



Price Level of Telecommunications Services in Finland 2009



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Price Level of Telecommunications Services in Finland 2009

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1. SUMMARY

'Price Level of Telecommunications Services in Finland 2009' is a survey that examines the price level development of telecommunications services used by households in 2009 in relation to price level from previous years. The survey is the second conducted by the Finnish Communications Regulatory Authority (FICORA). The survey also contains turnover data that concerns the entire telecommunications branch as well as retail prices from price lists. In order to illustrate index values the survey examines the minute-based prices of mobile phone subscriptions and the monthly prices of broadband subscriptions. The prices are in euros. Additionally, for the first time the survey contains a comparison between the price level of mobile phone calls and messaging services in Finland and the price level of corresponding services in other EU countries.

In 2009, households spent approximately EUR 1.4 billion on telecom services included in the survey, which is equal to the amount spent in 2008. Mobile phone calls accounted for slightly less than half of the amount households spent on telecom services. The share of voice services of the turnover decreased at the expense of data transmission services. The share of mobile broadband services of the turnover showed the strongest increase.

The price level of telecom services dropped by a total of 2.6 percent in 2009. The nominal price level of voice services was nearly six percent lower than in 2008 whereas the nominal price level of data transmission services was four percent higher. The different development of the price level between fixed and mobile network characterised the change more than the division into voice and data transmission services. During 2009, the price level of both fixed network voice services and data transmission services rose whereas the price level of both services in the mobile network dropped.

Data transmission in the mobile network and voice services in the fixed network represent the two extremes of the changes in the price level between 2007 and 2009. The price level of the former dropped considerably as mobile broadband subscriptions have grown in popularity whereas the price level of voice services in the fixed network rose significantly as the use of the fixed network has declined.

According to the fifteenth implementation report by the European Commission, the prices of mobile phone services in Finland last year were among the lowest in EU countries. Measured by different user volumes, the price level in Finland was 30 - 45 percent lower than the EU average.

2. INTRODUCTION

The 'Price Level of Telecommunications Services in Finland 2009' report reviews the price level trend in telecom services used by households during 2009 in proportion to the 2008 price level. The survey is a continuation to FICORA's 2009 survey of the price level of telecom services.


As regards the structure of the survey, the chapters that follow the introduction contain information on the source material for the survey as well as the index used in the survey and the method used to calculate the index. The third chapter contains a brief review of the general economic development. The chapter also presents the companies that provide telecom services and their turnovers. Chapters four and five deal with indexes and price level development in 2009, with chapter four focusing on the development of voice service prices and chapter five on data transmission service prices. In addition, the fourth chapter contains a comparison between the price level of mobile voice and messaging services in Finland and the price level in other EU countries. Chapter six discusses price developments in telecommunications services as a whole.

Whilst gathering information for 2009, FICORA received information that revises and complements the source material gathered in the previous years. The survey features new figures from 2008. Additionally, chapter 6.1 contains an information package on the new index values.

2.1 Background and scope of the survey

The aim of the survey of telecommunications service price levels is to study the price level of telecommunications services used by Finnish households and price trends compared to previous years. Key telecommunications services used by households were included, while telecommunications services used by corporate customers were excluded, as were telecommunications services used by Finnish consumers abroad. For the purposes of the survey, extensive background material containing key figures such as revenues and the number of subscriptions was collected from telecommunications operators.

The price indexes calculated for the survey reflect the development of prices actually paid by consumers rather than those appearing on telecommunications operators' price lists. Consequently, the survey does not reveal the price development of individual operators, but the general price development of particular services. The indexes used in the survey also



cover the impact of different special offers on the prices paid by consumers for telecommunications services. Price information collected from public sources was also used. Of the price information gathered from public sources, the survey illustrates the prices of mobile voice and messaging services in Finland, comparing them to other EU countries. The survey also illustrates the manner in which the list prices of broadband services vary between provinces in Finland.

2.2 Background material used in the survey

For the purpose of the survey, extensive service-specific background material was collected containing the number of subscriptions and volume of use per telecommunications operator, as well as revenue data. The material has been divided into the following service groups: fixed network voice services, fixed network data transmission services, mobile messaging services, mobile multimedia services, mobile voice services, mobile data transmission services (so-called mobile broadband services) and other mobile data transmission services. Based on the number of subscriptions, the background material covers at least 90 percent of the total supply of each service in Finland. Furthermore, chapter 3.1 contains turnover data from the entire telecommunications branch. This data is similar to the data published earlier by Statistics Finland in their Telecommunication Statistics. The material collected for the turnover data in chapter 3.1 covers more than 99.5 percent of the supply of telecom services in Finland, based on subscription volumes.

In addition to data requested from telecommunications operators, the public price lists of telecom operators were studied to obtain the retail prices of fixed and wireless broadband subscriptions. Regional price information for broadband subscriptions was collected from ten provinces. The implementation report published by the Commission has been used as a source in the comparison between the prices of voice and messaging services in different EU countries.

The information on price levels of telecom services was gathered last year from year 2007 which is the so-called year zero for price levels. The price level of voice services is also compared to calculated price indexes from previous surveys.

2.3 The indexes used in the survey, and their calculation

A total of seven indexes were calculated for the survey. These indexes are split into three levels. The highest level features the overall telecommunications service price level index. At the next level down, we have the voice and messaging service price level index and the data transmission service price level index. The lowest level features the fixed network voice service, mobile voice and messaging service, fixed network data transmission service and mobile data transmission service price indexes. In all cases, the highest-level price index has been calculated based on starting values, in other words unit price per service and weight per service.

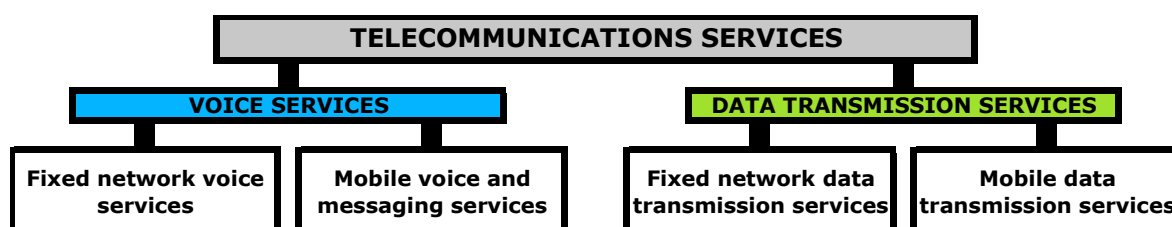



Figure 1: The grouping of telecom services used in the survey.

The Törnqvist price index¹ is used in calculating the indexes. This price index is a theoretical calculation model used to describe the price changes at a specific time and for certain commodities in relation to the price level at a pre-determined base time.

For the Törnqvist price index, unit prices per service were calculated by dividing a telecom operator's combined revenues for a particular service by the volume of use, such as call minutes, for that service. In other words, a so-called monopoly was formed for the calculation of unit prices per service and a unit price for the related telecom service was calculated.

In fixed and mobile voice services the unit price is based on the price per minute. This includes all call charges such as monthly fees, call charges and activation fees. In text messaging (SMS) and multimedia services (MMS), the unit price is based on the price per message, which includes all costs such as message charge and any monthly fees. In fixed network data transmission services and mobile broadband services, the price used is the monthly subscription fee. The unit price of other mobile data transmission services is based on the unit price per user. In the case of these data transmission services, unit prices include all fees and charges involved in the service, such as activation fees, monthly fees and charges per service.



In the price indexes calculated for various services, prices of services generating higher revenue are given more weight. For example, when calculating the overall index for telecommunications services, the prices of mobile network services are given more weight than those of fixed network services, because revenue from mobile network services is higher than that from fixed network services.

To calculate the indexes, so-called chain indexing was used, in other words price level comparisons are made between consecutive calculation times. The period between calculation times is one calendar year. In the survey, the price development for 2009 is compared to that for previous years. Therefore, 2007 is assigned a price index value of 100 for all indexes calculated.

In addition to price indexes calculated using nominal prices, the real price level of telecom services, and the price trend, were calculated. The real price level describes the relationship between telecom service prices and the general price level and its development. Price calculation was based on the consumer price index published by Statistics Finland. To calculate real price levels, each sub or total index calculated for the survey was divided by the value of the consumer price index.

In the survey, the so-called year zero is 2007 where the price level indexes have the value 100. However, in the survey, the change in the price level of 2009 is compared primarily to the price level from the previous year.

Additionally, in order to illustrate index values, the amount of money households spend on different telecom services has been calculated by using the background material. The average amount of money spent on a subscription per month has been calculated by dividing the turnover from the service by the average amount of subscriptions per year and then adding added tax to this figure.

2.4 The Törnqvist price index

Price indexes are used to depict the change in prices by a certain point in time, in relation to a certain base time. The simplest price index is one which compares average prices for two periods. Indexes do not provide an absolute value for changes in real price levels, but enable the formation of a sufficiently accurate picture of price level development. For the pur-

¹ The index is also known as the Divisia-Törnqvist price index or the Divisia price index.

poses of this survey, the Törnqvist price index was selected, which can be presented as follows:²:

$$P^T(p^1, x^1, p^0, x^0) = \prod_{n=1}^N (p_n^1 / p_n^0)^{(s_n^0 + s_n^1)/2},$$

where p_n^t is the price of the product n , x_n^t is the quantity of product n , and s_n^t is the weight of the product n at a time t , when $t = \{0, 1\}$ and $n = 1, \dots, N$. Weight is generally defined so that $s_n^t = p_n^t x_n^t / p^t x^t$, when $n = 1, \dots, N$, and $\sum_{n=1}^N s_n^t = 1$.

² Balk, Bert M. (2008): Price and Quantity Index Numbers: Models for Measuring Aggregate Change and Difference, Cambridge University Press.

3. GENERAL ECONOMIC DEVELOPMENT AND TELECOMMUNICATIONS SERVICES

In terms of gross domestic product, the long period of economic growth in Finland and practically all over the world came to a halt during the latter part of 2008 due to global recession. The Finnish gross domestic product decreased steeply in early 2009, but became stable towards the end of the year. The decrease in the gross domestic product during the entire year was over five percent.

The development of consumer prices in 2009 in relation to the development of prices in 2008 is used as a baseline in the survey. On average, consumer prices in 2009 remained on the level of 2008. Therefore the change in the nominal price in 2009 is equal to the change in the real price level.

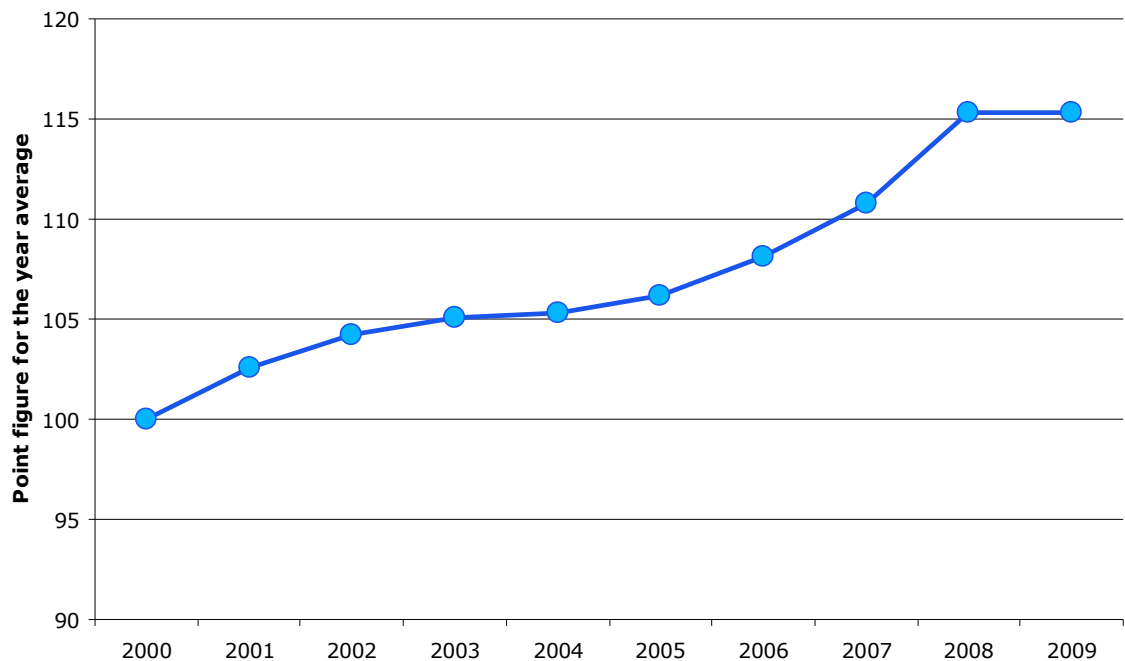


Figure 2: Consumer price index in 2000 - 2009 (year 2000 = 100, Source: Statistics Finland).

The economic growth for telecom operators in 2009 was fairly steady despite the global recession, and the recession barely changed the economic state of Finnish telecom operators. The development and profitability of operators remained relatively stable. New investments were made for instance in optical fibre and mobile networks. The recession led to a tightened price competition which could be seen most clearly in the increase of ported numbers.

According to Numpac Oy, in 2009 the number of ported mobile telephone numbers grew by 32 percent compared to 2008. Similarly, the number of ported telephone numbers in the fixed network grew by as much as 97 percent.

3.1 Turnover from telecommunications networks

This chapter contains turnover data that has been previously included in the Telecommunications Statistics published by Statistics Finland. Turnover from telecommunications networks amounted to a total of EUR 3.8 billion in 2009. The turnover consists of voice and data transmission services. This figure does not include for instance cable television operation or sale of terminal equipment.


Of the turnover from telecommunications networks in 2009, 55 percent came from mobile network and 45 percent from fixed network. Approximately three quarters of the turnover consisted of income from retail services. The rest consisted of income from wholesale services. Retail services consist of telecom services sold to consumer and corporate customers. These services are not used to provide other telecom services. As regards the turnover of retail services, approximately half comes from consumer customers and half from corporate customers. Wholesale services are services that telecom operators sell to each other and that are used to provide other telecom services. If a telecom operator wants to provide a fixed internet access service in the area of a telecommunications network owned by another telecom operator, it has to rent a wholesale product from the telecom operator in the area. In addition to leasing of networks, interconnection fees form another significant wholesale instalment.

| Turnover (billion euros) | | 2009 |
|---|--------------------------------|------------|
| Income from telecommunications networks | | 3,8 |
| Income from fixed telecommunications network | | 1,7 |
| | Income from retail services | 1,4 |
| | Income from wholesale services | 0,3 |
| Income from mobile network | | 2,1 |
| | Income from retail services | 1,5 |
| | Income from wholesale services | 0,6 |

Table 1. The division of revenue from telecommunications networks into wholesale and retail services.

3.2 Telecom operators and telecom service provision

In terms of turnover, the three biggest telecom operators in Finland are TeliaSonera Oyj (TeliaSonera), Elisa Oyj (Elisa) and DNA Oy (DNA). They are also the only operators to offer households mobile and fixed network services with wide geographic coverage, largely over




their own communications networks. In addition to these, 27 independent regional telecom operators in Finland have formed the Finnet Group, each of these companies owning a regional fixed network in their respective operating regions. Companies in the Finnet Group do not have their own mobile network, but, in addition to fixed-line network services, many offer mobile services as a service provider within the mobile operators' networks. Other significant telecommunications operators that have their own fixed network include AinaCom Oy and TDC Oy (TDC), both of which also provide mobile services. Several of the fixed network telecommunications operators provide broadband services also via cable TV network in their traditional communications areas. Another significant provider of broadband subscriptions is Welho, an operator that owns a cable TV network in the Helsinki metropolitan area. As regards wireless networks, the most significant operator is Digita Oy that owns the wireless @450 broadband network which covers the entire country. However, Digita Oy does not provide subscriptions directly to consumers.

TeliaSonera, Elisa and DNA provide broadband services in the fixed network practically in the whole of Finland. These three telecom operators run a geographically extensive backbone network, a necessity when providing nationwide services. In addition, telecom operators in the Finnet Group have access to a geographically extensive backbone network.

Around ten mobile network operators or service operators in Finland provide mobile services to household customers. The largest telecom operators providing mobile services, and running their own mobile network, are DNA, Elisa and TeliaSonera, as well as Elisa's and TeliaSonera's service operators Saunalahti and Tele Finland. These companies account for approximately 98 percent of all mobile phone subscriptions. All telecommunications operators and service operators provide voice, messaging and data transmission services. In addition, nearly all also provide mobile broadband services.

There are over 70 telecommunications operators or service operators operating in Finland that offer households fixed telephone network services or broadband network services. Fixed network services with nationwide coverage are offered by Finland's biggest telecom operators; DNA, Elisa and TeliaSonera, and (primarily within their own regions) operators in the Finnet Group. Through its partners, TDC also provides fixed broadband services in major cities. In addition to mobile network, wireless broadband services are provided over Digita's @450 network, regional Wimax networks and WLAN networks. Broadband connections provided using the @450 network, Wimax and WLAN technologies are classified as fixed broadband services because the connections currently offered using these technologies are, from the user's perspective, tied to a specific location even when based on wireless network



technology. Annex 1 lists telecom operators included in the price level indexes in the survey that offer mobile and/or fixed network services. However, the turnover data presented in chapter 3.1 includes material gathered from a larger group of telecom operators.

4. PRICE LEVEL DEVELOPMENT IN VOICE SERVICES

The real and nominal price level of voice services fell by less than six percent under 2009. During the previous year prices rose slightly and the index value for voice services was 95.0 in 2009. Therefore the nominal price level fell by five percent in comparison with 2007. Correspondingly, the real price level fell by less than nine percent. The price index for voice services includes mobile network voice and messaging services and fixed network voice services offered to household customers. The average prices formulated were the per-minute prices of mobile and fixed network voice services and the per-message prices of SMS and MMS services.

The total number of mobile phone subscriptions grew by 13 percent in 2009 whereas the number of fixed-line telephone subscriptions fell by 14 percent. At the end of the year, there were 7.7 million mobile phone subscriptions and over 1.4 million fixed-line telephone subscriptions in Finland, and of these 6.0 million mobile phone subscriptions and 0.7 million fixed-line telephone subscriptions were used by households. The number of mobile phone subscriptions also includes mobile broadband subscriptions that are not primarily meant for voice services.

In 2009, the number of call minutes in the mobile network grew approximately four percent in comparison with 2008, the total amount of minutes being over 15 billion. Correspondingly, call minutes in the fixed network decreased by as much as one quarter, to over two billion minutes. The decline in the number of minutes in the fixed network has been particularly fast specifically with households. In 2009, households accounted for nearly three quarters of all call minutes in the mobile network. However, in the fixed network households accounted for less than half of all call minutes.

In 2009, the price level of mobile network decreased slightly faster than in 2008. However, the price level of fixed network voice services did not rise as significantly in 2009 as in 2008. These two changes and the increased weight of mobile network services in relation to fixed network voice services led to the decline in the price level of voice services.

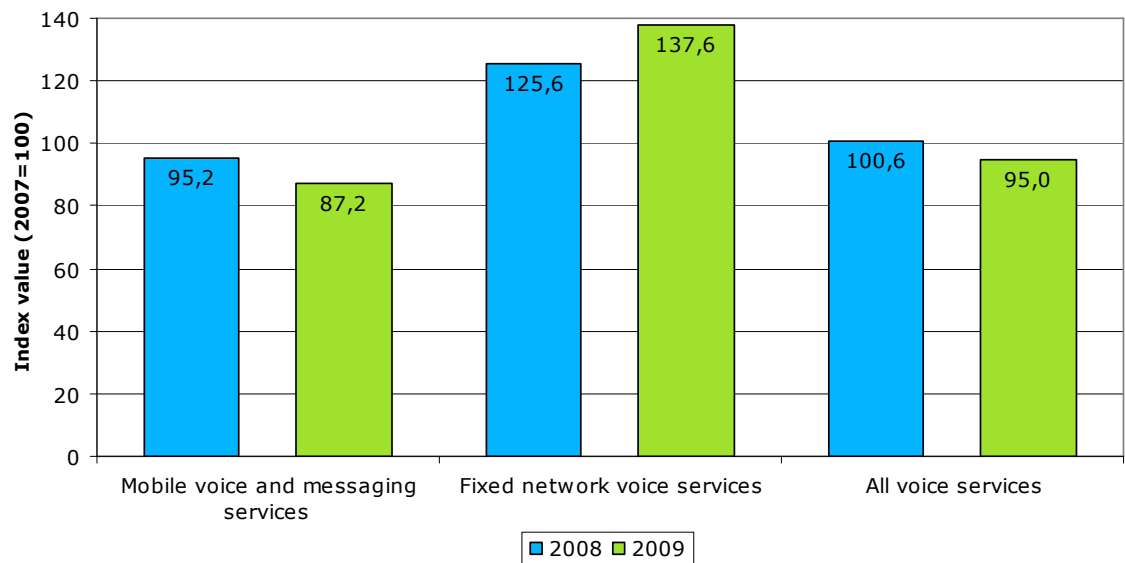


Figure 3: Relative nominal price level development in voice services 2007-2009.

Even though the price index for voice services decreased fairly clearly in the mobile network during 2009, the list prices of calls in the mobile network remained practically unchanged and the competition in the field consisted mainly of different voice and package deals. It is also evident from the change in the price level index that customers have changed from using more expensive subscriptions to more affordable ones even though there are no visible changes in the list prices.

Meanwhile, fixed network voice services continued to lose significance for households, which translated particularly into fewer call minutes per subscription during 2009. The decline in call minutes per subscription raised the price level index in the fixed network because the monthly fee for the subscription remains the same.

Mobile voice and messaging services carry a considerable weight in the total index although their share of the turnover in the survey has decreased slightly compared to previous years. Mobile voice and messaging services represented over 55 percent of the combined turnover of all telecom services in 2009. Fixed network voice services represented approximately 10 percent of the total turnover generated by all services, showing a decrease of ca three percentage units compared to 2008.

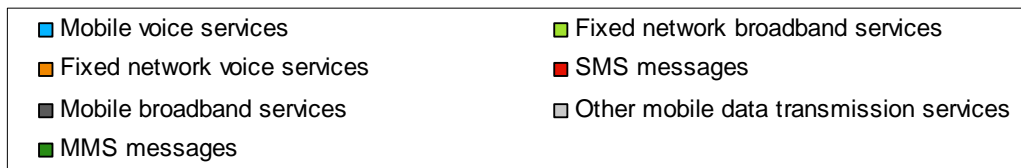
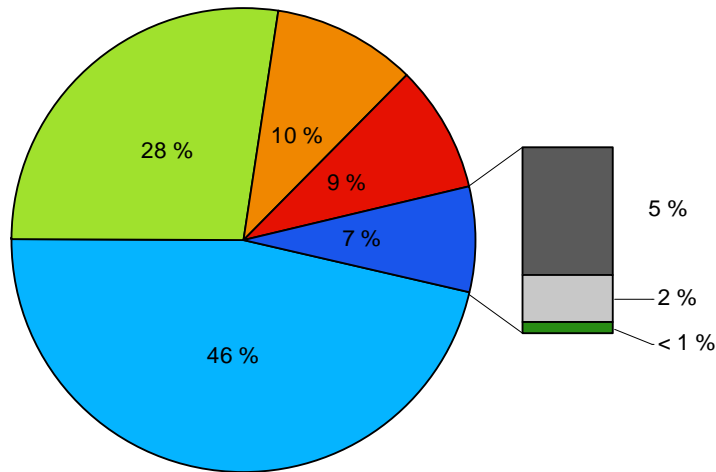


Figure 4: Breakdown of telecom operators' turnover by service provided to households in 2009.

Of the overall voice services provided, mobile voice and messaging services accounted for some 85 percent of the turnover from voice services, and fixed network voice services for about 15 percent in 2009.

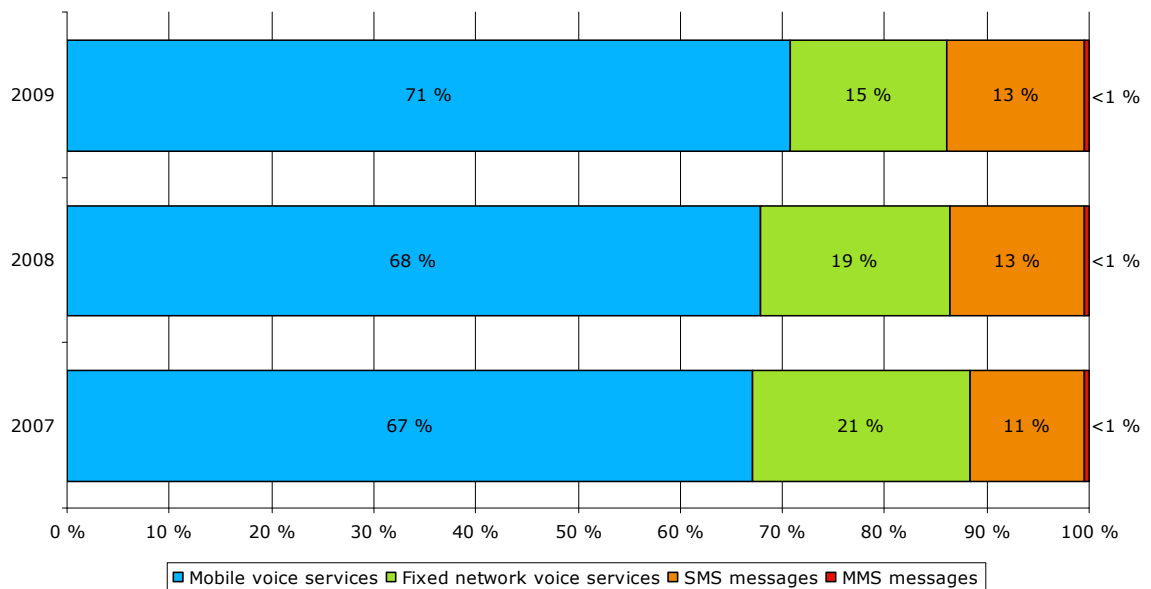


Figure 5: Breakdown of telecom operators' turnover by voice and messaging services provided to households.

4.1 Mobile voice and messaging services

The price level of mobile voice and messaging services fell by over eight percent in 2009. In comparison with 2007, the prices have dropped by less than 13 percent and therefore the price index for mobile voice and messaging services was 87.2. Mobile voice and messaging services consist of voice services, short message services (SMS) and multimedia messaging services (MMS). In 2009 households spent an average of around 15.50 euro per month per subscription on mobile voice and messaging services.

Mobile voice services represented a little less than 47 percent of the combined turnover of all telecom services in 2009, thus decreasing a few percent. Correspondingly, SMS and MMS services accounted for a total of over nine percent of the turnover. It is worth pointing out that mobile messaging services' share of the total telecom services turnover in 2009 was almost as great as the proportion of fixed network voice services. Voice services accounted for approximately 85 percent of the combined turnover generated by mobile voice and messaging services whereas messaging services accounted for approximately 15 percent.

4.2 List prices of mobile voice services Finland

The list prices of mobile voice services have remained considerably stable during the past few years. For instance, the changes in minute prices have been very small. The changes in list prices are mainly visible in the prices of different voice and SMS bundles as well as in the prices of any special offers. Table 2 includes the call prices of the most affordable subscription, on the basis of minute-based pricing, from every operator that provides mobile phone services in Finland (excluding Åland). The call prices of subscriptions between different service providers varied between 5.9 and 7.9 cents/minute. In addition, some of the service providers had separate connection fees for calls.

| Name of subscription | Price cents/min | To be taken into account |
|------------------------|-----------------|--------------------------|
| Academica Peruspaketti | 5,9 | |
| Globetel Tähti | 5,9 | |
| Dicame Liittymä | 5,99 | |
| Cubio Save | 6,5 | |
| Saunalahti Edukas | 6,6 | |
| DNA Mainio | 6,7 | |
| Tele Finland Perus | 6,9 | |
| Aina Liittymä | 7,9 | |
| Partel Aina | 7,9 | |
| Elisa Oiva | 7,9 | Connection fee 4.9 cents |
| Minun Sonera | 7,9 | Connection fee 4.9 cents |

Table 2. Minute prices from list prices for mobile phone subscriptions per operator in April 2010.

Even though the prices of calls have remained stable, they still vary greatly according to each service provider. The differences are most evident with the price of a three-minute-long phone call (Figure 6). The difference between the cheapest and the most expensive operator is as much as over 10 cents. As regards brief calls, connection fees for calls cause the biggest differences between prices.

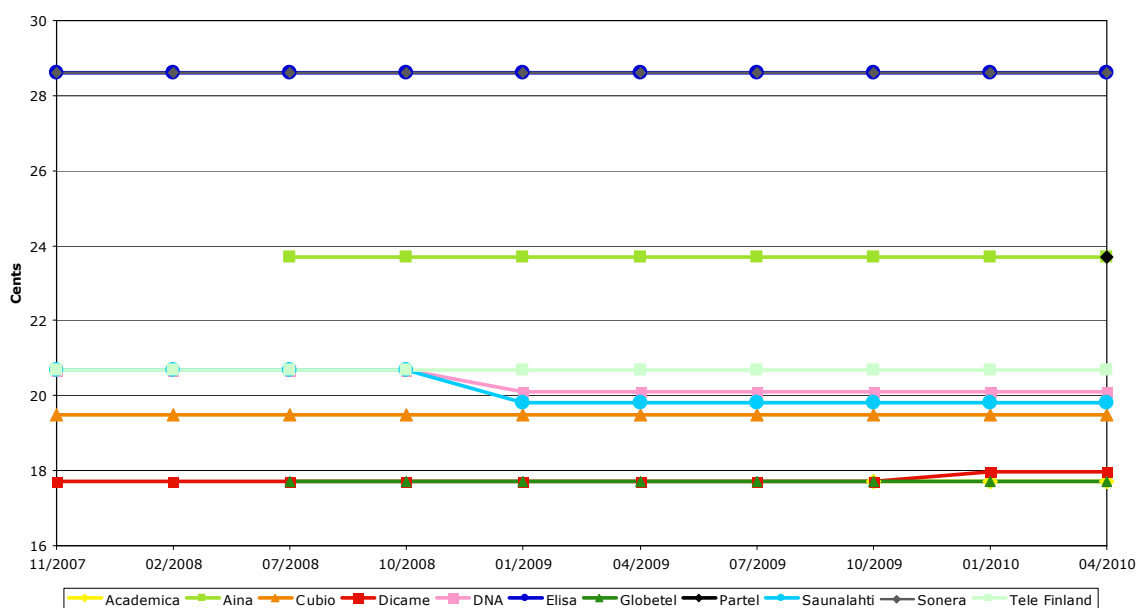


Figure 6. The price of a three-minute-long call per operator.

4.3 European comparison of mobile voice services

According to the information in the fifteenth implementation report published by the European Commission, Finland was among the most affordable countries in the European price comparison of mobile phone services. This chapter includes country-specific, non-weighted averages calculated on the basis of price basket comparisons. The price baskets that were used have been formed according to OECD's definitions from 2006³, and the user profiles behind the price baskets do not necessarily represent the real average use in a particular country. The prices are monthly prices and they include value added tax. According to the revenue data gathered for the survey, the average monthly fee for household customers for the services in question was approximately 15 euros in 2009.

The prices in the price basket comparison by the European Commission have been gathered from the price lists of the two biggest service providers, according to an estimate, from each EU country. Apart from few exceptions, the providers represent over half of the sub-

scriptions in the country in question. As regards Finland, the two service providers are Elisa and TeliaSonera. Of every service provider that has been chosen for the comparison, a subscription solution considered to be the cheapest has been selected for each price basket. In addition to mobile phone call minutes, the price baskets also include SMS and MMS messages. Direction of calls varies slightly according to each price basket, but with all profiles approximately 70 percent of calls are directed to mobile network, 20 percent to fixed network and less than ten percent to answering services. The profiles do not include data transmission.

In addition to subscriptions that are invoiced afterwards on a monthly basis, the comparison also includes subscriptions that are paid in advance (prepaid subscriptions) since these kinds of subscriptions constitute the majority of subscriptions in several countries. Although prepaid subscriptions constituted only ten percent of all mobile phone subscriptions in Finland in 2009, the corresponding share in the whole of EU was over 55 percent. According to the comparison, prepaid subscriptions were the most affordable alternative in Finland if the usage was low. When the use of voice and messaging services is high, subscriptions that are invoiced afterwards are usually the most affordable alternative. In the user profile representing the highest usage, all the least expensive subscriptions were subscriptions that were invoiced afterwards.

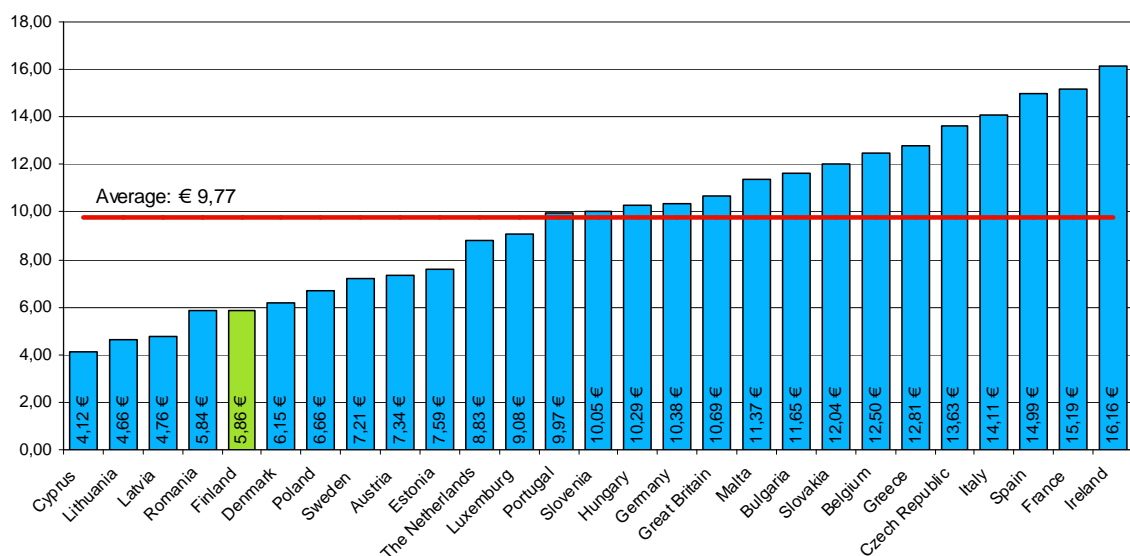


Figure 7. Low-usage basket (Source: European Commission).

Price basket representing low use includes 30 phone calls with the total duration of 44 minutes. Additionally, the profile includes 33 SMS messages and two-thirds of the price of a

³ <http://stats.oecd.org/Index.aspx>

single MMS message. In the comparison, Finland is in the fifth place with a monthly fee of 5.86 euros that is 40 percent more affordable than the EU average.

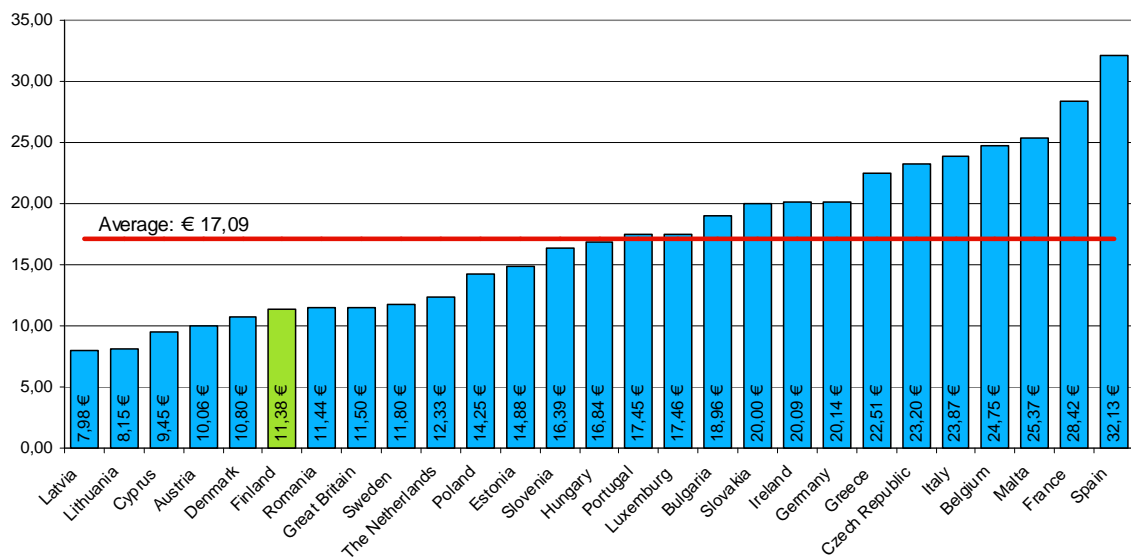


Figure 8. Medium-usage basket (Source: European Commission).

The price basket representing medium use includes 65 phone calls with the total duration of 114 minutes. Additionally, the profile includes 50 SMS messages and two-thirds of the price of a single MMS message. In the comparison, Finland is in the sixth place with a monthly fee of 11.38 euros that is over 30 percent more affordable than the EU average.

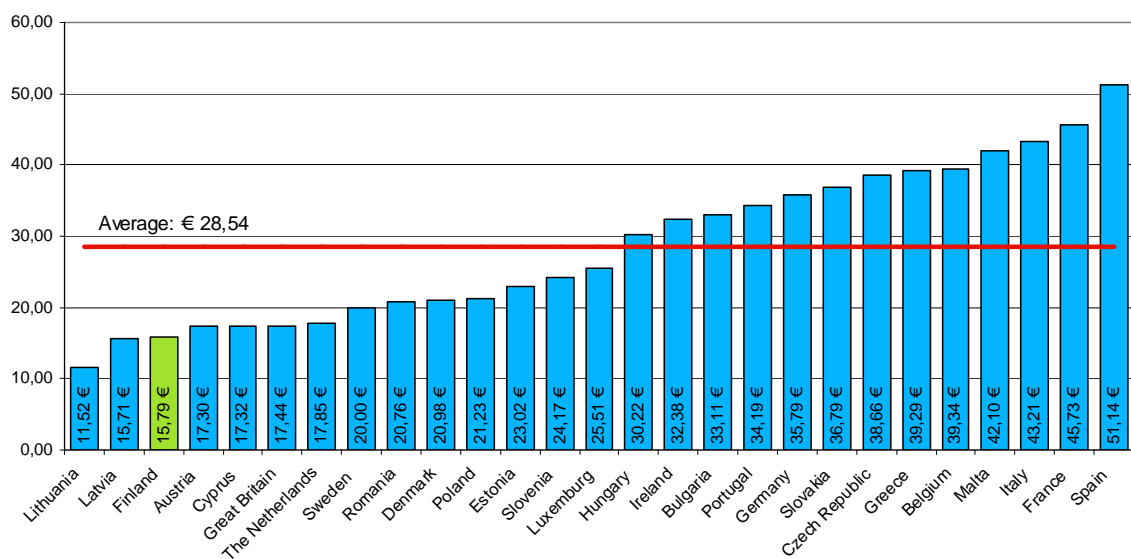



Figure 9. High-usage basket (Source: European Commission).



The price basket representing intensive use includes 140 phone calls with the total duration of 246 minutes. In addition, the profile includes 55 SMS messages and one MMS message. In the comparison, Finland is in the third place with a monthly fee of 15.79 euros that is 45 percent more affordable than the EU average.


To sum up, it can be stated that Lithuania and Latvia have the least expensive nominal prices in the comparison and their price baskets are less expensive than those of Finland's in all categories. However, the purchasing power of consumers is lower in these countries than in Finland and therefore, in relation to purchasing power, the price level in Finland can be considered to be lower. As regards the basket of low use, Cyprus is the least expensive country in Europe and in terms of the other baskets, Cyprus is in the top five countries. Apart from the basket of medium use, in which Denmark is five percent more affordable, Finland is ahead of the other Nordic Countries.

As regards the latter two price baskets, the monthly fee in Finland has decreased compared to 2008. In the first price basket, i.e. the basket representing low use, the monthly fee in Finland has remained approximately the same.

4.4 Fixed network voice services

The price level increase of fixed network voice services showed slower growth remaining at less than 10 percent during 2009 whereas there was an increase of more than 25 percent between 2007 and 2008. The price level index for fixed network voice services in 2009 was 137.6. A key factor contributing to this price increase was the rapid decrease in the use of fixed network voice services that have been replaced mainly by mobile network services. The number of fixed network subscriptions owned by household customers has decreased by less than a third from 2007, while call minutes have fallen to less than half. Meanwhile, the revenue from these services has decreased by a third. The share of fixed network voice services of the total turnover of telecom services decreased from 13 percent in 2008 to ca ten percent in 2009.

Approximately 18 euros per month was spent on each fixed network subscription in 2009. This sum of money has decreased by ca ten percent from 2008. However, when these numbers are examined regionally and from telecom operator to another, there are significant differences in the subscription-specific revenue and in the decrease of call minutes. Fixed network voice services include all fixed network voice service costs such as activation and monthly fees, calls and service calls. The unit price per minute rises, because the monthly



fee for the subscription is divided between fewer minutes than previously. The monthly fee for fixed network voice services was relatively high compared with the monthly fee for mobile voice services.

5. PRICE LEVEL DEVELOPMENT IN DATA TRANSMISSION SERVICES

The price level in data transmission services rose in 2009 by approximately four percent from the price level in 2008. Between 2007 and 2008 the price level had fallen slightly, but as the increase in the price level of fixed network data transmission services accelerated and the decrease in the price level of mobile network services slowed down, the total index for data transmission services began to rise in 2009. The price index for data transmission services was 103.0 as the starting value of 100 for the index is from 2007.

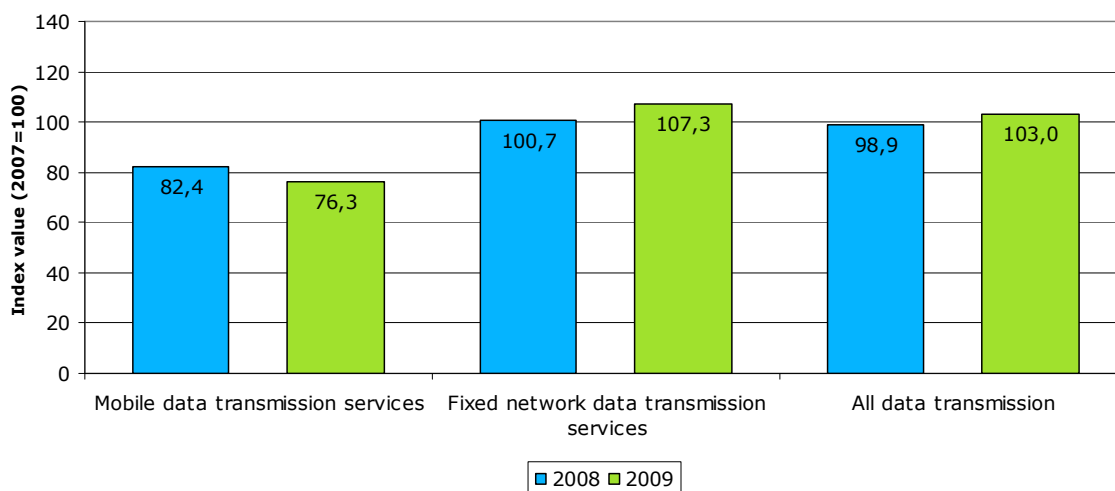


Figure 10. Price level development in data transmission services 2007 - 2009.

The price index of data transmission services calculated for the survey is based on mobile network and fixed network data transmission services offered to household customers. Mobile data transmission services are further divided into mobile broadband services and other mobile data transmission services. The starting values for data transmission service price indexes, or average prices, were calculated by dividing the telecom operators' revenues received from household customers by the number of subscriptions. Income from other mobile data transmission services was divided by the number of data transmission service users. The resulting average prices were the price-per subscription for fixed network data transmission services and mobile broadband services, and a price-per-user for mobile data transmission services. These values were used to calculate the price indexes for data transmission services.

At the end of 2009, the total number of fixed and mobile broadband subscriptions in Finland was almost 2.5 million, which was 18 percent more than in 2008. Households held approximately 1.9 million of these subscriptions. In addition, over 1.5 million mobile phone sub-

scriptions owned by households used mobile data transmission services other than mobile broadband services.

Fixed network services accounted for 80 percent of the total turnover generated by data transmission services and mobile data transmission services for 20 percent whereas in 2007, fixed network services accounted for as much as 93 percent of the total turnover. Fixed network data transmission services' proportion of the total turnover from data transmission services declined by some seven percentage units from 2008. The amount of money households spent on data transmission services grew in 2009 in both fixed and mobile network. In mobile broadband services in particular, the growth in income was rapid since the income more than doubled compared to 2008.

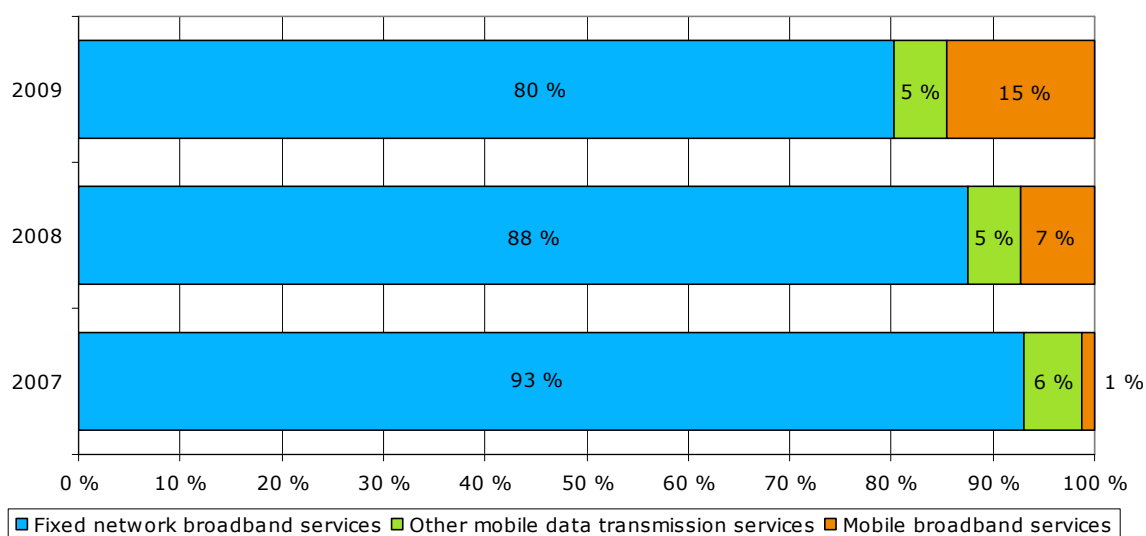



Figure 11. Breakdown of telecom operators' turnover by data transmission services provided to households.

5.1 Mobile data transmission services

The price level in mobile data transmission services decreased in 2009 by over seven percent. The decrease was substantially slower than in 2008 when the decrease was nearly 18 percent. The price index for mobile network data transmission services consists of two data transmission services: mobile broadband services and other mobile data transmission services.

Mobile broadband services cover subscriptions involving a fixed monthly fee, with an unlimited monthly data transmission volume and a minimum theoretical speed of 144 kbit/s. At the end of 2009 there were approximately 908 000 mobile broadband subscriptions in




Finland, whereas a year earlier the number of subscriptions was approximately 480 000. The strong growth in the number of mobile broadband subscriptions has been a significant factor in the market of data transmission services. As the 3G network expanded and 3G terminal devices became more popular, the use of data transmission services via mobile phones increased as well. At the same time, the number of fixed broadband subscriptions fell slightly during 2009.

Turnover from mobile broadband subscriptions used by households constituted for approximately 73 percent of the turnover consisting of data transmission in the mobile network in 2009. In 2008 the corresponding share was slightly under 60 percent and in 2007 less than 20 percent. Extensive mobile broadband service provision to consumers did not begin until in the closing months of 2007. The significance of mobile broadband services expressed in turnover and volume of use grew dramatically during the course of 2008. In 2009, an average of around 14.50 euros per month was spent on mobile broadband services per subscription.

Other mobile data transmission services have been priced differently, for example based on megabytes, minutes or days. Other data transmission services are also offered as service packages, with a monthly fee that includes a certain number of megabytes, minutes or days. If the customer exceeds this specified monthly limit, he or she pays a pre-announced unit price for the service. Due to inconsistent pricing methods, it is impossible to define a unit of measurement to which service prices could be proportioned. Therefore, the unit of measurement selected for the survey was a household customer using the service. This enables the calculation of the average spend per user on other data transmission services. However, price proportioned to the number of users is highly susceptible to changes in consumer behaviour since part of the other data transmission services are priced according to the used data transmission volume.

5.2 Fixed network data transmission services

In 2009, the prices of fixed network data transmission services grew by slightly less than seven percent compared to 2008, whereas the increase was less than one percent the year before. At the end of 2009 there were approximately 1.6 million fixed network broadband connections in Finland⁴, of which approximately 1.2 million was in domestic use. The number of subscriptions in domestic use has fallen approximately two percent in comparison with the situation at the end of 2008.



Fixed network data transmission services only include broadband services offered to household customers. In the calculation of indexes, account has been taken of the monthly fees, installation and connection charges and other subscription maintenance related fees paid by households. However, when calculating the index no account has been taken of information security services such as antivirus software unless these have been automatically included in the monthly subscription fee.

The price index does not directly indicate the manner in which the prices of broadband subscriptions with different speed classes developed, but it represents the average development of monthly fees paid for a broadband subscription. For instance, it is possible that in 2009 subscriptions with a speed of 2 Mbit/s were sold at the same price as those with a speed of 1 Mbit/s in 2008. In 2009, the share of subscriptions under 2 Mbit/s of all subscriptions has remained the same, that is, at approximately 40 percent. On the other hand, the share of subscriptions with a speed of at least 10 Mbit/s has risen to 16 percent, while a year earlier the share was approximately 10 percent. More information on the prices of broadband connections of various speeds is provided in the following chapter 5.3.

In 2009, the average amount of money spent on a fixed network broadband connection was approximately 33.50 euros per month. This sum is very close to the average price of a 2 Mbit/s connection calculated from the list prices. When comparing these prices, it should be borne in mind that the material used for the calculation of the index has a greater geographical coverage than the material calculated from price lists, taking also account of any activation fees and possible discounts.

5.3 Broadband service list price monitoring

FICORA monitors the price level of broadband services also by collecting list prices from service providers' public price lists. The information is gathered from different operators according to provinces and speed class. Since the speed categories available depend on the region, operator and the technology used, price specification is based on the minimum speed required. For the minimum speed definition, the speed required in each category is twice that of the previous category. In other words, the table indicates how much the price would change if the consumer wanted a connection that was twice as fast. The speed categories are as follows:

⁴ This figure includes wireless solutions in a fixed location.


- 1) at least 256 Kbit/s (only mobile broadband connections)
- 2) at least 512 Kbit/s (only mobile broadband connections)
- 3) at least 1 Mbit/s
- 4) at least 2 Mbit/s
- 5) at least 4 Mbit/s
- 6) at least 8 Mbit/s (only fixed network connections)
- 7) at least 16 Mbit/s (only fixed network connections)

Price development monitoring involves DNA, Elisa, TeliaSonera and local telecom operators. The most inexpensive broadband connection meeting the minimum speed requirement in each category was selected for each region. The offered speed may also exceed the specified limit significantly if the telecom operator in the region does not sell the minimum speed of the speed class. The average price in each region was calculated by weighting the price offered by the incumbent (traditional telecom operator) in that region, using twice the weighting of the two other telecom operators selected for the region. This market share estimate (50 % - 25 % - 25 %) is not based on the actual number of subscriptions in individual regions, but does provide a more accurate picture of the situation at national level than a non-weighted average.

| Fixed network broadband connection | | | | | | | |
|------------------------------------|------|------|---------|---------|---------|---------|---------|
| City | 256K | 512K | 1M | 2M | 4M | 8M | 16M |
| Helsinki | | | 22,90 € | 28,40 € | 28,40 € | 30,90 € | 38,65 € |
| Porvoo | | | 28,90 € | 40,90 € | 47,98 € | 47,98 € | 49,98 € |
| Turku | | | 26,18 € | 33,95 € | 38,93 € | 38,93 € | 49,23 € |
| Pori | | | 29,65 € | 35,40 € | 38,65 € | 38,65 € | 44,65 € |
| Hämeenlinna | | | 22,30 € | 32,90 € | 39,40 € | 39,40 € | 49,68 € |
| Tampere | | | 22,15 € | 29,65 € | 32,90 € | 32,90 € | 39,65 € |
| Lahti | | | 26,40 € | 33,15 € | 37,15 € | 37,15 € | 44,15 € |
| Kotka | | | 24,65 € | 34,15 € | 34,68 € | 34,68 € | 43,65 € |
| Lappeenranta | | | 29,90 € | 39,90 € | 46,98 € | 46,98 € | 49,98 € |
| Mikkeli | | | 25,40 € | 30,53 € | 38,68 € | 38,68 € | 47,48 € |
| Kuopio | | | 32,20 € | 38,40 € | 46,43 € | 46,43 € | 49,43 € |
| Joensuu | | | 23,40 € | 26,40 € | 33,65 € | 33,65 € | 39,93 € |
| Jyväskylä | | | 22,15 € | 29,40 € | 29,40 € | 32,90 € | 39,15 € |
| Seinäjoki | | | 34,65 € | 39,90 € | 44,00 € | 45,00 € | 49,98 € |
| Vaasa | | | 25,40 € | 36,15 € | 37,43 € | 37,43 € | 46,15 € |
| Kokkola | | | 34,15 € | 40,90 € | 45,93 € | 45,93 € | 51,43 € |
| Oulu | | | 27,95 € | 37,95 € | 41,70 € | 41,70 € | 48,20 € |
| Kajaani | | | 33,20 € | 36,45 € | 41,98 € | 41,98 € | 45,48 € |
| Rovaniemi | | | 30,93 € | 42,98 € | 45,25 € | 45,25 € | 49,68 € |
| Maarianhamina | | | 25,65 € | 35,65 € | 35,65 € | 35,65 € | 40,68 € |
| Weighted average | | | 25,71 € | 32,88 € | 35,96 € | 36,88 € | 43,78 € |

| Mobile broadband connection | | | | | | | |
|-----------------------------|---------|---------|---------|---------|---------|--------------------|-----|
| Region | 256K | 512K | 1M | 2M | 4M | 8M | 16M |
| Finland | 11,53 € | 14,87 € | 19,83 € | 31,50 € | 35,00 € | Data not collected | |

Table 3: List prices of broadband subscriptions by province and by speed category in April 2010.



The list prices of fixed network broadband connections show that the price gap between provincial centres is widest for the slowest connections. Weighted for population levels, the average price of a 1 Mbit/s or higher fixed broadband connection obtained from provincial centres was around 26 euros. The average monthly cost of a 2 Mbit/s connection was approximately 33 euros. Although the average price did not increase significantly in the next two categories, in the speed category 16 Mbit/s the average price was almost 44 euros per month. During the past year, the prices of the slowest speed classes have remained practically unchanged, but the average prices of the fastest connections have decreased slightly.

Meanwhile, the monthly cost of a 1 Mbit/s mobile broadband connection was just under 20 euros. Taking the maximum data transmission speed alone, mobile broadband connections in the speed categories 1 Mbit/s, 2 Mbit/s and 4 Mbit/s were somewhat less expensive than the corresponding fixed network broadband connections.

6. PRICE DEVELOPMENT IN TELECOMMUNICATIONS SERVICES

Households spent approximately 1.4 billion euros on telecom services included in the survey in 2009, which is equal to 2008 when the survey contained two more telecom operators with regard to fixed network data transmission services. The number of operators declined from 18 operators since the set number of subscriptions in domestic use (95 %) was attained already with the 16 biggest operators. The survey does not include the smallest telecom operators, entailing the exclusion of less than five per cent of household customers from the survey.

| Service | Proportion (%) | | |
|---|----------------|------|------|
| | 2007 | 2008 | 2009 |
| Mobile voice services | 49 | 48 | 46 |
| Fixed network broadband services | 25 | 26 | 28 |
| Fixed network voice services | 16 | 13 | 10 |
| SMS messages | 8 | 9 | 9 |
| Mobile broadband services | < 1 | 2 | 5 |
| Other mobile data transmission services | 2 | 2 | 2 |
| MMS messages | < 1 | < 1 | < 1 |

Table 4: Proportion of total turnover of the telecom services included in the survey.

Mobile calls accounted for slightly less than half of the money households spent on telecom services. The share of voice services of the turnover decreased at the expense of data transmission services. The share of mobile broadband services of the turnover increased the most.

Mobile network services accounted for 62 percent of the money households spent on telecom services, while the share of fixed network services was 38 percent.

6.1 Telecommunications service price level development between 2007 and 2008

The price level of telecommunications services fell by about three per cent in 2009, whereas between 2007 and 2008 the price level remained almost unchanged. In 2009, the total index value for telecommunications services was 97.5 and therefore there was a decrease of 2.5 percent compared to the 2007 price level.

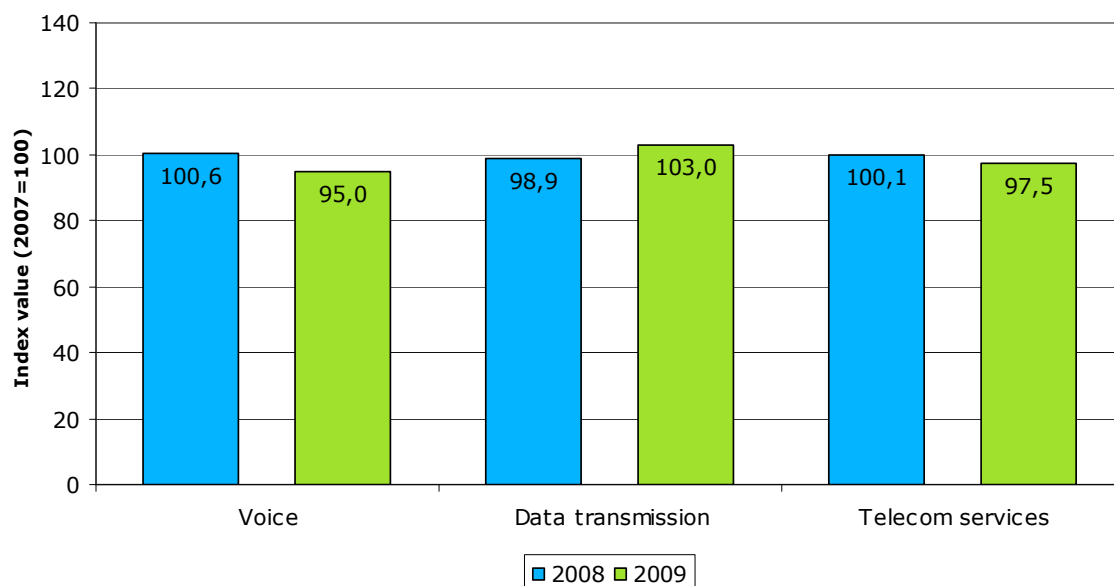


Figure 12. Key components of the telecom service price level indexes.

Among key components of the total index, the changes in the price indexes for voice and data transmission services were stronger in 2009 than in 2008, and they developed towards a different direction. The nominal price level of voice services is now five percent lower than in 2007, and conversely, the nominal price level of data transmission services is three percent higher. Unlike the indexes of the main components, all four subindexes developed in a similar manner in 2008 and 2009, even though the quantity of the change varied. The different development between the fixed and mobile network had a stronger influence on the change than the division into voice and data transmission services. During 2009, the price level of both fixed network voice services and data transmission services rose whereas the price level of both services in the mobile network dropped. Data transmission in the mobile network and, on the other hand, voice services in the fixed network represented the two extremes. The price level of the former dropped significantly as mobile broadband connections have grown in popularity whereas the price level of voice services in the fixed network rose as the use of the fixed network has declined.

| Nominal price indexes (2007=100) | | Point figure 2008 | Point figure 2009 |
|-----------------------------------|--|-------------------|-------------------|
| Telecom services | | 100,1 | 97,5 |
| Voice services | | 100,6 | 95,0 |
| | Fixed network voice services | 125,6 | 137,6 |
| | Mobile voice and messaging services | 95,2 | 87,2 |
| Data transmission services | | 98,9 | 103,0 |
| | Fixed network data transmission services | 100,7 | 107,3 |
| | Mobile data transmission services | 82,4 | 76,3 |

Table 5: The nominal price indexes for telecommunications services by type of service 2007 - 2009.

| Real price indexes (2007=100) | Point figure 2008 | Point figure 2009 |
|--|--------------------------|--------------------------|
| Telecommunications services | 95,2 | 93,7 |
| Voice services | 96,7 | 91,3 |
| Fixed network voice services | 120,7 | 132,3 |
| Mobile voice and messaging services | 91,5 | 83,8 |
| Data transmission services | 95,0 | 98,8 |
| Fixed network data transmission services | 96,8 | 103,1 |
| Mobile data transmission services | 79,2 | 73,3 |

Table 6: The real price indexes for telecommunications services by type of service 2007 - 2009.

When comparing the price level development to the development of other consumer prices, the price level of telecommunications services has decreased by 6.3 percent in comparison with 2007. Compared to 2008, the change in the nominal prices is similar to the change in the real prices, since in 2009 the consumer price index remained at the level of 2008.

6.2 Comparison of results with those of previous years

Telecommunications service price indexes enable a comparison of the development of voice service prices against the previous index on voice services published by the Ministry of Transport and Communications (MINTC). Similarly, the development of the price level of mobile voice and messaging services can be compared to the previous index published by MINTC.

In principle, the prices of telecommunications services have been affected by the prices of mobile services and fallen from early 2000 to 2006. However, the prices of fixed network voice services are an exception as they have been rising since the year 2000. In 2007, there was an increase mainly in the prices of mobile services and voice services in the fixed network. The prices of telecommunications services in 2008 remained almost at the same level as in 2007, but in 2009 the trend from the early 2000's reappeared: the prices of telecommunications services declined as the prices of mobile services fell.

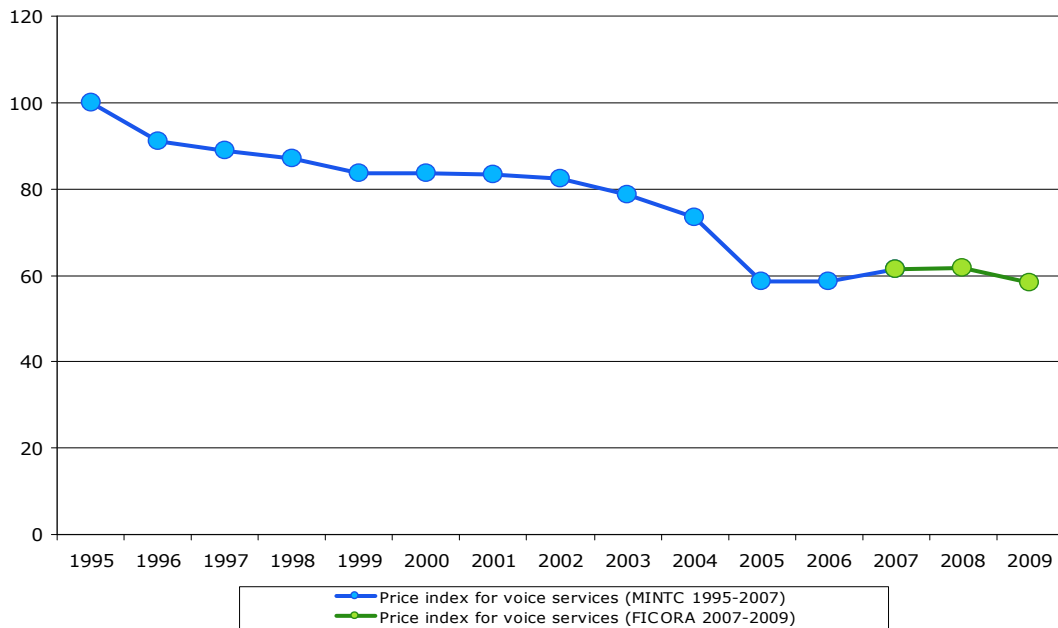


Figure 13: Voice service price index compared to the previous index published by MINTC.

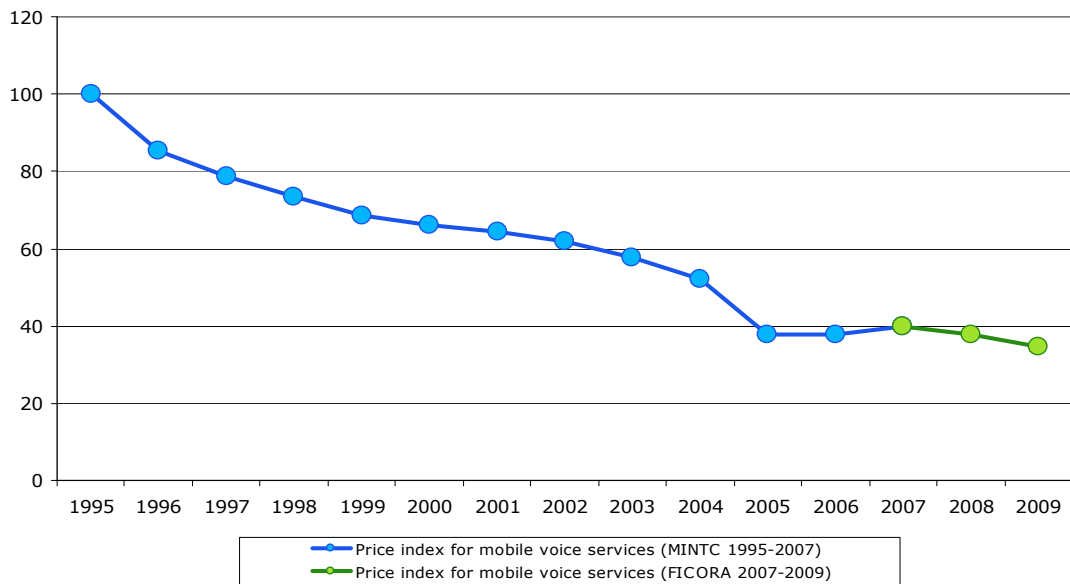


Figure 14: Mobile service price index compared to the previous index published by MINTC.

By and large, it is fair to say that the indexes for voice services in 2008 follow the trend of the last few years and there have been no dramatic changes compared with the previous nominal price indexes for fixed and mobile voice services published by the Ministry of Transport and Communications. As regards the index for voice services, the price level is decreasing after the increase between 2006 and 2008. The index for mobile voice and messaging services started to decline already in 2008.

| Telecom operators included in the survey by type of service | | |
|---|--------------------------------|--------------------------------|
| Mobile services | Fixed network services | |
| | Broadband services | Voice services |
| DNA Oy | Aina Group Oyj | Aina Group Oyj |
| Elisa Corporation | Anvia Oyj | Anvia Oyj |
| TeliaSonera Finland Oyj | Blue Lake Communications Oy | Blue Lake Communications Oy |
| | DNA Oy | DNA Oy |
| | Elisa Oyj | Elisa Oyj |
| | Kainuun Puhelinosuuskunta | Etelä-Satakunnan Puhelin Oy |
| | Kokkolan Puhelin Oy | Forssan Seudun Puhelin Oy |
| | Kymen Puhelin Oy | Ikaalisten-Parkanon Puhelin Oy |
| | Mikkelin Puhelin Oy | Kainuun Puhelinosuuskunta |
| | Pietarsaaren Seudun Puhelin Oy | Kokkolan Puhelin Oy |
| | Pohjanmaan Puhelin Oy | Kymen Puhelin Oy |
| | Salon Seudun Puhelin Oy | Loviisan Puhelin Oy |
| | Tampereen Puhelin Oy | Mariehamns Telefon Ab |
| | Telekarelia Oy | Mikkelin Puhelin Oy |
| | TeliaSonera Finland Oyj | Pietarsaaren Seudun Puhelin Oy |
| | Welho (SW Television Oy) | Pohjanmaan Puhelin Oy |
| | | Pohjois-Hämeen Puhelin Oy |
| | | Salon Seudun Puhelin Oy |
| | | Telekarelia Oy |
| | | TeliaSonera Finland Oyj |
| | | Vakka-Suomen Puhelin Oy |
| | | Ålands Telefonandelslag Ab |

Table: The telecom operators included in the survey by type of service.



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