

Treatment of telecommunication services in the Austrian CPI

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1. Introduction

Motivated by the revision and the re-weighting of the basket of goods and services in the year 2005 various sub-indices of the Austrian CPI were evaluated and new methods were implemented in those sub-indices where the new method improved the respective sub-index. The basic principles for the sub-index of telecommunication services are laid down in a commission regulation ((EG) No. 2646/98¹) which deals with minimum standards for the treatment of tariff prices in the HICP. Furthermore a document from Eurostat (2000) with an example and recommendations for new providers in the electricity market were taken into account.

The preparation of new consumer patterns for the sub index telecommunication was done with the help of data by the Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR-GmbH). This change of the consumption pattern was build into the consumer price index without impact on the inflation rate. At the same time the selection of providers and tariffs was examined and updated. This update of providers and tariffs is reflected in the inflation rate of the year 2005 and leads to a price decrease of the telecommunication sub index.

Henceforth the tariffs as well as their proportions will be verified in regular intervals and developments will be incorporated consequently. This approach is possible as detailed data about the telecommunication market are collected within the scope of the Austrian telecommunication-sampling-regulation and is supported by own surveys.

¹ Commission Regulation (EC) No. 2646/98 of 9 December 1998 laying down detailed rules for the implementation of Council Regulation (EC) No. 2494/95 as regards minimum standards for the treatment of tariffs in the HICP.

2. Minimum standards for the treatment of tariffs

In the regulation (EG) No. 2646/98 the notion of tariffs and tariff prices are introduced and the methods for the computation of sub-indices which include tariff prices are defined. A tariff is a list of pre-determined prices which are not able to be negotiated by an individual household. The prices are differentiated by characteristics of the customer and by the volume, the structure and the time point of consumption. Tariffs in the field of telecommunication typically consist of tariff prices per minute for e.g. regional calls (same prefix), domestic calls or calls to mobile phones within a certain time window (leisure time, business time).

In article 5 of (EC) No. 2646/98 methods for the computation of sub-indices are explained. These shall reflect price movements irrespective of changes of the consumption behaviour. If a certain tariff price changes, then the tariff prices shall be compared directly. E.g. when the tariff for a regional call changes from 0,51 € to 0,45 € then an index for regional calls should decrease about 12%. Does the specification of a tariff element change, e.g. are new time zones introduced, and then additional information about the consumption behaviour has to be gathered. Table 1 shows a fictitious example of such a change. The calls in the night decrease by 12%, the tariff for the remaining time frame stays constant. Three versions for different distributions of the calling minutes are compared. Version 1 assumes that 70% of the calls (calling minutes) are between 8 and 20 o'clock. As the price of the majority of calls is unchanged only a change of -4% is shown. The assumption that the calls are equally distributed, version 2, yields to a decrease of 6%. In version 3 it is assumed that most of the calls are made in the evening or night. Here the highest price decrease, -10%, is shown.

Computation of price changes during the introduction of new time windows							
Before		After		Change in %	Distribution of calls in %		
time frame	EUR	time frame	EUR		Version 1	Version 2	Version 3
0-24	0,51	8-20	0,51	0	70	50	20
		20-8	0,45	-12	30	50	80
Weighted average					-4	-6	-10

Other specification changes deal with changes of the definition of the geographic distance of a call. Examples of this kind are reorganisation from a kilometre border to the same prefix or vice versa. The approach for this kind of problems is the same as described above. In all cases additional assumptions about the distribution of calls have to be made.

When a new tariff or a new element, which can be seen as a newly significant good, is added, it has to be treated as foreseen in EG Nr. 1749/96² Article 4. An example for a newly significant good is MMS (Multimedia Messaging Service) which enables to send coloured pictures or voicemails with the mobile phone. This has to be taken into account without affecting the resulting index. The inclusion of MMS in the price survey shall not change the resulting inflation rate. If on the other hand MMS are only seen as successor of SMS (Short Message Service) with only better quality then it has to be included with the help of quality adjustment and the resulting index is affected by the inclusion. For Austria the first option was used.

3. Consumer Profiles

The usage of single tariff elements (e.g. Regional calls, domestic calls ...) as weighted items in the basket of goods is not able to deal with different problems which appear in the field of telecommunication. One method, which is rated as appropriate, is the usage of consumer profiles. A consumer profile consists of a description of an average consumer. Such an approach was taken by the Austrian chamber of workers (AK, 2005). There three types are defined to compare the prices of tariffs between different providers at the same point in time: first user, family and teenager. As there was no additional information of the distribution of calls over the day an equal distribution between business and leisure time was assumed. (Table 2)

From this average consumption behaviour the average cost per tariff and provider are computed. The aim of this is to compare the different tariffs of the different providers and give an advice which provider is the cheapest for a certain situation. The same approach is used by some countries to compare the price development over time within the CPIs. The most common additional assumption is that the consumer is selecting its tariff in a very rational way. Always the tariff with the cheapest costs for a certain profile is taken into account. This implies that the index is reacting without delay when new cheaper tariffs are introduced but is only reacting slowly when prices are rising. At least for Austria the assumption of the rational consumer seems not feasible: On the one hand consumer don't have the possibility to change the tariff or the provider as they are locked for a certain time span in their contracts, on the other hand different studies have shown that the Austrian consumers don't change their once selected provider after the commitment period. A study of the RTR-GmbH (2003) shows that only 3,4% of the Austrian consumers are willing to change their providers

² Commission Regulation (EC) No. 1749/96 of 9 September 1996 on initial implementing measures for Council Regulation (EC) No. 2494/95 concerning harmonized indices of consumer prices.

although they know, that cheaper offers are on the market. One recently changed aspect of the willingness to change is the possibility to take the same number to the next provider.

Example of a consumer profile: calling minutes in percentages and computed for 60 minutes						
Table 2						
Tariff elements	First user – computation for 30, 60 and 90 minutes		Family – computation for 30, 60 und 180 minutes.		Teenager – computation for 30, 60 und 180 minutes	
	Consumer profile – calling minutes					
	overall in %	60 Min.	overall in %	60 Min.	overall in %	60. Min
Business time						
Fixed network	35,0	21,0	12,5	7,5	10,0	6,0
Own network	10,0	6,0	15,0	9,0	22,5	13,5
Own network/ specific number	5,0	3,0	12,5	7,5	8,0	4,8
Own network/ other number			10,0	6,0	10,0	6,0
Leisure time						
Fixed network	35,0	21,0	12,5	7,5	10,0	6,0
Own network	10,0	6,0	15,0	9,0	22,5	13,5
Own network/ specific number	5,0	3,0	12,5	7,5	8,0	4,8
Own network/ other number			10,0	6,0	10,0	6,0
Mailbox (number)			10		30	
SMS (number)			10		50	

Q: Arbeiterkammer 2005

4. The Austrian Approach and the Basket of Goods and Services

Table 3 shows the basket of goods and services for the COICOP-group 08.3 telecommunication services with the weight of the CPI 2000 and 2005 and the HICP chain index weight for 2006. This sub index contains the fixed network and the mobile network as well as internet and online fees and the public phones. Prices for public phones are not collected any more as the volume was very low and the price collection was a very difficult task.

In this paper only the mobile and fixed network is taken into account. Therefore the four items 584 and 940 fixed network basic and calling fee and 949 and 950 mobile network basic and calling fee are in the scope of this paper.

During the year 2005 three areas were evaluated:

- The compilation of a new consumption pattern.
- The selection of providers and tariffs.
- The computation of the sub index.

CPI and HICP basket of telecommunication services¹⁾

Table 3

Code	Basket item	Weight in % ²⁾ in CPI				Weight in % ³⁾ in HICP	
		2000 = 100	Share within sub index	2005 = 100	Share within sub index	2005	2006
Fixed network							
584	Fixed network/ calling fee	0,8728	32	0,2743	12	0,4474	0,2715
940	Fixed network/ basic fee	0,6202	23	0,4942	21	0,3938	0,4892
968	Fixed network/ online fee	0,0984	4	0,0667	3	0,1016	0,0660
967	Internet fee	0,1983	7	0,1717	7	0,3103	0,1699
Mobile network							
949	Mobile network /basic fee	0,2626	10	0,6615	28	0,2691	0,6548
950	Mobile network/ calling fee	0,6117	23	0,7166	30	0,8074	0,7094
948	Public phone	0,0492	2			0,0550	
CC 08.3	Telecommunication services	2,7132		2,3848		2,3847	2,3609

1) Sub index 08.3 of COICOP= Classification of individual consumption on purpose. - 2) Weights from the CPI 2000 = 100 based on the household budget survey (HBS) 1999/ 2000 and 2005 = 100 based on the HBS 2004/05. - 3) The Harmonised Index of Consumer Prices (HICP) is a chain index with an annual weight update, therefore an own weighting scheme is existing for each year. The weights for 2005 are based on the HBS 99/00 with price updates since then and for 2006 on the HBS 04/05.

5. The Compilation of a new consumption pattern

The Austrian “telecommunication-sampling” regulation³ enables the RTR-GmbH to collect detailed data about the tele communication market. Statistics Austria is allowed to use the detailed data for its own purposes. Such kind of data transfer is called official help between authority bodies. They include detailed information at a very disaggregated level. The minutes, volumes and number of customers are classified by business and private consumers, mobile, fixed network and internet, providers and different tariff elements. These data are of course to be kept secret as the Austrian Market is very competitive. For the computation of the CPI and the HICP a detailed breakdown of the volume and the minutes by tariff elements is an important precondition to compile a new consumption pattern for the telecommunication sub index.

For the fixed network the following assumptions have been made:

³ Regulation of the ministry of traffic, innovation and technology about a mandate for statistical surveys in the area of communication. Federal Law Gazette II No. 365/2004. Verordnung des Bundesministeriums für Verkehr, Innovation und Technologie, mit der statistische Erhebungen für den Bereich Kommunikation angeordnet werden. BGBl. II Nr. 365/2004.

- The distribution of minutes between business and leisure time is 50:50.
- The distribution of minutes between the providers of the mobile network is done by the market shares of the providers.
- The selection of countries for foreign calls was done with the help of Berrer et al. (2003) and with the help of the information of providers.

A comparison between the old and the new consumption pattern shows, that the consumption behaviour of the Austrians has changed substantially since 2000. The calls within the local zone decreased while the calls in the domestic zone increased.

For the mobile network a distinction between business and private consumers couldn't be made. Therefore the following assumptions have been made:

- The distribution of the calling minutes between business and leisure time is 50:50, as it was done for the fixed network.
- Most of the customers with prepaid cards were accounted as private customers.
- For the customers with contracts it was assumed that private households have less calls in foreign countries than business customers, therefore the respective value was decreased.

A comparison couldn't be made as different consumption patterns were assigned to different tariff packages.

This part of the computation will be held constant for a certain time span. In Table 4a a fictitious example for the computation matrix is shown. In the column consumption pattern (fixed) a simple weighting matrix for two elements is shown.

Computation Matrix*) - Part 1					
		Table 4a			
Tariff element	consumption-pattern (fixed)	Provider A		ProviderB	
		Tariff A1	Tariff A2	Tariff B1	Tariff B2
		in EUR			
Regional call	70%	0,30	0,20	0,40	0,30
Domestic call	30%	0,50	0,40	0,40	0,30
Average price in EUR		0,36	0,26	0,40	0,30

*) Simplified fictitious example of the computation matrix.

6. Selection of providers and tariffs

The selection of providers was done with the data from the RTR-GmbH. To obtain coverage of 90%, in both networks new providers had to be taken into account. After that the selected providers were asked to rate which tariff packages were relevant for the private households. Most of them reported either the volumes or the percentages for the respective packages. The one with the highest volumes were taken into account for the price survey. The update of the selection of tariffs and the respective relative values will be done at least every six months.

Table 4a shows tariffs and tariff prices for two providers. For each selected tariff element the respective tariff prices are surveyed and entered in the computation matrix. For the fixed network 390 tariff prices are surveyed each month. These come from 15 different tariff packages, which are used for the basic fee as well as for the calling fee to reflect interactions in between. For the mobile network 649 tariff prices for 31 different tariff packages are collected. 20 tariffs and 440 tariff prices are from tariff packages with contract and 11 tariff packages or 209 tariff prices are from the pre-paid sector.

7. Computation of the indices

After the monthly survey of the tariff prices a weighted average of the calling fees per tariff is computed. In Table 4a the average prices can be found in the last line (average price in EUR). The weighted average of the tariff prices with the consumption pattern as weight is computed. The results are average tariff prices per minute.

In the next step these average prices are weighted within the providers. The average price per tariff is multiplied by the relative share of the tariff package within the providers. The result of this computation can be found in table 4b in the last but one column "average prices per provider in EUR". The last step is to compute a weighted sum for all providers, where the market shares of the providers are the weights. All elements in table 4b are variable that is to say that a change of one kind of share yields in a change of the inflation rate. To keep this data up to date information of the providers and data from RTR-GmbH are taken into account on a regularly basis.

Computation Matrix*) - Part 2				
				Table 4b
provider/tariff	Average price per tariff in EUR	share within the provider in %	Average-price per provider in EUR	Share of providers in %
Provider A			0,29	0,25
Tariff A1	0,36	70%		
Tariff A2	0,26	30%		
Provider B			0,34	0,75
Tariff B1	0,40	40%		
Tariff B2	0,30	60%		
Final result			0,33	
*) Simplified fictitious example of the computation matrix.				

Recapitulating it can be said that Index changes reflect:

- Changes of prices for tariff elements within an existing tariff.
- Update (changes) of the relative shares of tariffs within a provider; that are the changes of customers within existing tariffs - introduction of new tariffs and the fade out of old tariffs.
- The update of relative shares between providers, that are the changes of customer between providers.

The percentage shares of providers are taken from the RTR data which are selected quarterly.

8. Some special issues

In the mobile network two segments can be observed: customers with contracts and customers with prepaid cards. Customers with contracts pay a monthly fixed basic fee and a variable share according to their calling behaviour. Customers with prepaid cards don't have to pay a monthly basic fee, but have higher tariff prices that are connected with the variable costs. In that sense no special problems are connected with the calling fees. For the basic fee customers with prepaid cards are reflected according to their relative share, e.g. is the basic fee 20.- € and the share of contracts 70% than the average price for the computation of the inflation rate is 14.- €, the weighted average price. This implies that changes of the shares of contracts and pre-paid customers also yield to a change in the inflation rate. For

example, is the share of pre-paid customers changing to 50%, than the weighted average is 10.- € and the rate of change is -29%.

In both networks special rebates can be observed (bonus packages, tariff options ...). Special offers are connected with the call to certain destinations (best friend, family ...) or they are for free at all (100 minutes for free in all networks ...). The costs of these kinds of packages are independent of the actual usage. If only 50 minutes are called within a certain month, the full option price has to be paid anyhow. In the Austrian CPI and HICP such options are taken into account in such a way that the calling fee decreases but the basic fee increases when free minutes are introduced.

9. Conclusions

The described method for the computation of a sub index for telecommunication services proves to be feasible and flexible in the practical experience when price movements have to be observed in a very competitive market. Typical step functions when new tariffs are introduced in the index can be avoided with the described procedure. The inclusion of customer shares which are representative for the market is an important task for the computation of sub-indices for services in the telecommunication market.

References

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