

Deloitte.



Mobile telephony and taxation in Turkey



This report has been prepared on the basis of the limitations set out in the engagement letter and the matters noted in the Important Notice From Deloitte on page 1.

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited (“DTTL”), a UK private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.co.uk/about for a detailed description of the legal structure of DTTL and its member firms. Deloitte LLP is a limited liability partnership registered in England and Wales with registered number OC303675 and its registered office at 2 New Street Square, London, EC4A 3BZ, United Kingdom. Deloitte LLP is the United Kingdom member firm of DTTL.

© 2012 Deloitte LLP

Contents

- Important notice from Deloitte..... 4
- Mobile communications and taxation in Turkey..... 2
 - 1. Mobile communications in Turkey2
 - 2. The economic contribution of mobile telephony to the economy2
 - 3. Taxation on consumers and MNOs5
 - 4. Impacts of taxation reductions 10
- Appendix A The economic impact of mobile telephony in Turkey 13
 - A.1 Approach to estimating the economic impact..... 13
 - A.2 Benefits to the supply side of the economy 14
 - A.3 Impact on employment 18
 - A.4 Value add from taxation.....20
 - A.5 Overall benefits to the economy21
 - A.6 Other potential impacts22
- Appendix B Taxation on MNOs and consumers in Turkey 27
 - B.1 Mobile specific taxation.....27
 - B.2 Mobile specific taxation on consumers27
 - B.3 Taxation on MNOs.....36
 - B.4 Implications for MNOs.....37
 - B.5 Impact of changes in taxation policy40
- Appendix C Methodology and assumptions 47
 - C.1 Estimation of the economic impact of mobile telephony.....47
 - C.2 Impacts of the reduction of mobile specific taxes58

Important notice from Deloitte

This report (the “report”) has been prepared by Deloitte LLP (“Deloitte”) for the GSM Association in accordance with the engagement letter dated 1 July 2011, and on the basis of the scope and limitations set out below.

The report has been prepared solely for the purposes of assessing the structure and impact of mobile telephony and taxation of mobile telephony in Turkey as part of a wider study on taxation of mobile telecommunications services. It should not be used for any other purpose or in any other context, and Deloitte accepts no responsibility for its use in either regard.

The report is provided exclusively for the GSMA’s use under the terms of the Contract. No party other than the GSMA is entitled to rely on the report for any purpose whatsoever and Deloitte accepts no responsibility or liability or duty of care to any party other than the GSMA in respect of the report and/or any of its contents.

As set out in the engagement letter, the scope of our work has been limited by the time, information and explanations made available to us. The information contained in the report has been obtained from the GSMA, its members and third party sources that are clearly referenced in the appropriate sections of the report. Deloitte has neither sought to corroborate this information nor to review its overall reasonableness. Further, any results from the analysis contained in the report are reliant on the information available at the time of writing the report and should not be relied upon in subsequent periods.

Accordingly, no representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of Deloitte or by any of its partners, employees or agents or any other person as to the accuracy, completeness or correctness of the information contained in this document or any oral information made available and any such liability is expressly disclaimed.

All copyright and other proprietary rights in the report remain the property of Deloitte LLP and any rights not expressly granted in these terms or in the change order are reserved.

This report and its contents do not constitute financial or other professional advice, and specific advice should be sought about your specific circumstances. In particular, the report does not constitute a recommendation or endorsement by Deloitte to invest or participate in, exit, or otherwise use any of the markets or companies referred to in it. To the fullest extent possible, both Deloitte and the GSM Association disclaim any liability arising out of the use (or non-use) of the report and its contents, including any action or decision taken as a result of such use (or non-use).

Mobile communications and taxation in Turkey

This report was commissioned by the GSM Association ('the GSMA') to examine the economic contribution of mobile telephony and the impact of mobile specific taxation in Turkey. The report provides an analysis of the impact of mobile telephony on Turkish citizens and the economy in the last four years (2008-2011). It also describes the level of taxation that applies to mobile consumers and Mobile Network Operators ('MNOs') in Turkey, evaluating the effects that mobile specific taxes have on the industry and the wider economy.

The report summarises the detailed analysis contained in a series of annexes and is based on discussions and data provided by Turkcell and Vodafone, and on discussions undertaken with Avea and other stakeholders. Additional data has been provided by the GSMA and taken from publicly available sources that are referenced in the report or annexes.

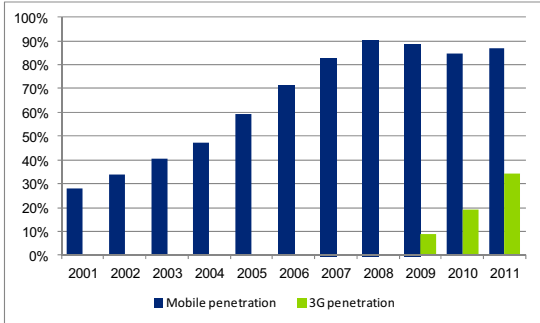
1. Mobile communications in Turkey

Turkey has a well-established mobile market characterised by three MNOs, Turkcell, Vodafone and Avea, each enjoying a market share of approximately 52.8%, 27.6% and 19.6% respectively in 2011.

Total mobile subscribers were over 65 million in Q4 2011, representing a penetration of 88.5%. Mobile penetration in Turkey increased until 2008, since when it has slightly fallen as a result of mobile number portability, while taxation on SIM cards and connections discourages consumers from owning more than one SIM card. Notably, penetration has failed to reach the 100% milestone that is common in European countries.

GSM networks cover 99% of the population. Mobile telephony also provides wireless data and broadband to 38.2% of the total mobile customers, with 3G services launched in 2009 and the expectation from the MNOs that LTE trials will be rolled out by the end of this year.

Figure 1: Mobile and 3G penetration levels in Turkey, 2011



Source: Wireless intelligence and MNOs' data

2. The economic contribution of mobile telephony to the economy

Mobile telephony in Turkey generates significant economic impacts through effects on the supply side of the economy, employment, increases in productivity and benefits gained by Turkish consumers.

In addition to the three MNOs, the mobile communications ecosystem in Turkey is formed by players such as equipment providers, typically international equipment manufacturers with offices in Turkey, and providers of other network services such as installation and maintenance; handset importers and distributors; airtime distributors and sellers, which include a host of retail points throughout the country; and suppliers of other services to MNOs such as advertising, accounting and other support services.

Figure 2: Mobile communications ecosystem in Turkey



This report estimates the economic impact of the mobile industry in terms of the direct and indirect effects provided to the supply side of the Turkish economy by the MNOs and by players in the wider mobile ecosystem, and of direct and indirect employment from firms in the ecosystem.

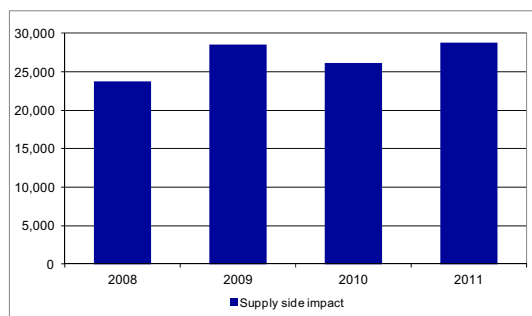
The report also discusses the potential productivity increases resulting from mobile workers using their phones for business purposes and the social benefits enjoyed by consumers as a result of access to mobile services.

Supply side impact

MNOs provide numerous benefits to the supply side of the Turkish economy through the direct effect of their expenditure, and these benefits are then transmitted to related industries in the mobile ecosystem and more widely across the economy.

In 2011 the mobile communications industry has contributed TRY 28.8 billion from supply side impacts to the Turkish economy.

Figure 3: Supply side value add of mobile communications in Turkey, TRY millions



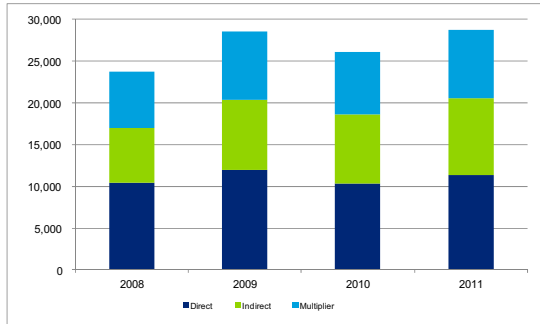
Source: Deloitte analysis

To calculate the value add generated by the industry, firstly the value add created by the mobile communications industry was estimated. This consists of the value created by MNOs' expenditure on wages, corporate and social responsibility ('CSR') programmes, dividends paid by MNOs and taxes recovered as a result of the MNOs' operations.

In addition, the indirect impacts from MNOs expenditure to parties in the wider mobile ecosystem have been estimated, i.e. what percentage of any amount spent by the end users remains within the national boundaries to be spent in the next round. Finally, a spend multiplier was applied to capture the effects on the wider economy.

In 2011 MNOs in Turkey are estimated to have provided a direct contribution of TRY 11.3 billion to the country's economy, while the indirect impacts amounted to TRY 9.2 billion, with a multiplier effect of TRY 8.2 billion. The direct contribution includes the 2009 purchase of 3G spectrum by the MNOs, which amounted to TRY 1.6 billion.

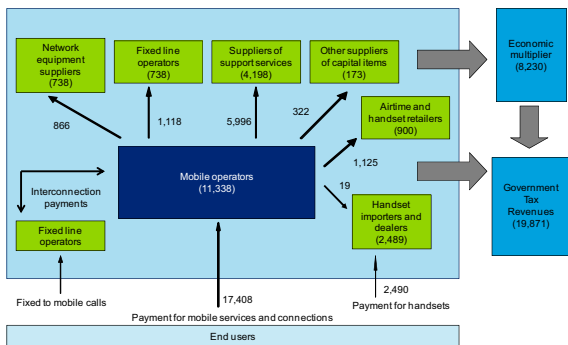
Figure 4: Supply side value add from mobile communications by component, TRY millions



Source: Deloitte analysis

The value add relationship between the MNOs and related industries in the ecosystem is shown below. The estimates of value add include the multiplier effect on the wider economy which is assumed to be 40% of the revenues generated directly by the MNOs and the related supply chain.

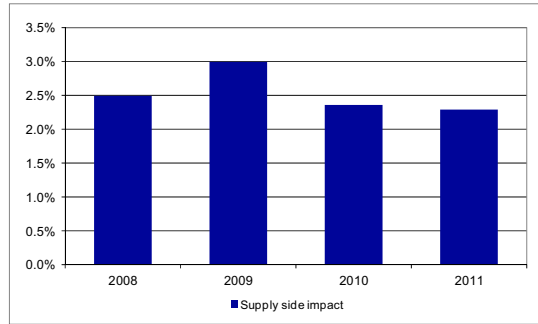
Figure 5: Mobile value chain and value add in Turkey in 2011, TRY millions



Source: Deloitte analysis, values in brackets represent value add

The overall estimated impact generated by the mobile telephony ecosystem in 2011 represented 2.3% of Gross Domestic Product ('GDP'),

Figure 6: Supply side value add as a proportion of GDP



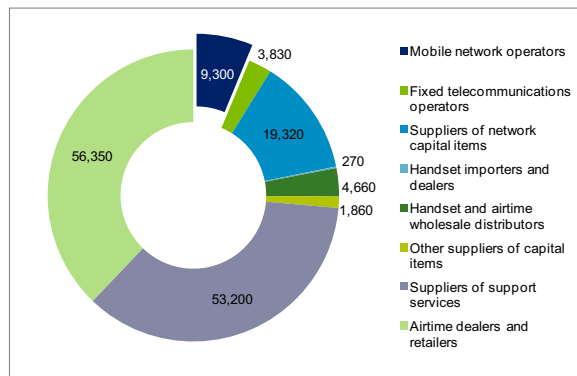
Source: Deloitte analysis

Impact on employment

Mobile services in Turkey contribute to employment in several ways, including direct employment of the MNOs, the employment in the related industries described above, the support employment created by outsourced work and taxes that the government subsequently spends on employment generating activities. Additional induced employment is created by employees and beneficiaries spending their earnings, thereby creating more employment.

While many services related to mobile telephony (such as radio and network equipment, handsets and smartphones) are designed and produced abroad, international providers recognise the importance of the Turkish market and have established offices and operations in the country, e.g. network equipment providers such as Ericsson, Huawei and Motorola, and handset producers such as HTC, Nokia and LG have local offices in Turkey.

Figure 7 Employment generated by the mobile communications ecosystem in 2011 (FTEs)



Source: Deloitte analysis

It is estimated that in 2011 the mobile communication industry employed nearly 150,000 Full Time Equivalents ('FTEs') in Turkey. A further 55,800 FTEs are estimated to be generated in the wider economy as a result of the interactions with the MNOs.

While MNOs employed over 9,000 FTEs in 2011, the wider mobile ecosystem employed almost 140,000 additional FTEs. Of these, over 56,000 are the airtime dealers and retailers operating from supermarkets, technology stores and smaller independent points of sale.

Other potential impacts

In addition to benefits to the supply side of the economy, mobile telephony generates potential productivity increases through the use of mobile telephony for business purposes as well as intangible and social benefits to consumers.

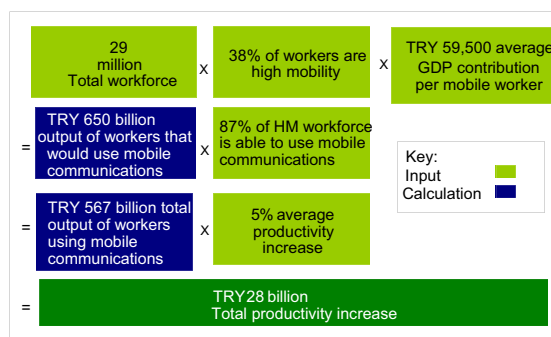
Discussions with MNOs and other stakeholders identified numerous ways in which mobile services have led to productivity increases in Turkey. Of particular note were:

- Improvements related to the provision of 3G and other high-value services such as wireless data, enhanced by the proliferation of smartphones, tablets, dongles and Machine To Machine ('M2M') operations.
- Improved efficiency in payments: Avea has a near field communication ('NFC') service which for example enables users to store their credit cards, ID cards and transport tickets within an NFC enabled SIM card, thereby saving time for these transactions.
- Improved efficiency of agricultural production and distribution of food supplies. The Vodafone Farmer's club provides farmers with weather alerts and local market price information.
- Development of M2M operations: Turkcell has provided over 750,000 SIM cards on automated platforms for wireless usage (including e.g. health and agriculture) for a number of companies in the public and private sector.
- Contribution to regional economic development, e.g. the creation of Turkcell Global Bilgi Erzurum Call

Centre and Avea Erzincan Call Centre in Eastern Turkey.

While these productivity impacts cannot be accurately quantified, an economic value approach can be employed to provide a high level estimation of potential productivity benefits. This indicates that, if mobile workers in Turkey achieved a 5% increase on their productivity as a result of using mobile phones, the potential productivity impact of mobile services on the economy could be up to TRY 28 billion in 2011.

Figure 8: Potential economic impact in 2011 of increased productivity amongst high mobility workers



Source: Deloitte analysis based on Deloitte assumptions, interviews and Turkey Bureau of Statistics

Mobile communications also provide a number of intangible benefits to consumers. These include the development of interpersonal and family communications, the promotion of social cohesion, the extension of communication to those on low incomes and the assistance in disaster relief. Consumers also benefit through corporate and social responsibility programmes undertaken by the MNOs, including health and education programmes.

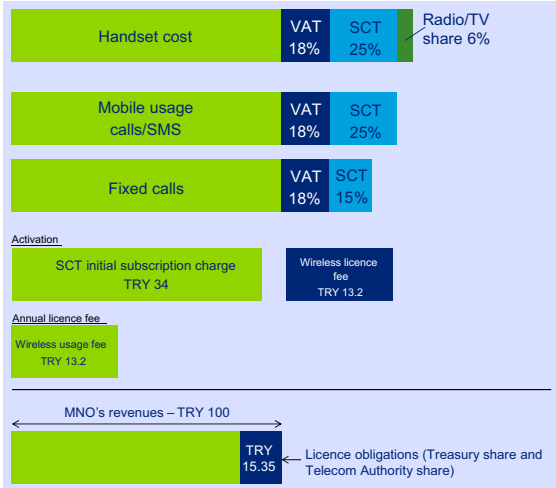
While such intangible consumer benefits cannot be accurately quantified, a willingness to pay analysis that combines data on usage increases and price decreases over the years can be employed to estimate how consumer benefits have increased over time in the last four years. This approach suggests that consumers potentially enjoyed the equivalent of up to TRY 8.2 billion in intangible benefits in 2011.

3. Taxation on consumers and MNOs

Despite the economic contribution estimated above, mobile consumers and MNOs in Turkey suffer a taxation

regime which is specific to this industry and more severe than that faced by consumers in European countries.

Figure 9: Mobile specific taxation on consumers and MNOs, 2011



Source: MNOs data

Taxes on mobile consumers include:

- A 25% Special Communications Tax ('SCT') on usage that is paid directly by mobile users and is applied on call minutes and messages on top of VAT (a reduced rate of 5% is applied on data usage and was introduced in 2009). As such, for every TRY 100 of net airtime and SMS usage purchased by customers, a tax of TRY 43 (VAT plus SCT) is paid by local consumers and businesses as tax in addition to the net price. The SCT applies in a discriminatory way to mobile telephony usage: the SCT applying to fixed telephony is set at 15%, a notably lower level, creating distortions in the market for telephone calls.
- Handsets are subject to heavy taxation in Turkey. A Special Consumption Tax of 25% is levied on the Cost, Insurance and Freight ('c.i.f.') price for each handset imported. This tax has also a TRY 100 'floor' amount that is applied when 25% of the import price of a handset amounts to less than TRY 100. The Special Consumption Tax was increased from 20% to 25% in 2011, while the minimum floor level was increased from TRY 50 to TRY 100. In addition to the Special Consumption Tax, handsets price is also subject to a 6% tax that benefits the Turkish Radio Television Foundation.

- An Initial Subscription Charge (TRY 34 in 2011) applies. This is an additional fixed component of the Special Communications Tax and consists of a fixed amount to be paid once by consumers when a new SIM card is purchased. It is adjusted every year according to inflation and has been set at TRY 37 for 2012.
- A Wireless Licence Fee (TRY 13.2 in 2011) is also paid by consumers when a new connection is purchased. This can be thought of as a registration fee and is paid regardless of whether the connection is used for voice services or mobile broadband. It is adjusted every year according to inflation and has been set at TRY 14.56 for 2012.
- Additionally, an annual Wireless Usage Fee (TRY 13.2 in 2011) applies as a rental fee that users pay annually for their active subscriptions and has been set at TRY 14.56 for 2012.

In addition to standard corporate and other spectrum and numbering fees paid to the government and regulator, MNOs in Turkey are subject to a mobile specific licence fee calculated as 15% of their turnover. However, fixed telecom operators are not subject to the Treasury Share fee as a similar fee applying to them was removed in 2004 prior to the fixed operator's privatisation.

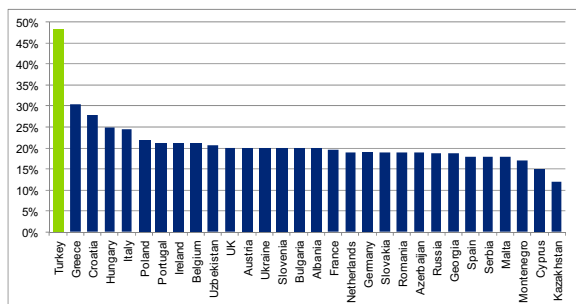
MNOs are also subject to a 'Telecommunications Regulation Authority Share' paid as a contribution to the expenses of the regulatory authority, calculated as the 0.35% of the operator's net sales per annum.

Taxation on mobile consumers in Turkey is complex and affects all components (e.g. handsets, subscription and usage) of mobile consumers' spend. In addition, as some of the fixed taxes are linked to inflation, taxation increases over time while competition and developments in the mobile market act to reduce prices and improve service quality.

According to a recent benchmarking study conducted by Deloitte for the GSMA, the mobile telecommunications sector in Turkey showed the highest taxation as a proportion of mobile service costs among the 111 global countries included in the research. Taxes represented 48.2% of the Total Cost of Mobile Ownership ('TCMO')

for the average consumer in 2011 against a global average of 18.2%.

Figure 10: Tax as a percentage of TCMO, 2011



Source: Deloitte/GSMA Global Mobile Tax Review 2011

The multitude of taxes affecting different components of the mobile service basket provides negative incentives and purchasing signals to customers and discriminates against mobile calls in favour of fixed calls, which potentially creates distortions to consumer choice and to competition in the market. This taxation structure has a number of economic and social implications for consumers:

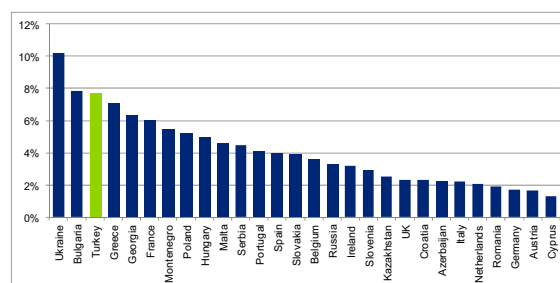
- Handset costs and subscription costs represent the most significant barrier to the consumption of mobile services, particularly for the poorer sectors of the population.
- Fixed taxes on subscriptions and taxation on handsets (in its fixed component) are regressive in nature and may contribute to reducing access, penetration and total network usage. Initial subscription taxes are also currently constraining acquisition of data only SIM cards and M2M cards.
- Specific taxation on usage, such as airtime taxes, can further represent a significant obstacle to usage of mobile services by the poorer sectors of the population, who could derive significant benefits from being connected.
- Since handsets and smartphones may represent the only access to wireless broadband for certain sectors of the population and in rural areas, handset taxes may also lead to underconsumption of internet services.

Finally, the imposition of mobile specific taxes may signal that the government wishes to discourage usage

in mobile services, as governments sometimes increase the consumption tax on goods for which they wish to discourage consumption, for example tobacco or alcohol.

In 2011, Turkey had one of the highest TCMO in the region and in Europe as a percentage of GDP per capita (7.7%), leading to consumers paying proportionately more for mobile services than in any European country. If mobile specific taxation was removed, the Turkish TCMO would decrease by 30%. This would align the Turkish TCMO as a percentage of GDP per capita (which would decrease to 5.4%) to the sample average (5.1%).

Figure 11: TCMO as a percentage of GDP per capita, 2011

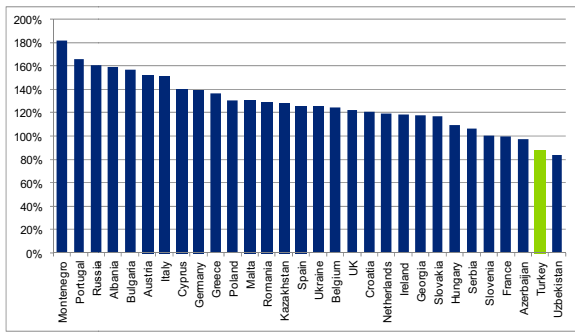


Source: Deloitte analysis

Given the high dispersion of income distribution in Turkey, the presence of fixed mobile specific taxes is likely to be disproportionately felt by the poorer sectors of the population.

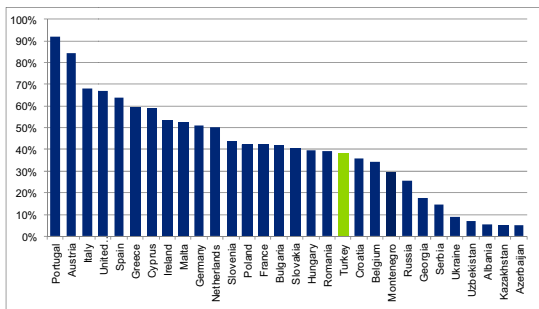
In no country in Europe does access to services (activation, SIM acquisition and handset) attract a mobile specific tax. This can be contrasted to penetration in Turkey, which is amongst the lowest in Europe and in the area. 3G penetration is also lagging well below European countries.

Figure 12: Mobile penetration in a sample of European and neighbouring countries, 2011



Source: Wireless Intelligence

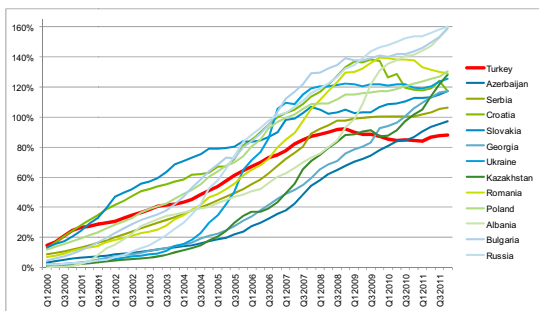
Figure 13: 3G penetration in a sample of European and neighbouring countries, 2011



Source: Wireless Intelligence

An analysis of countries that had a lower penetration than Turkey in 2000 suggests that penetration in all of them has outpaced Turkey by 2011. As such, and considering that higher income and professional workers are more likely to own multiple SIM cards, a substantially lower proportion of the population in Turkey has access to mobile telephony compared to European countries or other countries in the region.

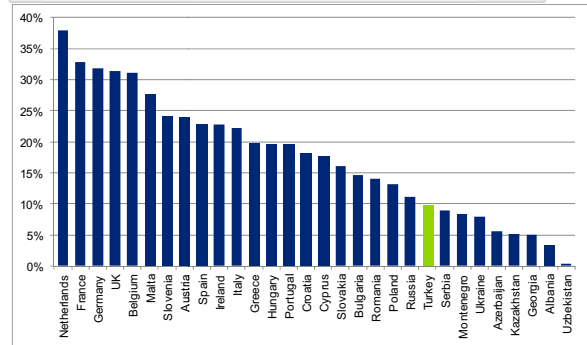
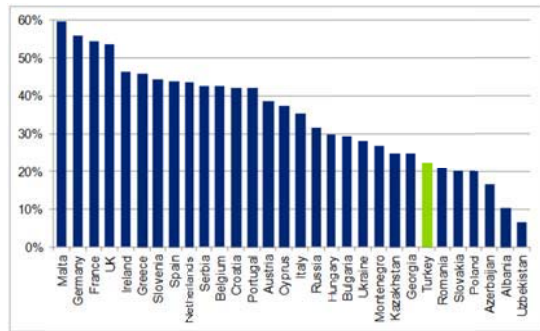
Figure 14: Penetration in a sample of European and neighbouring countries, 2000-2011



Source: Wireless Intelligence

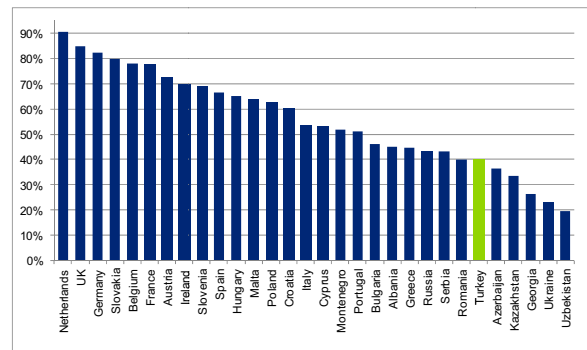
The negative impact of taxation on mobile penetration is likely to be exacerbated by the relatively low level of fixed line penetration in Turkey, despite the more favourable taxation treatment, and by low internet penetration compared to European countries.

Figure 15: Fixed telephone lines per 100 people, 2010



Source: World Bank data; Deloitte analysis

Figure 16: Penetration of internet, 2010



Source: World Bank data (2010); Deloitte analysis

As such, existing levels of mobile penetration, combined with low levels of fixed line and internet availability, make Turkey one of the least connected countries in Europe.

In addition to the potential distortions caused by taxation, the prices MNOs charge are impacted by the

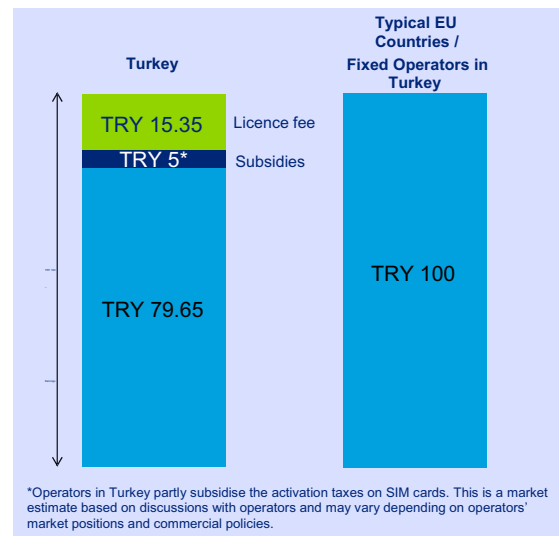
15.35% licence fee applicable on MNOs' revenues. This licence fee effectively acts as an additional tax and its implementation raises a number of concerns for MNOs:

- Unlike VAT or SCT, which are collected from consumers on behalf of the government, this licence fee is levied on MNOs directly. As such, the license fee cannot be itemised in prices or receipts and is therefore not transparent to consumers.
- This license fee is discriminatory in its treatment of mobile telephony relative to other industries, and as such is distortionary.
- No country in the EU applies a similar tax and the MNOs question whether it is aligned with the EUs telecommunications framework. Turkey is introducing regulation consistent with the EU framework in a number of areas, e.g. Mobile Termination Rates, and the MNOs contrast this with the current taxation policy.

A key impact of the levels of consumer and MNO taxation is that the MNOs need to provide substantive subsidies to customers in order to compete in the market. Such subsidies, particularly to incentivise activation and SIM card purchases, reduce the entry barriers that consumer taxation generates especially for the poorer and younger sections of the population.

MNOs' net earnings are therefore affected by both the licence fee and by tax related subsidies.

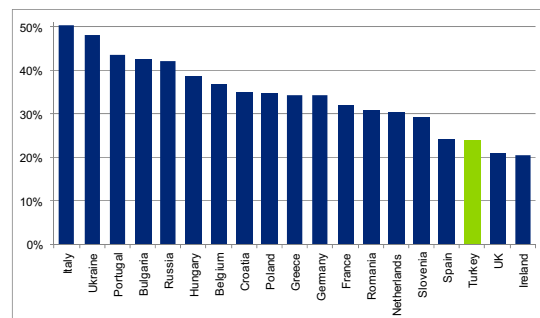
Figure 17 MNOs' earnings in Turkey and for a typical EU operator



Source: Deloitte analysis based on discussions with MNOs

This has a direct impact on the profitability of Turkish MNOs. For example, the EBITDA margin of MNOs in Turkey is significantly lower than EBITDA margin for a set of European countries in which no mobile specific taxation exists.

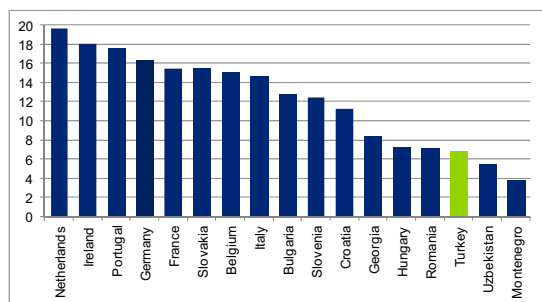
Figure 18: EBITDA margin, 2011



Source: Wireless Intelligence

Such a comparatively low EBITDA margin raises concerns about the ability of MNOs to recoup the large fixed investments that they incurred in order to set up and upgrade their networks, and about future investment in mobile networks. International comparisons relating to capex investment by MNOs indicate that Turkey lags behind European countries for which similar data is available.

Figure 19: Capex per capita, 2010, US\$



Source: Wireless Intelligence data

4. Impacts of taxation reductions

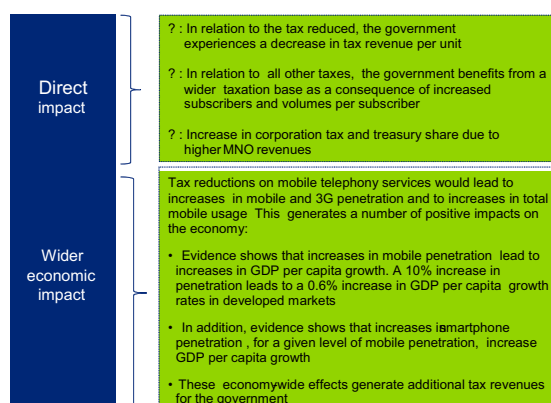
In countries where taxation is high, reducing taxation has the potential to provide more positive effects than in countries where taxation is lower.

The net impact of any taxation changes does, however, require a dynamic approach where governments explicitly account for the indirect impacts driven by the increased economic activities that are generated by improved mobile penetration and mobile usage. A well-documented positive relationship exists between increases in mobile penetration and mobile usage and GDP growth rates, due to the beneficial effects on the economy and on its productivity as discussed earlier in this study.

In order to consider this question, a simulation exercise was conducted which sought to estimate the impact that a reduction in mobile specific taxes in Turkey would have under a series of reasonable assumptions as to the growth of the market.

This scenario analysis compared a base case scenario (whereby no tax changes occur) against a scenario where a one off tax reduction was made in 2012, covering the period 2012 to 2016. This analysis focused on government revenues from taxation and a number of key indicators such as mobile penetration, 3G penetration, usage and handset sales. The simulated impact of a tax reduction and price reduction is evaluated using operators' data and a set of consumer demand elasticities in order to establish how the major market variables are impacted.

Figure 20: Direct and indirect effects on government tax revenues



The simulation analysis considered a combined scenario in which the government introduces three concurrent changes to its taxation policy, which could positively impact market growth whilst also delivering a positive outcome for the government through a market growth effect:

- The elimination of mobile specific subscription charges, i.e. the Wireless Licence Fee (TRY 13.2 in 2011) and the fixed component of the Special Communications Tax (TRY 34 in 2011) on data only SIM cards.
- A reduction of the Wireless Licence Fee and the fixed component of the Special Communications Tax on all other SIM cards.
- A reduction in the Special Communications Tax on calls and SMS from 25% to 15%, to realign it with the SCT applying to fixed telecom services.

As the market for data only SIM cards is in its infancy, removing taxation on data only SIM cards is expected to have a limited effect on government tax receipts whilst potentially leading to considerable increases in volumes. The initial subscription charges are particularly constraining the acquisition of data only SIM cards and M2M cards, hampering the potential productivity benefits generated by these services.

Reducing the activation tax on all other SIM cards is expected to lead to increases in penetration, which in the long term could align with levels in other countries. While the activation taxes potentially act as a barrier to entry by new subscribers, the SCT prevents consumers from increasing their usage per capita.

As such, a more lenient taxation regime would increase penetration and usage, expand the market and improve profitability.

The results of this simulation suggest that the reduction/elimination of taxation on SIM cards would increase mobile penetration levels by almost 5% each year compared to the counterfactual scenario in which these taxes are retained. Figure 21 shows that mobile penetration would reach 104% in 2016 as opposed to 98% in the base case scenario¹. 3G penetration instead would reach 72% in 2016 as opposed to 68% in the base case.

Figure 21: Mobile penetration and 3G penetration, 2012-2016

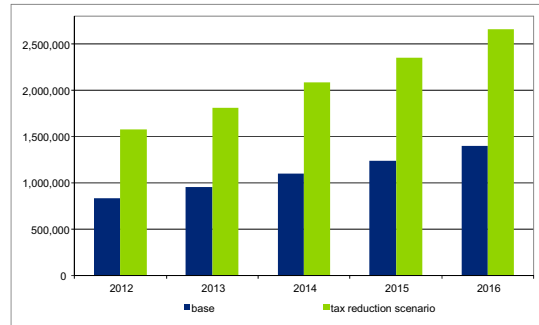


Source: Deloitte analysis

As expected, a significant contribution to this penetration improvement is due to the growth in data only SIM cards sold as a result of the tax reduction. A comparison of the two scenarios is presented in Figure 22.

¹Based on forecasts from the Wireless Intelligence.

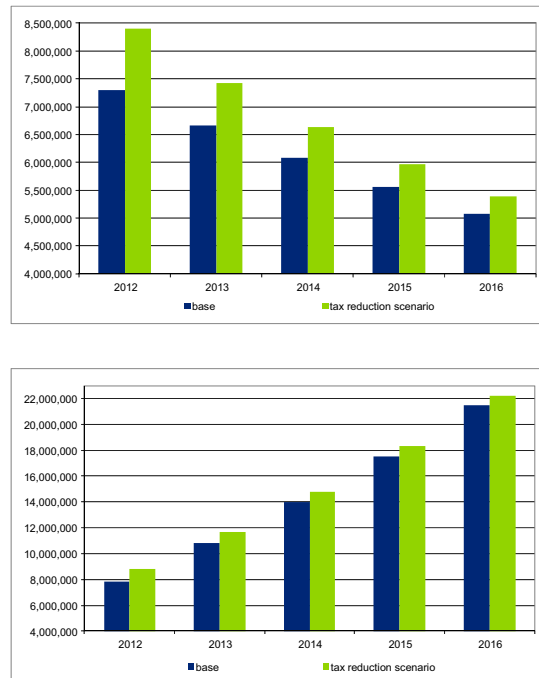
Figure 22: Sales of data only SIM cards, 2012-2016



Source: Deloitte analysis

The increased number of subscribers entering the market would also contribute to increasing the sales volumes of handsets, tablets, dongles and other devices for the use of data only SIM cards. While tablets, dongles and other M2M devices have not been explicitly considered in this simulation, the increases in the sales of feature phones and smartphones are respectively on average 10% and 7% higher under the simulated scenario. This is reported in Figure 23.

Figure 23: Sales of feature phones and sales of smartphones, 2012-2016

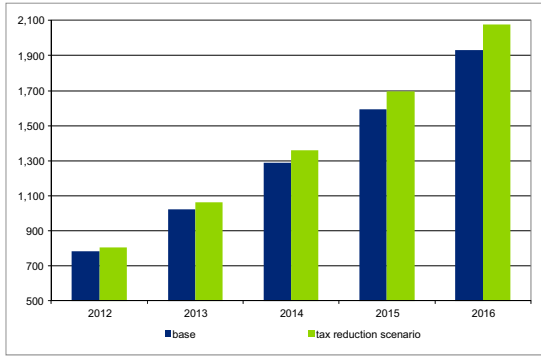


Source: Deloitte analysis

A further benefit of the increased number of 3G subscribers under the simulated scenario would be

wider internet usage: the results suggest a 5% increase in total data usage per annum over the base case, indicating a substantially improved access to mobile internet.

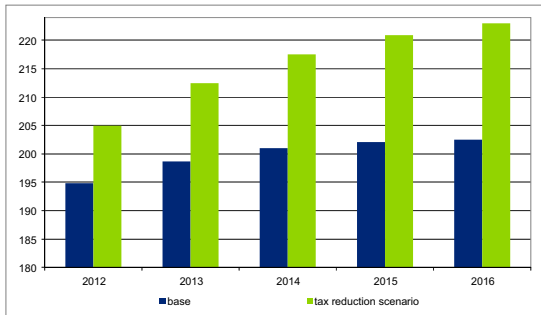
Figure 24: Total data usage, 2012-2016, Mb billions



Source: Deloitte analysis

In addition to the total usage increases due to penetration growth, the reduction in the SCT is expected to generate higher minutes of use and SMS per user, leading to a further total usage increase.

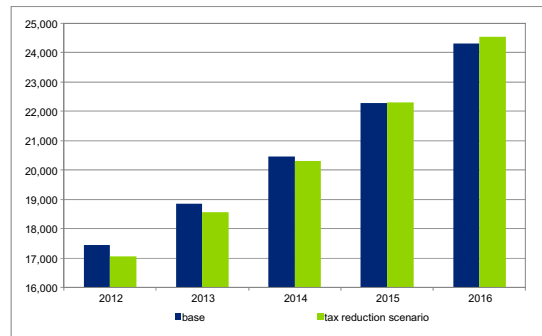
Figure 25: Total minutes of use (billions), 2012-2016



Source: Deloitte analysis

The overall analysis, whilst only indicative, suggests that the mobile market would grow as a result of the change in taxation policy: this would have a beneficial effect on the economy and on government's tax receipts. Despite an initial decrease in government's revenues (due to the reduction in taxation), the increased penetration and usage indicated by the analysis would more than compensate the initial effect and lead to an increase in government revenues four years after the introduction of the policy change. The effects could further be boosted by the additional investment and employment that MNOs could generate in response to increases in revenues and EBITDA resulting from market growth, which are not explicitly accounted for in this simulation. Figure 26 shows that government receipts from mobile specific and general taxation would be higher in 2015 and thereafter under the tax reduction scenario.

Figure 26: Government tax revenues, 2012-2016, TRY millions



Source: Deloitte analysis

Appendix A The economic impact of mobile telephony in Turkey

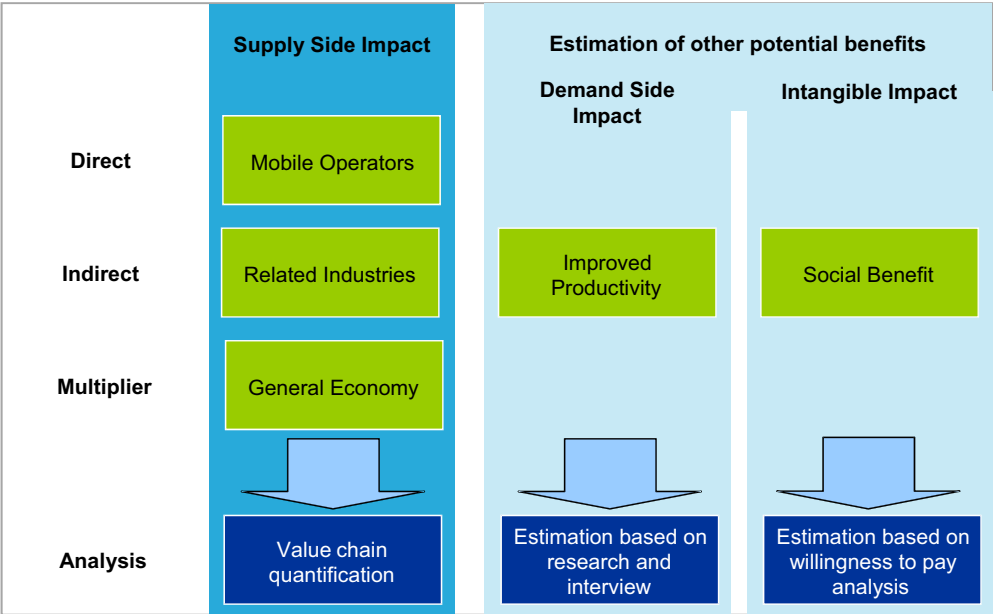
Mobile telephony in Turkey generates significant economic activity through effects on the supply side of the economy, employment, increases in productivity and benefits gained by Turkish consumers. This section describes these impacts over the last four years.

A.1 Approach to estimating the economic impact

The economic impact of mobile telephony in Turkey was estimated by accounting for the impact of the wider mobile ecosystem on the supply side of the Turkish economy. The analysis focussed on the flow of funds across the mobile supply chain, by estimating the value add created by the MNOs and their major stakeholders. An economic multiplier was used in order to capture the ‘knock-on’ impact to the wider economy. Impacts on direct and indirect employment from firms in the value chain were also estimated.

In addition, other potential benefits are discussed, including the potential productivity increase that occurred through the use of mobile telephony for business purposes, as well as the intangible and social benefits potentially enjoyed by consumers in Turkey.

Figure 27: Structure of the analysis of economic impact on GDP and employment



Source: Deloitte

This analysis was undertaken using publicly available statistics, data provided directly by the MNOs (Turkcell and Vodafone) and interviews with Turkcell, Vodafone and Avea and with other market participants including handset and airtime dealers. By combining supply side and demand

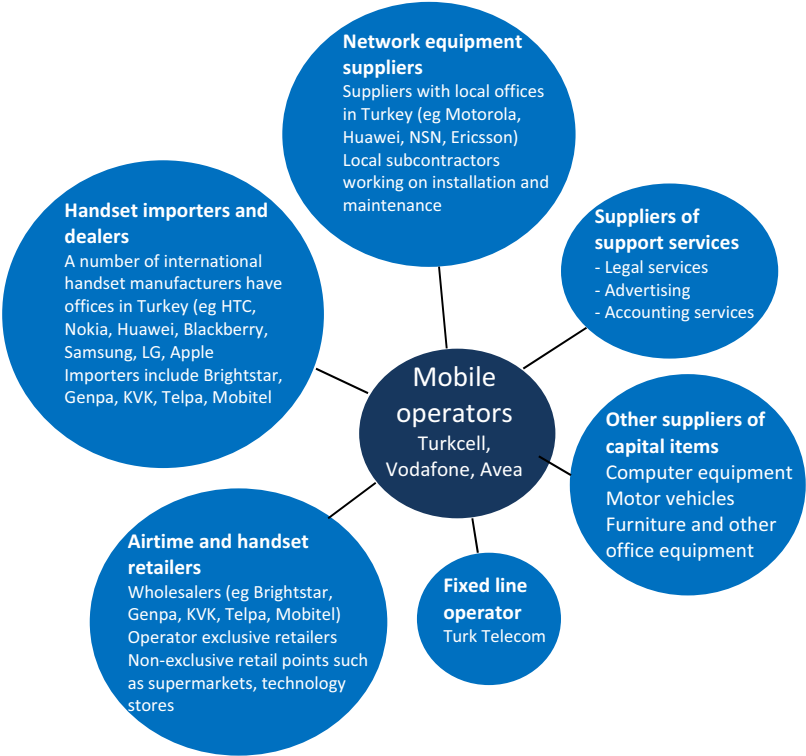
side analyses, it is possible to estimate the GDP contribution, employment created and tax revenues generated in Turkey by the mobile industry over the period 2008 to 2011. Each component of the value add chain is analysed below.

A.2 Benefits to the supply side of the economy

MNOs provide numerous benefits to the supply side of the Turkish economy through the direct effect of their expenditure, and these benefits are indirectly carried through to the related industries MNOs operate with and, more widely, to the Turkish economy.

As shown in Figure 28, in addition to three MNOs, the mobile communication market ecosystem in Turkey is formed by players such as equipment providers, typically international equipment producers with offices in Turkey, and providers of other network services such as installation and maintenance; handset importers and distributors; airtime distributors and sellers, which include a host of retail points throughout the country; and suppliers of other services to MNOs such as advertising, accounting and other support services.

Figure 28: The mobile communications ecosystem in Turkey



Source: Deloitte

To calculate the value add generated by the industry, firstly the value add created by the mobile communications industry was estimated. This consists of the value created by MNOs' expenditure

on wages, corporate and social responsibility ('CSR') programmes, dividends paid by MNOs and taxes recovered as a result of the MNOs' operations.

In addition, the 'leakages' from the system have been estimated, i.e. what percentage of any amount spent by the end users remains within the national boundaries to be spent in the next round. This was used to isolate the impact on the Turkish economy from the total international impact of the Turkish mobile communications industry.

In 2011, it is estimated that MNOs in Turkey provided a direct contribution of TRY 11.3 billion to the country's economy. The breakdown by category is provided in Table 1 below.

Table 1: Domestic value add of MNOs (excluding multiplier effect), TRY millions

Domestic value add	2008	2009	2010	2011
Employee wages and benefits	700	727	825	869
Contractors wages	40	38	46	31
Taxes and regulatory fees	9,080	10,280	8,727	9,267
CSR	11	14	15	16
Dividends	564	954	747	1,155
Total	10,395	12,013	10,359	11,338

Source: Deloitte analysis based on data provided by MNOs, interviews and analysis of company accounts. Differences are due to rounding.

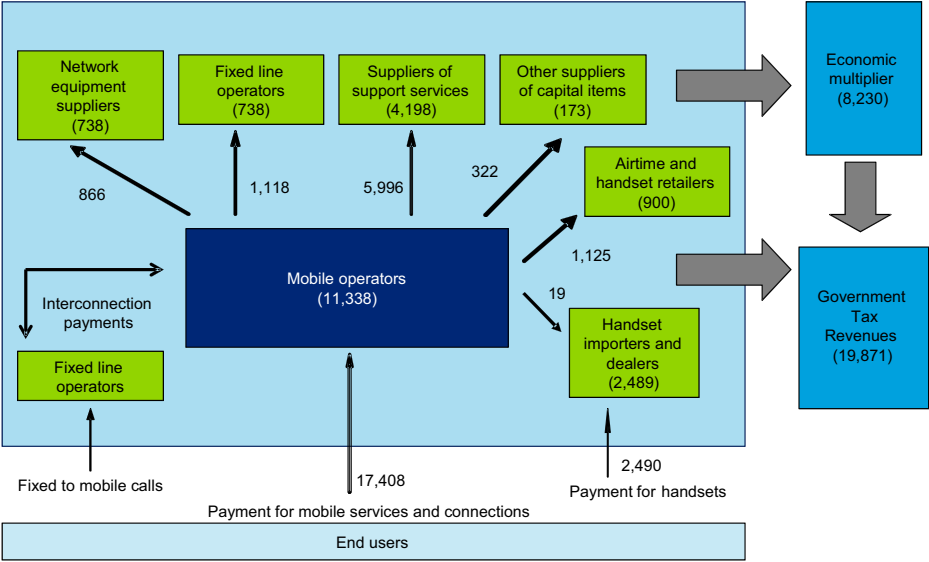
As discussed later in this report, taxation on mobile telephony consumers and business in Turkey is amongst the greatest worldwide. As such, in 2011, MNOs in Turkey have paid approximately TRY 9.3 billion to the government in taxes and regulatory fees (6% more than in 2010). This constitutes the largest element of value add generated by the MNOs in the country, representing 82% of the total. Taxation results are discussed in more detail in Appendix B. The value add generated by wages amounted to TRY 0.9 billion in 2011, while dividends paid across the industry amounted to over TRY 1 billion.

The value add relationship between the MNOs and the players in the mobile ecosystem, such as equipment importers, producers and providers of network support services, handset dealers, retailers of airtime, handsets and other providers of general support services, was then examined. Revenue flows from the MNOs to other players in the industry were then analysed and the resulting quantity translated into further value add.² MNOs in Turkey do not directly import handsets and therefore consumer spending on handsets has been separately estimated.

² Details on value add margins and the percentage of revenue translated into value add are contained in Appendix C.1.5.

The estimates of value add include the multiplier effect on the wider economy which is assumed to be 40% of the revenues generated directly by the MNOs and the related value chain.³ The result of this calculation is shown in Figure 29.⁴

Figure 29: Mobile value chain and value add in Turkey in 2011, TRY millions



Source: Deloitte analysis

Table 2 below indicates the calculation of the value add generated by the three MNOs and by each of the major actors in the Turkish telecommunication industry as a result of their transactions with the MNOs.⁵

³ The value of multiplier chosen for Turkey is discussed in Appendix C.1.1.4.
⁴ The figures next to the arrows represent the flow of money from one group to another. A first set of arrow shows how the money flows in first place from end users to the MNOs and to their major stakeholders. A second set of arrows shows how a part of the revenues collected by the MNOs subsequently flows to their major providers of services. The figures inside the boxes represent the value add generated by each group (in the form of taxes, wages, dividends and CSR). Finally, the two boxes indicate respectively the multiplier effect (the value add generated in the wider economy through subsequent rounds of spending) and the tax revenue collected by the government as a result of the transactions described. The amounts shown inside each square relate solely to domestic flows and domestic value add.
⁵ The second column of the table reports the revenues that each player receives from final users and from the MNOs. The third column contains only the portion of these revenues that is estimated to remain within Turkey. These domestic revenues are then split (column 4 and 5) into domestic costs (i.e. the general costs of business that are sustained by each player) and domestic value add (i.e. wages, taxes, dividends and CSR programs). Finally, the last column indicates the total domestic value add, which represents the value add produced not only by the MNOs and their stakeholders, but also by the subsequent rounds of money flows in the economy.

Table 2: Calculation of value add from mobile communications in Turkey in 2011, TRY millions

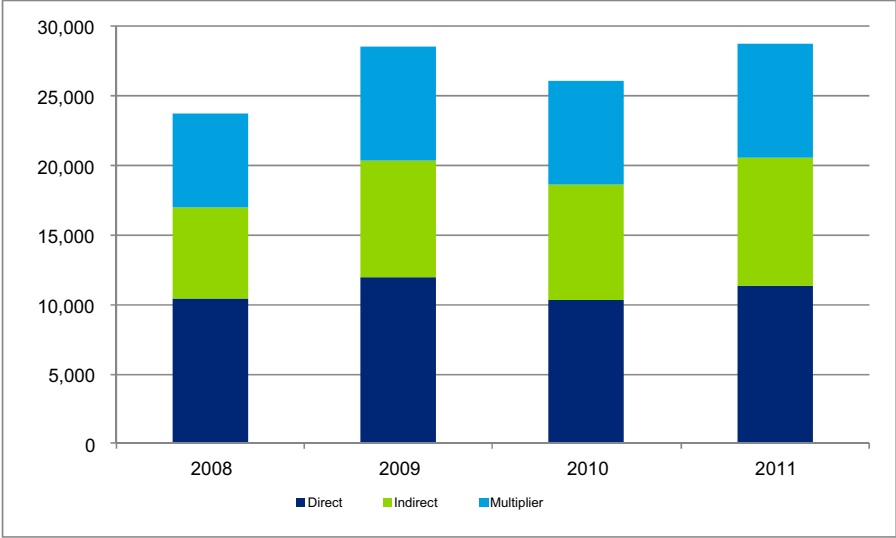
Domestic value add in 2011	Total revenue	Domestic revenue	Domestic cost	Domestic value add	Domestic value add with multiplier
MNOs	17,408	17,408	6,070	11,338	15,874
Fixed telecom operators	1,118	1,118	380	738	1,033
Network equipment and network services suppliers	1,616	866	128	738	1,033
Handset importers and dealers	7,192	2,510	20	2,489	3,485
Other suppliers of capital items	508	322	149	173	243
Suppliers of support services	6,028	5,996	1,799	4,198	5,877
Airtime wholesalers and retailers	1,125	1,125	225	900	1,260
Total	34,995	29,345	8,770	20,575	28,805

Source: Deloitte analysis. Differences are due to rounding.

Based on the data provided by the MNOs, it was estimated that 84% of the revenue flows generated by end users remains in Turkey. Of this, a large portion relates to network equipment suppliers and suppliers of support services. It was estimated that only 54% of MNOs expenditures on network equipment suppliers remains in Turkey. Concerning expenditures on handset designers and dealers, only 35% was estimated to be domestic.

The contribution of mobile telephony to the supply side of the economy in Turkey during 2008 to 2011 is summarised in Figure 30 below.

Figure 30: Supply side value add from mobile communications by component, TRY millions



Source: Deloitte analysis

The direct impact refers to the value add generated directly by the MNOs themselves. The indirect impact refers to the value add generated by their major stakeholders, while the multiplier effect refers to the impact on the wider economy, generated by further rounds of money flows.

The figure above also includes the 2009 purchase of 3G spectrum. Licenses were granted in April 2009 for twenty years. Three types of licenses were auctioned: Turkcell won a Type A license (operating at 45 MHz), Vodafone won a type B (operating at 35 MHz) while Avea secured a Type C (operating at 30 MHz). The overall payments amounted to TRY 1.6 billion, which represented a significant investment.

A.3 Impact on employment

Mobile services in Turkey contribute to employment in several ways, including direct employment by the MNOs, the employment in the related industries described above, 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.⁶

While many products related to mobile telephony (such as radio and network equipment, handsets and smartphones) are designed and produced abroad, international providers have established offices and operations in Turkey, recognising the importance of the mobile market. For instance, network equipment providers such as Ericsson, Huawei and Motorola, and handset producers

⁶ The first effect is obtained directly from MNOs. The support and induced employment is estimated using a multiplier of 1.4. For MNOs, no multiplier was applied as the majority of induced employment will be captured by the first round flows.

such as HTC, Nokia and LG have local offices in Turkey. Additional contributors to employment include other handset importers and dealers, and wholesalers and retailers of airtime and other mobile services. Only value add and employment that can be attributed to Turkish consumption has been included in the estimations.

It is estimated that in 2011 the mobile communication industry employed nearly 150,000 FTEs in Turkey, as shown in Table 3. A further 55,800 FTEs have been generated in the wider economy as a result of the interactions with the MNOs.

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

Employment Impact	Number of employees	Number of employees including multiplier
MNOs	9,300	9,300
Fixed telecommunications operators	3,830	5,360
Network equipment suppliers	19,320	27,000
Handset importers and dealers	270	380
Handsets and airtime wholesale distributors	4,660	6,530
Other suppliers of capital items	1,860	2,610
Suppliers of support services	53,200	74,500
Airtime dealers and retailers	56,350	78,900
Total	148,800	204,600

Source: Operator data, interviews and Deloitte analysis on average wage rates.⁷ Differences are due to rounding.

While MNOs employed over 9,000 FTEs in 2011, the wider mobile ecosystem on average employed 140,000 additional FTEs. Of these, over 56,000 are the airtime dealers and retailers operating from supermarkets (e.g. Carrefour), technology stores (e.g. Media Markt and Saturn) and smaller independent points of sale. Overall, in Turkey, there are an estimated 17,000 independent points of sale for handsets and airtime, each employing 2 or 3 FTEs on average. In addition, handset and airtime products are sold in banks, post offices, kiosks, oil stations and online websites: FTEs for these categories that do not primarily deal with mobile market products have been very conservatively accounted for.

Another substantial contribution to total employment is brought by the suppliers of support services (e.g. consulting, advertising and legal services). Finally, almost 20,000 FTEs were involved in the provision of network equipment and other network services: this category includes all major international equipment providers with local offices in Turkey (e.g. Ericsson, Motorola and Huawei) as well as the subcontractors involved in the equipment installation and maintenance.

⁷ 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.

A.4 Value add from taxation

As discussed in more detail in Appendix B, taxation on mobile telephony in Turkey is amongst the highest worldwide, affecting consumers through special communications and special usage taxes and MNOs through corporate and licence taxes.

In 2011, MNOs in Turkey paid approximately TRY 9,270 million to the government in taxes and regulatory fees. 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 Table 4.

Table 4: Tax and regulatory payments in Turkey from MNOs, TRY millions

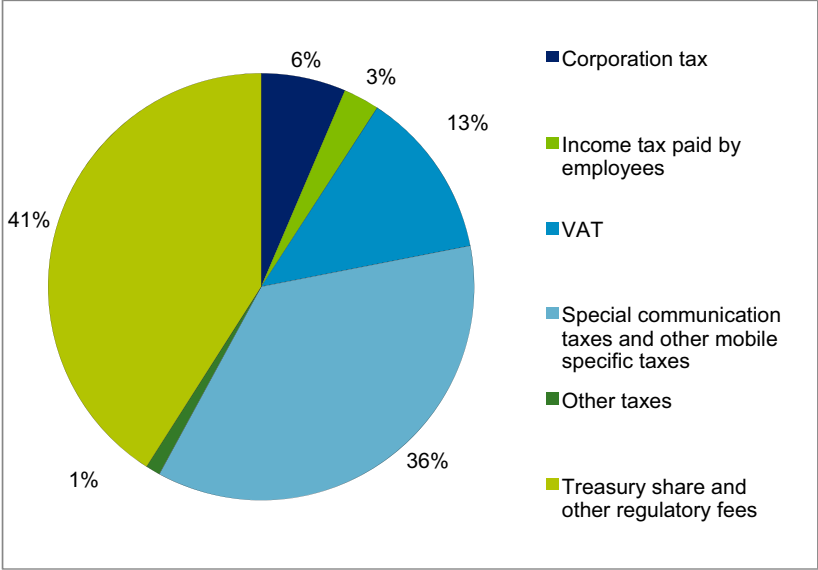
Taxes from MNOs	2008	2009	2010	2011
Corporation tax	812	645	596	596
Income tax paid by employees	216	209	229	254
Sales and mobile specific taxes	4,652	4,292	4,382	4,622
Regulatory fees (w/o 3G licences)	3,399	3,534	3,520	3,795
3G licenses	0	1,600	0	0
Total taxes and fees	9,080	10,280	8,727	9,267

Source: Deloitte analysis based on operator data. Differences are due to rounding.

Tax and regulatory fees represented 53% of domestic company revenues for Turkish MNOs in 2011. The largest proportion of tax revenue is raised through licence and other regulatory fees, which account for 41% of tax paid in 2011. Special Communications Taxes and other mobile specific taxes account for 36% of the total. The breakdown is illustrated in Figure 31.⁸

⁸ For some MNOs, total VAT payments reflect amounts carried forward in relation to the purchase of 2G-3G licenses.

Figure 31: 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 generated another TRY 4,930 million for the government in 2011. The largest payers of tax in the mobile supply chain, aside from the MNOs, are the handset designers and dealers and the suppliers of support services. The estimated tax revenue from each stage of the value chain is shown in Table 5.

Table 5: Total tax revenues from the mobile value chain in 2011, TRY millions

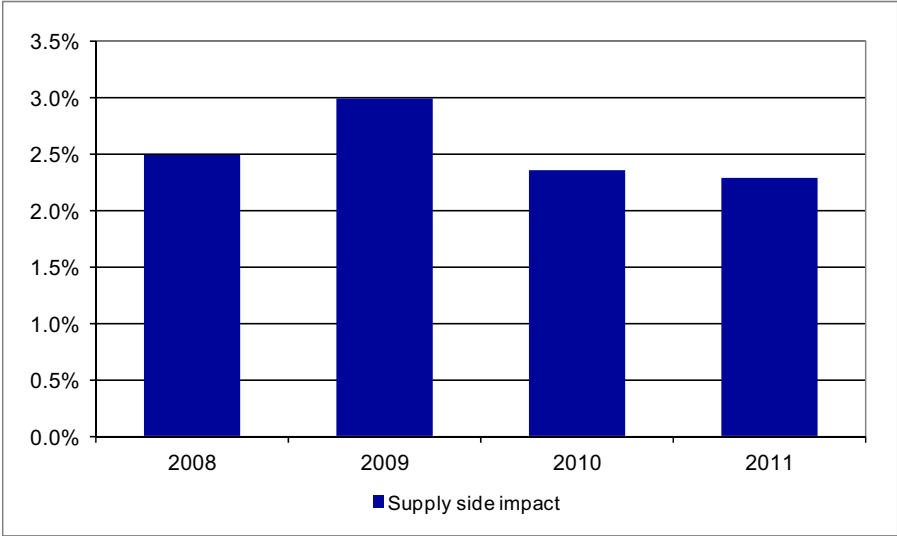
Tax Revenue	Tax revenue	Tax revenue with multiplier
MNOs	9,267	12,973
Fixed telecommunications operators	347	485
Network equipment suppliers	173	242
Handset designers and dealers	2,364	3,310
Other suppliers of capital items	67	94
Suppliers of support services	1,751	2,451
Airtime commission	225	315
Total	14,194	19,871

Source: Deloitte analysis based on company accounts, MNOs' data and interviews. Note this represents tax revenues directly created by revenue flows from the MNOs and not total tax revenues from the sector

A.5 Overall benefits to the economy

The discussion above has illustrated the economic contribution of the mobile telephony industry in Turkey. In summary, this study of the economic impact of mobile telephony in Turkey finds that in 2011 the mobile communications industry has contributed TRY 28.8 billion from the supply side impact. This represented 2.3% of GDP,

Figure 32: Supply side value add of the mobile ecosystem as a proportion of GDP



Source: Deloitte analysis

A.6 Other potential impacts

In addition to benefits to the supply of the economy, mobile telephony generates potential productivity increases through the use of mobile telephony for business purposes as well as intangible and social benefits to consumers.

A.6.1 Impact on Turkish productivity

Mobile operations in Turkey have been well established for over 15 years⁹ and the Turkish market is in this sense similar to most markets in Europe. Productivity improvements provided by mobile telephony to workers in the latest years are related to the provision of 3G and other high value services such as wireless data and are enhanced by the proliferation of smartphones, tablets, dongles and Machine To Machine (M2M) operations.

In addition to the well established benefits that mobile services provide to workers and businesses¹⁰, there are numerous ways in which mobile services have led to productivity increases in Turkey. The following additional recent positive impacts have been identified in the country:

- Improved efficiency of agricultural production and distribution of food supplies. The Vodafone Farmer’s Club provides farmers with weather alerts and local market price information.

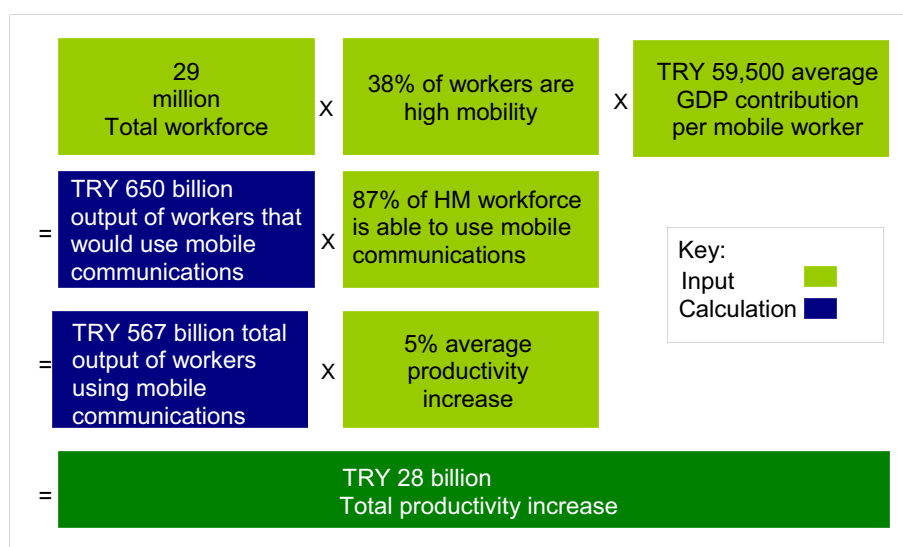
⁹ Turkcell established in 1994; Telsim was founded in 1994 and became Vodafone in 2007; Turk Telekom was founded in 1995 and merged into Avea in 2004.

¹⁰ These are discussed in section C.1.3

- Improved efficiency in payments: Avea has a near field communication ('NFC') service which enables users to store their credit cards, ID cards, transport tickets, etc. within an NFC enabled SIM card, therefore reducing transaction times.
- Development of M2M operations: Turkcell has provided over 750,000 SIM cards on automated platforms for wireless usage for a number of companies (including e.g. health and agriculture) in the public and private sector.
- Contribution to regional economic development, e.g. the creation of Turkcell Global Bilgi Erzurum Call Centre and Avea Erzincan Call Centre in Eastern Turkey.

While these productivity impacts cannot be accurately quantified, an economic value approach can be employed to provide a high level estimation of potential productivity benefits. The economic value concept set out in Figure 33 indicates that, if mobile workers in Turkey achieved a 5% increase on their productivity as a result of using mobile phones, the potential productivity impact of mobile services on the economy could be up to TRY 57 billion in 2011.

Figure 33: Economic impact in 2011 of increased productivity amongst high mobility workers



Source: Deloitte analysis based on Deloitte assumptions, interviews and Turkey Bureau of Statistics. Differences are due to rounding.

A.6.2 Benefits to consumers

Consumer benefits of mobile telephony are widely recognised in social and economic papers.¹¹ Mobile services promote social cohesion, contribute to extending communications (especially to users with low education and literacy), stimulate local content, contribute to providing technology knowledge to the less educated and assist in disaster relief. In addition, wireless data and

¹¹ Typical positive impacts of mobile telephony are reported in Appendix C.1.3 to this paper.

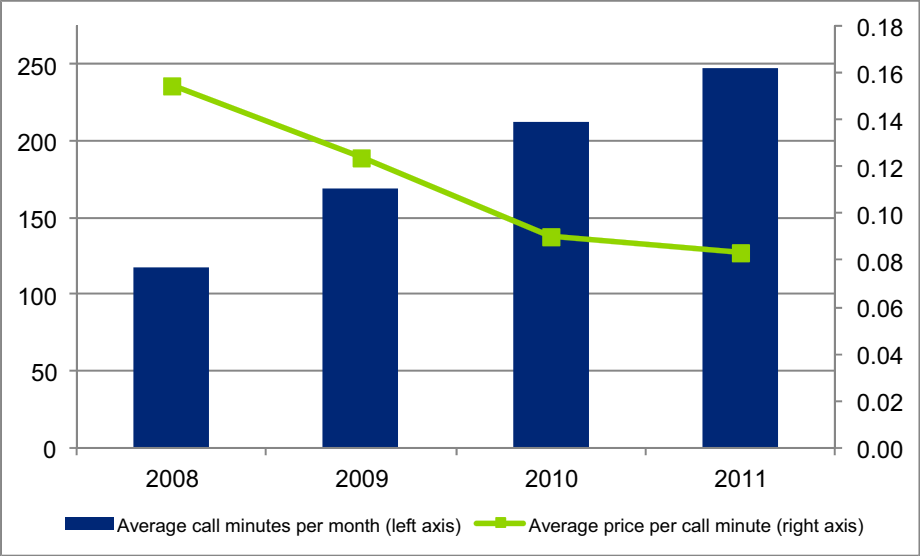
broadband allow these benefits to be amplified and coupled with those given by fixed telecom services.

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

- Vodafone Turkey Foundation collaborated with the Turkish Red Crescent in order to increase the number of voluntary blood donors and raise public awareness. 50,000 users subscribed to the service in the first week of its launch. An app which enables users on iOS and Android operating systems to track and monitor processes facilitating blood donation is expected to be launched.
- The 'Women Movement in Technology' project was launched by Turkey Vodafone Foundation, aiming to develop the social and economic integration of women through trainings on entrepreneurship, technology literacy and soft skill trainings.
- Avea runs the 'My Homeland is Anatolia, My Profession is Technology' programme with the aim of developing mobile applications in Anatolia's disadvantaged regions.
- Through improvements to its network, Turkcell enabled location information for 112 emergency calls. This allows users to send call location information to emergency institutions for calls made to the 112 Emergency Centre in Ankara, Antalya, and Isparta.

In addition, in Turkey, competition in the industry resulted in a reduction of prices and spurred a number of high-value services provided by the MNOs. Figure 34 below shows how usage per user per month has been growing over time at a steady rate over the last four years. This can be related to the substantial decrease in prices over the same period (over 46% from 2008 to 2011).

Figure 34: Price per minute and minutes of use per user per month

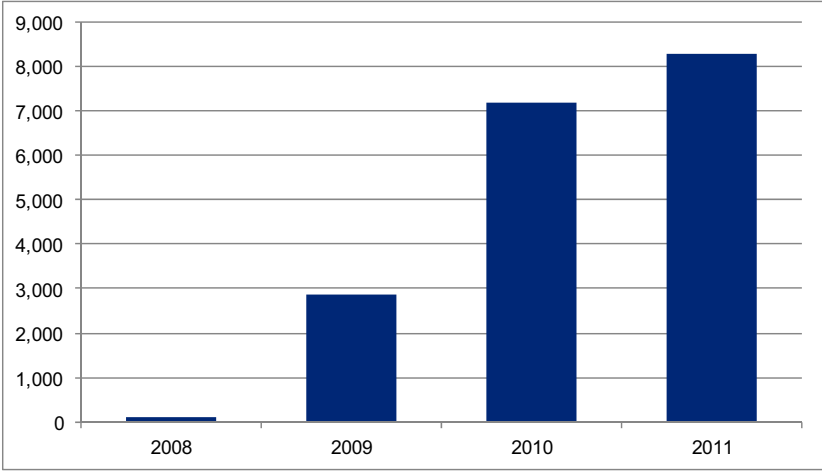


Source: Wireless Intelligence data; Deloitte analysis

While intangible consumer benefits cannot be accurately quantified, a willingness to pay analysis that combines data on usage increases and price decreases over the years can be employed to estimate how consumer benefits have increased over time in the last four years.. In particular, this approach, described in more detail in Appendix C.1.4, allows the estimation of the beneficial impact of price reductions and usage increases experienced in Turkey over the last four years. This approach suggests that consumers enjoyed up to the equivalent of TRY 8.2 billion in intangible benefits in 2011.¹²

¹² There are numerous reasons why these estimates could underestimate or overestimate the true value of intangible benefits. This methodology assumes that all subscribers joined the network in 2007: this allows estimation of only the consumer surplus enjoyed by customers that joined the network from 2008 onward, leading to an underestimation of the true consumer surplus. On the other hand, the methodology does not account for potential changes in the willingness to pay of consumers over time. The effect of this on the overall calculation depends on whether the true willingness to pay has increased or decreased over time.

Figure 35: Intangible benefits using willingness to pay concept, TRY millions



Source: Deloitte analysis

Appendix B Taxation on MNOs and consumers in Turkey

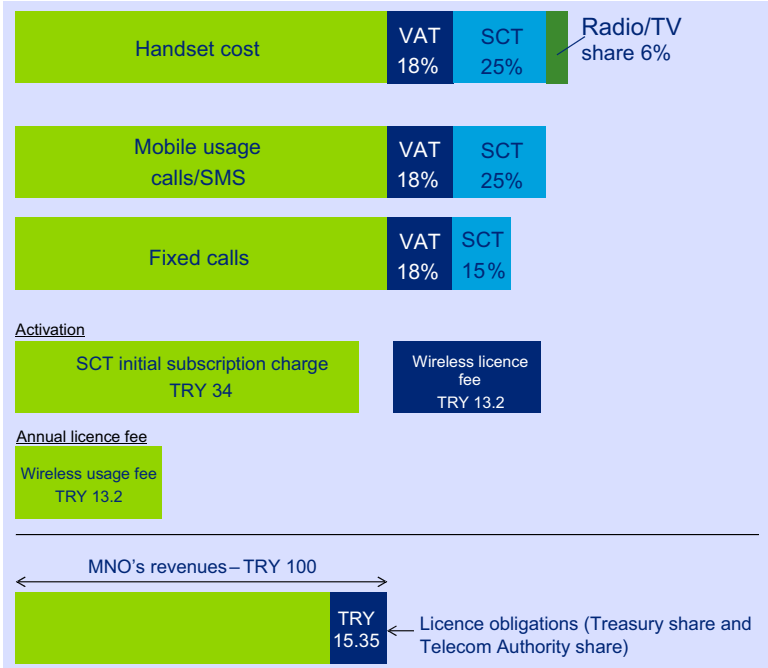
This appendix provides a more detailed account of the mobile specific taxation that Turkish consumers and MNOs are subject to and describes the impacts of this taxation on consumers, MNOs and the economy.

B.1 Mobile specific taxation

Despite the economic contribution estimated above, mobile consumers and MNOs suffer a taxation regime which is specific to this industry in Turkey and more severe than that faced by consumers and MNOs in any European country.

Figure 36 summarises the different taxes that apply to consumers in Turkey in 2011. These taxes, how they have increased in 2012 and their impacts on consumers and MNOs, are described in more detail below.

Figure 36: Mobile specific taxation on consumers and MNOs, 2011



Source: MNOs' data

B.2 Mobile specific taxation on consumers

Mobile consumers in Turkey are taxed on every component that forms a typical bundle of mobile service consumption, e.g. handsets, subscriptions and usage. This taxation which applies in addition to the standard 18% VAT rate, is summarised in Table 6 and described in more detail below.

Table 6: Summary of taxation paid by consumers in 2011

Mobile specific taxation on consumers								
Handsets			Airtime/SMS/Data		SIM activation			
VAT	Special Consumption Tax	Share of Turkish Radio TV	VAT	Special Communications Tax	VAT	Initial Subscription Charge	Wireless Licence Fee	Wireless Usage Fee
18%	25% on all handsets	6%	18%	25% on calls and SMS, 5% on data	18%	TRY 34	TRY 13.2	TRY 13.2 paid each year for an active SIM card

Source: MNOs' data

B.2.1 Mobile specific taxes on usage

The Special Communications Tax ('SCT') on usage is a 25% tax that is paid directly by mobile users and is applied on call minutes and messages on top of VAT. A reduced rate (5% instead of 25%) is applied on data usage.¹³ As noted by the OECD¹⁴, "this special tax was introduced in 1999 as a contribution to help recovery from the damage caused by the disastrous earthquake of August 1999. This high percentage tax had been understood to be temporary for one year when introduced". However, it has always remained in place, notwithstanding the economy's recovery since then. As such, for every TRY 100 of net airtime and SMS usage purchased by customers, a tax of TRY 43 is paid in addition to the net price.

The SCT applies in a discriminatory way to mobile telephony usage: the SCT applying to fixed telephony is set at 15%. For the same pre tax price, the retail post tax price is cheaper than a mobile call.

B.2.2 Mobile specific taxes on handsets

Handsets are subject to heavy taxation in Turkey. A Special Consumption Tax of 25% is levied on the Cost, Insurance and Freight ('c.i.f.') price¹⁵ for each handset imported and is passed through to consumers (in addition to VAT) at the moment of purchasing a new mobile device. This tax also has a TRY 100 'floor' amount that is applied when 25% of the import price of a handset amounts to less than TRY 100. This particularly affects the price of low end handsets, therefore impacting low end consumers and the poorer sectors of the population.

The Special Consumption Tax was increased from 20% to 25% in 2011, while the minimum floor level was increased from TRY 50 to TRY 100 in September 2011.

¹³ This reduced 5% rate was introduced in 2009.

¹⁴ "Regulatory reform in Turkey" (2002).

¹⁵ The c.i.f. price is the price of a good delivered at the frontier of the importing country, including any insurance and freight charges incurred to that point, before the payment of any import duties or other taxes on imports or trade and transport margins within the country.

In addition to the Special Consumption Tax, handsets price is also subject to a 6% tax that benefits the Turkish Radio Television Foundation. This is levied on handsets at the moment of importation.

B.2.3 Mobile specific taxes on mobile subscriptions

Mobile subscriptions are also subject to mobile specific taxation directly affecting consumers:

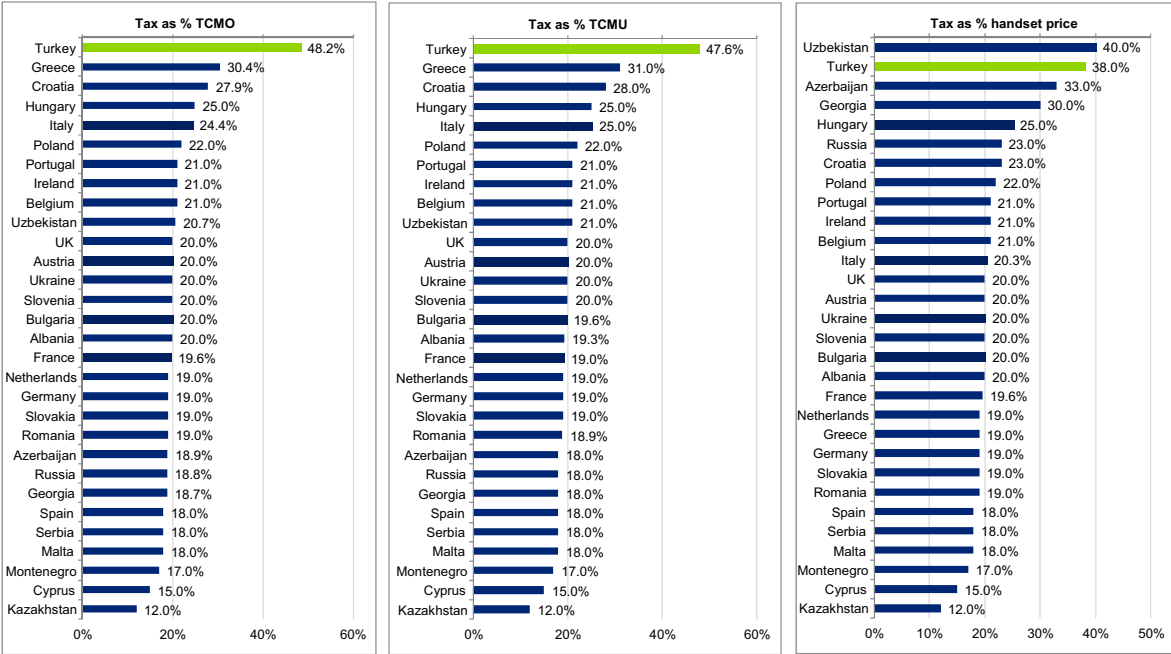
- An Initial Subscription Charge amounting to TRY 34 in 2011 applies. This is an additional fixed component of the Special Communications Tax and consists of a fixed amount to be paid once by consumers when a new SIM card is purchased. It is adjusted every year according to inflation and has been set at TRY 37 for 2012.
- A Wireless Licence Fee (TRY 13.2 in 2011) is also paid by consumers when a new connection is purchased. This tax can be thought of as a registration fee and is paid regardless of whether the connection is used for voice or mobile broadband. It is adjusted every year according to inflation and has been set at TRY 14.56 for 2012.
- An annual Wireless Usage Fee (TRY 13.2 in 2011) applies as a rental fee that users pay annually for their active subscriptions and has been set at TRY 14.56 for 2012.

B.2.4 Implications for mobile consumers

As noted above, taxation on mobile consumers in Turkey is complex and affects all components of mobile consumers' spend. In addition, as some of the fixed taxes are linked to inflation, taxation increases over time while competition and developments in the mobile market act to reduce prices and improve service quality.

According to a recent benchmarking study conducted by Deloitte for the GSMA, the mobile telecommunications sector in Turkey shows the highest taxation as a proportion of mobile services cost among the 111 global countries included in the research. As taxation in Turkey affects all components of the Total Cost of Mobile Ownership ('TCMO'), both tax as a proportion of TCMO and as a percentage of the Total Cost of Mobile Usage ('TCMU') are the highest worldwide. Turkey ranked first for taxation globally: on average, tax as a proportion of TCMO was 18.2% globally in 2011, while in Turkey this amounted to 48.2%. Tax as a proportion of usage costs was 47.6% in Turkey in 2011, while the global average was 18%. In Turkey, 38% of a handset costs was attributed to tax in 2011, while the global average of taxation as a proportion of handset costs was 23.3%.

Figure 37: Tax as a percentage of TCMO, TCMU and handset price, respectively



Source: Deloitte/GSMA Global Mobile Tax Review 2011

Since this study, taxation has further increased in autumn 2011, further impacting handsets costs and activation costs.

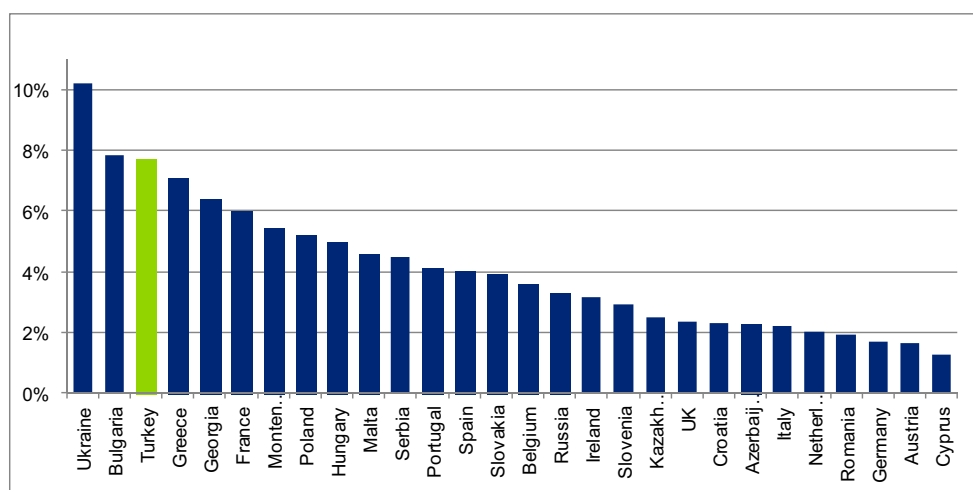
Such taxation has a number of economic and social implications for consumers:

- The multitude of taxes affecting different components of the mobile service basket provides negative incentives and purchasing signals to customers and discriminates against mobile calls in favour of fixed calls, which creates distortions to consumer choice and to competition in the market.
- By taxing the acquisition of SIM cards, mobile subscription and handsets, mobile specific taxation in Turkey hits access to mobile telephony particularly hard. Handset costs and subscription costs represent the most significant barrier to the consumption of mobile services, particularly for the poorer sectors of the population. Operators have also noted that these taxes are currently constraining acquisition of data only SIM cards and M2M cards.
- Fixed taxes on subscriptions and taxation on handsets are therefore regressive in nature and contribute to reduce access, penetration and total network usage.

- Specific taxation on usage, such as airtime taxes, can further represent a significant obstacle to usage of mobile services by the poorer sectors of the population, who could derive significant benefits from being connected.
- Since handsets and smartphones may represent the only access to wireless broadband for certain sectors of the population and in rural areas, handset taxes may also lead to under-consumption of internet services.
- Finally, the imposition of mobile specific taxes may signal that the government wishes to discourage usage of mobile services, as governments sometimes increase the consumption tax on goods for which they wish to discourage consumption, for example tobacco or alcohol.

A key impact of mobile specific taxation is to increase the total costs of mobile ownership for Turkish consumers. As shown in Figure 38, in 2011 Turkey had one of the highest TCMO as a proportion of GDP per capita in the region and in Europe (7.7%), meaning that consumers pay proportionately more for mobile services in Turkey than in any European countries. Therefore, affects direct consumer spending, with possible negative implications for the economy. If mobile specific taxation was removed, the Turkish TCMO would decrease by 30%. This would align the Turkish TCMO as a percentage of GDP per capita (which would decrease to 5.4%) to the sample average (5.1%).

Figure 38: TCMO as a percentage of GDP per capita



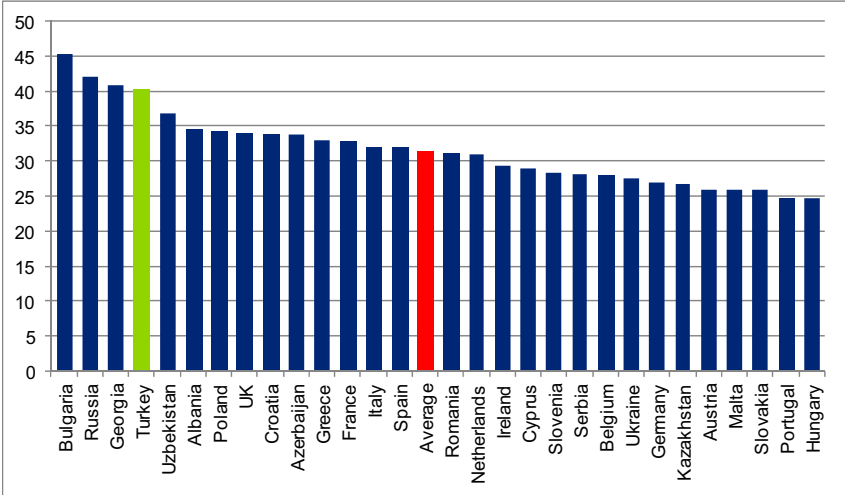
Source: Deloitte analysis

Given the high dispersion of income distribution in Turkey, as shown in Figure 39 by the Gini Index of inequality,¹⁶ the presence of fixed mobile specific taxes is likely to be disproportionately

¹⁶ The Gini index measures the extent to which the distribution of income within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

felt by the poorer sectors of the population. It is therefore more likely that in Turkey those consumers who would benefit the most from the beneficial social and productivity impacts generated by access to mobile telephony are those for which mobile specific taxation creates a barrier to service consumption.

Figure 39: Gini coefficient (2010)

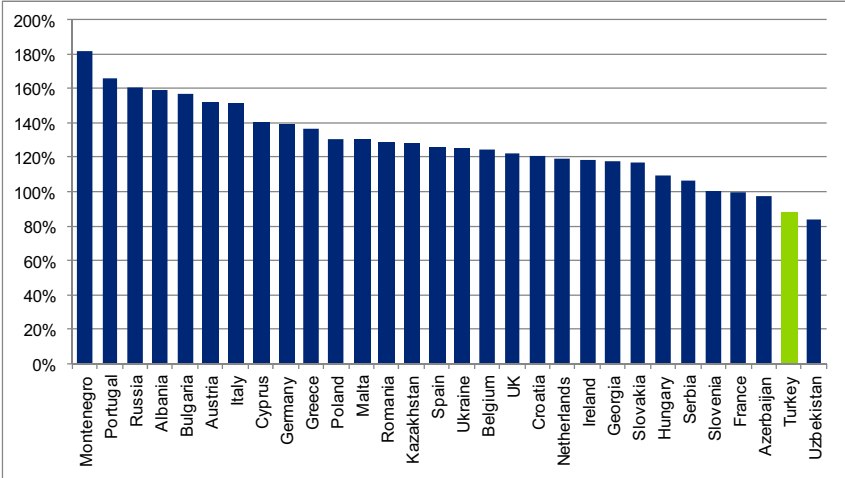


Source: CIA Factbook;

The higher share of tax as a proportion of costs of mobile ownership and usage and the structure of taxation create a significant barrier to entry in the mobile market. In particular, taxes on SIM activation and the annual Wireless Usage Fee contribute to limiting consumer choice and competition in the market.

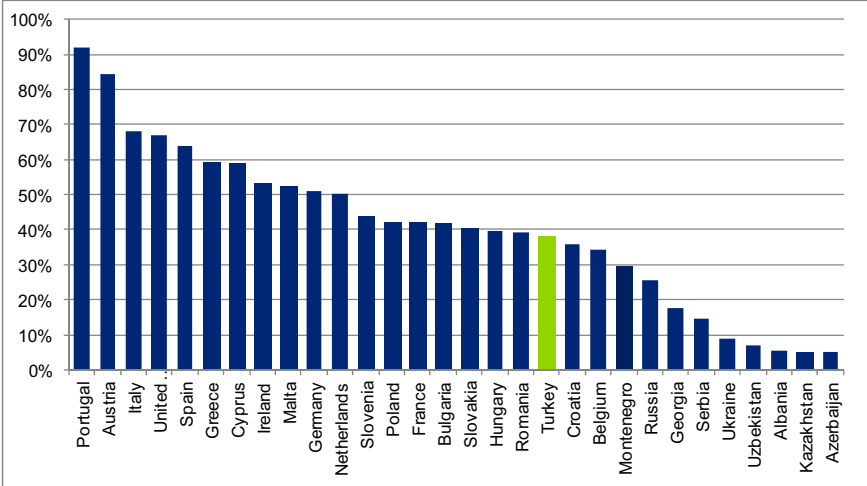
In no country in Europe does access to services (activation, SIM acquisition and handset) attract a mobile specific tax. This can be contrasted with mobile penetration in Turkey, which is amongst the lowest in Europe and in the area, still far from the 100% penetration milestone achieved by most European countries years ago. 3G penetration is also lagging well below European countries at 38%, compared to an EU average of 56%.

Figure 40: Mobile penetration in a sample of European and neighbouring countries



Source: Wireless Intelligence

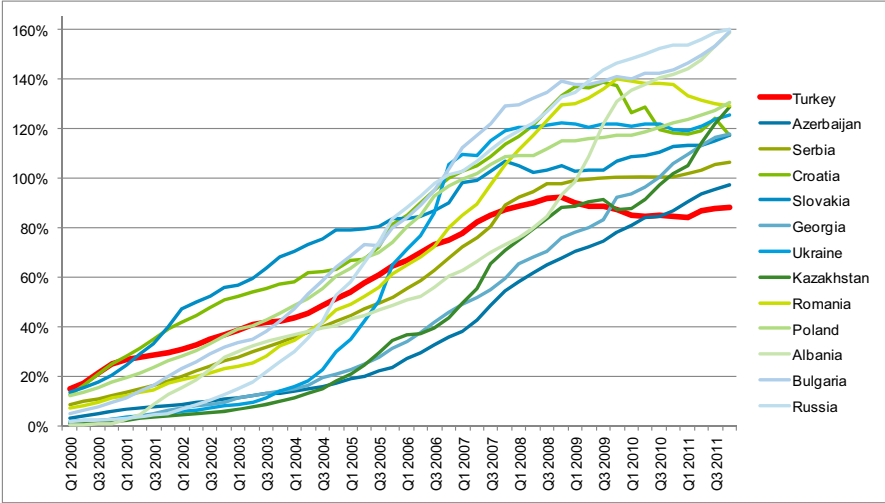
Figure 41: 3G penetration in a sample of European and neighbouring countries



Source: Wireless Intelligence

An analysis of countries that had a lower penetration than Turkey in 2000 suggests that penetration in all of them has outpaced Turkey by 2011. As such, and considering that higher income and professional workers are more likely to own multiple SIM cards, a substantially lower proportion of population in Turkey has access to mobile telephony compared to European countries and other countries in the region.

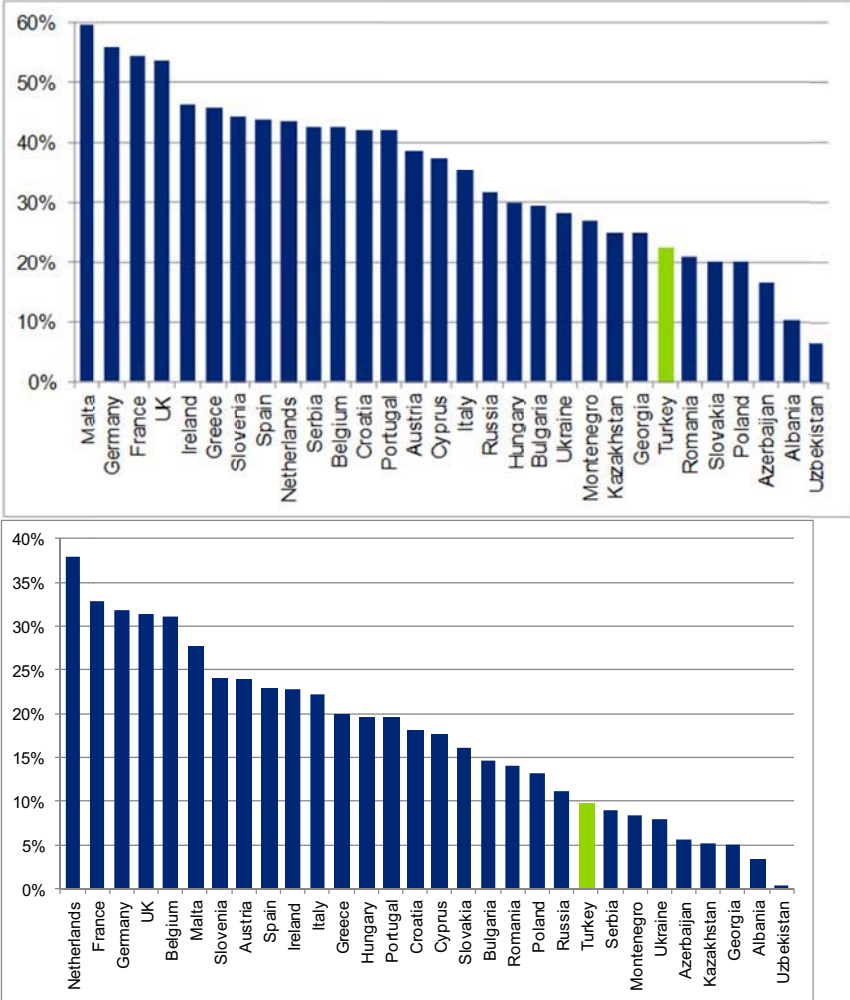
Figure 42: Penetration in a sample of European and neighbouring countries, 2000-2011



Source: Wireless Intelligence

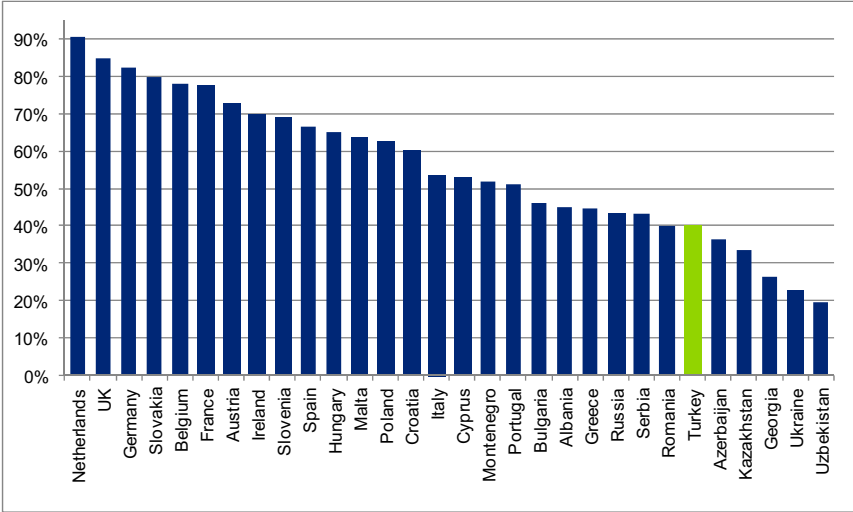
The negative impact of taxation on mobile penetration is likely to be exacerbated by the relatively low level of fixed line penetration in Turkey, despite the more favourable taxation treatment, and by low internet penetration compared to European countries.

Figure 43: Fixed telephone lines per 100 people



Source: World Bank data; Deloitte analysis

Figure 44: Penetration of internet



Source: World Bank data; Deloitte analysis

As such, existing levels of mobile penetration, combined with low levels of fixed line and internet availability make Turkey one of the least connected countries in Europe.

B.3 Taxation on MNOs

MNOs in Turkey are subject to a corporate tax as well as licence obligations and fees that act as a form of mobile specific taxation on MNOs’ revenues, as summarised in Table 7.

Table 7: Summary of taxation paid by MNOs in 2011

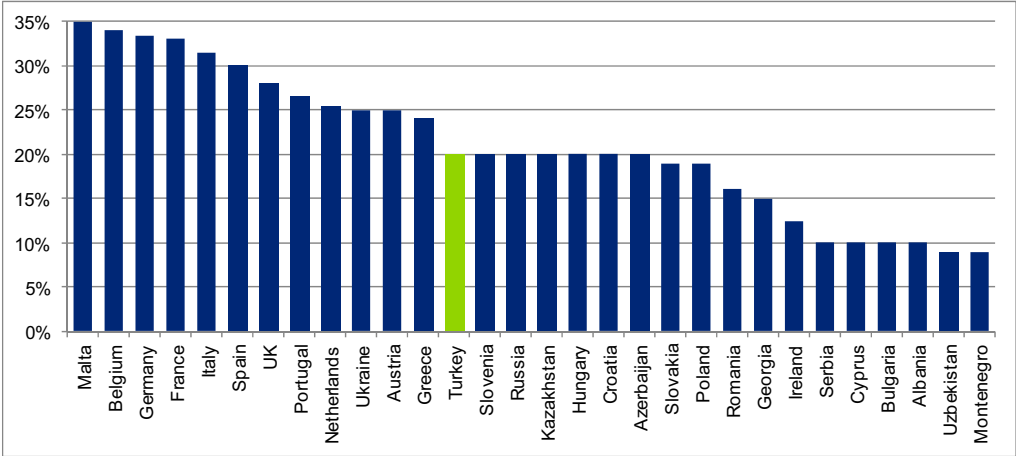
Corporation tax	Mobile specific taxation on MNOs	
	Telecom Authority Share	Treasury share tax
20.00%	0.35% of MNOs’ revenues	15% of MNOs’ revenues

Source: Deloitte/GSMA Global Mobile Tax Review (2011); MNOs’ data

B.3.1 Corporate taxation

Turkish businesses face a corporate tax rate of 20% on profits. Figure 45 below shows how this compares to a set of European and neighbouring countries.

Figure 45: Corporate tax rates in Europe



Source: Deloitte Global Mobile tax review 2011

B.3.2 Mobile specific taxation paid by the MNOs

MNOs in Turkey are subject to a licence fee calculated as 15% of their turnovers, paid to the Turkish Treasury on a monthly basis. In addition, they are subject to a ‘Telecommunications Regulation Authority Share’ paid as a contribution to the expenses of the regulatory authority, calculated as the 0.35% of the MNO’s net sales per annum. Fixed telecom operators are not subject to the Treasury Share fee as a similar fee applying to them was removed in 2004 prior to the fixed operator’s privatisation.

In addition to these licence fees, MNOs in Turkey are subject to other fees including usage and licence fees for the utilisation of spectrum, numbering fees for access to numbering resources in addition to fees required for the installation of base stations. MNOs notably paid TRY 1.6 billion for the purchase of 3G licences from the government.

B.4 Implications for MNOs

The level of consumer taxation discussed above influences MNOs’ pricing policies, while the discriminatory tax treatment of mobile telephony compared to fixed telephony further constrains MNOs’ ability to compete on a level playing field on prices.

These taxation pressures mean that the prices MNOs charge face a number of distortions, further exacerbated by the 15.35% licence fee applicable on MNOs’ revenues. This licence fee acts as an additional tax for MNOs and the implementation of this tax raises a number of concerns for MNOs:

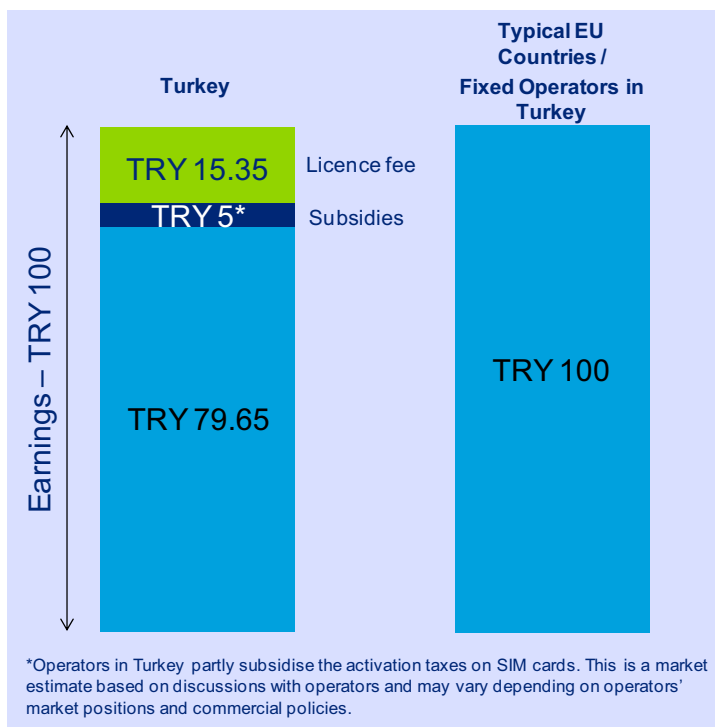
- Unlike VAT or SCT, which are collected from consumers on behalf of the government, this licence fee is levied on MNOs directly. As such, the licence fee cannot be itemised in prices or receipts and is therefore not transparent to consumers.

- This licence fee is discriminatory in its treatment of mobile telephony relative to other industries, including fixed telephony, and as such has a distortionary impact on the market.
- No country in the EU applies a similar tax and the MNOs question whether it is aligned with the EU framework. Turkey is introducing regulation consistent with the EU framework in a number of areas, e.g. Mobile Termination Rates, and the MNOs contrast this with the current taxation policy.

A key issue caused by the taxation structure in Turkey is the amount of customer subsidies MNOs need to fund in order to compete in the market, particularly to reduce the entry barriers that consumer taxation generates especially for the poorer and younger sections of the population. In particular, MNOs have noted the amount of subsidies required to incentivise activation and SIM card purchases, as these represent the highest barriers to entry and may constrain the development of effective competition in the market.

When considering the amount of subsidies that MNOs need to support to develop the market and the licence fee that requires MNOs to pay 15.35% of the revenues, Figure 46 indicates how MNOs' net earnings are affected by the licence fee and by tax related subsidies, amounting to around 80% of total earnings.

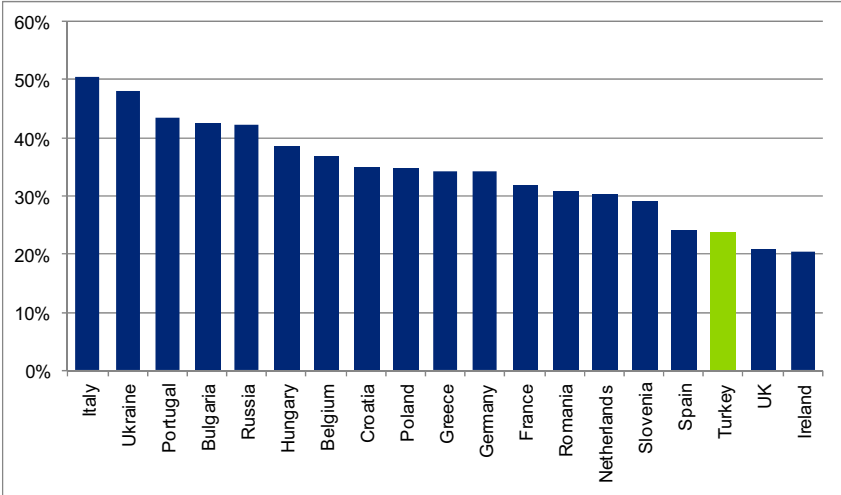
Figure 46 MNOs' earnings in Turkey and for a typical EU operator



Source: Deloitte analysis based on discussions with MNOs

This also has a direct impact on the profitability of Turkish MNOs. For example, the EBITDA margin¹⁷ of MNOs in Turkey is significantly lower than EBITDA margin for a set of European countries in which no mobile specific taxation exists.

Figure 47: EBITDA margin, 2011



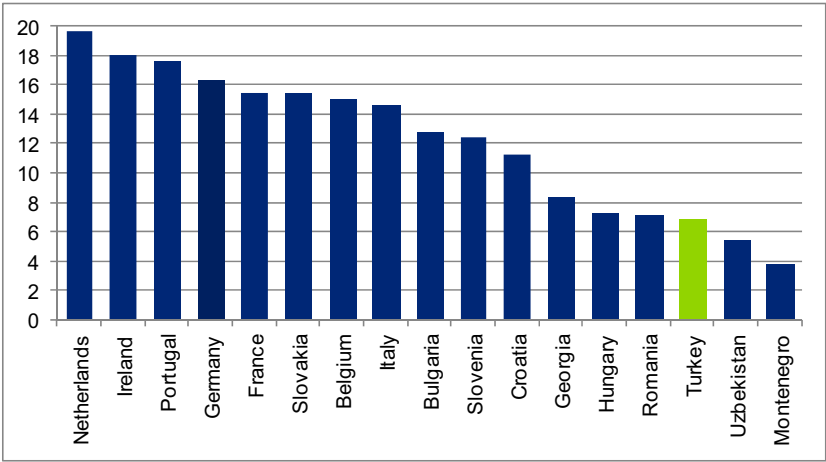
Source: Wireless Intelligence

Such a comparatively low EBITDA margin raises concerns about the ability of MNOs to recoup the large fixed investments that they incurred in order to set up and upgrade their networks, and about future investment in mobile networks.

International comparisons relating to capex investment by MNOs indicate that Turkey lags behind European countries for which similar data is available. As shown in Figure 48, in 2010 capex per capita was lower than Turkey only in Uzbekistan and Montenegro.

¹⁷ The EBITDA margin is a measurement of a company's operating profitability. It is equal to earnings before interest, tax, depreciation and amortization (EBITDA) divided by total revenue.

Figure 48: Capex per capita, 2010, US\$



Source: Wireless Intelligence

Turkey has so far attracted a significant amount of Foreign Direct Investment (‘FDI’) in mobile operations and two out of three MNOs are foreign-owned. However, the existing levels of consumer and MNOs taxation are reducing profitability and risk negatively impacting future prospects for investment at a time when MNOs are looking to develop advanced network to support wireless broadband and wireless data provision.

Investment in mobile network is crucial for Turkey’s development. As noted above, Turkey has one of the lowest fixed and internet penetrations in Europe and in the region. Access to mobile devices such as smartphones and tablets that provide access to wireless broadband is therefore paramount to the digitalisation of the country.

B.5 Impact of changes in taxation policy

This section shows the results of a simulation exercise aimed at estimating the impact that a reduction in mobile specific taxes in Turkey would have on government revenues and on a number of key indicators such as mobile penetration, 3G penetration, usage per subscriber, total usage and handset sales.

The simulation undertaken investigates the combined impact of the following changes to the current taxation regime in Turkey:

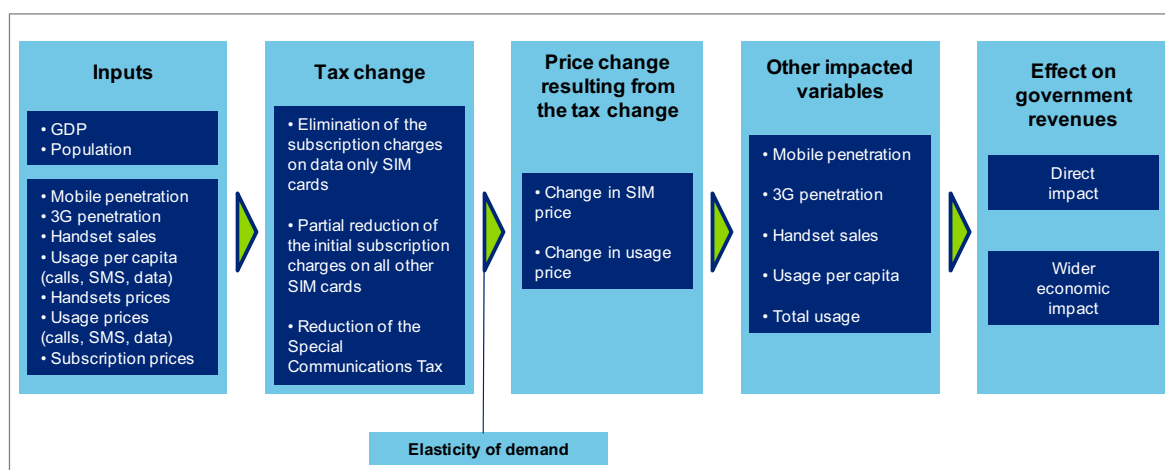
- Elimination of the initial subscription charges, i.e. the Wireless Licence Fee (TRY 13.2 in 2011) and the fixed component of the Special Communications Tax (TRY 34 in 2011) on data only SIM cards in 2012.
- A reduction of the Wireless Licence Fee and the fixed component of the Special Communications Tax on all other SIM cards in 2012.

- Reduction of the Special Communications Tax (SCT) on calls and SMS from 25% to 15%, to realign it with the SCT applying to fixed telecom services.

A base case scenario was created which projects market development and tax revenue collection for the years 2012 to 2016, assuming the application of the current taxation structure. A number of assumptions based on discussions with the MNOs, general market experience and external market projections from third parties were used to simulate the evolution of the main market variables (e.g. number of subscribers, usage levels and prices) in the base case scenario.¹⁸ The effects of the tax reductions were then measured relatively to this counterfactual scenario.

The simulation is constructed to carry out a number of distinct steps of analysis which are then aggregated to provide the total impact of taxation on the key market variables, including on government revenues, as summarised in Figure 49.

Figure 49: Methodology of the simulation



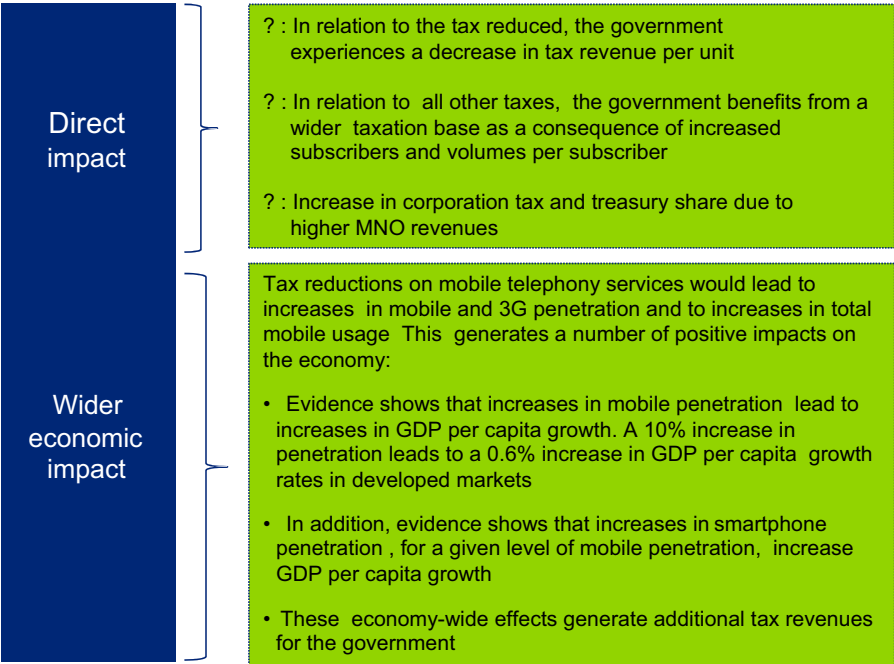
Source: Deloitte

The starting point of the model is given by a set of macroeconomic inputs (such as Turkish GDP and population) and a number of key variables related to the Turkish mobile market (mobile and 3G penetration, handset sales, usage per capita, handset, usage and subscription prices).

A retail price change is triggered when a tax reduction is applied. Following the price changes, the model employs a set of consumer demand elasticities in order to establish how the major market variables are impacted. Finally, the overall effect on government revenues is estimated as shown in Figure 50.

¹⁸ For details on the construction of the base case scenario, see Appendix C.2.3.

Figure 50: Direct and indirect effects on government tax revenues



Source: Deloitte

The direct impact on government tax revenues is the outcome of two components:

- Taxes collected by the government on each unit that is affected by the tax reduction will be at a lower per unit rate, therefore reducing taxation per unit.
- Volumes of handsets sales and total usage increase as a result of the tax reduction.

When considering taxation reductions on mobile telephony services, a key factor to take into account is the beneficial indirect impacts that such reductions would trigger. These indirect impacts are mainly driven by additional taxes that the government collects as a result of increased economic activities that are generated by improved mobile penetration and mobile usage. There is a well-documented positive relationship between increases in mobile penetration and mobile usage and GDP growth rates, due to the beneficial effects on the economy and on its productivity as discussed earlier in this study. These effects are simulated based on the results of econometric studies¹⁹ and the government tax receipts resulting from this additional economic growth are accounted for in the results.

¹⁹ Waverman, Leonard, Meloria Meschi, and Melvyn Fuss (2005). "The Impact of Telecoms on Economic Growth in Developing markets".

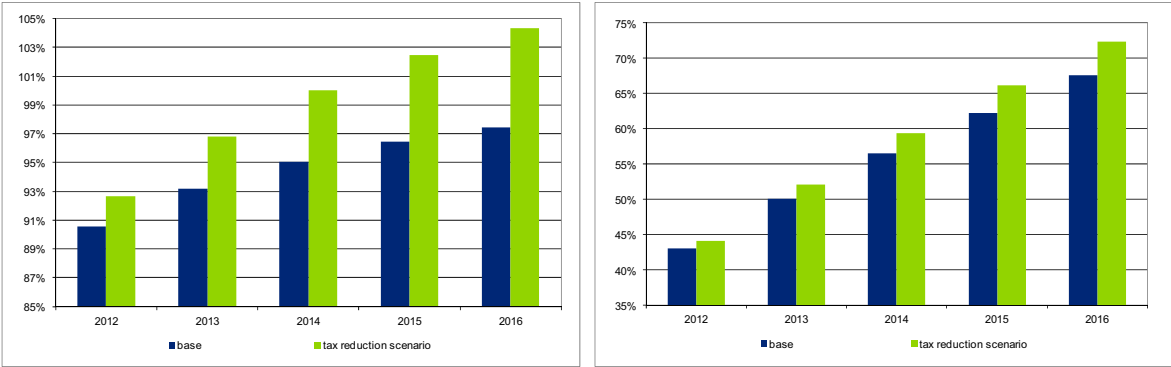
B.5.1 Impact of reducing the initial subscription charges on SIM cards and reducing the SCT

All initial subscription charges potentially act as a barrier to entry by new subscribers and their elimination/reduction would potentially contribute to realigning Turkish penetration levels with the standards of other developed European markets.

These taxes are currently particularly constraining the acquisition of data only SIM cards and M2M cards. Data only SIM cards are still in their infant phase in Turkey, representing just above 1% of the total market in 2011. As such, eliminating the activation taxes on these services is expected to have a limited effect on government tax receipts; at the same time, reducing the tax burden on these services is likely to achieve considerable increases in demand due to the higher elasticity compared to standard SIM cards.

The results of the scenario analysis suggest that the reduction/elimination of taxation on SIM cards would increase mobile penetration levels by almost 5% each year compared to the counterfactual scenario in which these taxes are retained. Figure 51 shows that mobile penetration would reach 104% in 2016 as opposed to 98% in the base case scenario²⁰. 3G penetration instead would reach 72% in 2016 as opposed to 68% in the base case. It is expected that the widening of the consumer base would positively impact those consumers that are currently prevented from accessing the market, such as the poorer sectors of the population.

Figure 51: Mobile penetration and 3G penetration, 2012-2016

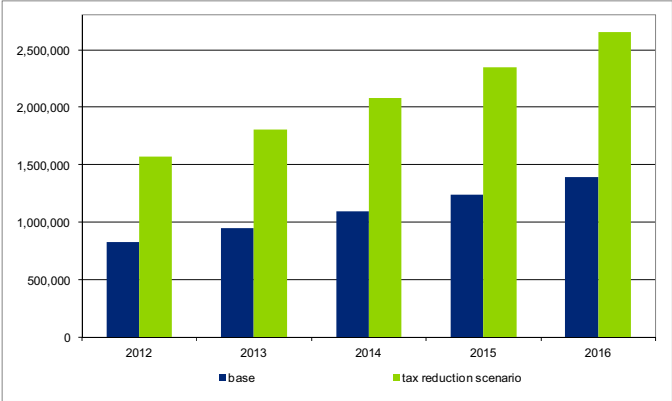


Source: Deloitte analysis

As expected, a significant contribution to this penetration improvement is due to the growth in data only SIM cards sold as a result of the tax reduction. A comparison of the two scenarios is presented in Figure 52.

²⁰ Based on forecasts from the Wireless Intelligence.

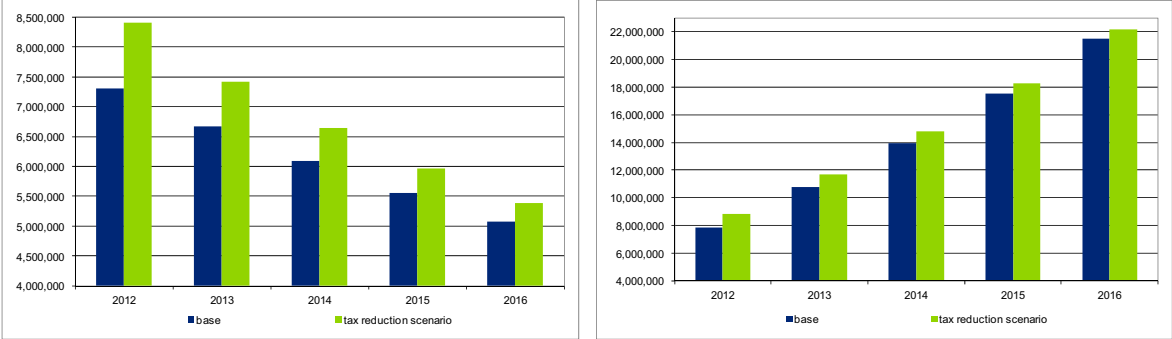
Figure 52: Sales of data only SIM cards, 2012-2016



Source: Deloitte analysis

The increased number of subscribers entering the market would also contribute to expanding the sales volumes of handsets, tablets, dongles and other devices for the use of data only SIM cards. While tablets, dongles and other M2M devices have not been explicitly considered in this simulation, the increases in the sales of feature phones and smartphones would be respectively on average 10% and 7% higher under the simulated scenario. This is reported in Figure 53.

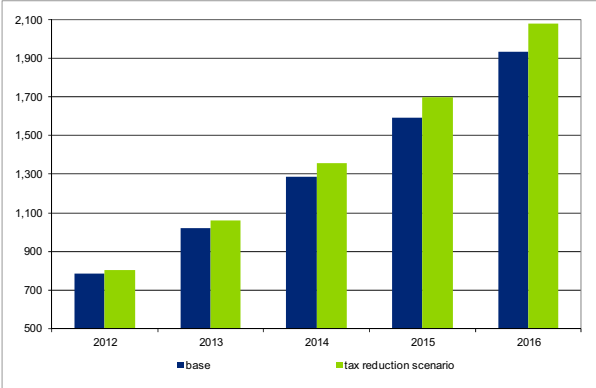
Figure 53: Sales of feature phones and sales of smartphones, 2012-2016



Source: Deloitte analysis

A further benefit of the increased number of 3G subscribers under the simulated scenario would be wider internet usage. In order to estimate the change in total internet usage, a detailed account was taken for the differences in data usage per capita between data only SIM cards –which are expected to attract a higher level of usage per capita- and all other SIM cards. The results suggest a 5% increase in total data usage per annum over the base case, indicating a substantially improved access to mobile internet.

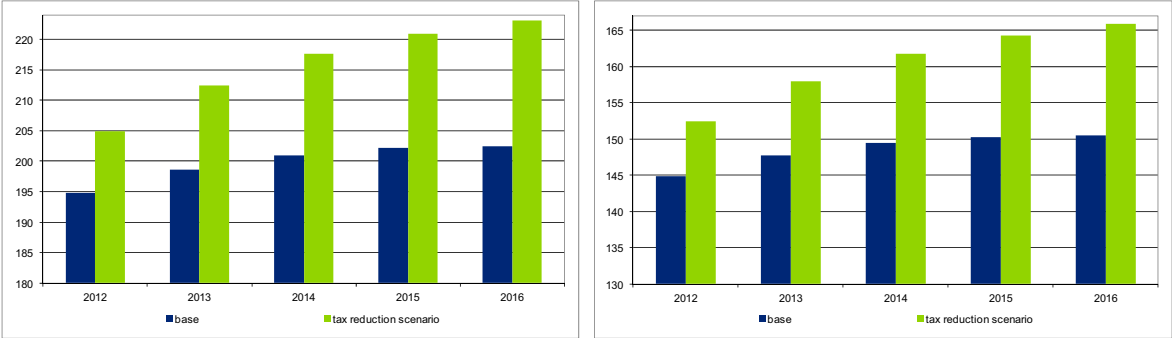
Figure 54: Total data usage, Mb billions



Source: Deloitte analysis

In addition to the total usage increases due to penetration growth, the reduction in the SCT is expected to generate higher minutes of use and SMS per user, leading to a further total usage increase.

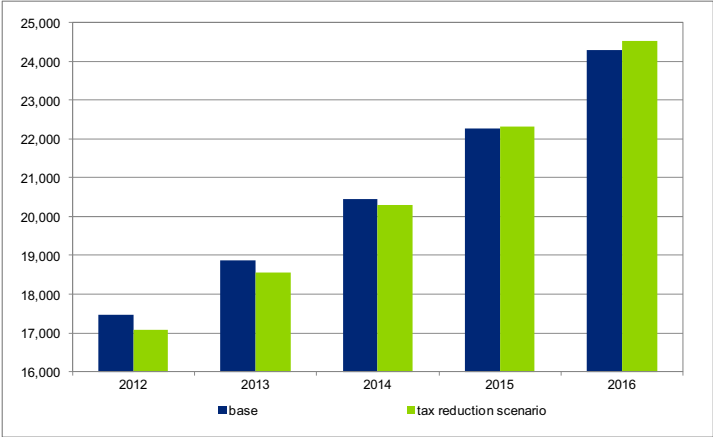
Figure 55: Total minutes of use (billions) and total SMS (billions), 2012-2016



Source: Deloitte analysis

The overall analysis, whilst only indicative, suggests that the mobile market would grow as a result of the change in taxation policy: this would have a beneficial effect on the economy and on government’s tax receipts. Despite an initial decrease in government’s revenues (due to the reduction in taxation), the increased penetration and usage indicated by the analysis would more than compensate the initial effect and lead to an increase in government revenues four years after the introduction of the policy change. The effects could further be boosted by the additional investment and employment that MNOs could generate in response to increases in revenues and EBITDA resulting from market growth, which are not explicitly accounted for in this simulation. Figure 56 shows that government receipt from mobile specific and general taxation would be higher in 2015 and thereafter under the tax reduction scenario. Higher mobile and 3G penetration would contribute to an increase in the GDP growth rate. This indirect effect, combined with higher mobile service usage, is expected to deliver a positive tax outcome in the medium term.

Figure 56: Government tax revenues, 2012-2016, TRY millions



Source: Deloitte analysis

Appendix C Methodology and assumptions

This section outlines the approach taken in estimating the economic contributions of the mobile industry to the Turkish economy.

C.1 Estimation of the economic impact of mobile telephony

C.1.1 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 on 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 data and operator data were 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:²¹

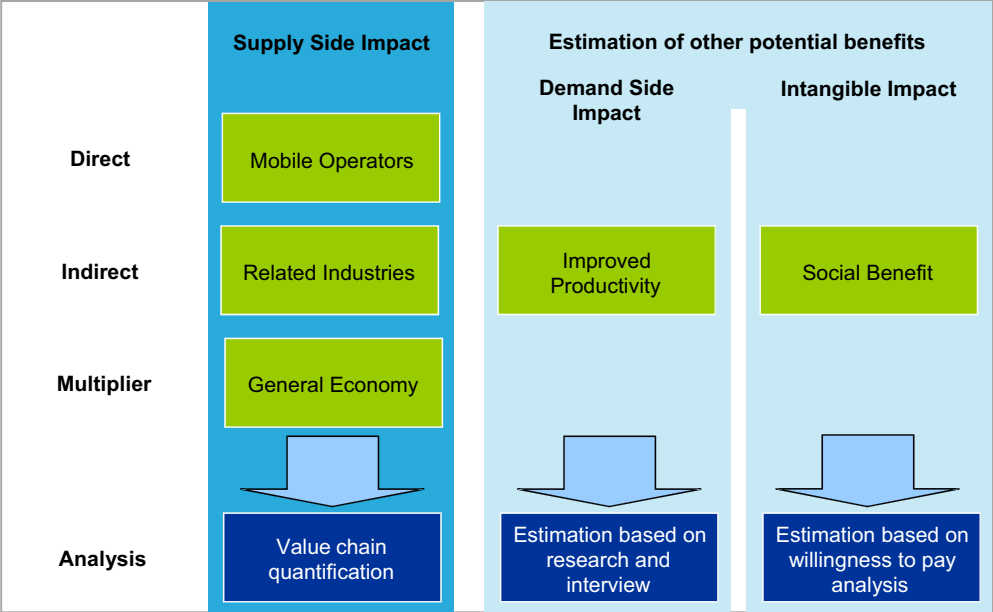
- The direct impact from the MNOs.
- The indirect impact from other industries related to mobile services.
- The indirect impact due to the surplus enjoyed by end users in terms of productivity improvements.
- The indirect impact due to more qualitative social benefits enjoyed by the population, referred to as 'intangible benefits'.

The static analysis has been structured as illustrated by the following figure. The different impacts are summed together to give the total economic impact.²²

²¹ 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.*

²² 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.

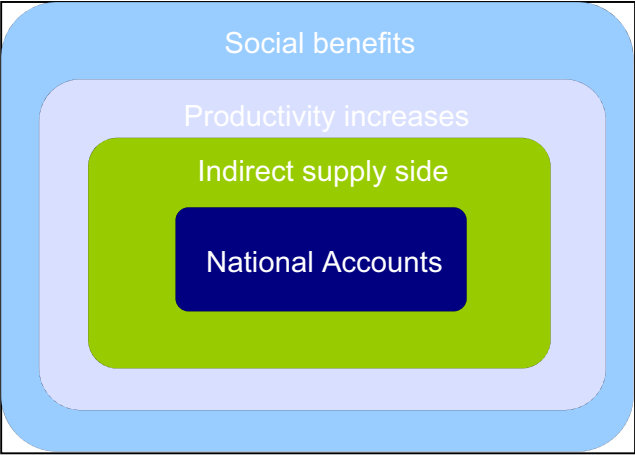
Figure 57: Structure of the analysis of economic impact on GDP and employment



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 58: This methodology and national accounts

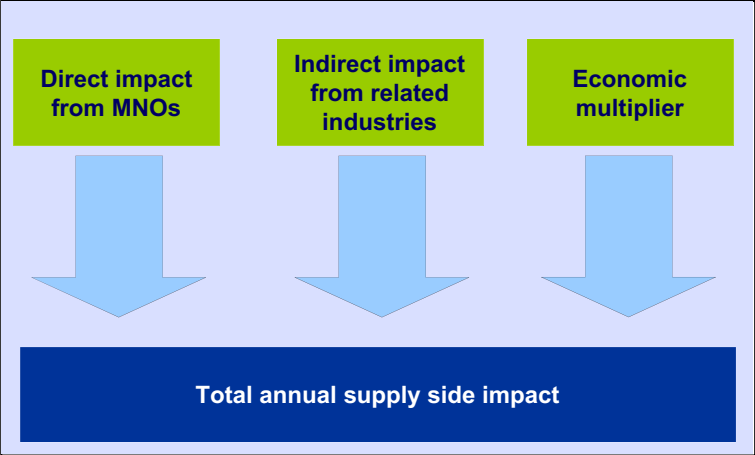


Source: Deloitte

C.1.1.1 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 59: Structure of the supply side analysis

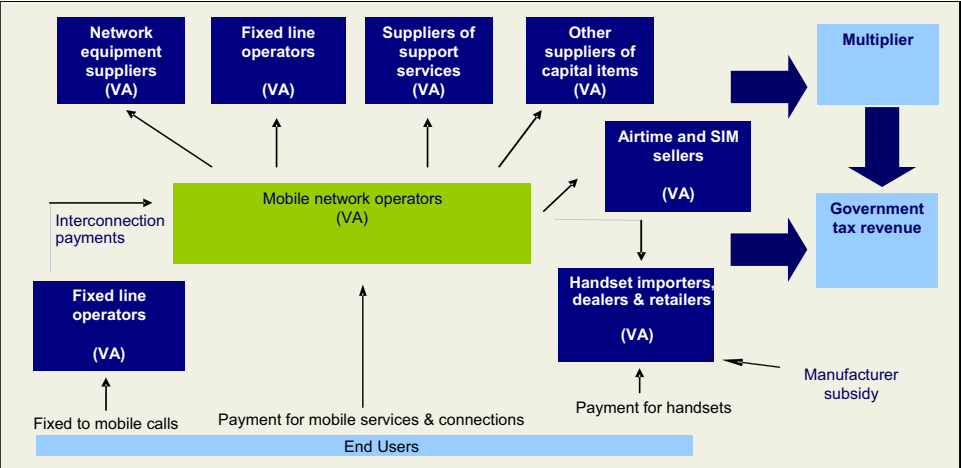


Source: Deloitte

This gives a snapshot view but does not take into account the future benefits to the economy resulting from growth. A customer’s spending 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 for 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. Flows of value between stakeholders are shown in the diagram below.

Figure 60: Mobile value chain



Source: Deloitte

Estimates of the flows are based on:

- discussions with MNOs
- interviews with local market experts, handset and airtime dealers
- analysis of government taxation statistics
- analysis of accounts and billing information.

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

C.1.1.2 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 MNO management accounts interviewing which identify the final destination of monetary flows.

C.1.1.3 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 C.1.5.

C.1.1.4 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 which are 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 61: Multiplier benchmarks

Title of study	Multiplier
The contribution of mobile phones to the UK economy (2002), O2 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
Deloitte/GSMA 2011. 'Mobile telephony and taxation in Croatia'	1.3
Deloitte/GSMA 2011. 'Mobile telephony and taxation in Kenya'	1.2
Deloitte/GSMA 2011. 'Mobile telephony and taxation in Bangladesh'	1.4

Source: Deloitte

An economic multiplier of 1.4 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 a 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 Turkey.

C.1.1.5 Calculating tax revenues

Government tax revenues are raised through taxes specific to mobile services, corporation tax, income tax and regulatory fees. Tax revenues are collected from all components in the value chain.

Based on interviews with the main parties, assumptions were made on the percentage of money flows that are subject to the national tax regime.²³

Information on revenues for various taxes was collected as follows:

- economy-wide taxes: value added (sales) taxes, corporate taxes and income tax paid by employees
- mobile taxes: licence, spectrum and other regulatory fees, plus all mobile specific taxes peculiar to the Turkish tax system.

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

C.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 was partly estimated directly by collecting data from the MNOs. For the related industries, a combination of two methods was employed: information from interviews with the MNOs was given priority. Whenever direct information was missing, employment in related industries was calculated by dividing the proportion of revenue spent on wages by the average wage rate in the sector. Finally, support and induced employment was estimated using a multiplier: 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 of the economic basis of the industry and country that are the object of the study. Discussions with stakeholders were conducted on this issue and it was chosen to apply a multiplier of 1.4 on all value add including employment.

C.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

²³ Following interviews with the main parties, only a limited degree of leakage from the informal sector has been assumed.

such as Turkey. 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 workers in certain occupations to cut out the middle-man, e.g. 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: 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. Mobile phones will give them greater accessibility and better knowledge of demand.
- Improving job search: mobile services improve the chances of the unemployed finding employment by 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 phones have encouraged the growth of small business and has increased their efficiency.
- Data and smartphone proliferation amplifies these effects and gives access to applications and email.

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 this area was considered and interviews with stakeholders have been undertaken in order to provide an indication of the demand side impact of mobile communications.

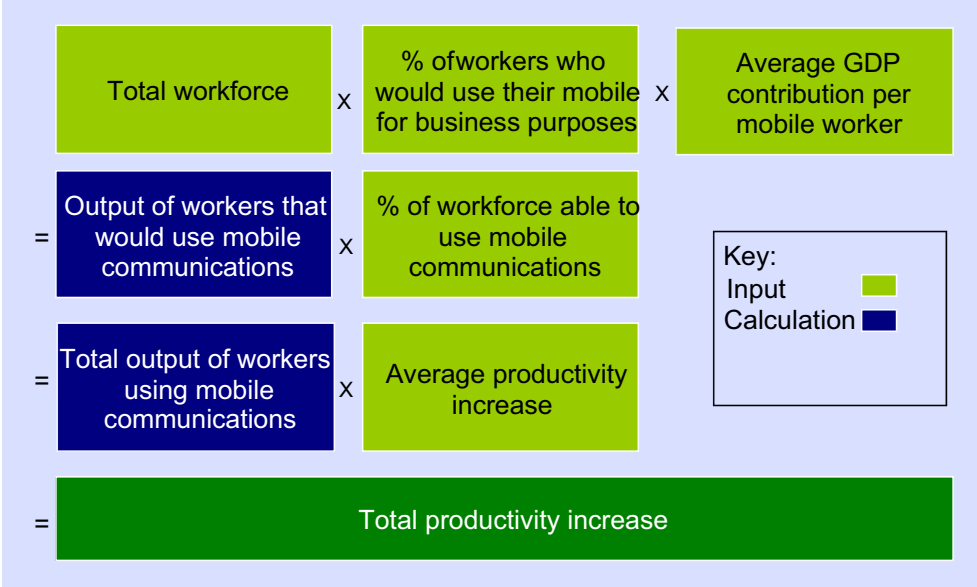
The impact of the productivity improvements on the overall economy is estimated by assuming that the productivity improvement will be experienced by high mobility employees within the economy. In line with similar studies²⁴, high mobility workers are defined as those workers who undertake a moderate 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 referring to data from the national bureau of statistics and international labour databases. The productivity gain of high mobility workers with access to mobile phones was estimated by

²⁴ Examples include: McKinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone.*

undertaking interviews to identify the impacts seen in each country and by referring to previous studies.

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

Figure 62: Calculation of economic impact of productivity improvements



Source: Deloitte

C.1.4 Intangible benefits

Finally, the intangible impact of the mobile industry was identified. Information provided during interviews with MNOs in Turkey was utilised; additional findings from other economic impact reports were drawn upon and extended.

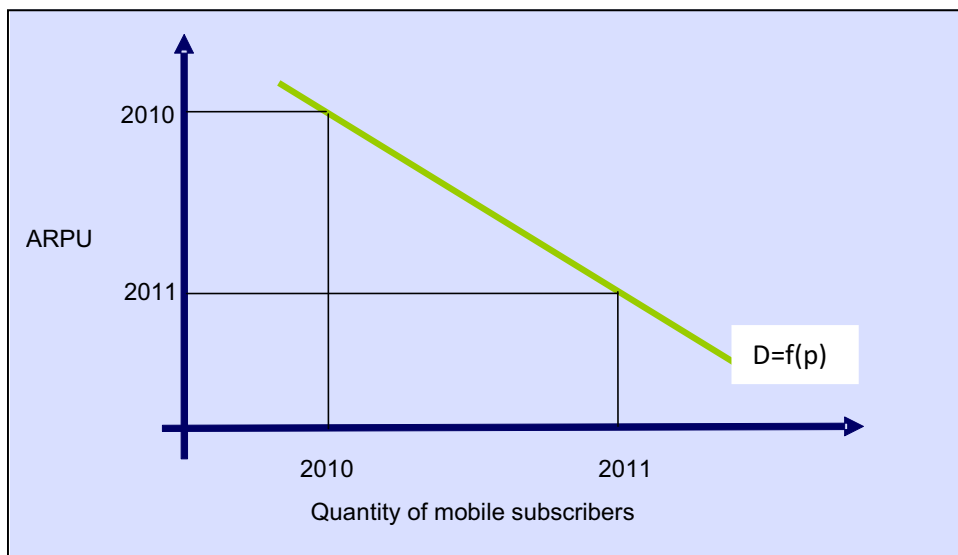
As with productivity, economic and social research was undertaken in the last ten years on the numerous ways in which mobile services can promote intangible benefits. These are presented here for general review and include:

- Promoting social cohesion: through enabling contact with family members or friends who have moved away, and building trust through sharing of handsets (which has been found to be common in developing countries). In addition, a number of studies found a statistically robust relationship between mobile ownership and willingness to help others in the community.
- Extension of communications: especially to users with low education and literacy.

- 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. One method for estimating a value using actual data is the willingness to pay concept.²⁵ This seeks to calculate the increase in consumer surplus that results from a change in the price of a good.

Figure 63: Increase in consumer surplus following a reduction in price



Source: Deloitte

The willingness to pay concept was used to calculate the value of the intangible benefits of mobile phones in this study.²⁶ Historical minutes of use ('MOU') per user and average price per minute show how much customers are willing to pay for mobile services. If it is assumed that these intangible benefits of owning a mobile phone are unchanged over time, then the value for this form of consumer surplus can be considered to be the difference between price per minute at the time of subscription, less price per minute today (which is likely to be less due to increased competition and other factors). Total consumer surplus is then the difference in price per minute multiplied by the total minutes of use at the old price.

²⁵ See: McKinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone.*

²⁶ There is a potential for double counting between the productivity improvement and the intangible impact.

There are numerous reasons why these estimates could underestimate or overestimate the true value of intangible benefits. This methodology assumes that all subscribers joined the network in 2007: this allows estimating only the consumer surplus enjoyed by customers that joined the network from 2008 onward, leading to an underestimation of the true consumer surplus. On the other hand, the methodology does not account for potential changes in the willingness to pay of consumers over time. The effect of this on the overall calculation depends on whether the true willingness to pay has increased or decreased over time.

C.1.5 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 Turkcell and Vodafone, while estimates were used for Avea 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 Turkey.</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.</p> <p>A multiplier of 1.4 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>

Assumption	Value																																																																		
Value add margins for each segment of the value chain	<p>Value add margins are the total percentage 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 Turkey. 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>66%</td> </tr> <tr> <td>Network equipment suppliers</td> <td>85%</td> </tr> <tr> <td>Handset producers and dealers</td> <td>99%</td> </tr> <tr> <td>Other suppliers of capital items</td> <td>54%</td> </tr> <tr> <td>Suppliers of support services</td> <td>70%</td> </tr> <tr> <td>Airtime, SIM and commission</td> <td>80%</td> </tr> </tbody> </table>	Margin on domestic revenues	% value add margin	Fixed telecommunications operators	66%	Network equipment suppliers	85%	Handset producers and dealers	99%	Other suppliers of capital items	54%	Suppliers of support services	70%	Airtime, SIM and commission	80%																																																				
Margin on domestic revenues	% value add margin																																																																		
Fixed telecommunications operators	66%																																																																		
Network equipment suppliers	85%																																																																		
Handset producers and dealers	99%																																																																		
Other suppliers of capital items	54%																																																																		
Suppliers of support services	70%																																																																		
Airtime, SIM and commission	80%																																																																		
Airtime commission	Commissions data was based on interviews with MNOs.																																																																		
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 5% for high mobility workers is assumed based on interviews and a review of similar studies.</p> <p>The estimate of the percentage of high mobility workers in each employment activity is provided below.</p> <table border="1"> <thead> <tr> <th>Employment by sector</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>% of high mobility</th> </tr> </thead> <tbody> <tr> <td>Agriculture and Forestry</td> <td>5,016,000</td> <td>5,254,000</td> <td>5,579,211</td> <td>5,949,167</td> <td>25%</td> </tr> <tr> <td>Mining and Quarrying</td> <td>115,000</td> <td>103,000</td> <td>109,375</td> <td>116,628</td> <td>25%</td> </tr> <tr> <td>Manufacturing</td> <td>4,235,000</td> <td>3,949,000</td> <td>4,193,435</td> <td>4,471,500</td> <td>25%</td> </tr> <tr> <td>Electricity and Water</td> <td>91,000</td> <td>78,000</td> <td>82,828</td> <td>88,320</td> <td>25%</td> </tr> <tr> <td>Building and Construction</td> <td>1,241,000</td> <td>1,249,000</td> <td>1,326,310</td> <td>1,414,258</td> <td>25%</td> </tr> <tr> <td>Wholesale and Retail Trade, Restaurants and Hotels</td> <td>4,573,000</td> <td>4,542,000</td> <td>4,823,140</td> <td>5,142,961</td> <td>50%</td> </tr> <tr> <td>Transport and Communications</td> <td>1,089,000</td> <td>1,081,000</td> <td>1,147,912</td> <td>1,224,029</td> <td>75%</td> </tr> <tr> <td>Finance, Insurance, Real Estate and Business services</td> <td>1,169,000</td> <td>1,339,000</td> <td>1,412,881</td> <td>1,516,166</td> <td>75%</td> </tr> <tr> <td>Community, Social and Personal Services</td> <td>3,664,000</td> <td>3,682,000</td> <td>3,909,908</td> <td>4,169,172</td> <td>35%</td> </tr> <tr> <td>Average high mobility</td> <td></td> <td></td> <td></td> <td></td> <td>38%</td> </tr> </tbody> </table>	Employment by sector	2008	2009	2010	2011	% of high mobility	Agriculture and Forestry	5,016,000	5,254,000	5,579,211	5,949,167	25%	Mining and Quarrying	115,000	103,000	109,375	116,628	25%	Manufacturing	4,235,000	3,949,000	4,193,435	4,471,500	25%	Electricity and Water	91,000	78,000	82,828	88,320	25%	Building and Construction	1,241,000	1,249,000	1,326,310	1,414,258	25%	Wholesale and Retail Trade, Restaurants and Hotels	4,573,000	4,542,000	4,823,140	5,142,961	50%	Transport and Communications	1,089,000	1,081,000	1,147,912	1,224,029	75%	Finance, Insurance, Real Estate and Business services	1,169,000	1,339,000	1,412,881	1,516,166	75%	Community, Social and Personal Services	3,664,000	3,682,000	3,909,908	4,169,172	35%	Average high mobility					38%
Employment by sector	2008	2009	2010	2011	% of high mobility																																																														
Agriculture and Forestry	5,016,000	5,254,000	5,579,211	5,949,167	25%																																																														
Mining and Quarrying	115,000	103,000	109,375	116,628	25%																																																														
Manufacturing	4,235,000	3,949,000	4,193,435	4,471,500	25%																																																														
Electricity and Water	91,000	78,000	82,828	88,320	25%																																																														
Building and Construction	1,241,000	1,249,000	1,326,310	1,414,258	25%																																																														
Wholesale and Retail Trade, Restaurants and Hotels	4,573,000	4,542,000	4,823,140	5,142,961	50%																																																														
Transport and Communications	1,089,000	1,081,000	1,147,912	1,224,029	75%																																																														
Finance, Insurance, Real Estate and Business services	1,169,000	1,339,000	1,412,881	1,516,166	75%																																																														
Community, Social and Personal Services	3,664,000	3,682,000	3,909,908	4,169,172	35%																																																														
Average high mobility					38%																																																														

Assumption	Value
Multiplier	<p>Employment information for 2008-2011 was obtained from the national statistics office. Percentages 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> <p>A multiplier of 1.4 was applied to supply side direct and indirect value add in order to capture the full impact on the Turkish economy.</p> <p>This multiplier was selected following a literature review and interviews. This choice is discussed in more detail in Appendix C.1.1.4.</p>

C.2 Impacts of the reduction of mobile specific taxes

This section describes the methodology and assumptions used to simulate the impact that a reduction in mobile specific taxation in Turkey might have on government revenues and on a number of key indicators such as mobile penetration, 3G penetration, usage per subscriber, total usage and handset sales.

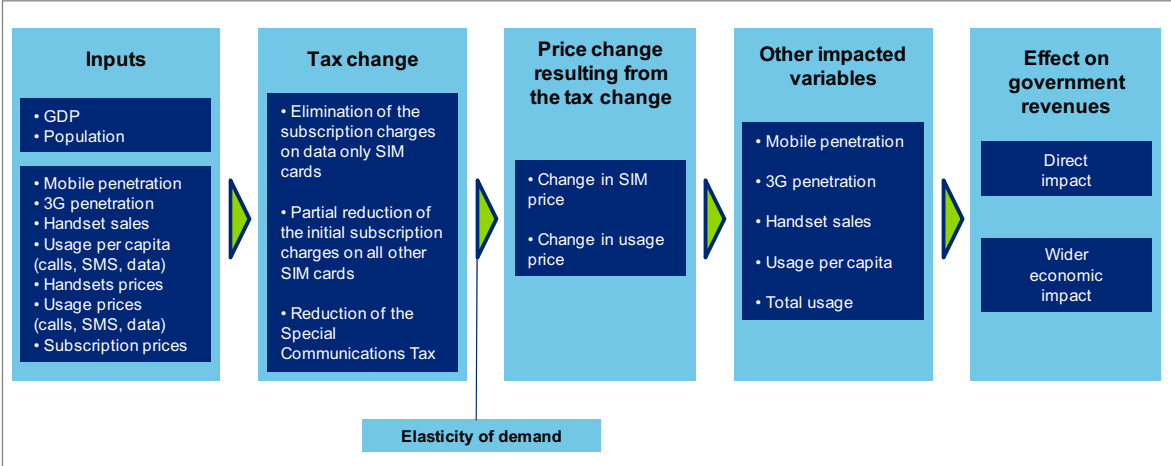
The simulation undertaken investigated the combined impact of the following changes to the current taxation regime in Turkey:

- Elimination of the initial subscription charges, i.e. the Wireless Licence Fee (TRY 13.2 in 2011) and the fixed component of the Special Communications Tax (TRY 34 in 2011) on data only SIM cards in 2012.
- An 85% reduction of the Wireless Licence Fee and the fixed component of the Special Communications Tax on all other SIM cards in 2012.
- Reduction of the Special Communications Tax (SCT) on calls and SMS from 25% to 15%, to realign it with the SCT applying to fixed telecom services.

A simulation model has been developed in order to provide an estimation of the impact of each tax reduction. A base case scenario was created which simulates market development and tax revenue collection for years 2012 to 2016, assuming the application of the current taxation structure. A number of assumptions based on discussions with MNOs, general market experience and external market projections from third parties were used as a basis to simulate how the main market variables (e.g. number of subscribers, usage levels and prices) evolve in the base case scenario. The effects of the tax reductions were then measured relative to this base case scenario.

The simulation model is constructed to carry out a number of distinct steps of analysis which are then aggregated to provide the total impact of taxation on the key market variables, including on government revenues, as shown in Figure 64.

Figure 64: Tax reduction simulation methodology



Source: Deloitte

The starting point of the model is given by a set of macroeconomic inputs (such as Turkish GDP and population) and a number of key variables related to the Turkish mobile market (mobile and 3G penetration, handset sales, usage per capita, handset, usage and subscription prices).

A retail price change is triggered when a tax reduction is applied. Following the price changes, the model employs a set of consumer demand elasticities in order to establish how the major market variables are impacted. Finally, the overall effect on government revenues is estimated as outlined in section C.2.2.

The following sections present the details of this approach.

C.2.1 Introduction of a tax reduction

A change in taxation policy is simulated starting from 2012. This is the element characterising the difference between the base case scenario (a scenario where all market variables behave as if the tax is retained) and the alternative scenario (in which the tax is reduced/eliminated).

A tax reduction generates a number of effects that have been simulated, including:

- Effect on retail prices;
- Effect on products and services volumes; and

- Effect on government tax revenues.

C.2.1.1 Effect on retail prices

The tax reduction is reflected in the retail price of the relative service (handsets, usage or SIM cards). It was assumed that a reduction in taxation would be fully reflected in the prices faced by the final customers (rather than resulting in an increase in corporate profit margins). Where markets are fully competitive, economic theory suggests that prices should be reflective of costs, including a normal return on capital employed. Thus, where markets are deemed to be competitive, a fall in the tax rate should result in an equivalent, or nearly equivalent, fall in retail prices.²⁷ In Turkey there are three licensed MNOs, and prices of telecom services have been steadily falling over time. Interviews conducted with the MNOs suggested that MNOs actively place a constraint on each other's pricing decisions. Therefore, based on these considerations and in light of the approach that has been taken in similar studies,²⁸ it was assumed that 100% of any change in tax is reflected in the consumer price.

C.2.1.2 Impact on volumes

Following the reduction in retail prices, a simulation is made of how relevant service volumes (handset sales, usage per capita, total usage and number of mobile and 3G subscribers) are impacted. This is done by employing a different type of consumer price elasticity for each type of product. The following table presents the elasticity estimations reported in studies that are most relevant for Turkey.

²⁷ The exact proportion of the tax decrease that is reflected in consumer prices depends upon the relationship between consumer and producer surplus. In a perfectly competitive market, price is equal to cost and 100% of the reduction in tax is assumed to be passed through to the consumer. As competition reduces from this level then the percentage passed through to the consumer is also reduced.

²⁸ For example, see: Frontier Economics (2006). *Impact of mobile taxation in Bangladesh*.

Table 8: Elasticity measures

Elasticity of usage	Source
0.28 - 0.45	Haucap, Heimeshoff and Karacuka (2010). 'Competition in the Turkish Mobile Telecommunications Market: Price Elasticities and Network Substitution'.
Elasticity of subscriptions	Source
0.2 - 0.9	Grzybowski (2004), cited in 'The Economics of Taxing Mobile Phone Usage in Turkey' (Waverman 2008 ²⁹)
0.43	Rodini (2002) , cited in 'The Economics of Taxing Mobile Phone Usage in Turkey' (Waverman 2008)

Source: Deloitte literature review

Concerning the elasticity of usage, the most suitable measure appears to be the one estimated by Haucap, Heimeshoff and Karacuka in 2010. For mobile usage in Turkey, they find a short term elasticity of 0.28 and a long term elasticity of 0.45. Given the medium term horizon in this tax impact model, a choice was made to use 0.4.

For the elasticity of subscriptions, two studies (by Grzybowski in 2004 and by Rodini in 2002) appeared to be most relevant. Both were cited in a previous study on taxation in the mobile telecommunications industry in Turkey (Waverman 2008). An average figure was computed for the purposes of this model: an elasticity of 0.5 was therefore selected for subscriptions.

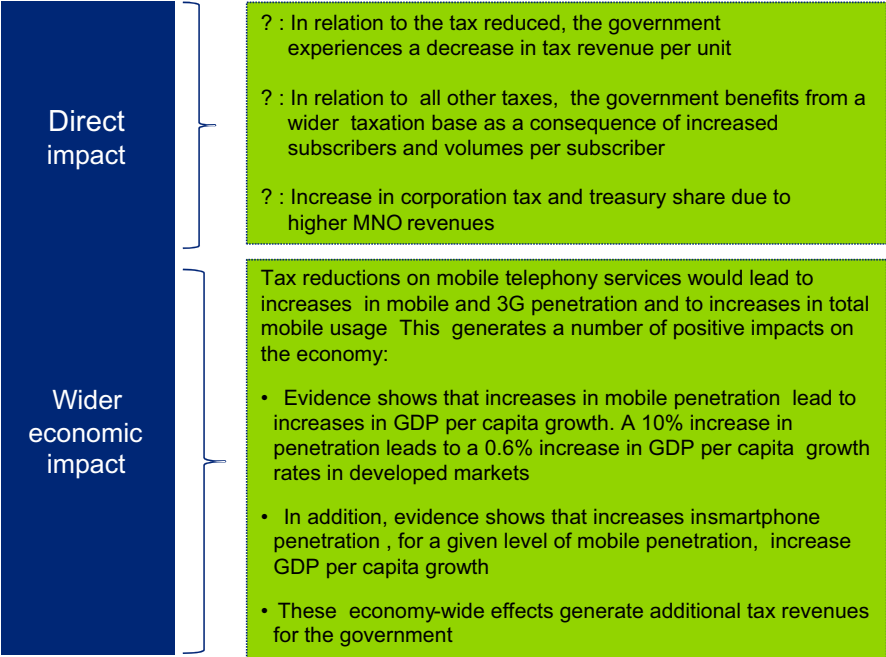
Finally, no specific study on the elasticity of data only SIM cards was available. Given the very initial stage of development for this product, the MNOs suggested a higher elasticity compared to the one used for standard of subscriptions. For this reason, an elasticity of 0.9 was assumed for data only SIM cards in the model.

C.2.2 Impact on government tax revenues

The simulated tax reduction leads to a change in government tax revenues. In order to estimate this variation one needs to account for the direct as well as the indirect effects of the tax reduction, as shown in Figure 65.

²⁹ Waverman (2008), 'The economics of taxing mobile phone usage in Turkey'

Figure 65 Impact of taxation reductions on government tax revenue



Source: Deloitte

The direct impact has two components:

- Taxes collected by the government on each unit that is affected by the tax reduction will be at a lower per unit rate, therefore reducing taxation per unit.
- The user and usage tax base increases as a result of the tax reduction proportionally to the market elasticity, leading in this model to higher volumes of handset sales, higher number of subscribers, higher usage per capita and higher total usage.

The indirect impact refers to a number of induced effects on wider economic growth resulting from tax reductions, in particular due to the beneficial effects that mobile telephony generates in a country, as noted in the analysis of economic contribution of the industry in this paper. These effects include the benefits to economic growth associated with increases in penetration of mobile services. A 2005 study by Leonard Waverman³⁰ found that that a 10% increase in mobile penetration yields an increase of 0.6% in the growth rate of GDP in developed markets. A study from Deloitte³¹ found that this figure equated to 1.2% for developing markets.

³⁰ Waverman, Leonard, Meloria Meschi, and Melvyn Fuss (2005). "The Impact of Telecoms on Economic Growth in Developing markets".

³¹ Deloitte (2006), "Global Mobile Tax Review 2006-2007" on behalf of the GSM Association.

These wider effects on economic growth determine a higher level of GDP in the scenario where the taxes are reduced compared to the scenario in which taxes are assumed to remain unchanged. This higher level of economic activity will then generate additional government revenues from general taxation.

C.2.3 Specific model inputs and assumptions

The following inputs and assumptions specific to Turkey were made to simulate the impact of tax reductions.

Economic factors:

- Historic Turkish GDP data and GDP forecasts were extracted from the International Monetary Fund's World Economic Outlook Database.
- A general measure of taxation as a percentage of GDP in Turkey was obtained from the CIA World Factbook.
- Population data was extracted from the World Bank's World Development Indicators. Population was forecasted to grow at an average 1.3% a year, in line with the trend experienced in the last six years.
- All variable taxes in the base case (counterfactual) scenario were assumed to remain the same during 2012-2016. Fixed taxes (Wireless Licence Fee, Wireless Usage Fee and the fixed component of the Special Communications Tax) are assumed to grow over time to reflect historic inflation.

Market data and prices:

- Mobile penetration and 3G penetration were obtained from Wireless Intelligence. Wireless Intelligence also provides forecasts: mobile penetration was assumed to grow during years 2012 to 2016 by 2.2 percentage points on average each year). 3G penetration was assumed to grow by 6.6 percentage points on average each year.
- Historic volumes of handset sales were obtained directly from estimates by MNOs. Feature phone sales were assumed to decrease at an average 9% a year, while smartphone sales were assumed to grow in future years, albeit at a decreasing rate (33% a year on average).
- The historic prices of feature phones and smartphones were provided by Turkcell and Vodafone. The price of feature phones was assumed to decrease at an average of 5% a year during years 2012 to 2016, while the price of smartphones was assumed to decrease by 4% a year during the same period. These assumptions have been made based on discussions with market participants and local market experts.

- With regards to SIM card/activation prices, it was assumed that currently the price of these items is constituted only by tax, i.e. is the sum of the Wireless Licence Fee and the fixed component of the Special Communications Tax. This is consistent with discussions with MNOs and with the subsidy levels identified in Turkey.
- It was assumed that not every new subscription leads to an additional mobile phone sold: only 40% of new SIM cards have been associated with the sale of a new handset.
- Calls price per minute and price of SMS were assumed to remain stable at 2011 levels during 2012-2016. These assumptions are based on discussions with MNOs and in consideration of market maturity and the degree of price decreases witnessed in recent years.
- Price per Mb of data usage was assumed to decrease at a decreasing rate from 2012 to 2016 (11% on average). Data prices have been decreasing consistently in recent years (which is typical for new services); however, the expectation is that price decreases will continue in future years, albeit at a lower rate.
- Minutes of use per subscriber per month were based on the Wireless Intelligence. Given the relatively high level of minutes of use in Turkey and given that the levels of penetration are progressively approaching 100%, it was assumed that MOU per capita decrease at 2% a year during 2012 to 2016.
- SMS per user per month were obtained from Turkcell and Vodafone and aggregated to the market level using market shares as a weight. It was assumed that SMS per user per month will decrease by 2% a year during 2012-2016.
- Data usage measured in terms of Mb per user per month was provided by Turkcell and Vodafone and aggregated to the market level using market shares. From discussions with the operators it was established that Mb per user per month are higher for subscribers with data only SIM cards compared to the average subscriber. Mb per user per month have been assumed to grow at an average 10% a year during 2012-2016 for all SIM cards, consistently with market developments.

Market elasticities:³²

- Elasticity of mobile usage (calls and SMS) was assumed to be 0.4.
- The elasticity of demand for data only SIM cards was assumed to be 0.9, while the elasticity for all other subscriptions was assumed to be 0.5.

³² See section C.2.1.2 for a more detailed discussion of the elasticities selected for the simulation.

Impact of increases of mobile penetration on GDP growth rates:³³

- Dynamic growth coefficient for mobile penetration: It was assumed that a 10% increase in mobile penetration raises the growth rate of GDP by 0.6%.³⁴

³³ See section C.2.2 for a more detailed discussion of the impact of mobile penetration on the growth rate of the economy.

³⁴ Waverman, Leonard, Meloria Meschi, and Melvyn Fuss (2005). "The Impact of Telecoms on Economic Growth in Developing markets".

List of figures and tables

- Figure 1: Mobile and 3G penetration levels in Turkey, 20112
- Figure 2: Mobile communications ecosystem in Turkey.....3**
- Figure 3: Supply side value add of mobile communications in Turkey, TRY millions.....3
- Figure 4: Supply side value add from mobile communications by component, TRY millions4
- Figure 5: Mobile value chain and value add in Turkey in 2011, TRY millions.....4
- Figure 6: Supply side value add as a proportion of GDP.....4
- Figure 7 Employment generated by the mobile communications ecosystem in 2011 (FTEs)4
- Figure 8: Potential economic impact in 2011 of increased productivity amongst high mobility workers.....5
- Figure 9: Mobile specific taxation on consumers and MNOs, 2011.....6
- Figure 10: Tax as a percentage of TCMO, 20117
- Figure 11: TCMO as a percentage of GDP per capita, 20117
- Figure 12: Mobile penetration in a sample of European and neighbouring countries, 2011.....8
- Figure 13: 3G penetration in a sample of European and neighbouring countries, 20118
- Figure 14: Penetration in a sample of European and neighbouring countries, 2000-2011.....8
- Figure 15: Fixed telecom services per 100 people, 2010.....8
- Figure 16: Penetration of internet.....8
- Figure 17 MNOs’ earnings in Turkey and for a typical EU operator.....9
- Figure 18: EBITDA margin, 2011.....9
- Figure 19: Capex per capita, 2010, US\$.....10
- Figure 20: Direct and indirect effects on government tax revenues.....10
- Figure 21: Mobile penetration and 3G penetration, 2012-2016.....11
- Figure 22: Sales of data only SIM cards, 2012-201611
- Figure 23: Sales of feature phones and sales of smartphones, 2012-201611
- Figure 24: Total data usage, 2012-2016, Mb billions.....12
- Figure 25: Total minutes of use (billions), 2012-201612
- Figure 26: Government tax revenues, 2012-2016, TRY millions.....12
- Figure 27: Structure of the analysis of economic impact on GDP and employment13
- Figure 28: The mobile communications ecosystem in Turkey.....14**
- Figure 29: Mobile value chain and value add in Turkey in 2011, TRY millions.....16
- Figure 30: Supply side value add from mobile communications by component, TRY millions18
- Figure 31: Breakdown of 2011 tax revenues from MNOs by source21
- Figure 32: Supply side value add of the mobile ecosystem as a proportion of GDP.....22
- Figure 33: Economic impact in 2011 of increased productivity amongst high mobility workers23
- Figure 34: Price per minute and minutes of use per user per month.....25
- Figure 35: Intangible benefits using willingness to pay concept, TRY millions26
- Figure 36: Mobile specific taxation on consumers and MNOs, 2011.....27
- Figure 37: Tax as a percentage of TCMO, TCMU and handset price, respectively30
- Figure 38: TCMO as a percentage of GDP per capita31
- Figure 39: Gini coefficient (2010).....32
- Figure 40: Mobile penetration in a sample of European and neighbouring countries.....33
- Figure 41: 3G penetration in a sample of European and neighbouring countries33
- Figure 42: Penetration in a sample of European and neighbouring countries, 2000-201134
- Figure 43: Fixed telephone lines per 100 people.....35
- Figure 44: Penetration of internet.....36
- Figure 45: Corporate tax rates in Europe37
- Figure 46 MNOs’ earnings in Turkey and for a typical EU operator.....38
- Figure 47: EBITDA margin, 2011.....39
- Figure 48: Capex per capita, 2010, US\$.....40
- Figure 49: Methodology of the simulation41
- Figure 50: Direct and indirect effects on government tax revenues.....42
- Figure 51: Mobile penetration and 3G penetration, 2012-2016.....43
- Figure 52: Sales of data only SIM cards, 2012-201644
- Figure 53: Sales of feature phones and sales of smartphones, 2012-201644
- Figure 54: Total data usage, Mb billions45
- Figure 55: Total minutes of use (billions) and total SMS (billions), 2012-201645
- Figure 56: Government tax revenues, 2012-2016, TRY millions.....46
- Figure 57: Structure of the analysis of economic impact on GDP and employment48

Figure 58: This methodology and national accounts	48
Figure 59: Structure of the supply side analysis	49
Figure 60: Mobile value chain	49
Figure 61: Multiplier benchmarks	51
Figure 62: Calculation of economic impact of productivity improvements	54
Figure 63: Increase in consumer surplus following a reduction in price.....	55
Figure 64: Tax reduction simulation methodology	59
Figure 65 Impact of taxation reductions on government tax revenue	62
Table 1: Domestic value add of MNOs (excluding multiplier effect), TRY millions	15
Table 2: Calculation of value add from mobile communications in Turkey in 2011, TRY millions.....	17
Table 3: Contribution to employment from the mobile value chain in 2011	19
Table 4: Tax and regulatory payments in Turkey from MNOs, TRY millions	20
Table 5: Total tax revenues from the mobile value chain in 2011, TRY millions.....	21
Table 6: Summary of taxation paid by consumers in 2011.....	28
Table 7: Summary of taxation paid by MNOs in 2011	36
Table 8: Elasticity measures	61

Deloitte.

Davide Strusani
Assistant Director,
TMT Economic Consulting, Deloitte LLP
dstrusani@deloitte.co.uk



Gabriel Solomon
Head of Regulatory Policy
GSMA
gsolomon@gsm.org