EXPERIENCES WITH THE COLLECTION OF QUANTITY INDICATORS FOR THE TELECOMMUNICATION SECTOR IN GERMANY

STATISTISCHES BUNDESAMT

AUGUST 1994

Statistisches Bundesamt
Gruppe VI C - Dienstleistungen

Wiesbaden, August 1994

Voorburg Group on Service Statistics 1994
Session 7: Prices and Quantities

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At the 1993 Meeting of the Voorburg Group in Oslo, the Federal Statistical Office of Germany submitted proposals for quantity indicators for the telecommunication (TK) sector. In the following, the results of a voluntary survey testing the above-mentioned indicators will be discussed.

1. What are service data needed for?

Despite the further liberalisation of the German telecommunication market (reflected by the 1994 Second Postal Structures Reform Act which, among other things, provides for the conversion of the Deutsche Bundespost Telekom (DBP-Telekom) into a stock corporation from 1 January 1995), the government of the Federal Republic of Germany has continued to consider the safeguarding of equal competitive conditions in the telecommunication market a task to be fulfilled in the context of its economic policy. In this respect acting as a competition authority, the Federal Ministry of Posts and Telecommunications (BMPT) is in charge of the regulatory tasks to be fulfilled. The following information is required for a continuous observation and regulation of the market:

- number and structure of networks operated
- degree of supply and network utilization by types of network
- network services
- increase of network volume
- network users (online-database and mailbox providers, etc.)
- providers of telecommunication services on leased lines
- number and types of telecommunication services (excl. network services)
- number and types of terminals.

The above information is also of great interest to enterprises participating in the market for purposes of inter-firm comparisons, market share calculations, and the like.

Information about the number of access units provided, the volume of the services rendered and additionally the turnover in a breakdown by

telecommunication services and types of network is not least required for the compilation of official price statistics. Based on this information, the weights are determined for calculating the institutional price index for post and telecommunication services. Since 1962, this index has been calculated by the Federal Statistical Office at monthly intervals.

2. Presentation of the service data inquired

First, the survey variables were specified on the basis of a BMPT service classification. As a second step, the ways were examined in which these telecommunication services (explained in the form of examples only) are described and offered by the largest German provider, i.e. DBP-Telekom, and private suppliers. It became obvious that individual services may be allocated to various groups of services. Thus, for instance, DBP-Telekom classifies the *Provision of networks* under Communication services, while it is assigned to Network management services by private providers. Besides, differences became obvious in the definitions used. As a third step, quantity indicators were defined and grouped as follows:

- operation of a communication network
- operation of an online-database/mailbox
- provision of additional telecommunication services

The individual steps are outlined in enclosure 2. The quantity indicators are specified in the above-mentioned paragraphs of the questionnaire (enclosure 1).

The quantity indicators specified include both indicators in use (e.g. number of access units, connections, sessions) and new indicators (e.g. to describe the network structure) and parameters. As for new indicators, only the availability of a given service was inquired in this first approach (e.g. in paragraph 4.1 of enclosure 1). Quantities will have to be determined on the basis of further inquiries.

The following will briefly describe the contents of the main quantity indicators (the paragraphs indicated refer to the questionnaire in enclosure 1):

The *Number of switching centres, length of cable, and number of stations* (paragraphs 2.2 and 2.3) characterise the structure of the networks as a basis for the services provided. A comparison between the *Length of cable based on glass-fibre technology of the own line-based network* and the entire length of the *Own line-based network* may be taken as a yardstick to measure the degree of technical up-to-dateness of the networks. Together with the digitization of switching, glass-fibre technology represents the technical optimum to be achieved.

The *Number of access units* and the *Number of successful connections* (paragraph 2.4) are the most relevant and at the same time closely interrelated statistical quantities of the communication branch. In the same

/ as the volumes of passenger and of goods transport depend on the nber of transport facilities, the number of successful connections ntually depends on the number of available access units.

e *degree of network utilization* which is determined by multiplying the *mber of successful connections* with the *Average duration of connection* ıy be considered an important performance indicator.

e *Number of successful connections with other networks* (paragraph 2.4) lects economic relations. On the one hand, services are provided for other twork operators if a connection is made to another network, and on the ner, services are enlisted if a connection is made from other networks.

ıe indicator of *Registered users* of online-databases and mailboxes aragraph 3.2) corresponds to the variable of *Number of access units* levant for network operators. It is a parameter indicating the degree of ntinuous demand for information from online-databases and mailboxes. egistered users are the main potential group of users demanding this ervice.

he number of *Sessions* (paragraph 3.3) and *Average time of a session* are ıquired to determine the degree of utilization of the services offered. The me (duration) of a session corresponds to the average duration of onnection inquired from network operators. The degree of utilization of an nline-database or mailbox may be obtained by multiplying the average luration of a session with the number of sessions.

The telecommunication services listed in paragraph 4.3, i.e. *Booking service (seat reservation, hotel rooms, air tickets, hire cars, etc.), order service, money transfer service, producing accounts of individual charges, and breakdown service* were recorded in quantitative terms only. They are additional services (value-added services) for network users (e.g. hotels, travel agencies, banks) that are usually offered free of charge. The aim of offering this kind of services is to get the competitive edge over other competitors.

3. Survey experience

3.1 Basis, approach, results

The liberalisation of the German telecommunication market is a gradual process in which the BMPT has supervisory and regulatory functions. As far as the production of telecommunication services is concerned, the right of installing and operating line-based communication channels (at least until the end of 1997) is reserved for the Federation. However, the BMPT grants licenses to private enterprises for installing and operating mobile radio and satellite communication networks. All other telecommunication services, excl. voice communication for third parties (until 1997), may be offered in the free market. The BMPT has to be notified of the provision of these services via line-based communication channels, i.e. leased DBP-Telekom lines.

The survey could be based on addresses of a total of 324 enterprises which either were granted by the BMPT licenses for network operation until the end of 1992, had notified the provision of telecommunication services or were permitted to operate telecommunication systems not subject to licensing (German Railways, public utility companies, communities, etc.).

The approach used was as comprehensive as possible at the time. Enterprises whose main activity was in the telecommunication sector were covered in the same way as enterprises who performed a secondary activity in this area, such as operating leased networks for data communication. Even some government institutions were covered to check the opportunities to include telecommunication service data from this sector (with a view to comprehensive *production* statistics). However, the number of enterprises and institutions contacted should not be considered to be complete (not even for the market sector), as telecommunication services are not necessarily notified immediately. In some cases, they are not even notified at all. The total of enterprises and local units presently engaged in the telecommunication sector in Germany is not known. Reasons are that, on the one hand, an exhaustive census of non-agricultural local units has not been conducted since 1987 and, on the other, a (business) register of enterprises or local units does not exist.

The survey was initiated in September 1993. The course of data collection is depicted in the chart of enclosure 3. After the completion of data collection, which was based on voluntary response, a total of 81 valid questionnaires were available. The number of non-response cases was 215, while failures due to the fact that enterprises contacted did not belong to the survey population totalled 28.

Because of the wide range of services offered, the enterprises were, on the basis of typical variable values, grouped into the following homogeneous classes whose service data were analysed later:

1. Network operators

1.1 Providers of line-based networks
1.2 Providers of multiplex-radio networks
1.3 Providers of satellite communication networks
1.4 Other network operators

2. Providers of telecommunication services (non-network operators)

2.1 Professional database providers
2.2 Professional mailbox providers
2.3 Nonprofit organizations
2.4 Internal applications
2.5 Providers of remote control services
2.6 Providers of other services
2.7 Other non-network operators

Unfortunately, the largest enterprises operating in this sector such as DBP-Telekom and Mannesmann Mobilfunk did not participate in the survey. Consequently, the conclusions drawn refer to a share of the total market only. This share whose size is unknown can therefore not be considered to be representative. For this reason, the conclusions drawn can only be regarded as first results giving an idea of the problems and difficulties encountered in collecting service data.

3.2 Service data of network operators

For basic services (number of access units, connections, average duration of connection), complete data were provided by the enterprises of the three different groups (providers of line-based networks, of multiplex-radio networks, and of satellite communication networks) only with regard to access units (see enclosure 4). Noticeably, only few types of access units were specified. One enterprise each of the three groups supplied information about connections and their duration.

Special telecommunication services (network services, online-databases, other value-added services) were, with the exception of mailboxes, not indicated by the providers of line-based networks contacted. Providers of multiplex-radio networks explicitly mentioned network management services, providers of satellite communication networks even added code, protocol and format conversion, and the adjustment of signalling rates, and one enterprise indicated a comprehensive mailbox operation.

What can generally be said about the collection of service data is that gathering information about networks (switching centres, length of cable, stations) did not pose any problems. Surprisingly, however, the collection of actual service data (basic services, special telecommunication services) caused problems even with regard to the number and duration of connections, though these data should be available as they are the basis for producing charges accounts. Conclusions regarding the availability of data on network services and special telecommunication services cannot be drawn from the information provided by network operators as very few of them offered these services at all.

The intermediate results obtained are the following:

1. The only variable for which reliable data could be collected for the enterprises surveyed (unless their main activity was network operation) was the number of access units. There was very small interest in the number and duration of connections; they were regarded as services required to carry out the main activity of an enterprise. Typical telecommunication services (network services, online-databases, other value-added services) were usually not offered by these enterprises.

2. Enterprises whose main activity is in the telecommunication sector

have additional information about the number and also the duration of connections (from which the average duration of connection can be determined). However, these data were usually not supplied. The reasons for not providing this information will be inquired in interviews in the near future. In this context, the recording of special telecommunication services will be discussed as well.

3.3 Service data of other providers of telecommunication services (non-network operators)

61 enterprises not operating any network were assigned to this group. It comprises mainly enterprises operating online-databases and/or mailboxes and enterprises offering additional telecommunication services (above all remote control services).

The main indicators for quantifying the telecommunication services provided by enterprises essentially operating online-databases and/or mailboxes (professional database and mailbox providers, nonprofit organizations, internal applications) are the number of registered users, the number of sessions and their average duration. The enterprises concerned were quite able to supply information about the number of registered users, while substantial non-response was observed with regard to the number of sessions and their average duration. Though it is not surprising that these data are often missing for online-databases which may be used free of charge (particularly internal applications), the fact is striking that only half of the professional database providers were in a position to answer these questions for the databases operated by them. And what is even more, only 25 % of the professional mailbox providers supplied data for the mailboxes operated by them. The fact that database and mailbox accounts are based on criteria such as the exact online times of individual users or lump-sum prices rather than the number of sessions could be an explanation for this phenomenon. Other reasons can only be established in direct contact with the enterprises concerned.

Only very few enterprises operating online-databases and mailboxes offered additional telecommunication services. However, only part of the enterprises could supply exact quantitative information.

Enterprises offering additional telecommunication services provided in particular permanent and non-permanent remote control services to third parties. In general, the providers of remote control services did not offer any further telecommunication services. For this reason, the vast majority of these enterprises had to supply only two pieces of information in relation to telecommunication services, that is about the use of permanent and of non-permanent remote control services. Although the majority of enterprises answered this question, some problems were encountered as well.

Additional telecommunication services were also offered by enterprises classified under *Other services*. However, this group required for survey

evaluation, is suitable for systematic methodological analyses to a very limited extent only. Since this group incorporates in part greatly varying activities, general conclusions cannot be drawn. The fact should be mentioned, however, that these enterprises had, not least due to their very specific activities, sometimes even rather significant problems with the questionnaire. In a similar way, this is also true for the group of *Other non-network operators* which included enterprises that could not or not definitely be assigned to one of the other classes.

The survey result for non-network operators indicates that, if their effort is to be kept justifiable, particularly online-database and mailbox providers can be expected to supply only information about the number of users for service data surveys. Part of the enterprises faced great difficulty in supplying data such as the number of sessions and their average duration, i.e. quantity indicators to determine the utilization of online databases and mailboxes.

The recording of additional telecommunication services in quantitative terms is also difficult and should therefore only be recommended for enterprises which, like the providers of remote control services, have their main activity clearly in this area.

4. Further procedure

The above-mentioned approach was used to investigate, among other things, the preconditions for producing comprehensive statistics of telecommunication services (with a view to production statistics) in Germany at the present time. For two reasons, the result was negative. On the one hand, not all providers of these services are known for the time being, and on the other, a binding definition of certain telecommunication services in the sense of operational statistical concepts is not possible on the basis of the knowledge obtained from this pilot survey. To this end, detailed knowledge will be required of the services provided by large enterprises of this sector, which did unfortunately not participate in the pilot survey.

Taking account of the conditions prevailing, the proposal is made to restrict the objective of further considerations and work to the institutional approach covering enterprises as statistical units. Apart from service data, the main data on economic activity, i.e. gross performance and costs, in particular the input of goods and services, and production factors, in particular employees and fixed capital formation, should be inquired. In view of the fact that complete coverage cannot yet be ensured (the register planned will certainly not be complete before the year 2000) and detailed knowledge has not yet been acquired of how and where individual telecommunication services can be operationally and efficiently recorded, coverage should be restricted to enterprises mainly engaged in the telecommunication sector. These are primarily operators of independent line-based and not line-based communication networks, i.e. telephone, mobile radio and satellite communication networks. A new questionnaire taking account of these considerations is attached in enclosure 5.

Enterprises whose main activity is either in the production or trade of office machinery, data processing and communication systems and equipment, or in the area of data processing or databases, will thus be explicitly excluded. The same applies to enterprises whose main activity is in the areas of hardware consulting, software production, data processing services, databases, maintenance and repair of office machinery, and data processing systems and equipment. In line with the main-activity principle, internal telecommunication activities of other branches such as insurance companies, banks and computer centres and activities of households such as hobby mailboxes will not be covered either.

After restricting coverage to the above area, it should be checked whether enterprises providing so-called value-added services should also be covered. As a result of the above delineations, these services are rendered by a small specific part of the sector only. A typical feature of the units concerned is that, using lines of network operators, they add essential service features to usual voice and data communication, a result of which is the generation of new services (*value-added* services) which may be sold. Examples are, for instance, network management services, video conferencing, videotex, booking and order services. A decisive criterion in this context should be that these services must be the main activity of an enterprise.

A survey following this definition would currently cover about 40 to 60 enterprises. To ensure that it would be representative by nature, the enterprises covered would have to be put under the obligation to provide information.

After altering both the coverage and list of variables of a survey of this kind, the stock of addresses of the enterprises operating in the telecommunication sector will have to be completed, first of all by establishing a comprehensive business register. The work to be performed to this end was started after the adoption of the EC Regulation on business registers on 22 July 1993. It will however take five to seven years to achieve this aim in Germany. At the same time, as mentioned under 3, ways of covering the telecommunication services will have to be further investigated, in particular in discussions with representatives of large enterprises engaged in this sector.