corporate taxes whilst it is assumed that only a small proportion of streetside airtime sellers and handset dealers pay taxes. Therefore not all flows are assumed to be subject to taxation.

- Economy wide taxes: value added (sales) taxes, corporate taxes and income tax paid by employees.
- Mobile taxes: licence and spectrum fees, import duties, and other mobile specific taxes.

Tax revenues were calculated directly from the MNOs and also from other entities in the value chain.

### **A.1.2 Calculating the impact on employment**

Mobile services contribute to employment via several avenues:

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

The first impact is estimated directly by collecting data from the MNOs and, for the related industries, dividing the proportion of revenue spent on wages by the average wage rate in each sector. Typically, support and induced employment is estimated using a multiplier and other studies have used a ratio of 1.1 to 1.7 for induced employment. The use of such multipliers can often be criticised for the lack of consideration to the economic basis of the industry and country under consideration. Discussions with stakeholders were conducted on this issue and it was chosen to apply a multiplier of 1.3 on all value add including employment.

### **A.1.3 Increases in productivity**

Significant economic and social research was undertaken in the last ten years on the numerous ways in which mobile services can improve productivity, including in more developed markets such as Croatia. In section of the main paper the key effects identified in the last three years in Croatia were identified, discussed and measured. Several important effects have been identified in the research in the last years. These are presented here for general review and include:

- Improving information flows: mobile services allow certain occupations to cut out the middle-man as traders can obtain information on prices, quality, and quantities directly. This improves the incomes of producers, and helps reduce wastage.
- Reducing travel time and costs: similarly, mobile services allow workers to trade and share information without travelling.

- Improving efficiency of mobile workers: mobile services improve the efficiency of all workers in the economy. This effect will particularly be felt by workers with unpredictable schedules, for example those involved in repair and maintenance, or collection and delivery. Mobiles will give them greater accessibility and better knowledge of demand.
- Improving job search: mobile services improve the chances of the unemployed finding employment through enabling people to call for opportunities rather than relying on word of mouth. Further to this, owning a mobile phone makes workers more employable as they are contactable while absent from their place of work.
- Encouraging entrepreneurialism: mobile has encouraged the growth of small business and has increased its efficiency.
- As discussed in the main report, data and smartphone proliferation amplifies these effects and gives access to applications and emails.

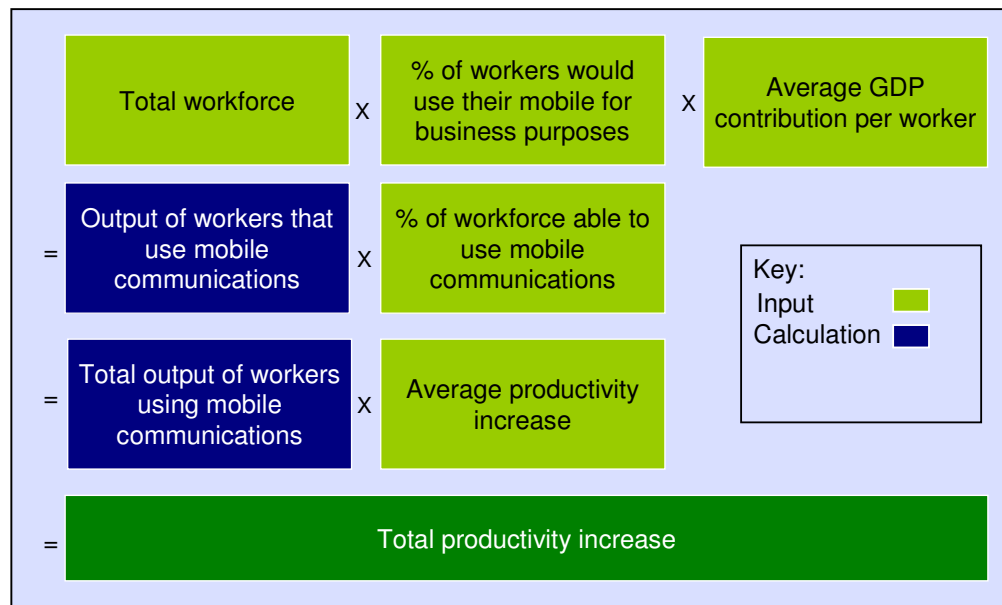
No established economic methodology exists to estimate the GDP and employment effects of such productivity improvements across the economy. As such, available evidence from the literature in the area was considered and interviews with stakeholders have been undertaken in order to provide an indication of the demand side impact of mobile communications.

The impact on the productivity improvements on the overall economy is estimated by assuming that the productivity improvement will be experienced by high mobility employees within the economy. In line with similar studies<sup>21</sup>, high mobility workers are defined as those workers who undertake a moderate to high degree of travel in the course of their employment e.g. taxi drivers, salesmen and transport workers. The proportion of high mobility workers was calculated by reference to data from the national bureau of statistics and international labour databases. The productivity gain of high mobility workers with access to a mobile phone was estimated by undertaking interviews to identify the impacts seen in each country and by reference to previous studies.

The process for calculating the impact of the productivity improvements on the economy is set out in the figure below.

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<sup>21</sup> Examples include: McKinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone.*

**Figure 26: Calculation of economic impact of productivity improvements**

Source: Deloitte

### A.1.4 Intangible benefits

Finally, we considered the intangible impact of the mobile industry. As with productivity, economic and social research was undertaken in the last ten years on the numerous ways in which mobile services can promote intangible benefits. In section 2.5 of the main paper the key effects identified in the last three years in Croatia were identified and discussed. Several additional important effects have been identified in the research in the past. These are presented here for general review and include:

- Promoting social cohesion: through enabling contact when family members or friends who have moved away.
- Extension of communications: especially to users with low education and literacy, particularly through the use of texts.
- Stimulating local content: this can be particularly useful for allowing users to learn about local services such as healthcare or education.
- Assisting in disaster relief: mobile services allow families and friends to stay in touch in the event of a natural disaster, which can also ensure that they obtain more rapid relief.

Whilst it is difficult to assign a specific value to these benefits in terms of contribution to GDP or employment, it is clear that many of these social and educational benefits could make people happier, healthier and more motivated; and hence more employable and able to contribute to GDP.

## A.2 Data limitations and detailed assumptions

### Assumptions used in the economic impact assessment

Assumption	Value																
Employment levels	<p><u>Direct employment by MNOs</u></p> <p>Data was obtained directly from T-Mobile and VIPnet, while estimates were used for Tele2 based on publicly available information, including market shares.</p> <p><u>Indirect employment</u></p> <p>Employment figures for most segments of the value chain were estimated based on discussions with MNOs. However, employment figures for some segments were estimated as revenue inflow multiplied by wages as percentage of revenue divided by average wage. Wages as percentage of revenue was estimated based on discussions with MNOs. Average wage was estimated by using assumptions on operator wage and average wage in Croatia.</p> <p>For airtime employment, interviews with MNOs' staff identified the number of points of sale and distributors by type. Based on interviews, an appropriate level of employment was assumed for each type. On average 0.4 FTEs were assumed for each point of sale.</p> <p>A multiplier of 1.3 was applied to indirect levels to gauge the total employment effect in the economy. No multiplier was applied to direct MNO employment as a large amount of employment will already be captured by the first round flows.</p>																
Value add margins for each segment of the value chain	<p>Value add margins are the total % of revenue spent domestically on (i) sales, import, income, corporate and regulatory taxes; (ii) wages; (iii) CSR; and (iv) profit.</p> <p><u>Direct value add of MNOs</u></p> <p>All data was obtained directly from MNOs</p> <p><u>Indirect value add</u></p> <p>These percentages are estimated based on interviews and a review of accounts of companies in Croatia. The value add margins used for the supply chain are as follows:</p> <table border="1"> <thead> <tr> <th>Margin on domestic revenues</th><th>% value add margin</th></tr> </thead> <tbody> <tr> <td>Fixed telecommunications operators</td><td>58%</td></tr> <tr> <td>Network equipment suppliers</td><td>68%</td></tr> <tr> <td>Handset producers and dealers</td><td>63%</td></tr> <tr> <td>Other suppliers of capital items</td><td>51%</td></tr> <tr> <td>Suppliers of support services</td><td>64%</td></tr> <tr> <td>Airtime, SIM and payphone commission</td><td>62%</td></tr> <tr> <td>Other expenditure</td><td>54%</td></tr> </tbody> </table>	Margin on domestic revenues	% value add margin	Fixed telecommunications operators	58%	Network equipment suppliers	68%	Handset producers and dealers	63%	Other suppliers of capital items	51%	Suppliers of support services	64%	Airtime, SIM and payphone commission	62%	Other expenditure	54%
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Handsets	Handset prices, percentage of handsets sold by MNOs, proportion of illegal and second hand sales were estimated based on interviews and estimates from MNOs.																																																																		
Productivity improvement	<p>An annual productivity improvement of 8% for high mobility workers is assumed based on interviews and a review of similar studies.</p> <p>High mobility workers are estimated as 58% of the total workforce based on data from Croatia office of national statistics. The estimate of the percentage of high mobility workers in each employment activity is provided below.</p> <table><tr><th>Employment by sector</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>% High Mobility</th></tr><tr><td>Agriculture and Forestry</td><td>69,560</td><td>69,560</td><td>65,543</td><td>65,543</td><td>25%</td></tr><tr><td>Mining and Quarrying</td><td>8,841</td><td>8,841</td><td>7,544</td><td>7,544</td><td>25%</td></tr><tr><td>Manufacturing</td><td>272,812</td><td>272,812</td><td>256,842</td><td>256,842</td><td>25%</td></tr><tr><td>Electricity and Water</td><td>38,340</td><td>38,340</td><td>39,594</td><td>39,594</td><td>25%</td></tr><tr><td>Building and Construction</td><td>140,661</td><td>140,661</td><td>142,204</td><td>142,204</td><td>70%</td></tr><tr><td>Wholesale and Retail Trade, Restaurants and Hotels</td><td>329,223</td><td>329,223</td><td>308,463</td><td>308,463</td><td>80%</td></tr><tr><td>Transport and Communications</td><td>114,024</td><td>114,024</td><td>110,063</td><td>110,063</td><td>90%</td></tr><tr><td>Finance, Insurance, Real Estate and Business services</td><td>115,705</td><td>115,705</td><td>112,724</td><td>112,724</td><td>90%</td></tr><tr><td>Community, Social and Personal Services</td><td>159,957</td><td>159,957</td><td>160,988</td><td>160,988</td><td>35%</td></tr><tr><td>Average high mobility</td><td></td><td></td><td></td><td></td><td>58%</td></tr></table> <p>Employment information for 2009-2010 is obtained from the national statistics office. 2008 and 2011 employment is estimated on the basis of the labour force growth rate. Percentage of workers who are high mobility are Deloitte assumptions based on benchmarks from previous studies and experience. Average high mobility is a weighted average.</p> <p>The GDP contribution of these workers is estimated by calculating the total GDP relating to high mobility sectors and dividing by the total number of high mobility workers.</p>	Employment by sector	2008	2009	2010	2011	% High Mobility	Agriculture and Forestry	69,560	69,560	65,543	65,543	25%	Mining and Quarrying	8,841	8,841	7,544	7,544	25%	Manufacturing	272,812	272,812	256,842	256,842	25%	Electricity and Water	38,340	38,340	39,594	39,594	25%	Building and Construction	140,661	140,661	142,204	142,204	70%	Wholesale and Retail Trade, Restaurants and Hotels	329,223	329,223	308,463	308,463	80%	Transport and Communications	114,024	114,024	110,063	110,063	90%	Finance, Insurance, Real Estate and Business services	115,705	115,705	112,724	112,724	90%	Community, Social and Personal Services	159,957	159,957	160,988	160,988	35%	Average high mobility					58%
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