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# STUDIES ON STATISTICS

Federal Republic of Germany

## No. 40

# Kind-of-Activity Units in Mining and Manufacturing

FEDERAL STATISTICAL OFFICE, WIESBADEN

PUBLISHERS: W. KOHLHAMMER GmbH STUTTGART AND MAINZ

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# Kind-of-Activity Units in Mining and Manufacturing

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# 1 Study on the Introduction of Kind-of-Activity Units (KAUs) as Statistical Units in Mining and Manufacturing


## By Hermann Glaab*)


## 1. Foreword

Since the reorganization of statistics on production industries, the main feature of the system of surveys for this sector of the economy has been the enterprise concept. As the smallest legally autonomous unit which keeps accounts and draws up balance sheets for commercial and/or tax reasons, the enterprise forms the central inquiry and presentation unit. For the purposes of regional inquiries, the enterprise is divided into local units. Since enterprises and local units may be active not only in a particular branch but at the same time in several sectors, these units should also be broken down on the basis of their economic activity into "branch-specific" components, namely kind-of-activity units and local kind-of-activity units. While official statistics have for a long time now provided data on enterprises, local units and local kind-of-activity units, there were in the past no tools which could have been used to obtain data on kind-of-activity units. It was only in recent years that the reorganization of statistics on production industries created the conditions for rectifying this omission in the enterprise concept.

The following pages deal with the purpose and definition of kind-of-activity units, describe the processing methods and other preparatory work for the production of data on kind-of-activity units, and then present and analyse initial results regarding the homogeneity and heterogeneity of enterprises and activities in mining and manufacturing. The study is based entirely on results obtained without estimates. The estimates produced for more detailed analyses and the results obtained by these methods for the number of employees, wages and salaries, turnover and census value added are described briefly in a separate paper.


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## 2. Reasons for the introduction of kind-of-activity units

The discussion about the introduction of kind-of-activity units as the inquiry and presentation units for industrial statistics goes back to the 1950s, when a self-contained and coherent system of economic statistics was developed[1].

It seemed natural to develop the new system on the basis of the enterprise as the central statistical unit, since as an "economic entity" governed by legal regulations it has good sources of information. In taking this decision it had also to be borne in mind, however, that the many different types of enterprises impair the comparability of the results for this unit. This wide range of enterprises reflects the different nature of individual functions in the set of functions, the various product ranges and production programmes and combinations of these functional and institutional criteria. All the special features resulting from the individual structure of the enterprises must, however, be disregarded when it comes to presenting results by enterprise, since the enterprise with all its data can be classified in only one sector.

The basis for the economic classification of the statistical units is their main economic activity. This is determined according to where the greatest proportion of value added - generally gross value added at factor cost - is generated. If this variable is not known, approximations or, alternatively, numbers of employees are used. In accordance with this principle of classification, the branch results obtained from data for enterprises are undoubtedly typical of the individual economic activities, but analyses based exclusively on such data inevitably suffer from a lack of clarity caused by extraneous activities of often unknown scale. Data on enterprises are therefore not very suitable for any analysis of production, and input-out-

1) See Fürst, G. et al: "Unternehmen, fachliche Unternehmensteile und örtliche Einheiten als Grundlage für die statistische Darstellung wirtschaftlicher Tatbestände" in WiSta 12/1957, pp. 643 ff.

put analyses, for example, thus require homogeneous units. Only if the inquiry relates to units delineated as far as possible in the same way in terms of both technology and products can reliable information be obtained about production.

By presenting results for enterprises corresponding with their activities with an additional breakdown by kind-of-activity unit, shifts of main activity, which ultimately lead to switches of main activity and therefore to changes in economic structure, can be detected earlier and their causes determined more easily. More precise data by branch along the lines of homogeneous production processes, however, not only contribute to an improvement of structural analyses and comparisons at national level but are equally suitable for bringing out differences in international studies.

The introduction of KAUs also offers new approaches for market studies, since the breakdown of the data on enterprises/activities by KAU means that signs of specialization and diversification can be detected and shown with a greater degree of reliability than previously. Thus, market risks and prospects not only for individual enterprises but also for whole branches become more easily recognizable because both horizontal and vertical interrelationships are revealed. In particular, analyses can show that outside a branch delineated at enterprise level other enterprises are dominant at the level of KAUs in the same branch. It is therefore quite clear that concentration studies are interested in data for KAUs.

KAUs have also been taken into account in the weighting scheme for the production indices with base 1980=100. The new system of indices for the base year 1980 was constructed for the first time using census value added figures for KAUs.

The examples given here show that the main aim of introducing KAUs is to supplement the existing figures, particularly for enterprises, and to make them so clear by means of additional information that economic analyses based on these data can be made more precise.

## 3. Definitions

KAUs have so far been referred to as homogeneous units but a more precise definition has not been given. According to the Directive of the Statistical Office of the European Communities (SOEC) on the coordinated annual inquiries into industrial activity[2], KAUs are defined as statistical units that carry on a single activity which is characterized by the nature of the goods or services produced, this activity being defined in terms of a standard classification of economic activities. In addition, KAUs should have an output which is as homogeneous as possible, use a narrow range of inputs and be identifiable from the accounts. This last requirement means that they should at the same time be defined within the enterprise as an area of responsibility and be of some importance. The KAU coincides with the enterprise when the activity or activities carried out by the enterprise fall within a single heading of the classification. Enterprises which fulfil this condition are referred to as homogeneous. As a result of this identity between a homogeneous enterprise and a KAU, there are no separate KAUs for ancillary units. According to the above-mentioned Directive, ancillary units are services which - as regards their nature and importance - are found in every similar production unit and serve only that production unit. In practical terms, the administration, purchase, sales, stores, repair and transport departments are contrasted in this context with the actual production activity.

Since enterprises cannot function without these ancillary units, even if the quantitative contribution of individual ancillary units varies from case to case, the ancillary units must be attributed to the KAUs. This problem is similar to the one which occurs in drawing up the cost apportionment sheet; this too involves laying down apportionment criteria for costs caused by several or all cost units.

In view of all these definitions, the boundaries for KAUs are based on cost unit concepts and not on cost centre criteria. This is brought out quite clearly by the fact that a production unit may use its machinery to produce at the same time parts for mechanical engineering, e.g. turbines, and for electrical engineering, e.g. generators. When it comes to forming KAUs, a cost centre of this type must be divided up into these two sectors. KAUs are not formed for certain functions either, e.g. sales, even if their organization is clearly delineated within an enterprise and they can be compared to legally autonomous marketing companies, to use the same example. The possibility of forming KAUs on the basis of functional criteria, mentioned at the beginning of this paper, can thus be ruled out.

## 4. Preparatory work for the introduction of kind-of-activity units and visits to enterprises

In view of the methodological problems and the fact that enterprises' information sources are geared to their requirements, Fürst expressed in the article

2) SOEC: Coordinated annual inquiry into industrial activity in the Member States of the European Communities, Council Directive and methods for carrying out the inquiry, Doc. No 4000/77 - EN, 1977, p. 10 ff.

mentioned in Footnote 1 considerable doubts about a general survey for KAUs[3]. It was not until the reorganization of industrial statistics from the mid-1970s onwards that the conditions were created for the introduction of the KAU as a new statistical unit. These conditions were both legal and technical in nature, since the Law on Statistics on Production Industries of 6 November 1975 decrees the setting up of a file of enterprises to be used for carrying out some of the preparatory work regarded as essential. A central concern of the preparatory work involved determining the KAUs for each enterprise on the basis of the data used for production statistics and the information from the file and, where appropriate, informing the enterprises, since the definitions to be observed and, above all, the allocation of all production (products) to the headings of the classification of economic activities used, would have caused the enterprises considerable difficulties. In order to delineate the individual KAUs, the production recorded for local units with the help of the file was aggregated to give the enterprise's production and then allocated to the economic activities by means of a conversion programme. In addition to the number of KAUs this stage thus also provided information on the economic activities and the production value of the KAUs.

The next step was to ascertain whether the enterprises could supply data for the KAUs formed in this way. The following points had to be clarified:

- Do the enterprises have the necessary records in the required breakdown?

- Are simple conversions sufficient or do parts of the accounts have to be reworked at the same time?

- Can existing records be adapted to statistical requirements by the enterprises on the basis of a reproducible method?

- Are the enterprises willing to actually keep such records?

In 1981, talks were held to answer these questions with nine enterprises which had a total of 126 KAUs. These talks confirmed the remarks made by Fürst in the above-mentioned article: "Cost accounting is ..... always dictated by criteria of expediency, which will lead to different subdivisions from one enterprise to another; uniform principles of subdivision, which could also be used as the basis for statistical inquiries, are out of the question. The whole process (i.e. the product-based subdivision of enterprises into kind-of-activity units and the collection of appropriate data) would only be meaningful, however, if the costs are really 'imputed' and substantial overheads .... are not apportioned to the individual groups of products in accordance with a more or less random formula."[4]

It was ascertained in particular that in all the enterprises visited the organizational structure differs from the breakdown into KAUs based on production statistics. This structure cannot be transposed into any of the existing classifications. The enterprises therefore have no figures in a breakdown by KAUs. The accounts generally refer to products and are geared to the requirements of the various divisions, which are not the same as KAUs used for statistical purposes.

The enterprises visited operate on markets on which in many cases demand is not for a single specific product but a "system package" is expected from the supplier. The enterprises are therefore obliged to offer a particular range of products from different sectors in a combined form. This has virtually no organizational consequences for the actual manufacture, since there is often no particular difference between the various industries as far as technology is concerned (steel construction, mechanical engineering, motor vehicle industry, electrical engineering). On the contrary, the enterprises become flexible only at the workshop level, i.e. they use machines of the same type for making different products.

Since the enterprises' organization and the division into KAUs do not have the same coverage, the enterprises would have to compile the figures required for a survey of KAUs in a different breakdown than the existing one from the accounts. This would require an activity number being allocated to each cost unit throughout the apportionment system, according to which all wage-slips, for example, would additionally have to be apportioned once again. However, even a solution of this type would have its limitations, since generally speaking only wage costs chargeable to production can be shown using this method. On the other hand, wage costs chargeable to overheads are neither attributed to a specific cost unit nor included as a separate element in the apportionment calculation. They would have to be allocated separately to the individual KAUs on the basis of new formulae. In all divisions which develop software in the broadest sense of the word, and in group management services, training departments, sales and marketing departments, the apportionment of labour costs according to cause to cost units comes up against major problems. With such a method of apportionment, changes in the organization could also lead to changes in the cost structure, even though there is no connection with the actual production process.

3) See Fürst, G.: "Unternehmen, fachliche Unternehmensteile ..." in WiSta 12/1957, pp. 660, 662, 669.

4) Fürst, G.: "Unternehmen, fachliche Unternehmensteile ...." in WiSta 12/1957, p. 662.

Since in many cases there is no causal chain for an apportionment of costs according to cause or such a chain can only be shown with disproportionately high expense and effort, the enterprises apportion 40 to 60 % of the total costs to different cost units by means of certain formulae. If the collection of data by KAU on wages and salaries, for which there are records and which constitute the biggest cost component, entails such considerable difficulties, then a breakdown of employees by KAU will almost certainly be even more difficult.

The same applies to most of the other variables listed for KAUs in the Directive published by the SOEC on the coordinated annual inquiry, particularly for internal transfers and goods and services received. In the case of manufacture in several stages it may happen, for example, that depending on the utilization of capacity certain parts are manufactured in the works itself or bought-in from the market. At the next processing stage the origin of the parts is no longer known. It should also be borne in mind that internal transfers and services are generally recorded only between cost centres and not between cost units. In this connection, account must also be taken of the fact that settlement prices are determined differently from one enterprise to another. It therefore does not seem very promising to try to record flows within an enterprise in a form which differs from that used by the enterprise itself.

Even a survey limited to data for that KAU which coincides with the enterprise's main sphere of activity (main economic activity) would almost certainly be virtually impossible to carry out, because the organizational structure of the enterprise does not coincide with the subdivision into KAUs. To give an example: according to its annual report, an enterprise is made up of five divisions. The turnover is distributed over these divisions (according to the annual report) in the ratio 0.3 : 0.3 : 0.2 : 0.1 : 0.1. According to the Federal Statistical Office's assessment, the same enterprise has more than ten KAUs, with the unit which determines the main activity accounting for well over half of total production (for reasons of anonymity the figures have been considerably rounded off). If this enterprise were required to provide data for its KAU which determines the main activity, it would be obliged to take the necessary data from the differing divisions, with all the above-mentioned difficulties that this involves.

As an inevitable result of all the above, the Federal Statistical Office's work was concentrated on developing methods of estimation for a series of characteristics for KAUs. In order to be able to assess the scope and therefore also the effects of the estimates, the investigations described below were carried out.

Before this description, however, a number of methodological points must be dealt with.

## 5. Points of methodology

### a) Gross production value

In addition to the numbers of KAUs throughout the sectors of manufacturing industry, this study considers only production values and their distribution. The data for these characteristics are therefore a sort of quantitative structure which forms the basis for the approaches to and assessment of all the required stages in the work.

The methodological explanations given below describe the conditions under which KAUs can be formed on the basis of the data available. These methodological remarks form at the same time the basis for the methods of estimation to be described at a later stage.

At enterprise level, gross production value comprises:

- turnover on sales of products manufactured by the enterprise and industrial services rendered to others;
- turnover on sales of goods purchased for merchanting or factoring;
- turnover on other non-industrial activities;
- changes in stocks of finished and unfinished products manufactured by the enterprise, and
- capital goods manufactured by the enterprise (for its own use).

This production value includes percentages which cannot be attributed to industry. For the purposes of studies on production industries, the turnover on sales of goods purchased for merchanting or factoring and on other non-industrial activities must therefore be excluded. In order to distinguish it from the enterprise's gross production value, the value thus reduced by the "non-producing" fractions will therefore be referred to below as "reduced gross production value". Since the individual components of turnover are known for the enterprises with 20 or more employees covered by the inquiry, the reduced gross production value can be calculated for them. This value is compared with the production value determined from the production survey of local units, the results of which were processed to give data for enterprises. The production statistics use code numbers to record finished products, provided that they are intended for sale and/or - as marked appropriately

in the Nomenclature of Goods for Production Statistics - for further processing within the same enterprise. Production intended for sale is to be reported on the basis of the ex-works selling prices obtained during the reference period, including packing but excluding turnover tax, discounts and excise duty; the data on production intended for further processing are to be expressed in terms of quantity. Jobbing, contract processing, repairs and assembly are recorded in the production statistics as industrial services in terms of value.

The following are also to be reported by local units on the basis of production costs:

- products for the production or repair of the parent enterprise's plant and equipment;
- means of production as well as fuels and lubricants produced for the own consumption of the enterprise;
- products manufactured for employees' free allowances.

At first sight, the annual production value for enterprises obtained from the quarterly survey of production in local units and the reduced gross production value therefore tally to a large extent as far as their content is concerned. However, differences may arise between these two aggregates for the following reasons:

- The cost structure survey refers to the financial year, which may differ from the calendar year, whereas the production statistics are based on the calendar year.
- Excise duties are included in enterprises' turnover but not in the production returns.
- Enterprises' stocks are valued at production cost, whereas in the production statistics they are valued at selling prices.
- Production intended for further processing is recorded only in terms of quantity and must therefore be valued at market prices for the purpose of preparing the data.
- Enterprises' stocks are recorded on a reference date; on the other hand, production intended for further processing may be recorded several times, depending on the number of manufacturing stages which the goods have to pass through and which have to be recorded (even within a KAU).

In accordance with the gross principle - i.e. parts of the output of a KAU may be the input for another KAU in the same enterprise - the sum of the production values of an enterprise's KAU may not be smaller than its reduced gross production value; however, no definite limit can be given for the amount by which it may exceed the reduced gross production value.

Technical defects, e.g. gaps in the recording of production or classification of local units with the wrong enterprises, which likewise lead to differences between production value and reduced gross production value, are eliminated as part of plausibility checks. These adjustments can only be made accurately in the case of enterprises covered by the cost structure survey but, since these enterprises account for at least 80 % of total turnover for each activity and size class based on the number of employees, the two production values can be made to tally in a very exact and plausible way.

### b) Economic classification of the results

The assignment of production, which is to be reported according to code numbers, to the various headings of the German Industrial Classification of Economic Activities, version for Statistics of Production Industries (SYPRO), is carried out in principle at the most detailed level of the SYPRO, i.e. by economic activity (SYPRO four-digit headings, SYPRO branches). Since some code numbers (e.g. for repairs) cannot be classified clearly under SYPRO branches, additional numbers have also been introduced. The data for the additional branches are allocated proportionally to the normal branches before they are evaluated.

If during this process it is observed that an enterprise covers several identical SYPRO branches, these are aggregated to form a single KAU.

For some analyses, KAUs were also formed at the level of SYPRO groups (SYPRO two-digit headings, the next higher presentation level). With the changeover from four- to two-digit headings, the number of KAUs is automatically reduced, since the degree of homogeneity and heterogeneity of an economic sector is in the final analysis also determined by the degree of detail of the classification used. If the level of classification is not sufficiently detailed, all enterprises are homogeneous, whereas if it is too detailed this leads to fragmentation of the results with many individual cases and to a considerable amount of analytical work.

## 6. Homogeneity and heterogeneity of enterprises

An initial picture of the homogeneity and heterogeneity of enterprises is given by showing enterprises

Table 1: Enterprises in mining and manufacturing and their KAUs in 1980 by number of KAUs [1]

| Enterprises with ... KAUs | Enterprises | Production value | | Cumulative figures | | | |
|---|---|---|---|---|---|---|---|
| | | | | Enterprises | KAUs | Production value | |
| | Number | 1 000 DM | Share of total % | Number | | 1 000 DM | Share of total % |
| 20 and over | 8 | 55 049 974 | 46 | 8 | 192 | 55 049 974 | 46 |
| 15 - 19 | 6 | 52 013 258 | 43 | 14 | 284 | 107 063 232 | 89 |
| 14 | 4 | 17 492 177 | 15 | 18 | 340 | 124 555 409 | 104 |
| 13 | 3 | 16 197 523 | 13 | 21 | 379 | 140 752 932 | 117 |
| 12 | 9 | 20 163 271 | 17 | 30 | 487 | 160 916 203 | 134 |
| 11 | 14 | 11 792 182 | 10 | 44 | 641 | 172 708 384 | 144 |
| 10 | 19 | 4 347 458 | 4 | 63 | 831 | 177 055 842 | 148 |
| 9 | 22 | 55 085 553 | 46 | 85 | 1 029 | 232 141 395 | 193 |
| 8 | 44 | 17 330 232 | 14 | 129 | 1 381 | 249 471 627 | 208 |
| 7 | 76 | 42 955 124 | 36 | 205 | 1 913 | 292 426 751 | 244 |
| 6 | 218 | 37 185 713 | 31 | 423 | 3 221 | 329 612 464 | 275 |
| 5 | 404 | 73 830 747 | 62 | 827 | 5 241 | 403 443 211 | 336 |
| 4 | 907 | 74 718 497 | 62 | 1 734 | 8 869 | 478 161 708 | 398 |
| 3 | 2 742 | 171 105 876 | 143 | 4 476 | 17 095 | 649 267 584 | 541 |
| 2 | 7 596 | 210 673 084 | 176 | 12 072 | 32 287 | 859 940 668 | 717 |
| 1 | 24 547 | 340 174 673 | 283 | 36 619 | 56 834 | 1 200 115 341 | 1 000 |

1) KAUs on the basis of SYPRO 4-digit headings.

as a function of the number of their KAUs. This "concentration table" (see Table 1) shows that only a few enterprises - eight altogether - have a large number of KAUs, i.e. 20 or more. Only when the number of KAUs per enterprise is six or fewer are the figures higher, and only slightly over 800 enterprises have five or more KAUs. However, these enterprises account for around a third of production. The last line of the table shows that approximately two thirds of enterprises, accounting for just under 30 % of production, are homogeneous. Taking the last two lines together, it can be seen that almost 90 % of enterprises, accounting for over 45 % of production, have at most two KAUs.

Following on from this overall picture of enterprises, Diagram 1 in the Annex shows the distribution of KAUs over the various sectors (line = sector to which the enterprises belong, column = sector to which the KAUs belong). Since this diagram is a reduction of a matrix comprising 209 x 209 cells, neither sector designations nor class frequencies can be given but only symbols for size classes. In another way, however, it would not be possible, given the present booklet format, to provide at least in a diagram a comprehensive and graphic picture of the distribution of KAUs.

The most frequently occurring symbol consists of two colons (::) for the size class 1 to 9 KAUs. In interpreting this diagram it should therefore be borne in mind that this symbol often represents only one, two or three KAUs, so that as a rule there can be no question of mass phenomena. This state of affairs is emphasized in particular by analyses in which no account is taken of class frequencies 1 and 2. (It would help to consider the following remarks in conjunction with Diagram 2 in the Annex). With this method of presentation, which is based on confidentiality regulations, well-defined "dispersion fields" and white areas can be seen from the spatial distribution of the frames which contain points. Some of these dispersion fields were transposed to Diagram 1; they are bounded by broken lines. The other frames (solid lines) are SYPRO two-digit headings.

An analysis of the dispersion fields in a form of presentation which leaves out low class frequencies shows better than Diagram 1 that heterogeneity is concentrated on certain sectors, e.g. the SYPRO two-digit heading "Quarrying and working of stones and earth", "Metal working", the SYPRO two-digit heading "Chemical industry", the "Clothing and textile industry" and the main group "Food, drink and tobacco industry". A line-by-line analysis of these heterogeneous sectors shows that there is virtually no spread of diversification to "alien" sectors, i.e. in only a few cases from "Metal working" to the "Chemical industry" or from the "Textile industry" to the main group "Food, drink and tobacco industry". At most, a vertical interrelationship due to technical reasons can be seen, e.g. from the foundry primary product to the finished mechanical engineering product. It is also noticeable that in many sectors both electrical and plastic products are manufactured. These are presumably components for own production. Outside the framed areas the enterprises - in the presentation from which low class frequencies have been omitted - are largely homogeneous, with the exception of the two sectors mentioned above; in many sectors, there are no further KAUs in any significant number, apart from around the main diagonal. It can be concluded from this "optical" analysis that diversification is restricted to a not inconsiderable extent by technical know-how. It can also be assumed that the extension of the production range takes place not at enterprise but at group level, either by separating lines of production and making them legally autonomous or by taking outside enterprises into the group.

Table 2: KAUs in mining and manufacturing in 1980 by branch of economic activity/main group and production value of enterprises

| Branch of economic activity/main group | KAUs of enterprises with a production value | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | of up to 10 Mill. DM | | | of DM 10 Mill. and over | | | Total | | |
| | Production value | KAUs | KAUs per enterprise | Production value | KAUs | KAUs per enterprise | Production value | KAUs | KAUs per enterprise |
| | Mill. DM | Number | | Mill. DM | Number | | Mill. DM | Number | |
| Mining | 194 | 50 | 1.0 | 30 893 | 72 | 2.4 | 31 088 | 122 | 1.6 |
| 22 Mineral oil refining | 55 | 15 | 1.7 | 79 492 | 84 | 1.8 | 79 547 | 99 | 1.8 |
| 24 Production and processing of fissionable and fertile materials | 14 | 2 | 1.0 | 352 | 4 | 1.0 | 366 | 6 | 1.0 |
| 25 Quarrying, extraction and working up of stone and earths | 6 408 | 1 918 | 1.4 | 22 196 | 1 074 | 1.8 | 28 604 | 2 992 | 1.5 |
| 27 Iron and steel industry | 84 | 25 | 1.8 | 101 101 | 331 | 3.6 | 101 185 | 356 | 3.4 |
| 28 Non-ferrous metal industry, non-ferrous metal semi-finished products industries | 89 | 30 | 1.4 | 22 230 | 270 | 2.0 | 22 319 | 300 | 1.9 |
| 29 Foundries | 1 304 | 371 | 1.3 | 10 486 | 371 | 2.1 | 11 790 | 742 | 1.6 |
| 30 Drawing plants, cold rolling mills, secondary transformation of metals, other metal workshops not elsewhere classified | 1 001 | 371 | 1.3 | 7 583 | 254 | 1.6 | 8 584 | 625 | 1.4 |
| 40 Chemical industry | 2 606 | 689 | 1.4 | 127 833 | 1 261 | 1.8 | 130 440 | 1 950 | 1.6 |
| 53 Wood-working | 1 676 | 517 | 1.4 | 5 794 | 240 | 1.7 | 7 471 | 757 | 1.5 |
| 55 Manufacture of pulp, paper and board | 164 | 34 | 1.1 | 13 398 | 152 | 1.4 | 13 562 | 186 | 1.4 |
| 59 Manufacture of rubber products | 411 | 133 | 1.3 | 10 895 | 174 | 1.8 | 11 306 | 307 | 1.5 |
| Basic and producer goods industries | 13 813 | 4 105 | 1.4 | 401 361 | 4 215 | 1.9 | 415 174 | 8 320 | 1.6 |
| 30 Drawing plants, cold rolling mills, secondary transformation of metals, other metal workshops not elsewhere classified | 3 503 | 993 | 1.2 | 9 671 | 487 | 1.6 | 13 173 | 1 480 | 1.3 |
| 31 Manufacture of structural metal products, rolling stock | 4 046 | 1 276 | 1.4 | 19 524 | 696 | 1.9 | 23 570 | 1 972 | 1.6 |
| 32 Mechanical engineering | 12 233 | 4 857 | 1.8 | 108 958 | 4 097 | 2.3 | 121 192 | 8 954 | 2.0 |
| 33 Manufacture of road vehicles; repair of motor vehicles, etc. | 4 965 | 1 935 | 1.2 | 109 998 | 822 | 2.3 | 114 963 | 2 757 | 1.4 |
| 34 Shipbuilding | 314 | 85 | 1.2 | 6 473 | 109 | 2.4 | 6 787 | 194 | 1.7 |
| 35 Manufacture of aircraft and spacecraft | 111 | 38 | 1.7 | 6 407 | 29 | 1.8 | 6 518 | 67 | 1.8 |
| 36 Electrical engineering; repair of electrical household goods | 5 824 | 2 049 | 1.5 | 97 250 | 1 802 | 2.0 | 103 074 | 3 851 | 1.7 |
| 37 Manufacture of precision and optical instruments, clocks and watches | 3 551 | 1 438 | 1.4 | 10 794 | 500 | 2.1 | 14 345 | 1 938 | 1.5 |
| 38 Manufacture of tools and finished metal goods (excl. electrical equipment) | 6 208 | 2 261 | 1.5 | 26 810 | 1 479 | 2.1 | 33 018 | 3 740 | 1.7 |
| 50 Manufacture of office machinery and data processing equipment | 158 | 60 | 1.6 | 11 566 | 66 | 1.8 | 11 724 | 126 | 1.7 |
| Capital goods industry | 40 914 | 14 992 | 1.5 | 407 450 | 10 087 | 2.1 | 448 364 | 25 079 | 1.7 |
| 39 Manufacture of musical instruments, toys and games, articles of jewellery, fountain pens; working up of natural carving and moulding materials; photographic and cinematographic laboratories | 1 980 | 731 | 1.4 | 3 907 | 217 | 1.5 | 5 887 | 948 | 1.4 |
| 51 Manufacture of ceramic goods | 335 | 109 | 1.2 | 3 356 | 101 | 1.6 | 3 691 | 210 | 1.4 |
| 52 Manufacture and processing of glass | 817 | 209 | 1.2 | 8 358 | 161 | 1.4 | 9 175 | 370 | 1.3 |
| 54 Manufacture of wood products | 7 374 | 2 788 | 1.5 | 21 120 | 1 039 | 1.6 | 28 494 | 3 827 | 1.5 |
| 56 Processing of paper and board | 1 988 | 660 | 1.3 | 15 015 | 488 | 1.7 | 17 003 | 1 148 | 1.5 |
| 57 Printing and duplicating | 5 726 | 1 625 | 1.1 | 11 562 | 403 | 1.2 | 17 288 | 2 028 | 1.1 |
| 58 Manufacture of plastic products | 4 723 | 1 533 | 1.4 | 20 922 | 887 | 1.6 | 25 644 | 2 420 | 1.5 |
| 61 Manufacture of leather | 199 | 42 | 1.1 | 903 | 37 | 1.3 | 1 102 | 79 | 1.2 |
| 62 Manufacture of leather goods | 1 734 | 527 | 1.1 | 4 305 | 154 | 1.2 | 6 039 | 681 | 1.2 |
| 63 Textile industry | 3 960 | 1 246 | 1.4 | 29 822 | 1 437 | 2.0 | 33 781 | 2 683 | 1.7 |
| 64 Clothing industry | 5 595 | 2 582 | 1.3 | 14 730 | 711 | 1.5 | 20 326 | 3 293 | 1.4 |
| 65 Repair of consumer goods (excl. electrical household goods) | 6 | 5 | 1.0 | - | - | - | 6 | 5 | 1.0 |
| Consumption goods industry | 34 436 | 12 057 | 1.3 | 134 000 | 5 635 | 1.6 | 168 435 | 17 692 | 1.4 |
| 68 Food and drink industries | 8 862 | 2 914 | 1.4 | 112 229 | 2 654 | 1.6 | 121 091 | 5 568 | 1.5 |
| 69 Tobacco industry | 111 | 26 | 1.0 | 15 852 | 27 | 1.3 | 15 963 | 53 | 1.2 |
| Food, drink and tobacco industry | 8 974 | 2 940 | 1.4 | 128 081 | 2 681 | 1.6 | 137 054 | 5 621 | 1.5 |
| Total | 98 331 | 34 144 | 1.4 | 1 101 785 | 22 690 | 1.9 | 1 200 115 | 56 834 | 1.6 |

Table 3: Branch of economic activity groups and size classes of production value of enterprises in mining and manufacturing by average number of KAUs per enterprise in 1980

| KAUs per enterprise from more than .... to .... inclusive | Production value of enterprises from ... up to ... Mill. DM | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 and over | 50-100 | 10-50 | 5-10 | 2-5 | 1-2 | up to 1 |
| | Number of branch of economic activity groups | | | | | | |
| 1.0 ..... | 1 | 5 | 1 | 2 | 2 | 6 | 5 |
| 1 - 1.5 ..... | 1 | 3 | 16 | 28 | 25 | 23 | 19 |
| 1.5 - 2 ..... | 3 | 16 | 17 | 5 | 7 | 3 | 3 |
| 2 - 3 ..... | 15 | 10 | 1 | | | | |
| | Branch of economic activity groups with more than 3 KAUs per enterprise and a production value of DM 100 Mill. and over | | | | | | |
| 3.1 ..... | 21 Mining | | | | | | |
| 3.3 ..... | 25 Quarrying, extraction and working up of stone and earths | | | | | | |
| 3.3 ..... | 28 Non-ferrous metal industry, non-ferrous metal semi-finished products industries | | | | | | |
| 3.3 ..... | 30 Drawing plants, cold rolling mills, secondary transformation of metals, other metal workshops not elsewhere classified | | | | | | |
| 3.5 ..... | 63 Textile industry | | | | | | |
| 3.5 ..... | 38 Manufacture of tools and finished metal goods (excl. electrical equipment) | | | | | | |
| 3.6 ..... | 32 Mechanical engineering | | | | | | |
| 3.6 ..... | 33 Manufacture of road vehicles; repair of motor vehicles, etc. | | | | | | |
| 3.7 ..... | 36 Electrical engineering; repair of electrical household goods | | | | | | |
| 3.9 ..... | 51 Manufacture of ceramic goods | | | | | | |
| 4.5 ..... | 29 Foundries | | | | | | |
| 4.5 ..... | 34 Shipbuilding | | | | | | |
| 4.9 ..... | 31 Manufacture of structural metal products, rolling stock | | | | | | |
| 4.9 ..... | 37 Manufacture of precision and optical instruments, clocks and watches | | | | | | |
| 5.8 ..... | 27 Iron and steel industry | | | | | | |

While we have so far been concerned with the numerical distribution of KAUs, Diagram 2 shows the importance of KAUs on the basis of production data. For this purpose, the production of KAUs is shown in relation to production by sector (of enterprises) for percentage shares greater than 0.5 %. The SYPRO two-digit headings are again frames by solid lines. The impression given by Diagram 1, namely that there is a high degree of dispersion of KAUs within certain sectors, is considerably modified by the data on percentage shares of production, since in many cases the values are under 1 % and in only 19 cases does production outside the SYPRO two-digit headings amount to 10 % or more.

In order both to counteract the fragmentation into a large number of insignificant KAUs and to take account of the "concentration" within the SYPRO two-digit headings, the KAUs were defined for an analysis based on SYPRO two-digit headings.

As a result of this changeover to the next higher level of classification, 44 enterprise sectors become fully homogeneous (the enterprises in these SYPRO branches are active only within the SYPRO group); at four-digit level there were only ten. If we draw the line for homogeneity at 95 % of production in the KAU determining the main activity, then 112 out of 208 SYPRO branches are homogeneous.

The number of cases in which more than 10 % of production is achieved in a SYPRO two-digit heading outside the heading determining the main activity increases from 19 to 24 with the changeover from the lowest to the next higher level of classification. This moderate increase emphasizes that in the majority of cases the dispersion in the lines actually involves only small percentages and that the heterogeneous enterprise sectors are of little significance.

The enterprises were subsequently broken down into two size classes of production value in addition to the breakdown by sector. The limit for the classes was set at a production value of DM 10 million, because this is achieved by approximately 100 employees.

Table 2 shows that there is no stratum (combination sector/size class of production value) below the DM 10 million limit in which the average number of KAUs (defined on the basis of 4-digit headings) per enterprise is at least two.

An analysis of the data in a more detailed breakdown by size classes of production value, which for reasons of space is given here only in an abbreviated form, shows that the greatest average number of KAUs is to be found among enterprises with a production value of DM 100 million or more. Here again, however, there are only 15 strata with an average of more than 3 KAUs (see Table 3).

Table 4: KAUs in mining and manufacturing in 1980 by main group and production value of enterprises

| Enterprises with a production value from DM .... Mill. up to .... | Enterprises | | | | KAUs | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | on the basis of SYPRO 2-digit headings | | | on the basis of SYPRO 4-digit headings | | |
| | Number | Share in the group in % | Production value 1 000 DM | Share in the group in % | Number | Share in the group in % | KAUs per enterprise | Number | Share in the group in % | KAUs per enterprise |
| **Mining 1)** | | | | | | | | | | |
| up to 1 | - | - | - | - | - | - | - | - | - | - |
| 1 - 2 | 10 | 12.8 | 15 028 | 0.0 | 10 | 9.7 | 1.0 | 10 | 8.2 | 1.0 |
| 2 - 5 | 22 | 28.2 | 76 956 | 0.2 | 22 | 21.4 | 1.0 | 22 | 18.0 | 1.0 |
| 5 - 10 | 16 | 20.5 | 102 490 | 0.3 | 18 | 17.5 | 1.1 | 18 | 14.8 | 1.1 |
| 10 - 50 | 14 | 17.9 | 328 903 | 1.1 | 21 | 20.4 | 1.5 | 29 | 23.8 | 2.1 |
| 50 - 100 | 3 | 3.8 | 238 661 | 0.8 | 3 | 2.9 | 1.0 | 3 | 2.5 | 1.0 |
| 100 and over | 13 | 16.7 | 30 325 618 | 97.5 | 29 | 28.2 | 2.2 | 40 | 32.8 | 3.1 |
| Total | 78 | 100 | 31 087 655 | 100 | 103 | 100 | 1.3 | 122 | 100 | 1.6 |
| **Basic and producer goods industries 1)** | | | | | | | | | | |
| up to 1 | 44 | 0.8 | 29 040 | 0.0 | 50 | 0.8 | 1.1 | 53 | 0.6 | 1.2 |
| 1 - 2 | 335 | 6.4 | 532 598 | 0.1 | 373 | 5.8 | 1.1 | 438 | 5.3 | 1.3 |
| 2 - 5 | 1 421 | 27.2 | 4 855 564 | 1.2 | 1 589 | 24.5 | 1.1 | 1 933 | 23.2 | 1.4 |
| 5 - 10 | 1 181 | 22.6 | 8 395 969 | 2.0 | 1 325 | 20.4 | 1.1 | 1 681 | 20.2 | 1.4 |
| 10 - 50 | 1 570 | 30.1 | 34 076 906 | 8.2 | 1 921 | 29.6 | 1.2 | 2 508 | 30.1 | 1.6 |
| 50 - 100 | 296 | 5.7 | 20 820 814 | 5.0 | 415 | 6.4 | 1.4 | 523 | 6.3 | 1.8 |
| 100 and over | 370 | 7.1 | 346 463 081 | 83.5 | 807 | 12.5 | 2.2 | 1 184 | 14.2 | 3.2 |
| Total | 5 217 | 100 | 415 173 972 | 100 | 6 480 | 100 | 1.2 | 8 320 | 100 | 1.6 |
| **Capital goods industry 1)** | | | | | | | | | | |
| up to 1 | 334 | 2.2 | 265 942 | 0.1 | 361 | 1.9 | 1.1 | 413 | 1.6 | 1.2 |
| 1 - 2 | 1 857 | 12.5 | 2 921 654 | 0.7 | 2 090 | 11.0 | 1.1 | 2 508 | 10.0 | 1.4 |
| 2 - 5 | 4 877 | 32.8 | 16 108 324 | 3.6 | 5 743 | 30.3 | 1.2 | 7 264 | 29.0 | 1.5 |
| 5 - 10 | 3 053 | 20.5 | 21 617 870 | 4.8 | 3 771 | 19.9 | 1.2 | 4 807 | 19.2 | 1.6 |
| 10 - 50 | 3 622 | 24.3 | 76 091 783 | 17.0 | 4 885 | 25.7 | 1.3 | 6 619 | 26.4 | 1.8 |
| 50 - 100 | 613 | 4.1 | 43 063 267 | 9.6 | 995 | 5.2 | 1.6 | 1 499 | 6.0 | 2.4 |
| 100 and over | 531 | 3.6 | 288 295 373 | 64.3 | 1 133 | 6.0 | 2.1 | 1 969 | 7.9 | 3.7 |
| Total | 14 887 | 100 | 448 364 213 | 100 | 18 978 | 100 | 1.3 | 25 079 | 100 | 1.7 |
| **Consumption goods industry 1)** | | | | | | | | | | |
| up to 1 | 617 | 4.9 | 447 491 | 0.3 | 640 | 4.2 | 1.0 | 746 | 4.2 | 1.2 |
| 1 - 2 | 1 886 | 15.0 | 2 860 103 | 1.7 | 2 147 | 14.2 | 1.1 | 2 464 | 13.9 | 1.3 |
| 2 - 5 | 4 100 | 32.5 | 13 468 640 | 8.0 | 4 815 | 31.8 | 1.2 | 5 495 | 31.1 | 1.3 |
| 5 - 10 | 2 507 | 19.9 | 17 659 304 | 10.5 | 2 989 | 19.8 | 1.2 | 3 352 | 18.9 | 1.3 |
| 10 - 50 | 2 877 | 22.8 | 61 386 154 | 36.4 | 3 606 | 23.8 | 1.3 | 4 292 | 24.3 | 1.5 |
| 50 - 100 | 377 | 3.0 | 25 524 231 | 15.2 | 529 | 3.5 | 1.4 | 749 | 4.2 | 2.0 |
| 100 and over | 235 | 1.9 | 47 089 451 | 28.0 | 404 | 2.7 | 1.7 | 594 | 3.4 | 2.5 |
| Total | 12 599 | 100 | 168 435 374 | 100 | 15 130 | 100 | 1.2 | 17 692 | 100 | 1.4 |
| **Food, drink and tobacco industry 1)** | | | | | | | | | | |
| up to 1 | 77 | 2.0 | 58 652 | 0.0 | 77 | 2.0 | 1.0 | 101 | 1.8 | 1.3 |
| 1 - 2 | 378 | 9.8 | 578 624 | 0.4 | 383 | 9.7 | 1.0 | 468 | 8.3 | 1.2 |
| 2 - 5 | 953 | 24.8 | 3 132 432 | 2.3 | 973 | 24.7 | 1.0 | 1 337 | 23.8 | 1.4 |
| 5 - 10 | 731 | 19.0 | 5 203 825 | 3.8 | 747 | 18.9 | 1.0 | 1 034 | 18.4 | 1.4 |
| 10 - 50 | 1 184 | 30.8 | 27 164 708 | 19.8 | 1 213 | 30.7 | 1.0 | 1 713 | 30.5 | 1.4 |
| 50 - 100 | 245 | 6.4 | 17 189 818 | 12.5 | 258 | 6.5 | 1.1 | 414 | 7.4 | 1.7 |
| 100 and over | 270 | 7.0 | 83 726 067 | 61.1 | 295 | 7.5 | 1.1 | 554 | 9.9 | 2.1 |
| Total | 3 838 | 100 | 137 054 127 | 100 | 3 946 | 100 | 1.0 | 5 621 | 100 | 1.5 |
| **Mining and manufacturing, total 1)** | | | | | | | | | | |
| up to 1 | 1 072 | 2.9 | 801 126 | 0.1 | 1 128 | 2.5 | 1.1 | 1 313 | 2.3 | 1.2 |
| 1 - 2 | 4 466 | 12.2 | 6 908 006 | 0.6 | 5 003 | 11.2 | 1.1 | 5 888 | 10.4 | 1.3 |
| 2 - 5 | 11 373 | 31.1 | 37 641 915 | 3.1 | 13 142 | 29.4 | 1.2 | 16 051 | 28.2 | 1.4 |
| 5 - 10 | 7 488 | 20.4 | 52 979 458 | 4.4 | 8 850 | 19.8 | 1.2 | 10 892 | 19.2 | 1.5 |
| 10 - 50 | 9 267 | 25.3 | 199 048 456 | 16.6 | 11 646 | 26.1 | 1.3 | 15 161 | 26.7 | 1.6 |
| 50 - 100 | 1 534 | 4.2 | 106 836 791 | 8.9 | 2 200 | 4.9 | 1.4 | 3 188 | 5.6 | 2.1 |
| 100 and over | 1 419 | 3.9 | 795 899 590 | 66.3 | 2 668 | 6.0 | 1.9 | 4 341 | 7.6 | 3.1 |
| Total | 36 619 | 100 | 1 200 115 341 | 100 | 44 637 | 100 | 1.2 | 56 834 | 100 | 1.6 |

1) The systematic breakdown applies only to enterprise data, the KAUs belonging to the enterprises may be spread over all SYPRO groups and branches.

Table 4 gives - albeit in highly aggregated form - some additional information to Table 2 by showing in systematic order for main groups and for mining and manufacturing the average number of KAUs per enterprise.

The aggregation for mining and manufacturing in Table 4 shows that the average numbers of KAUS are very low. If the KAUs are defined on the basis of SYPRO groups, even the 1 419 enterprises with a total production of over DM 100 million have an average of only 1.9 KAUs. If on the other hand the KAUs are defined on the basis of SYPRO branches (4-digit headings), then even the enterprises with a total production value of

Table 5: Degrees of homogeneity of branch of economic activity groups in 1980

| Branch of economic activity groups | KAUs | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | | | of enterprises with a production value of more than DM 10 Mill. | | | |
| | Number | Production value | Degree of homogeneity | | Number | Production value | Degree of homogeneity | |
| | | | HA 1) | HP 1) | | | HA 1) | HP 1) |
| | | Mill. DM | % | | | Mill. DM | % | |
| 21 Mining | 116 | 46 061 | 68.68 | 67.46 | 66 | 45 866 | 47.76 | 67.32 |
| 22 Mineral oil refining | 74 | 62 242 | 69.60 | 75.42 | 64 | 62 191 | 67.33 | 75.41 |
| 24 Production and processing of fissionable and fertile materials | 6 | 366 | 100.00 | 100.00 | 4 | 352 | 100.00 | 100.00 |
| 25 Quarrying, extraction and working up of stone and earths | 3 030 | 28 747 | 63.68 | 79.11 | 1 130 | 22 417 | 52.33 | 76.42 |
| 27 Iron and steel industry | 228 | 93 653 | 45.56 | 82.96 | 205 | 93 568 | 43.55 | 82.96 |
| 28 Non-ferrous metal industry, non-ferrous metal semi-finished products industries. | 255 | 25 580 | 60.47 | 67.44 | 230 | 25 488 | 58.50 | 67.35 |
| 29 Foundries | 944 | 15 112 | 53.25 | 56.33 | 530 | 13 734 | 37.95 | 52.88 |
| 30 Drawing plants, cold rolling mills, secondary transformation of metals, other metal workshops not elsewhere classified | 2 198 | 25 133 | 70.91 | 74.91 | 816 | 20 648 | 57.18 | 70.97 |
| 31 Manufacture of structural metal products, rolling stock | 1 879 | 24 292 | 67.27 | 73.65 | 677 | 20 202 | 54.35 | 70.22 |
| 32 Mechanical engineering | 9 053 | 119 933 | 49.51 | 72.64 | 4 158 | 107 836 | 42.70 | 71.24 |
| 33 Manufacture of road vehicles; repair of motor vehicles, etc. | 2 614 | 112 842 | 76.64 | 77.64 | 685 | 107 860 | 50.69 | 76.92 |
| 34 Shipbuilding | 134 | 6 059 | 85.35 | 83.88 | 58 | 5 747 | 78.09 | 83.25 |
| 35 Manufacture of aircraft and spacecraft | 54 | 6 344 | 72.61 | 94.97 | 28 | 6 234 | 61.36 | 94.97 |
| 36 Electrical engineering; repair of electrical household goods | 3 777 | 96 609 | 60.56 | 64.78 | 1 700 | 90 762 | 52.07 | 63.14 |
| 37 Manufacture of precision and optical instruments, clocks and watches | 1 870 | 13 450 | 67.98 | 72.53 | 468 | 9 943 | 48.20 | 64.85 |
| 38 Manufacture of tools and finished metal goods (excl. electrical equipment) | 3 880 | 34 977 | 56.32 | 71.97 | 1 547 | 28 743 | 46.13 | 68.79 |
| 39 Manufacture of musical instruments, toys and games, articles of jewellery, fountain pens; working up of natural carving and moulding materials; photographic and cinematographic laboratories | 955 | 6 059 | 70.09 | 87.34 | 227 | 4 075 | 63.40 | 84.70 |
| 40 Chemical industry | 1 984 | 132 292 | 60.33 | 68.23 | 1 261 | 129 642 | 54.39 | 67.74 |
| 50 Manufacture of office machinery and data processing equipment | 159 | 14 082 | 50.01 | 78.92 | 87 | 13 913 | 45.84 | 78.83 |
| 51 Manufacture of ceramic goods | 215 | 3 996 | 74.21 | 74.53 | 104 | 3 655 | 62.82 | 72.58 |
| 52 Manufacture and processing of glass | 364 | 9 104 | 79.98 | 77.33 | 149 | 8 284 | 74.32 | 75.47 |
| 53 Wood-working | 885 | 7 967 | 60.93 | 80.53 | 319 | 6 214 | 49.36 | 78.97 |
| 54 Manufacture of wood products | 3 618 | 28 177 | 66.90 | 86.83 | 1 012 | 21 021 | 63.10 | 85.86 |
| 55 Manufacture of pulp, paper and board | 191 | 13 710 | 74.15 | 82.56 | 150 | 13 530 | 71.45 | 82.40 |
| 56 Processing of paper and board | 1 133 | 16 624 | 67.57 | 77.10 | 456 | 14 659 | 59.48 | 75.41 |
| 57 Printing and duplicating | 1 975 | 17 871 | 93.08 | 94.21 | 417 | 12 155 | 84.29 | 92.26 |
| 58 Manufacture of plastic products | 2 421 | 29 496 | 69.86 | 76.63 | 985 | 24 688 | 58.98 | 73.79 |
| 59 Manufacture of rubber products | 275 | 10 060 | 72.30 | 87.33 | 146 | 9 646 | 64.55 | 87.02 |
| 61 Manufacture of leather | 76 | 1 107 | 89.13 | 90.17 | 33 | 901 | 87.64 | 88.82 |
| 62 Manufacture of leather goods | 686 | 6 065 | 85.92 | 95.55 | 159 | 4 321 | 77.37 | 94.86 |
| 63 Textile industry | 2 524 | 33 017 | 62.36 | 73.36 | 1 327 | 29 146 | 50.70 | 70.89 |
| 64 Clothing industry | 3 468 | 21 806 | 71.43 | 85.00 | 840 | 16 137 | 59.87 | 82.54 |
| 65 Repair of consumer goods (excl. electrical household goods) | 236 | 96 | 10.86 | 24.56 | 43 | 44 | 1.39 | 4.00 |
| 68 Food and drink industries | 5 506 | 121 346 | 68.70 | 84.61 | 2 611 | 112 522 | 64.19 | 84.20 |
| 69 Tobacco industry | 51 | 15 842 | 89.69 | 94.98 | 26 | 15 732 | 80.67 | 94.95 |
| Total | 56 834 | 1 200 115 | x | x | 22 718 | 1 101 876 | x | x |

1) Measure of homogeneity.

DM 50 to under 100 million have an average of 2.1 KAUs and enterprises with a total production value of over DM 100 million an average of 3.1 KAUs. All the other average numbers are under two.

The figures presented in Tables 2 to 4 suggest the conclusion that over all sectors the number of KAUs increases with the level of production value and therefore with the size of enterprise. These figures also show that enterprises with a maximum production value of DM 10 million or a maximum of 100 employees are largely homogeneous.

Following on from the analysis by sector and size class, an attempt was made in a further stage to quantify the homogeneity/heterogeneity of the sectors by means of a coefficient. For this purpose, the average production of the (identical) KAUs was measured as a proportion of the production of the relevant enterprises. The degree of homogeneity HA = 68.68 in Table 5 means that the "mining" KAUs account on average for 68.68 % of the total production ( = 100 %) of the enterprises with KAUs in the mining sector. As regards the measure of homogeneity HA, the average is determined on the basis of the number of KAUs found in each

case, whereas for the measure of homogeneity HP the average is an arithmetic mean weighted on the basis of production.

$$HA = \frac{1}{n} \sum_{i}^{n} P_i$$

where:

$n$ = number of identical KAUs

$P_i$ = share of a KAU i in the total production of the relevant enterprise (%)

$$HP = \frac{1}{\sum_{i}^{n} G_i} \cdot \sum_{i}^{n} G_i \cdot P_i$$

$G_i$ = production in KAU i of an enterprise.

The high percentages, particularly in the case of the measure of homogeneity HP, show that the KAUs determining the main economic activity clearly dominate the enterprises' production and that the other activities are of secondary importance.

This initial study of the distribution and significance of KAUs indicates that enterprises' diversification takes place predominantly within the SYPRO 2-digit headings or within sectors that can be defined very precisely in terms of an economic classification, so that typical enterprise structures can be assumed for the purposes of estimates. The methods of estimation based on this assessment show that the objectives pursued with the introduction of KAUs can be achieved to a large extent without a problematical breakdown of enterprises and a survey based thereon. These methods of estimation, the data used and the results obtained are described, as already mentioned in the introduction, in a separate paper.

# 2 Estimation Methods and First Results for Kind-of-Activity Units (KAUs) in Mining and Manufacturing

By Manfred Fuhr *)

## 1. Foreword

The results for enterprises and local units recorded and processed as part of the statistics of production industries are shown according to the main economic activity of the units and therefore also contain data on units outside the branch. On the other hand, the use of KAUs makes it possible to show results in terms of homogeneous production processes. Amongst other things, this increases the scope for structural analysis and comparison. Efforts were therefore made originally to collect results for KAUs as part of the annual cost structure statistics. However, as a series of detailed talks with enterprises from various branches of economic activity showed, this would have caused the enterprises barely justifiable difficulties. These problems have already been described at some length in the article "Study on the introduction of kind-of-activity units as a statistical unit in mining and manufacturing"[1]. The Federal Statistical Office's work was therefore aimed primarily at developing estimation methods that can be used to determine reliable data for the variables census value added, turnover, total wages and salaries and number of employees of KAUs.

Following the first estimates of results for KAUs for 1978, made in 1980, further experience has since been gained from the results produced for 1979 and 1980. The knowledge thus gained has led to consolidation of the methods and validation of the results, so that the estimated figures for 1979 and 1980 can now be published for the first time. The introduction of KAUs thus completed achieves a further aim of the reorganization of statistics of production industries.

The introduction of a new statistical unit and the determination of results for it solely by means of estimates can be achieved by various methods, the choice of which is based on a wide variety of conditions. A technical condition is the availability of highly detailed individual data as the smallest building blocks with which the statistical unit is ascertained and from which data can be produced for it by means of appropriate aggregation. It is also an advantage to have further data which serve as basic values for these aggregates. In the system of surveys on production industries KAUs can be identified from the existing statistics and basic data obtained for them. Thus, in practical terms, the production statistics provide data which can be used to delimit KAUs individually. Since in this system individual combinations of data from different surveys are also possible, individual comparisons can also be made over the whole range of variables at enterprise level. By comparing the figures harmonized in this system, macro-economic structures can be determined.

This article follows on from the above-mentioned article which appeared in the October 1983 issue of this publication. Although it is not absolutely essential to be familiar with the latter, this would make it easier to understand the remarks made below. The present article deals with the methodological bases and problems arising from the basic data for the estimates, describes the estimation methods for census value added, turnover, number of employees and total wages and salaries, and presents results obtained for 1980 from these estimates according to main groups and two-digit headings (sectors of activity) of the underlying classification of economic activities SYPRO[2].

## 2. Methodological notes on the list of variables

The framework for the development of statistics for KAUs is constituted by the Directive of the Council of the European Communities[3]. This lays down that data are to be collected for KAUs each year from enterprises

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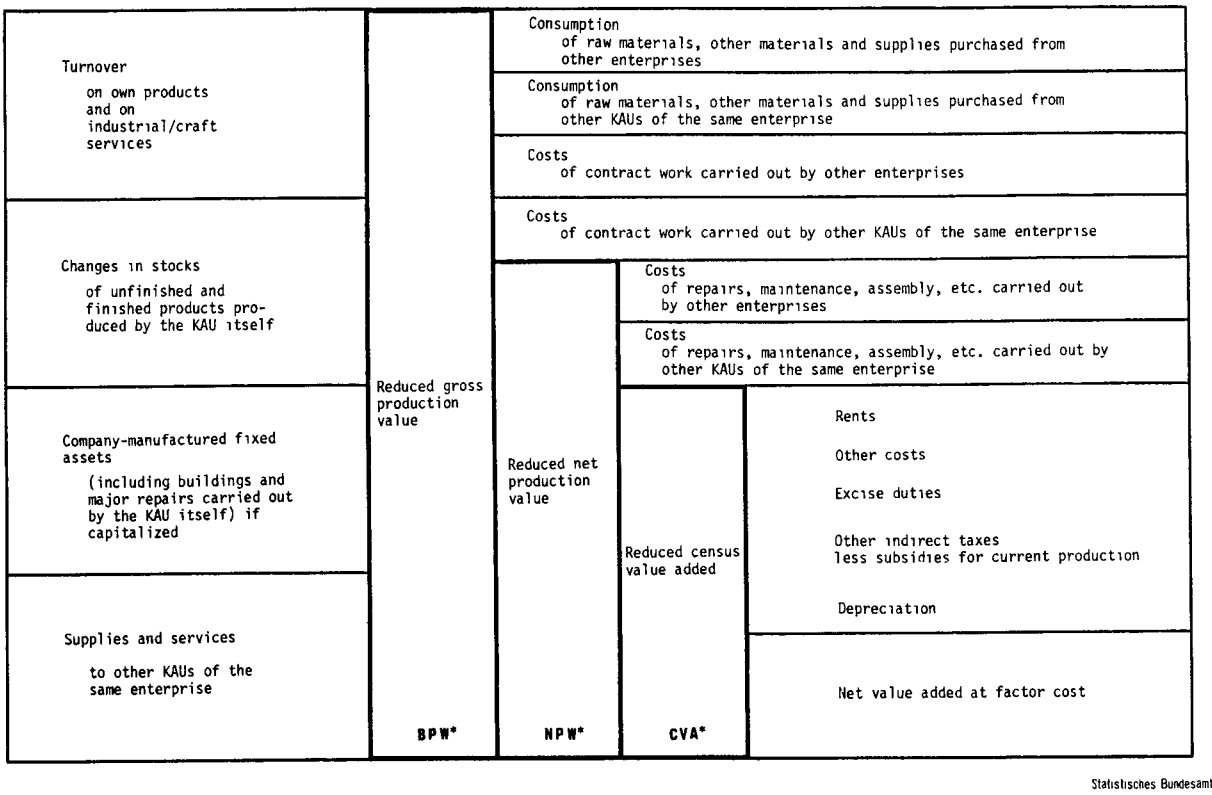
1) See Glaab, H.: "Untersuchungen zur Einführung fachlicher Unternehmensteile als statistische Einheit im Bergbau und Verarbeitenden Gewerbe" in WiSta 10/1983, pp. 770 ff.

2) SYPRO = Industrial Classification of Economic Activities - Version for Statistics of Production Industries - Edition 1979.

3) See SOEC, Doc. No 4000/77: "Coordinated annual inquiry into industrial activity in the Member States of the European Communities".

Figure 1

PRODUCTION ACCOUNT OF A KIND-OF- ACTIVITY UNIT IN PRODUCTION INDUSTRY




with 100 or more employees; for enterprises with fewer than 100 employees, however, a division into KAUs is not regarded as necessary. The results to be published are therefore to refer to KAUs of enterprises in mining and manufacturing with 20 or more employees. According to the above-mentioned Directive, KAUs are defined as statistical units that carry on a single activity as part of an enterprise. The activities are characterized by the nature of the goods or services produced and are defined in terms of a standard classification of economic activities.

For the unit thus defined, in the final phase of development of the statistics for KAUs the number of employees should be shown by employment status, e.g. non-manual worker, together with the individual components of gross production value and a detailed breakdown of intermediate consumption. The aim of this extensive list of variables was to calculate figures for value added up to gross value added at factor cost and to produce meaningful indicators, such as "Total wages per manual worker" or "Turnover per person employed", for homogeneous units. While keeping to the basic aim of determining results for homogeneous units, the list of data to be collected for KAUs in the Federal Republic of Germany was reduced to the variables regarded as essential basic data, namely gross production value, census value added, turnover, number of employees and total wages and salaries. These variables are available for enterprises in such a way as to permit reliable estimates, deriving data for KAUs from the data on enterprises. In view of this situation, an actual survey is not needed in order to meet the basic requirements of the Directive.

The starting point of the list of variables is the determination of gross production value for KAUs. This value can be obtained on the basis of the quarterly production survey for local units. Using data from the file of production industries, the production of local units reported during a year according to the "Commodity Classification for Industry Statistics" (as from the reference year 1982, according to the "Nomenclature of Goods for Production Statistics") is aggregated to give the enterprises' annual production and within the enterprises the manufacture of products of the same kind is classified under the same branch of activity (this is known as the special processing of production statistics). This operation covers KAUs engaged in the production of electricity and in the building industry in addition to mining and manufacturing. They are formed on the basis of the returns on prefabricated buildings produced in manufacturing enterprises; the data on electricity production are taken from the "Survey on electricity generation plant in local units" whose enterprises do not belong to the energy and water supply sector. However, the statistics give only the quantity of electricity produced, so that this production, like production in-

tended for further processing in the same enterprise, has to be valued at average market prices in order to obtain total production values[4].

KAUs are defined on the basis of the production returns aggregated in this way and provide a classification of enterprises by economic activity based on their production activities. The aggregation and valuation give the variable total production value, whose components correspond to the gross production value of a producing KAU.

For enterprises, the gross production values can be obtained from the cost structure survey and - where enterprises are not obliged to provide returns for these sample statistics - from a combination of data from the annual investment survey and the cumulative annual values derived from the monthly report. However, the "production account" of an enterprise includes elements extraneous to production industries, namely activities in trade and other activities of a non-industrial/non-craft type. The variables relating to these activities must be eliminated for the purposes of the study of KAUs in production industries. The gross production value of enterprises which does not include these non-producing components is therefore referred to below as "reduced gross production value".

In Figure 1 the variables by which the production account of the KAUs differs from the production sector of the enterprise are underlined. This makes it easy to show the "balance sheet extension" obtained by dividing the enterprise into KAUs, since in a production account relating solely to the activities of the enterprise the transactions between the KAUs are not considered.

In detail, the following relationships exist between the measures of performance of a producing KAU:

turnover (on own products)
+ change in stocks of finished and unfinished products
+ company-manufactured fixed assets
+ supplies and services to other KAUs of the same enterprise
= gross production value

Gross production value
- consumption of raw materials, other materials and supplies purchased from other enterprises
- consumption of raw materials, other materials and supplies purchased from other KAUs of the same enterprise
- costs of contract work put out to other enterprises
- costs of contract work carried out by other KAUs of the same enterprise
= net production value

Net production value
- costs of repairs, maintenance, assembly, etc. carried out by third parties
- costs of services purchased from other KAUs of the same enterprise
= census value added.

This derivation of the measures of performance shows why net production value, which is often used in the statistics of production industries as value added, is not suitable for analyses at the level of KAUs. It includes transaction flows taking place within the enterprise between the KAUs, namely the costs of other industrial/craft services such as repairs and maintenance. For the study of KAUs, census value added is therefore used as the figure for value added, since all transactions between KAUs are netted out and it can be aggregated to give the value for the enterprise without double counting of KAUs. By analogy with reduced gross production value, the census value added in which trading activities and other activities of a non-industrial or non-craft type are not included, is designated "reduced census value added" at enterprise level. In accordance with the methodological requirements described above, the absolute reduced census value added tallies with the sum of the census valued added figures for producing KAUs. This is a precondition for the reduced census value added which can be calculated for "enterprises covered by the cost structure survey" serving as the basis for the census value added estimate for KAUs.

It has not been possible so far to use any individual data for estimating the other variables; only data aggregated by branch of activity have been used, with the classification criterion for KAUs being determined according to the enterprise's main activity and the activity of the KAU. In this way, summary harmonization of the variables for KAUs is possible with both the enterprise variable and the variable for local KAUs taken from the monthly report on mining and manufacturing for local units. The results for the various units are, however, comparable only up to a point, on account of various methodological factors. Thus, in mining and manufacturing the aggregation of a variable for KAUs on the basis of a classification of economic activities should in fact lead to the same result as the same aggregation for local KAUs, provided the same method of recording is used for the units observed. However, in accordance with the method used for the annual surveys KAUs are only formed by enterprises in mining and manufacturing with 20 or more employees. On the other hand, the group of reporting local KAUs still includes units of enterprises which are not classified under mining and manufacturing and of enterprises with fewer than

4) For details of the method of valuation, see Glaab, H.: "Untersuchungen zur Einführung fachlicher Unternehmensteile ..." in WiSta 10/1983, pp. 772 ff.

20 employees[5]. Moreover, the obligation to report of the units included in the monthly survey is determined on the basis of information taken from a sample month prior to the reporting year. In the annual surveys of enterprises, on the other hand, data are only collected from enterprises which satisfy the criteria for inclusion in the reporting group in the reference year. This leads to reporting groups that are not wholly identical, which means full equality of variables cannot be demanded, despite the harmonization of the classifications. However, as the level of the values of the variables for KAUs and local KAUs will be the same, the estimated results for KAUs can at least be structured by the data for local KAUs.

The definition of turnover on own products covers, for both KAUs and institutional units, sales within the production industries sector; it comprises the proceeds of all products manufactured as part of the production activity. In the case of local KAUs, it may not, as an annual total of cumulated monthly values, include price reductions occurring in the meantime. In the case of enterprises, however, it is taken in the cost structure survey from the enterprises' annual statement of accounts[6]. For the purpose of estimating turnover for KAUs, it is therefore harmonized with the figure for enterprises.

The enterprises' data on the number of employees include, in addition to persons engaged in production, the employees engaged in the other functions (branches of activity) in the enterprise. In the case of local KAUs, in accordance with their definition only economically active persons are shown who can be classified under branches of activity in mining and manufacturing. Accordingly, the data for KAUs must be harmonized in order to obtain a meaningful estimate of the number of employees.

On the other hand, for the estimation of total wages and salaries of KAUs there is no parallel at the level of local KAUs. Instead, the data for local units based on the classification by economic activity and taken from the monthly report on mining and manufacturing are used in order to obtain structural data for the KAUs. In order to determine these figures, certain unclarities in the comparison of the units with one another must be allowed. Since it can be assumed that KAUs are well represented by local units and also that only structural data are used, this lack of clarity seems negligible. On the other hand, the data on total wages and salaries for enterprises are beset with the same problems as those outlined above for the number of employees. In this case, as it is necessary to limit the data to the KAUs observed, the total wages and salaries for enterprises must be restricted to the wages and salaries paid in production industries.

## 3. Establishment of the basis of estimation

In order to show the results according to the subdivision required by the above-mentioned Community Directive, the individual results from a combination of the cost structure survey and the investment survey are first of all compared, as enterprise values, with the total production values of KAUs described in the previous section and these values are then compared with one another by means of a check programme. This is necessary because the units submitting returns for production statistics also include manufacturing local units of enterprises which do not come under mining and manufacturing and local units of enterprises which have fewer than 20 employees and are classified under "exceptional branches of activity"[7]. According to the methodology of the annual surveys of enterprises, however, results for KAUs should only be shown if the enterprise comes under mining and manufacturing and has 20 or more employees.

The enterprises covered by the annual surveys of enterprises constitute the formal framework of the group of reporting units; as already mentioned, the data produced from the special processing of the quarterly production statistics form the technical basis for the enterprise results. The comparison makes it possible to eliminate KAUs whose enterprise does not belong to the required group of reporting units. The existence of a KAU corresponding to the enterprise's main economic activity is checked and the reduced gross production value of the enterprise compared with the sum of the total production values of its KAUs.

Any inconsistencies revealed by this comparison are eliminated by means of careful individual estimates. The implausible cases are dealt with by using, amongst other things, data on the range of production taken from the enterprise's annual report.

The inconsistencies observed in the comparison of the data for enterprises and KAUs are due to both methodological[8] and technical causes. For example, organizational changes in the enterprise/local unit rela-

5) For details see Heppt, E.: "Umstellung des kurzfristigen Berichtssystems im Bergbau und Verarbeitenden Gewerbe" in WiSta 6/1979, pp. 394 ff.

6) For details, see Stock, G.: "Kostenstrukturerhebungen im Bergbau und Verarbeitenden Gewerbe" in WiSta 9/1983, pp. 678 ff.

7) These are 13 activities in the branches stone and earth, wood-working and food and drink industries which are characterized by small enterprises and in which enterprises with generally 10 or more employees are surveyed each month.

8) Regarding the reasons for the differences between the values obtained from the production statistics and the survey of enterprises, see Glaab: "Untersuchung zur Einführung fachlicher Unternehmensteile ..." in WiSta 10/1983, pp. 772 ff.

tionship cannot be incorporated retrospectively in the data base for production statistics but are taken into account in the annual survey of enterprises. Moreover, certain unclarities in the breakdown by activity have to be accepted; these are caused by the fact that the main economic activity of the enterprises has to be determined on the basis of information dating back to before the reference year. If, however, there is a change in an enterprise's production programme during the period under review, this leads to a reallocation of the values to the KAUs, whereby the main activity determined from the previous year no longer has to exist as a KAU or is only very small in comparison with the other KAUs.

The extensive checks ensure the establishment of a basis of estimation which, after the elimination of non-paired cases and adjustment of the values for paired cases, includes the individual total production values of KAUs in production industries defined on the basis of SYPRO four-digit headings[9] and belonging to enterprises with 20 or more employees in mining and manufacturing. This breakdown by activity and the level of the total production values included constitute a structure for both individual enterprises and branches of activity from which the data on the other variables can be derived by means of the estimates described below.

## 4. Estimation of census value added

The method for estimating census value added comprises two stages: in the first stage the value added and, derived therefrom, the share of value added, i.e. the net ratio of census value added to total production value, are determined for KAUs of enterprises covered by the cost structure survey by means of an iterative process, while in the second stage these net ratios are used to determine the census value added for KAUs of enterprises not covered by the cost structure survey.

The methodological starting point for the first stage is the definition of the KAU based on the classification of economic activities, which itself is predominantly product-orientated. Since the economic activities classified according to production method or raw materials are mainly concerned with the result of the production process, it would seem obvious to assume a duality between a KAU and a cost unit defined by the classification of economic activities[10]. Similarly, the census value added can be compared with an element of the apportionment calculation - like the sum of overheads which cannot be directly apportioned. The fact that the calculation component census value added also includes such things as parts of profits in addition to wages and salaries does not impair comparability with the cost category "Overheads" used in the apportionment calculation, since this too includes a "profit" element. Any reference below to the cost category census value added is intended only to illustrate the parallels between the method of estimation and the apportionment calculation.

The only criterion for breaking down the enterprise's census value added, apart from the type of activity, is the total production value. In this first stage, therefore, the enterprise's value added is first of all apportioned to the KAUs on the basis of the total production values. Assuming that the cost category census value added has been taken into account in the relation of the total production values to one another, a breakdown of this kind is permissible. This apportionment gives an initial approximation of the value added of KAUs of enterprises included in the cost structure survey. This value added is used to calculate individual net ratios of the KAUs. For each branch of activity of the KAUs these are used to determine an average net ratio which is applied to the individual total production values of the KAUs in this branch. This stage in the calculation provides new values which in turn are used as logical apportionment criteria to determine the value added of KAUs. The repeated use of this method leads in the first stage to an iterative process which yields branch-specific net ratios (cf. the formulae below).

In the second stage these net ratios are applied to the total production values of all KAUs and, in the case of enterprises covered by the cost structure survey, the census value added is apportioned once again. For each KAU there is an individual value added which in the case of KAUs of enterprises covered by the cost structure survey is harmonized with the enterprise value.

In order to determine the end of the repeating steps in the iterative stage of the estimation, the sum of the quadratic deviations between the values to be used for apportionment purposes and the final census value added values is observed in addition to the trend of the average net ratio. The problems in the choice of calculation formulae have to do with developing the

9) For KAUs, SYPRO means in this case the Industrial Classification of Economic Activities, Edition 1979, Version for Statistics of Production Industries, to which a number of special headings have been added, including "Repairs, assembly, contract processing, etc. of various groups of products".

10) For more detailed remarks on the relationship of the cost unit to the KAU, see Glaab: "Untersuchung zur Einführung fachlicher Unternehmensteile ..." in WiSta 10/1983, pp. 770 ff.

method in such a way that the whole system becomes stable after not too many repetitions, i.e. that only convergent sequences of net ratios are produced.

The following symbols may be used to describe the system by means of formulae.

Let

| | |
|---|---|
| $l = 1,2, \ldots$ | iteration step |
| $i = 1,2, \ldots, n$ | enterprises covered by the cost structure survey |
| $i = n+1, n+2, \ldots, n^*$ | other enterprise in the group of reporting units |
| $j = 1,2, \ldots, k$ | branch of activity of KAUs |
| $ij$ | KAU in branch of activity j of enterprise i |
| $CVA^*_i$ | reduced census value added of enterprise i |
| $GP_{ij}$ | total production value of KAU ij |
| $CVA_{ij}(l)$ | estimated census value added of KAU ij in the lth iteration step |
| $A_j$ | number of KAUs in branch of activity j |
| $NQ_{ij}(l)$ | net ratio of KAU ij in the lth iteration step |
| $NQ_j(l)$ | estimated net ratio for branch of activity j in the lth iteration step |
| $Q_j(l)$ | sum of the quadratic deviations in branch of activity j |

In order to apportion the values on the basis of the total production values, as mentioned above, and to coordinate the branch-specific net ratios, the following calculations are made in the first stage as part of an iteration step.

a) $$\overline{CVA_{ij}}(l) = NQ_j(l-1) \cdot GP_{ij}$$

b) $$CVA_{ij}(l) = \frac{\overline{CVA_{ij}}(l)}{\sum_{j=1}^{k} \overline{CVA_{ij}}(l)} \cdot CVA_i^*$$

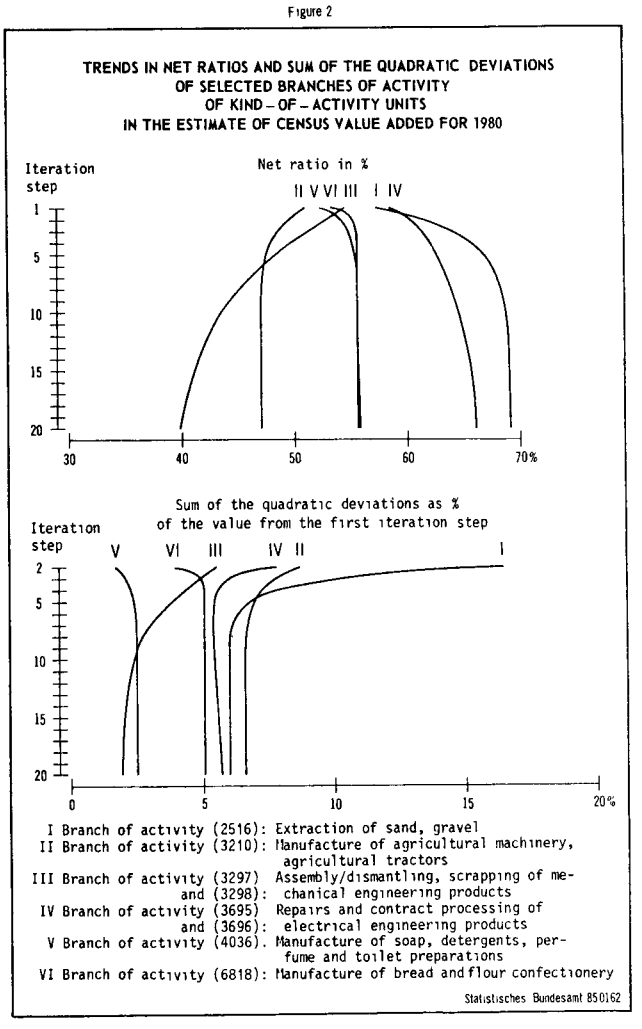
c) $$Q_j(l) = \sum_{i=1}^{n} \left(CVA_{ij}(l) - \overline{CVA_{ij}}(l)\right)^2$$

d) $$NQ_{ij}(l) = \frac{CVA_{ij}(l)}{GP_{ij}} = \frac{\overline{CVA_{ij}}(l)}{\sum_{j=1}^{k} \overline{CVA_{ij}}(l)} \cdot \frac{CVA_i^*}{GP_{ij}}$$

e) $$NQ_j(l) = \frac{\sum_{i=1}^{n} NQ_{ij}(l)}{A_j}$$

With the initial value $NQ_j(0) = 1$ for all j, repetition of calculations a) to e) several times gives an iteration method for estimating net ratios, which are used in the second stage to estimate value added in all KAUs. This comes to the same thing as applying formula a) to the total production value. In order to preserve the additivity of census value added for individual enterprises, the values are also apportioned according to formula b) for the KAUs of enterprises covered by the cost structure survey. The end of the iteration process is determined when the net ratios and the sum of the quadratic deviations in all branches of activity show no - or only a slight - change after a further application of all the calculation formulae.

Figure 2



In order to have a sufficiently large number of KAUs for determining the average net ratio, the 251 economic activity headings for production industries were aggregated into 225 technical codes in processing the data for e.g. the 1980 reference year. After 20 repetitions, the trend of the net ratios and quadratic deviations showed such a stable picture that no further calculation steps were necessary.

Figure 2 shows for selected branches the trend of the net ratios and the sums of the quadratic deviations over the sequence of iteration steps. It can be seen that the net ratio for the KAUs in branch of activity 2516 "Extraction of sand, gravel" has the value of 57.3 %, rises to 69.0 % after 14 repetitions and after a total of 20 repetitions shows a change of only 0.1 percentage points, reaching a value of 69.1 %. In order to be able to show the trend of the quadratic deviation for different branches in one diagram, it is measured as a percentage of the value from the first iteration step. In the case of KAUs in the same branch, as above, the quadratic deviation falls from 16.4 % in the second step to 5.965 % in the 14th step and shows a slight rise to 5.967 % in the 20th step. The more

Table 1: Net ratios of selected branches of activity in 1980

| Branches of activity (M.o. = Manufacture of) | Net ratio 1) of the | | Degree of homogeneity $HP_j$ 4) branches of activity |
|---|---|---|---|
| | KAUs | enter-prices 3) | |
| Mineral oil refining | 36.6 | 33.5 | 75.4 |
| Extraction of sand, gravel | 69.1 | 63.9 | 80.3 |
| Working up of natural stone, n.e.c. | 65.3 | 61.6 | 90.2 |
| M.o. sand-lime bricks | 55.5 | 57.0 | 85.1 |
| M.o. ready-mixed concrete | 37.9 | 39.7 | 91.2 |
| Blast furnace plants, steel mills and hot rolling mills (excl. m.o. steel tubes) | 22.9 | 40.3 | 86.6 |
| Refining of non-ferrous light metals | 23.4 | 31.9 | 69.6 |
| Non-ferrous metal foundries | 52.5 | 54.2 | 52.8 |
| M.o. steelworks and rolling mill equipment etc. (excl. construction machinery ) | 54.5 | 52.1 | 66.6 |
| M.o. construction machinery, machinery for the preparation of building materials and similar machinery | 57.4 | 49.7 | 78.0 |
| M.o. gearwheels, gears, bearings, etc. | 62.6 | 63.8 | 80.9 |
| M.o. other machinery and equipment | 55.4 | 52.2 | 69.4 |
| M.o. motor-cars and motor-car engines | 35.3 | 45.0 | 86.2 |
| M.o. batteries, accumulators | 44.2 | 51.9 | 87.6 |
| M.o. electrical meters, telecommunication equipment, electrical measuring and controlling equipment etc. | 64.0 | 65.1 | 60.7 |
| M.o. optical instruments (excl. spectacles and photographic equipment) | 68.9 | 70.4 | 66.0 |
| M.o. hand tools and agricultural tools and equipment | 62.4 | 59.9 | 74.8 |
| M.o. basic chemicals (also manufacture followed by further processing of such products) | 37.2 | 44.1 | 70.5 |
| M.o. office machinery | 65.6 | 65.0 | 79.1 |
| M.o. data processing equipment | 62.8 | 68.8 | 78.9 |
| M.o. wooden furniture (excl. upholstered furniture) | 53.8 | 51.2 | 91.7 |
| Preparation of wool fibres, twisting and winding of wool | 27.7 | 45.3 | 38.1 |
| M.o. men's outerwear | 58.7 | 48.3 | 88.6 |
| M.o. women's and children's outerwear | 60.4 | 42.6 | 92.5 |
| Grain mills and husking mills | 18.5 | 15.2 | 91.7 |
| Malting | 11.4 | 12.3 | 69.6 |
| Mineral water and soft drink industries | 41.3 | 46.2 | 85.8 |
| M.o. other food products (excl. m.o. compound animal feed) | 50.5 | 41.4 | 56.9 |

1) Value added as % of production value. - 2) From the iterative estimate. - 3) From the cost structure survey. - 4) The degree of homogeneity $HP_j$ is a measure of the homogeneity of the enterprises which have

KAUs in the given branch of activity j. Let
i = 1,2, ..., n enterprises,
j = 1,2, ..., k branch of activity of KAUs,
$GP_{ij}$ = total production value of the KAUs in the branch of activity j of enterprise i,
then

$$HP_j = \frac{100}{\sum_{i=1}^{n} GP_{ij}} \sum_{i=1}^{n} \left( GP_{ij} \cdot \frac{GP_{ij}}{\sum_{j=1}^{k} GP_{ij}} \right)$$

homogeneous a branch of activity is, the closer together are the estimated net ratio for the KAUs and the ratio for the same branch of activity in the cost structure survey. Table 1 shows for branch of activity 2591 "Manufacture of ready-mixed concrete" a slight difference of 1.5 percentage points between the ratio for enterprises and the estimated ratio for KAUs, with a high degree of homogeneity $HP_j$ of 91.2 %. In branch 6301 "Preparation of wool fibres, twisting and winding of wool" with a degree of homogeneity HP of 38.1 %, there is a substantial difference of 17.6 percentage points between the two ratios. The degree of homogeneity is characterized here by the measure $HP_j$, which is described in the above-mentioned article on page 781 of the October 1983 issue.

The ratios calculated according to the technical codes are applied in turn to all KAUs in a specific branch. Although census value added figures for KAUs in branches of activity which for the first stage of estimation are combined under one code are calculated on the basis of the same net ratio in accordance with the above formula a), the classification of the KAU by branch remains the same.

This method gives a value added for each of the KAUs defined on the basis of the production statistics. However, the actual aim of the estimates is not to obtain individual data. The application of this method represents an attempt to take account of enterprises' specific features as expressed in the range of production and input structure, which differ from one enterprise to another, and not to lose individual data through aggregation.

## 5. Estimation of turnover and number of employees

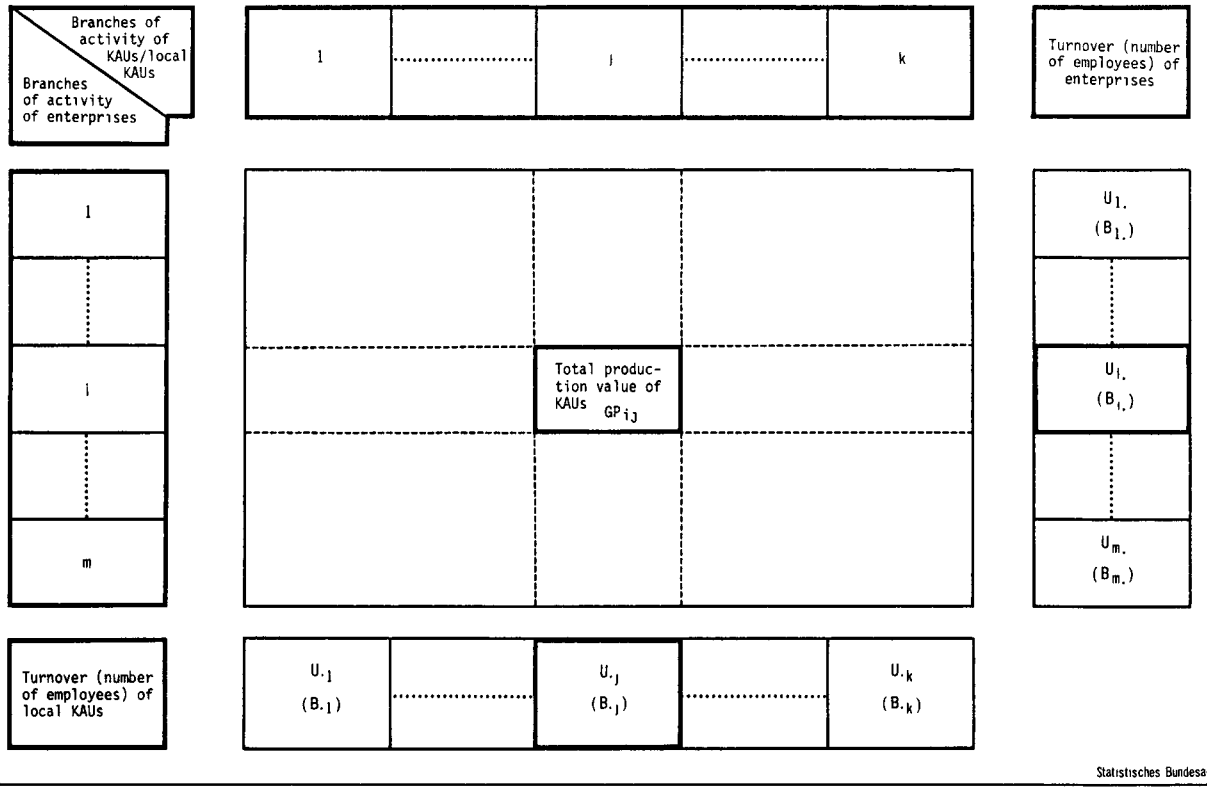
In addition to the institutionally defined data on number of employees and turnover of enterprises, the data of local KAUs are used in order to structure the results to be estimated for the KAUs defined according to activity and institutional criteria, as already mentioned above. This reduces the requirements placed on the estimation model, since the level of the results is validated in the breakdown by activity.

As the results for local KAUs are available only as aggregates for the branch of activity, the estimates themselves are made only at the level defined by the branch of activity of both the enterprises and the local units.

As in the case of census value added, the estimation methods for turnover and number of employees involve an iterative process, although it is based on other conditions. An iteration step is defined as being when the values for enterprises and local KAUs are distributed as marginal totals of a matrix, by means of ratio estimates, over the cells of this matrix. The

Figure 3

DIAGRAM OF THE ESTIMATION OF TURNOVER (NUMBER OF EMPLOYEES) OF KIND-OF-ACTIVITY UNITS



method is similar to one described as long ago as 1942[11], which has also been used by the German Institute for Economic Research (DIW) to compile input-output tables[12]. The individual matrix cells characterize KAUs at the level described above, defined in terms of branches of activity. As Figure 3 shows, the row number designates the branch of the enterprise and the column number that of the KAU. In the margins, the correspondingly defined values of the KAUs are compared with the matrix in the form of a row vector and the enterprise values in the form of a column vector.

In order to arrive at an initial value, it is assumed that the figures for both turnover and number of employees of the KAUs in the matrix are structured in such a way as to correspond to the distribution of the total production value. The permissibility of this assumption is shown by a high degree of correlation between the variable to be estimated and the total production value obtained from the marginal figures of the estimation model. In an analysis for the reference year 1978, the Bravais-Pearson correlation coefficient for turnover and total production has the value r = 0.97 and for number of employees and total production the value r = 0.83.

The enterprises' and local KAUs' figures for number of employees and turnover and the total production values of KAUs classified according to SYPRO four-digit headings are compiled in accordance with the diagram shown in Figure 3. The production values that cannot be attributed to any economic activity (repairs, contract work, assembly, etc.) are allocated to the branches of activity within a sector according to share of total production value.

The sequence of the procedure for determining turnover and number of employees is determined by the methodological restrictions/special features described in the section entitled "Methodological notes on the list of variables". Thus, in estimating turnover the row vector of local KAUs is first of all distributed over the matrix of KAUs, followed by the column vector of enterprises. In estimating the number of employees, the sequence is reversed. As a result, the number of employees of KAUs in a branch of activity is exactly equal to the number of employees of local KAUs in the same branch. In the case of turnover, the data for enterprises are equal to the data for their KAUs.

11) See Stephan, F.F.: "An Iterative Method of Adjusting Sample Frequency Tables when Expected Marginal Totals are Known" in The Annals of Mathematical Statistics 1942, Vol. 13, No 2 pp. 166 ff.

12) See Stäglin, R.: "Aufstellung von Input-Output-Tabellen" in DIW-Beiträge zur Strukturforschung, Vol. 4, 1968, pp. 72 ff.

The calculation formulae for an iteration step for turnover and number of employees can be described by means of the following symbols:

| | |
|---|---|
| $l = 1,2, \ldots\ldots\ldots$ | iteration step |
| $i = 1,2, \ldots\ldots, m$ | branch of activity of enterprises |
| $j = 1,2, \ldots\ldots, k$ | branch of activity of KAUs/local KAUs |
| $B_{i.}\langle U_{i.}\rangle$ | number of employees ⟨turnover⟩ of the enterprises in branch i |
| $B_{.j}\langle U_{.j}\rangle$ | number of employees ⟨turnover⟩ of the KAUs in branch j |
| $B_{ij}(l)\ \langle U_{ij}(l)\rangle$ | number of employees ⟨turnover⟩ of KAUs in branch j of enterprises in branch i after l iteration steps. |

The following formulae are used in calculating turnover:

$$aa)\quad \overline{U_{ij}}(l) = \frac{U_{ij}(l-1)}{\sum_{i=1}^{m} U_{ij}(l-1)} \cdot U_{.j}$$

$$ab)\quad U_{ij}(l) = \frac{\overline{U_{ij}}(l)}{\sum_{j=1}^{k} \overline{U_{ij}}(l)} \cdot U_{i.}$$

Similarly, the formulae used in estimating the number of employees are as follows:

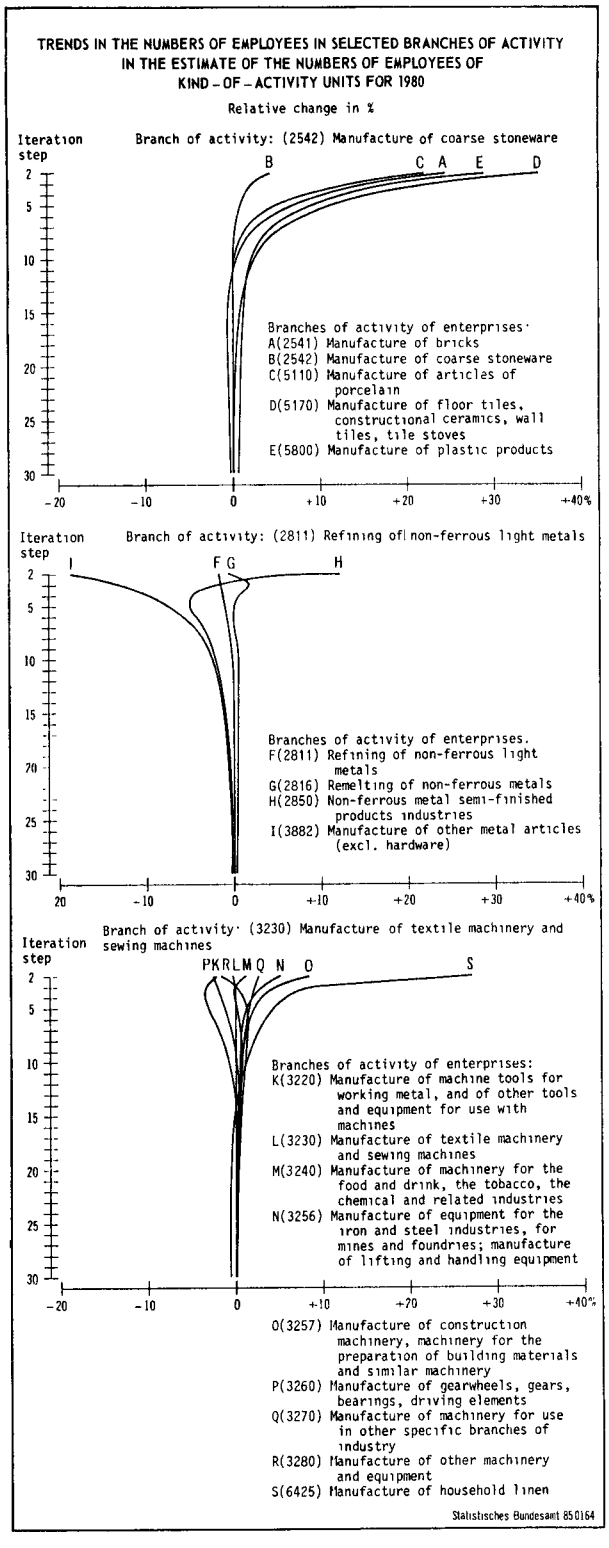
$$ba)\quad \overline{B_{ij}}(l) = \frac{B_{ij}(l-1)}{\sum_{j=1}^{k} B_{ij}(l-1)} \cdot B_{i.}$$

$$bb)\quad B_{ij}(l) = \frac{\overline{B_{ij}}(l)}{\sum_{i=1}^{m} \overline{B_{ij}}(l)} \cdot B_{.j}$$

As the initial value for both estimates, the total production value is substituted into the values $U_{ij}(0)$ and $B_{ij}(0)$, so that the calculation of aa) and ab) - or ba) and bb) - describes a complete iteration step. The estimation procedures described in this way generally converge very quickly. Since the numerical solution represents only an approximation of the actual solution, a further criterion must be given for determining the end of the process. Of possible use in this connection are the absolute and relative change in the values in two successive steps

$$U_{ij}(l) - U_{ij}(l-1) \quad \text{and} \quad \frac{U_{ij}(l)}{U_{ij}(l-1)} - 1,$$

Figure 4




both of which are supposed to be close to zero or almost equal to zero. The formula applies in the same way to the number of employees.

For the reference year 1980, the total production values of KAUs were aggregated to form a matrix with 208 x 209 cells, of which only 3 993 are occupied. The calculations were terminated after 98 steps for both number of employees and turnover.

In order to show how quickly the values converge, Figure 4 shows the relative changes in the figures for number of employees of KAUs in the first 30 repetitions of selected branches of activity, which after only about 25 iteration steps are almost equal to zero.

## 6. Estimation of wages and salaries

As already mentioned in the methodological notes on the variables, there are no figures broken down by activity available for the estimation of wages and salaries, apart from the data on the wages and salaries paid in the whole enterprise and in the individual local units. There are no data for KAUs of the type available for number of employees and turnover. The average total wages and salaries per person employed for enterprises in mining and manufacturing are therefore used for the branches of activity broken down by KAUs. The basic figure for the KAUs is the number of employees estimated in accordance with the method described in the previous section.

It is assumed that the average total wages and salaries per person employed in KAUs of a branch of activity are equal, irrespective of the enterprises' main economic activity. This can be deduced from the equality of the production figures for KAUs in the same branches of activity, since units of this type produce similar (the same) goods irrespective of the branch of activity in which their enterprise is classified. By multiplying the number of employees of KAUs by the enterprises' average total wages and salaries per person employed, a structural picture is obtained in the enterprises' branches of activity for the total wages and salaries of the KAUs in the same branches. The values thus obtained determine the interrelation between the wages and salaries paid in the KAUs.

In order to bring out in this estimate too the connection between the KAUs and the relevant enterprises, in a second step the enterprises' total wages and salaries are apportioned to the KAUs at the most detailed level of breakdown by branch of activity. Since, however, the figure for the enterprise - as in the case of number of employees - covers all economic activities of the enterprise, the wages and salaries for the production sector must be estimated first of all. This is based on the ratio of reduced census value added to census value added of the enterprises, since this is a measure of the relationship of production industries to the whole of the enterprise sector.

The calculations to be made in estimating the total wages and salaries of KAUs can be expressed in terms of the following formulae:

Let

$B_{ij}$ = number of employees of KAUs in branch of activity j of enterprises in branch of activity i

$L_j$ = total wages and salaries of local units in branch of activity j

$B_{.j}$ = number of employees of local units in branch of activity j

$L_i$ = total wages and salaries of enterprises in branch of activity i

$CVA_{i.}$ ($CVA^*_{i.}$) = (reduced) census value added of enterprises in branch of activity i

$L_{ij}$ = estimated total wages and salaries of KAUs in branch of activity j of enterprises in branch of activity i

a) $\overline{L}_{ij} = B_{ij} \cdot \frac{L_{.j}}{B_{.j}}$

b) $L_{i.}^* = \frac{CVA_{i.}^*}{CVA_{i.}} \cdot L_{i.}$

c) $L_{ij} = \frac{\overline{L}_{ij}}{\sum_{j=1}^{k} \overline{L}_{ij}} \cdot L_{i.}^*$

There are no particular problems in applying this method, especially since it does not involve iterations as the methods for the other variables do. It is based rather on already estimated data for the number of employees of KAUs and is therefore dependent on the quality of the estimate of the number of employees.

## 7. Consistency of the estimated results for the different variables

In the methods of estimating basic data by kind of activity described above, particular importance is attached to the need for harmonization in two dimensions. Wherever it is possible by definition, the requirement is imposed - and incorporated in the method - that the sum of the values for KAUs be equal to the value for the enterprise. At the same time, it is assumed that units in the same branch of activity are similar, and the variable is required to be additive in respect of the local KAUs. These conditions for the variables to be estimated are a logical continuation of the possibilities used in the basic statistics of detecting inconsistencies by means of plausibility checks. The problems of the methods described lie mainly in difficulties of definition connected with the systematic delimitation of the units or the content of the variables.

The estimation methods attempt to find a compromise between the various frameworks defined by the basic statistics - a compromise which is in keeping with the understanding of these statistical units. The results of these estimates are used to ascertain to what extent the methods achieve this objective. For this purpose, the estimated values at the most detailed level of breakdown are compared with the help of ratios derived from the cost structure survey. In order to obtain a system which is consistent from one variable to another, the following ratios are determined for KAUs and enterprises covered by the cost structure survey: turnover/production value, census value added/production value, census value added/turnover, total wages and salaries/census value added, total wages and salaries/number of employees and turnover/number of employees. In the comparisons, particular attention is paid to the dispersion of the indicators for enterprises in the same branch of activity in order to have, in addition to the comparison with results by branch of activity, a basis of measurement which can be used to lay down a range for the estimated results within which the values are to be regarded as plausible.

The checks are meaningful, however, only in the case of KAUs that have a sufficiently high weight, which is determined by the proportion of the total production value of the KAUs in a branch of industry to the total production value of the branch of industry of the enterprise to which they belong. Moreover, the institutional branch aggregates are comparable with the enterprise results.

The implausibilities in the estimated results ascertained by means of these checks can be eliminated by, for example, further aggregation of the branches of activity into sectors and are duly taken into account in the figures presented. Even at the lowest aggregation level, more than 90 % of the variables for 1979, for example, proved to be plausible.

## 8. Results

Table 2 gives some idea of the dispersion of the branches of activity of enterprises over the production sectors as defined on the basis of the production statistics. This table, which is broken down by main groups of enterprises and their KAUs, shows the occupancy ratios, the total production values as basic data and the estimated results for the other variables. It can be seen that both the KAUs themselves and the variables relating to them are concentrated almost exclusively on the enterprises' branch of activity of the same name. Thus, out of the 236 000 persons employed in mining enterprises, 226 000 are employed in KAUs in the same sector. In the basic and producer goods industries, 90.7 %

Table 2: Kind-of-activity units by main groups of enterprises and KAUs in 1980

| Main groups of KAUs | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per person employed |
|---|---|---|---|---|---|---|---|---|---|
| | Number | in 1 000 | Mill. DM | | | | % | DM | |
| **Mining 1)** | | | | | | | | | |
| Mining | 84 | 226 | 13 392 | 29 965 | 8 241 | 23 534 | 44.7 | 104 175 | 36 478 |
| Basic and producer goods industries | 24 | 8 | 311 | 1 032 | 281 | 2 406 | 30.2 | 320 768 | 37 468 |
| Capital goods industry | . | . | . | . | . | . | . | . | . |
| Consumption goods industry | . | . | . | . | . | . | . | . | . |
| Food, drink and tobacco industries. | – | – | – | – | – | – | – | – | – |
| Total | 122 | 236 | 13 750 | 31 088 | 8 608 | 26 537 | 44.2 | 112 413 | 36 465 |
| **Basic and producer goods industries 1)** | | | | | | | | | |
| Mining | 26 | 12 | 5 201 | 15 893 | 449 | 3 069 | 32.7 | 251 142 | 36 773 |
| Basic and producer goods industries | 7 130 | 1 388 | 127 733 | 382 583 | 50 179 | 297 574 | 33.4 | 214 378 | 36 150 |
| Capital goods industry | 647 | 88 | 4 165 | 8 352 | 2 880 | 13 714 | 49.9 | 156 602 | 32 884 |
| Consumption goods industry | 465 | 69 | 3 559 | 7 522 | 1 977 | 11 225 | 47.3 | 163 667 | 28 830 |
| Food, drink and tobacco industries. | 52 | / | 200 | 825 | 5 | / | 24.2 | / | 33 910 |
| Total | 8 320 | 1 557 | 140 857 | 415 174 | 55 491 | 328 094 | 33.9 | 210 774 | 35 648 |
| **Capital goods industry 1)** | | | | | | | | | |
| Mining | . | . | . | . | . | . | . | . | . |
| Basic and producer goods industries | 800 | 80 | 5 243 | 12 115 | 2 645 | 5 601 | 43.3 | 70 259 | 33 182 |
| Capital goods industry | 23 482 | 3 660 | 223 963 | 432 064 | 123 633 | 408 250 | 51.8 | 111 551 | 33 782 |
| Consumption goods industry | 792 | 41 | 2 114 | 3 984 | 1 147 | 3 589 | 53.0 | 86 657 | 27 695 |
| Food, drink and tobacco industries. | . | . | . | . | . | . | . | . | . |
| Total | 25 079 | 3 781 | 231 404 | 448 364 | 127 447 | 417 454 | 51.6 | 110 394 | 33 703 |
| **Consumption goods industry 1)** | | | | | | | | | |
| Mining | . | . | . | . | . | . | . | . | . |
| Basic and producer goods industries | 503 | 29 | 1 531 | 4 153 | 870 | 3 923 | 36.9 | 137 043 | 30 399 |
| Capital goods industry | 786 | 21 | 1 270 | 2 545 | 649 | 2 975 | 49.9 | 142 793 | 31 140 |
| Consumption goods industry | 16 399 | 1 473 | 78 456 | 161 730 | 38 550 | 145 929 | 48.5 | 99 096 | 26 178 |
| Food, drink and tobacco industries. | . | . | . | . | . | . | . | . | . |
| Total | 17 692 | 1 522 | 81 260 | 168 435 | 40 069 | 152 829 | 48.2 | 100 408 | 26 325 |
| **Food, drink and tobacco industries 1)** | | | | | | | | | |
| Mining | . | . | . | . | . | . | . | . | . |
| Basic and producer goods industries | 100 | 25 | 288 | 506 | 857 | 131 | 45.0 | 5 216 | 34 246 |
| Capital goods industry | . | . | . | . | . | . | . | . | . |
| Consumption goods industry | . | . | . | . | . | . | . | . | . |
| Food, drink and tobacco industries. | 5 501 | 480 | 49 898 | 136 359 | 13 146 | 124 749 | 36.6 | 259 928 | 27 392 |
| Total | 5 621 | 516 | 50 252 | 137 054 | 14 304 | 129 892 | 36.7 | 251 698 | 27 717 |
| **Total mining and manufacturing 1)** | | | | | | | | | |
| Mining | 116 | 239 | 18 681 | 46 061 | 8 711 | 26 617 | 40.6 | 111 491 | 36 491 |
| Basic and producer goods industries | 8 558 | 1 529 | 135 045 | 400 390 | 54 833 | 309 635 | 33.7 | 202 513 | 35 863 |
| Capital goods industry | 24 932 | 3 775 | 229 453 | 443 059 | 127 365 | 425 507 | 51.8 | 112 713 | 33 738 |
| Consumption goods industry | 17 671 | 1 589 | 84 246 | 173 418 | 41 857 | 165 783 | 48.6 | 104 306 | 26 336 |
| Food, drink and tobacco industries. | 5 557 | 480 | 50 099 | 137 187 | 13 152 | 127 264 | 36.5 | 265 079 | 27 394 |
| Total | 56 834 | 7 612 | 517 524 | 1 200 115 | 245 919 | 1 054 807 | 43.1 | 138 566 | 32 305 |

1) The economic classification refers to main groups of the enterprises to which the KAUs belong.

of the approximately DM 140 000 million census value added of enterprises is generated by KAUs in the same main group.

The first conclusion to be drawn from the above remarks, which apply to all the variables, is that in order to present results for KAUs extracts are sufficient to show the special features of branches of activity. Analysis of a sector at a more detailed level of breakdown, such as that given in Table 3 for mechanical engineering, shows that here too the vast majority of the values are concentrated on the KAUs which represent the main activity of the enterprises. There are extreme values for the number of employees in the case of the KAUs determining the main activity. The highest value (90 %) is found for KAUs in branch of activity 3260 "Manufacture of gearwheels, gears, bearings, etc." and the lowest (68.8 %) in branch 3256 "Manufacture of equipment for the iron and steel industries etc.". The figures for KAUs which are not in the same branch of activity as the enterprise show clearly that in the mechanical engineering sector the branches of activity of the enterprises include a fairly large number of units extraneous to the branch. In Table 3, approximately 17.2 % of the turnover in other branches of mechanical engineering is realized on products which

Table 3: KAUs of enterprises in mechanical engineering in 1980 by branch of activity of the enterprises

| Sector of activity of the KAUs (M.o. = Manufacture of) | Proportion (%) of the branch of activity of the enterprises | | | | |
|---|---|---|---|---|---|
| | Number of employees | Census value added | Total production value | Wages and salaries | Turnover |
| **M.o. agricultural machinery, agricultural tractors** | | | | | |
| M.o. agricultural machinery, agricultural tractors | 78.69 | 78.08 | 81.10 | 77.28 | 81.79 |
| Other branches of mechanical engineering | 8.74 | 10.19 | 8.34 | 8.58 | 7.05 |
| Outside the mechanical engineering sector | 12.57 | 11.73 | 10.56 | 14.14 | 11.16 |
| **Manufacture of machine-tools for working metal, and of other tools and equipment for use with machines** | | | | | |
| M.o. machine-tools for working metal, and of other tools and equipment for use with machines | 86.54 | 89.21 | 88.33 | 85.97 | 86.10 |
| Other branches of mechanical engineering | 3.85 | 4.86 | 5.21 | 3.83 | 5.95 |
| Outside the mechanical engineering sector | 9.61 | 5.93 | 6.46 | 10.20 | 7.95 |
| **M.o. textile machinery and sewing machines** | | | | | |
| M.o. textile machinery and sewing machines | 88.79 | 89.13 | 87.76 | 88.52 | 87.96 |
| Other branches of mechanical engineering | 5.77 | 5.98 | 6.76 | 5.75 | 7.08 |
| Outside the mechanical engineering sector | 5.44 | 4.89 | 5.48 | 5.73 | 4.96 |
| **M.o. machinery for the food and drink, the tobacco, the chemical and related industries** | | | | | |
| M.o. machinery for the food and drink, the tobacco, the chemical and related industries | 80.95 | 85.57 | 83.81 | 80.52 | 81.43 |
| Other branches of mechanical engineering | 10.49 | 9.83 | 10.81 | 10.44 | 12.93 |
| Outside the mechanical engineering sector | 8.56 | 4.60 | 5.38 | 9.04 | 5.64 |
| **M.o. equipment for the iron and steel industries etc. (excl. construction machinery)** | | | | | |
| M.o. equipment for the iron and steel industries etc. (excl. construction machinery) | 68.76 | 71.80 | 72.38 | 68.00 | 70.26 |
| Other branches of mechanical engineering | 15.66 | 15.51 | 14.69 | 15.52 | 15.96 |
| Outside the mechanical engineering sector | 15.58 | 12.69 | 12.93 | 16.48 | 13.78 |
| **M.o. construction machinery, machinery for the preparation of building materials and similar machinery** | | | | | |
| M.o. construction machinery, machinery for the preparation of building materials and similar machinery | 80.92 | 86.78 | 86.64 | 80.39 | 86.42 |
| Other branches of mechanical engineering | 10.75 | 4.95 | 9.94 | 10.68 | 9.54 |
| Outside the mechanical engineering sector | 8.33 | 8.27 | 3.42 | 8.93 | 4.04 |
| **M.o. gearwheels, gears, bearings, etc.** | | | | | |
| M.o. gearwheels, gears, bearings, etc. | 89.96 | 88.88 | 88.20 | 89.19 | 88.63 |
| Other branches of mechanical engineering | 4.91 | 5.22 | 5.43 | 4.87 | 4.52 |
| Outside the mechanical engineering sector | 5.13 | 5.90 | 6.37 | 5.94 | 6.85 |
| **M.o. machinery for use in other specific branches of industry** | | | | | |
| M.o. machinery for use in other specific branches of industry | 82.27 | 85.23 | 84.24 | 82.02 | 86.77 |
| Other branches of mechanical engineering | 10.97 | 9.32 | 9.78 | 10.94 | 8.52 |
| Outside the mechanical engineering sector | 6.76 | 5.45 | 5.98 | 7.04 | 4.71 |
| **M.o. other machinery and equipment** | | | | | |
| M.o. other machinery and equipment | 74.87 | 74.57 | 73.07 | 73.68 | 72.14 |
| Other branches of mechanical engineering | 11.29 | 10.78 | 11.60 | 11.11 | 10.69 |
| Outside the mechanical engineering sector | 13.84 | 14.65 | 15.33 | 15.21 | 17.17 |

Table 4: Turnover of KAUs as a proportion of the sector of activity 1) of enterprises in 1980

| Sector of activity 1) of the enterprises (M.o. = Manufacture of) | Proportion of the turnover of KAUs in the branch of activity 1) of the enterprises % | Proportion of the turnover of KAUs in the sector of activity 2) of the enterprises % |
|---|---|---|
| Mining | 88.7 | 88.2 |
| Mineral oil refining | 76.2 | |
| Production and processing of fissionable and fertile materials | 100.0 | |
| Quarrying, extraction and working up of stone and earths | 97.4 | 84.0 |
| Iron and steel industry | 87.4 | 81.3 |
| Non-ferrous metal industry, non-ferrous metal, semi-finished products industries | 84.6 | 74.3 |
| Foundries | 69.0 | 68.3 |
| Drawing plants, cold rolling mills, etc. | 91.0 | 87.4 |
| M.o. structural metal products, rolling stock | 82.4 | 76.6 |
| Mechanical engineering | 88.9 | 78.9 |
| M.o. road vehicles; repair of motor vehicles, etc. | 96.8 | 88.7 |
| Shipbuilding | 84.9 | |
| M.o. aircraft and spacecraft | 99.2 | |
| Electrical engineering; repair of electrical household goods | 93.3 | 75.6 |
| M.o. precision and optical instruments, clocks and watches | 81.3 | 75.5 |
| M.o. tools and finished metal goods | 84.8 | 78.8 |
| M.o. musical instruments, toys and games, fountain pens, etc. | 90.9 | 88.6 |
| Chemical industry | 81.3 | 65.1 |
| M.o. office machinery and data processing equipment | 80.2 | 77.0 |
| M.o. ceramic goods | 94.1 | 83.7 |
| M. and processing of glass | 94.9 | 82.4 |
| Wood-working | 92.0 | 82.8 |
| M.o. wood products | 93.0 | 88.4 |
| M.o. pulp, paper and board | 84.5 | |
| Processing of paper and board | 80.2 | 77.7 |
| Printing and duplicating | 93.7 | |
| M.o. plastic products | 82.8 | |
| M.o. rubber products | 83.5 | |
| M.o. leather | 92.3 | |
| M.o. leather goods | 97.2 | |
| Textile industry | 91.5 | 75.6 |
| Clothing industry | 98.3 | 90.2 |
| Repair of consumer goods (excl. electrical household goods) | 100.0 | 100.0 |
| Food and drink industries | 99.8 | 88.0 |
| Tobacco industry | 68.1 | 65.7 |

1) SYPRO two-digit headings. - 2) SYPRO four-digit headings.

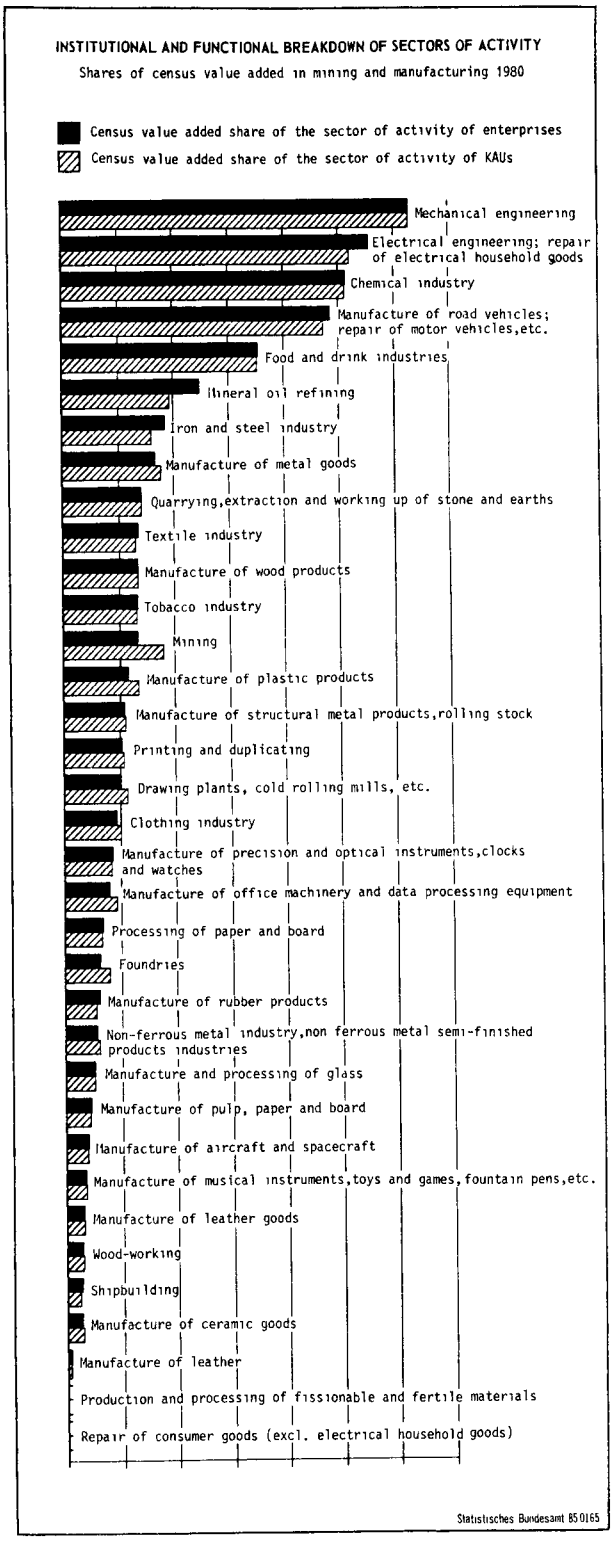
cannot be classified as mechanical engineering[13].

A fuller description of the extraneous units of the branches of activity of the enterprises can be obtained from Table 4, which shows the breakdown for turnover.

Apart from the two homogeneous sectors of activity 24 and 65, Table 4 shows an uneven picture but in 23 of the remaining 33 sectors roughly 85 % or more of turnover is realized in the branch of activity of the enterprise.

13) Further data on the main groups and mechanical engineering for 1980 are given in the section of tables, which also gives results for 1979.

Figure 5




The lowest proportion of turnover realized by KAUs in the branch of activity of the enterprises is in the chemical industry, i.e. only 65.1 %. The proportion of KAUs in the same sector of activity is 16.2 percentage points higher at 81.3 %. There is very little increase between branch and sector of activity in mining (+ 0.5 %) and in foundries, in which the difference amounts to 0.7 %. The greatest difference is to be found in the case of enterprises in electrical engineering, where

Table 5: Number of employees in selected branches of activity of KAUs

| Branch of activity of the KAUs | Branch of activity of the enterprises in which the activity of the KAUs shows the greatest proportion of the number of employees | | Branch of activity of the enterprises with the greatest proportion of the number of employees within the branch of activity of KAUs | |
|---|---|---|---|---|
| | Branch of activity | Proportion (%) of the number of employees in the branch of activity of the enterprise | Branch of activity | Proportion(%) of the number of employees in the branch of activity of the KAUs |
| Extraction of petroleum and natural gas | Extraction of petroleum and natural gas | 72 | Mineral oil refining | 44 |
| Quarrying of limestone, gypsum, chalk | Quarrying of limestone, gypsum, chalk | 48 | Manufacture of cement | 36 |
| M.o. large prefabricated structural components of concrete for building | M.o. of large prefabricated structural components of concrete for building | 75 | M.o. concrete products (excl. pumice building material, large prefabricated structural components for buildings) | 48 |
| Forging,pressing and hammer works | Forging, pressing and hammer works | 61 | Blast furnace plants, steel mills and hot rolling mills (excl. manufacture of steel tubes) | 59 |
| M.o. switches, intersections and similar track material | M.o. of switches, intersections and similar track material | 99 | Blast furnace plants, steel mills and hot rolling mills (excl. manufacture of steel tubes) | 41 |
| Repair of electrical household goods | Repair of electrical household goods | 95 | M.o. domestic type electric appliances | 40 |
| M.o. household linen | M.o. household linen | 54 | Weaving of cotton, n.e.c. | 52 |
| Repair of consumer goods (excl. electrical household goods) | M.o. musical instruments | 1 | M.o. photographic, projection and cinematographic equipment | 29 |

only 75.6 % of turnover is generated in the branch of activity of the enterprises but the turnover relating to electrical engineering as a whole amounts to 93.3 % of total turnover of the sector of activity.

Since the branches of activity can be formed according to both activity and institutional criteria, census value added is particularly suitable for a comparison of these two categories. Figure 5 shows the sectors of activity classified in order of their institutionally defined shares of value added. Mechanical engineering is the largest sector, accounting for 12.5 % of the value added of mining and manufacturing at both enterprise and KAU level. It should be noted that in the first seven positions the order of the sectors is the same if the comparison is based on activity or an institutional breakdown. Also of note are large differences of one percentage point in opposite directions between the share of the enterprises' sector of activity and that of the KAUs in the case of mineral oil refining and mining. Mining is of particular importance in the case of enterprises which have their main activity in the basic and producer goods industries. On the other hand, enterprises in mineral oil refining are extremely active in other sectors, although this is not reciprocated. The importance of KAUs vis-à-vis enterprises is thus not so great in this sector.

Particular attention is to be paid to an activity of KAUs if it plays a major part in a branch of activity of enterprises but is itself carried out to a large extent by enterprises in other branches. Table 5 shows activities with an adequate occupancy ratio which on the basis of the number of employees make up the greatest proportion of the activities of the enterprises in a branch of activity but themselves are carried out primarily by enterprises in other branches. An analysis at the level of sectors of activity shows no dominances outside the enterprise's main activity except in one case; at the lowest level 17 out of 209 economic activities of KAUs are not carried out principally by enterprises in this branch. Thus, although in the branch "Extraction of petroleum and natural gas" 72 % of the persons employed are found in enterprises in the same branch, the majority of persons involved in this activity are employed in enterprises engaged in mineral oil refining.

Table 6 shows for the chemical industry an analysis of value added by branch of activity of enterprises and KAUs, census value added being shown as a proportion of the enterprise figure. The results thus compiled are used to aggregate the production indices for KAUs to give indices for enterprises. As can be seen from this table, more than 70 % of the enterprises in branch 4039 "Manufacture of chemical products, mainly for industrial and agricultural purposes" are engaged in this activity, which means that the short-term trends in these KAUs have a decisive influence on enterprise branch 4039. However, since 11.9 % of the value added of these enterprises is generated in branch 3980 "Manufacture of fountain pens and the like; working up of natural carving and moulding materials", this structural factor also has a pertinent influence on short-term trends in

Table 6: Extract from the weighting scheme for the production index with base 1980 for the chemical industry

| Classification No.1) | Branches of activity of the KAUs (M.o. = Manufacture of) | Proportion of the census value added in the branch of activity of the enterprise in %. | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 4031 1) M.o. basic chemicals (also manufacture followed by further processing of such products) | 4034 M.o. chemical products, mainly for industrial and agricultural purposes | 4035 M.o. pharmaceutical products | 4036 M.o. soap, detergents, perfume and toilet preparations | 4037 M.o. photographic chemical material | 4039 M.o. other chemical products, chiefly for household and office use | 4090 Man-made fibres industry |
| 2200 | Mineral oil refining | . | - | - | - | - | - | - |
| 2850 | Non-ferrous metal semi-finished products industries | 8 | - | - | - | - | - | - |
| 3015 | Steel-wire drawing (incl. m.o. steel-wire products) | - | - | - | - | - | - | . |
| 3240 | M.o. machinery for the food and drink, the tobacco, the chemical and related industries | - | - | - | - | - | . | - |
| 3721 | M.o. photographic, projection and cinematographic equipment | - | - | - | - | . | - | - |
| 3760 | M.o. medical and orthopaedic mechanical appliances | - | - | 10 | - | - | - | - |
| 3842 | M.o. articles made of sheet steel (excl. furniture) | - | - | - | - | - | . | - |
| 3931 | M.o. toys and games, Christmas tree decoration | - | - | - | - | - | 9 | - |
| 3980 | M.o. fountain pens and the like; working up of natural carving and moulding materials | - | - | - | - | - | 119 | - |
| 4031 | M.o. basic chemicals (also manufacture followed by further processing of such products) | 780 | 58 | 15 | 59 | . | - | 145 |
| 4034 | M.o. chemical products, mainly for industrial and agricultural purposes | 93 | 860 | 21 | 55 | . | 73 | - |
| 4035 | M.o. pharmaceutical products | 62 | 50 | 931 | 49 | - | - | - |
| 4036 | M.o. soap, detergents, perfume and toilet preparations | - | 6 | 23 | 775 | - | 24 | - |
| 4037 | M.o. photographic chemical material. | - | - | - | - | 508 | - | - |
| 4039 | M.o. other chemical products, chiefly for household and office use | - | - | - | 25 | . | 708 | - |
| 4090 | Man-made fibres industry | 19 | - | - | - | . | - | 700 |
| 5060 | M.o. office machinery | - | - | - | - | - | . | - |
| 5500 | M.o. pulp, paper and board | - | - | - | - | - | . | - |
| 5691 | M.o. other articles of paper and board | - | - | - | 37 | - | - | - |
| 5700 | Printing and duplicating | . | - | - | - | . | - | - |
| 5800 | M.o. plastic products | 24 | 14 | - | - | - | 13 | - |
| 5900 | M.o. rubber products | - | 12 | - | - | - | - | - |
| 6323 | Throwing, m.o. thread from silk, texturing | - | - | - | - | . | - | 74 |
| 6332 | Weaving of cotton, n.e.c. | - | - | - | - | - | - | . |
| | Total | 1 000 | 1 000 | 1 000 | 1 000 | 1 000 | 1 000 | 1 000 |

1) Industrial Classification of Economic Activities, Edition 1979 - Version for Statistics of Production Industries (SYPRO), brief descriptions.

the branch of activity of the enterprises.

## 9. Outlook

The methods described in this article meet the demand for annual basic data on number of employees, turnover, value added and wages and salaries for KAUs. Since the basic statistics used are largely exhausted by the estimates, there is virtually no scope for development of the methods applied. A significant improvement can be expected, however, if the basic figures are mutually validated by further individual data and comparisons. Particular consideration should be given to the possibility of obtaining information on the breakdown of en-

terprises by activity by processing data for KAUs taken from the cumulative annual figures in the monthly report on local units in mining and manufacture; this was done for the first time for 1980. The data on the activity of local units can be aggregated with the help of the file to give data on activities of enterprises, the directly recorded data being compared with the data derived from the production statistics. This comparison relates to both the existence of the activities and the values of the variables which represent them. On the one hand, this extension of the comparison considerably augments the information on the completeness of the production data and gives reason to suppose that the breakdown by activity will become more stable over the years. On the other hand, a comparison of number of employees and turnover between enterprises and their KAUs leads to overall harmonization of the figures.

In addition, the information on local KAUs provides data on persons not engaged in production industries and persons employed in KAUs of the construction industry, which are available only as overall figures in the data for enterprises. Moreover, the yearly cumulation of the monthly returns on number of employees represents a flow to be used for apportioning local units' total wages and salaries to local KAUs.

It is impossible to say definitely at present whether this exercise and the subsequent reconciliation between the results of the various surveys will create the precondition for taking over from the methods of estimation of turnover and number of employees of KAUs described in this article. Another question to be considered is to what extent the estimation of wages and salaries can be improved by a refined method which after individual harmonization of the figures for number of employees and total wages and salaries between enterprises and local units apportions the wages and salaries recorded in local units to their local KAUs. The wage and salary figure obtained in this way for local KAUs would then be aggregated to give data for KAUs. Such a method would probably lead to greater accuracy since account can be taken of enterprises' individual features.

The central element of the estimates remains, however, the determination of census value added in accordance with the procedure described, although the method to be applied can also take account of non-production activities of the enterprises.

Annex to article: "Estimation methods and first results for kind-of-activity units (KAUs) in mining and manufacturing"

KIND-OF-ACTIVITY UNITS BY MAIN GROUPS OF ENTERPRISES AND KAUs IN 1979

| Main groups of KAUs | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per person employed |
|---|---|---|---|---|---|---|---|---|---|
| | Number | in 1 000 | Mill. DM | | | | % | DM | |
| **Mining[1]** | | | | | | | | | |
| Mining | 89 | 218 | 11 685 | 21 668 | 7 504 | 23 118 | 53,9 | 106 017 | 34 415 |
| Basic and producer goods industries | 29 | 6 | 262 | 767 | 192 | 1 444 | 34,1 | 257 051 | 34 164 |
| Capital goods industry | | | | | | | | | |
| Consumption goods industry | | | | | | | | | |
| Food,drink and tobacco ind. | – | – | – | – | – | – | – | – | – |
| Total | **138** | **226** | **12 006** | **22 529** | **7 761** | **24 902** | **53,3** | **110 302** | **34 376** |
| **Basic and producer goods industries[1]** | | | | | | | | | |
| Mining | 22 | 14 | 1 580 | 4 555 | 484 | 2 138 | 34,7 | 155 040 | 35 099 |
| Basic and producer goods industries | 7 233 | 1 396 | 129 268 | 368 874 | 48 094 | 276 540 | 35,0 | 198 090 | 34 450 |
| Capital goods industry | 663 | 73 | 3 719 | 7 271 | 2 277 | 8 841 | 51,1 | 121 462 | 31 286 |
| Consumption goods industry | 488 | 60 | 3 465 | 7 255 | 1 596 | 9 779 | 47,8 | 164 043 | 26 781 |
| Food,drink and tobacco ind. | 58 | 1 | 199 | 875 | 25 | / | 22,8 | / | 30 104 |
| Total | **8 464** | **1 543** | **138 231** | **388 829** | **52 477** | **298 350** | **35,6** | **193 351** | **34 008** |
| **Capital goods industry[1]** | | | | | | | | | |
| Mining | | | | | | | | | |
| Basic and producer goods industries | 793 | 81 | 5 026 | 11 573 | 2 535 | 6 296 | 43,4 | 77 487 | 31 196 |
| Capital goods industry | 23 513 | 3 600 | 212 302 | 404 040 | 113 246 | 377 597 | 52,5 | 104 889 | 31 457 |
| Consumption goods industry | 813 | 42 | 2 105 | 4 005 | 1 126 | 4 637 | 52,5 | 109 506 | 26 596 |
| Food,drink and tobacco ind. | | | | | | | | | |
| Total | **25 124** | **3 724** | **219 471** | **420 071** | **116 932** | **388 562** | **52,2** | **104 332** | **31 397** |
| **Consumption goods industry[1]** | | | | | | | | | |
| Mining | | | | | | | | | |
| Basic and producer goods industries | 505 | 27 | 1 309 | 3 554 | 759 | 2 917 | 36,8 | 106 974 | 27 842 |
| Capital goods industry | 784 | 20 | 1 197 | 2 332 | 568 | 1 648 | 51,3 | 82 632 | 28 486 |
| Consumption goods industry | 16 542 | 1 488 | 73 969 | 151 779 | 36 302 | 137 672 | 48,7 | 92 551 | 24 404 |
| Food,drink and tobacco ind. | | | | | | | | | |
| Total | **17 838** | **1 535** | **76 503** | **157 819** | **37 631** | **142 348** | **48,5** | **92 748** | **24 519** |
| **Food, drink and tobacco industries[1]** | | | | | | | | | |
| Mining | | | | | | | | | |
| Basic and producer goods industries | 98 | 6 | 225 | 444 | 222 | 286 | 50,6 | 47 252 | 36 774 |
| Capital goods industry | | | | | | | | | |
| Consumption goods industry | | | | | | | | | |
| Food,drink and tobacco ind. | 5 601 | 470 | 47 540 | 128 714 | 13 243 | 116 266 | 36,9 | 247 451 | 28 186 |
| Total | **5 727** | **482** | **47 941** | **129 427** | **13 639** | **122 024** | **37,0** | **253 166** | **28 296** |
| **Total mining and manufacturing[1]** | | | | | | | | | |
| Mining | 115 | 232 | 13 301 | 26 291 | 8 005 | 25 274 | 50,6 | 108 784 | 34 455 |
| Basic and producer goods industries | 8 658 | 1 516 | 136 090 | 385 213 | 51 802 | 287 483 | 35,3 | 189 605 | 34 165 |
| Capital goods industry | 24 989 | 3 698 | 217 379 | 413 894 | 116 260 | 392 024 | 52,5 | 105 997 | 31 435 |
| Consumption goods industry | 17 861 | 1 592 | 79 611 | 163 150 | 39 093 | 153 961 | 48,8 | 96 716 | 24 558 |
| Food,drink and tobacco ind. | 5 668 | 471 | 47 769 | 130 128 | 13 278 | 117 444 | 36,7 | 249 382 | 28 194 |
| Total | **57 291** | **7 510** | **494 151** | **1 118 676** | **228 439** | **976 186** | **44,2** | **129 987** | **30 419** |

1) The economic classification refers to main groups of the enterprise to which the KAUs belong.

KIND-OF-ACTIVITY UNITS BY SELECTED BRANCHES OF ACTIVITY OF THE ENTERPRISES AND OF THE KAUs IN 1979

| Classification No.1) | Sector of activity of the KAUs (M.o. = Manufacture of) | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per persons employed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | | Mill. DM | | | | % | DM | |
| **3210 M.o. agricultural machinery, agricultural tractors[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 241 | 42 002 | 2 177 | 5 483 | 1 217 | 4 865 | 39,7 | 115 827 | 28 978 |
| 3220 | M.o. mach. tools for working met. etc. | 7 | 321 | 12 | 24 | 10 | 16 | 52,1 | 50 434 | 31 413 |
| 3230 | M.o. textile mach. and sewing mach. | 3 | 31 | 2 | 3 | 1 | 2 | 76,4 | 72 979 | 30 326 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 19 | 1 061 | 56 | 97 | 34 | 53 | 57,7 | 49 752 | 31 993 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 24 | 346 | 25 | 42 | 12 | 32 | 59,8 | 93 386 | 33 250 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 28 | 782 | 41 | 101 | 24 | 88 | 40,9 | 113 122 | 31 031 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 4 | 48 | 3 | 4 | 1 | 3 | 62,6 | 62 623 | 30 674 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 7 | 331 | 19 | 34 | 11 | 28 | 57,3 | 84 522 | 31 780 |
| 3280 | M.o. other machinery and equipment | 42 | 1 483 | 87 | 147 | 48 | 117 | 58,9 | 78 609 | 32 333 |
| | Total 3) | **508** | **53 072** | **2 733** | **6 579** | **1 555** | **5 788** | **41,6** | **109 055** | **29 303** |
| **3220 M.o. machine-tools for working metal and the like[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 13 | 44 | 3 | 7 | 1 | 9 | 44,8 | 201 316 | 30 422 |
| 3220 | M.o. mach. tools for working met. etc. | 991 | 123 865 | 7 237 | 11 493 | 4 085 | 10 858 | 63,0 | 87 658 | 32 978 |
| 3230 | M.o. textile mach. and sewing mach. | 14 | 158 | 14 | 21 | 5 | 20 | 67,8 | 126 843 | 31 837 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 74 | 1 020 | 71 | 118 | 34 | 88 | 60,0 | 86 473 | 33 588 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 46 | 624 | 52 | 94 | 22 | 101 | 54,9 | 162 311 | 34 906 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 19 | 225 | 19 | 37 | 7 | 44 | 52,9 | 196 614 | 32 577 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 31 | 1 125 | 79 | 126 | 36 | 122 | 63,0 | 108 843 | 32 202 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 47 | 799 | 61 | 102 | 27 | 117 | 59,6 | 146 906 | 33 363 |
| 3280 | M.o. other machinery and equipment | 105 | 1 449 | 108 | 181 | 49 | 198 | 59,5 | 136 627 | 33 944 |
| | Total 3) | **1 589** | **142 351** | **8 159** | **13 111** | **4 660** | **12 626** | **62,2** | **88 693** | **32 739** |
| **3230 M.o. textile machinery and sewing machines[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | . | . | . | . | . | . | . | . | . |
| 3220 | M.o. mach. tools for working met. etc. | 12 | 221 | 9 | 14 | 7 | 13 | 63,4 | 57 746 | 30 812 |
| 3230 | M.o. textile mach. and sewing mach. | 216 | 47 468 | 2 564 | 4 206 | 1 412 | 3 966 | 61,0 | 83 559 | 29 745 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 19 | 819 | 33 | 64 | 26 | 47 | 52,0 | 56 965 | 31 381 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 8 | 196 | 11 | 20 | 6 | 21 | 56,5 | 106 924 | 32 613 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | . | . | . | . | . | . | . | . | . |
| 3260 | M.o. gearwheels, gears, bearings etc. | 4 | 48 | 2 | 4 | 1 | 3 | 62,8 | 71 702 | 30 087 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 20 | 1 415 | 68 | 122 | 44 | 137 | 55,8 | 96 776 | 31 171 |
| 3280 | M.o. other machinery and equipment | 22 | 722 | 33 | 61 | 23 | 65 | 54,8 | 90 005 | 31 714 |
| | Total 3) | **359** | **54 297** | **2 862** | **4 767** | **1 617** | **4 513** | **60,0** | **83 110** | **29 775** |
| **3240 M.o. machinery for the food, drink and tobacco industries, etc.[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 36 | 1 047 | 88 | 184 | 32 | 277 | 48,0 | 264 453 | 30 083 |
| 3220 | M.o. mach. tools for working met. etc. | 58 | 1 816 | 102 | 180 | 59 | 209 | 56,9 | 115 149 | 32 611 |
| 3230 | M.o. textile mach. and sewing mach. | 17 | 361 | 32 | 50 | 11 | 60 | 64,3 | 166 624 | 31 482 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 768 | 82 937 | 5 430 | 10 219 | 2 755 | 9 421 | 53,1 | 113 593 | 33 213 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 40 | 676 | 54 | 109 | 23 | 144 | 49,2 | 213 215 | 34 517 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 31 | 443 | 45 | 77 | 14 | 114 | 59,0 | 258 276 | 32 214 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 8 | 19 | 1 | 2 | 1 | 3 | 64,2 | 142 979 | 31 844 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 47 | 1 013 | 79 | 138 | 33 | 195 | 57,5 | 192 979 | 32 991 |
| 3280 | M.o. other machinery and equipment | 82 | 2 438 | 160 | 325 | 82 | 438 | 49,3 | 179 477 | 33 566 |
| | Total 3) | **1 246** | **103 994** | **6 312** | **12 217** | **3 415** | **12 023** | **51,7** | **115 610** | **32 835** |
| **3256 M.o. equipment for the iron and steel industries, etc. (excl. construction machinery)[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 8 | 22 | 1 | 3 | 1 | 3 | 44,6 | 144 001 | 30 312 |
| 3220 | M.o. mach. tools for working met. etc. | 38 | 4 362 | 206 | 333 | 143 | 273 | 61,8 | 62 701 | 32 859 |
| 3230 | M.o. textile mach. and sewing mach. | 8 | 31 | 2 | 3 | 1 | 3 | 70,2 | 90 731 | 31 722 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 66 | 4 749 | 241 | 452 | 159 | 294 | 53,4 | 61 854 | 33 466 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 573 | 85 598 | 5 572 | 10 657 | 2 977 | 9 938 | 52,3 | 116 101 | 34 780 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 62 | 3 570 | 246 | 479 | 116 | 502 | 51,4 | 140 638 | 32 460 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 24 | 673 | 37 | 62 | 22 | 52 | 60,0 | 77 855 | 32 086 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 16 | 240 | 15 | 25 | 8 | 25 | 58,2 | 105 082 | 33 243 |
| 3280 | M.o. other machinery and equipment | 88 | 6 292 | 347 | 647 | 213 | 615 | 53,6 | 97 729 | 33 822 |
| | Total 3) | **1 058** | **130 843** | **7 744** | **15 258** | **4 453** | **14 489** | **50,7** | **110 738** | **34 036** |

1) Industrial Classification of Economic Activities, Edition 1979 - Version for Statistics of Production Industries (SYPRO), brief descriptions. - 2) The economic classification refers to main groups of the enterprises to which the KAUs belong. - 3) Incl. KAUs not belonging to mechanical engineering.

KIND-OF-ACTIVITY UNITS BY SELECTED BRANCHES OF ACTIVITY OF THE ENTERPRISES AND OF THE KAUs IN 1979

| Classification No.1) | Sector of activity of the KAUs (M.o. = Manufacture of) | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per person employed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | | Mill. DM | | | | % | DM | |
| **3257** | **M.o. construction machinery, machinery for the preparation of building materials and similar machines[2]** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 10 | 185 | 9 | 25 | 5 | 25 | 37,0 | 133 488 | 28 221 |
| 3220 | M.o. mach. tools for working met. etc. | 16 | 248 | 12 | 19 | 8 | 14 | 63,3 | 58 124 | 30 592 |
| 3230 | M.o. textile mach. and sewing mach. | 5 | 73 | 5 | 8 | 2 | 6 | 64,2 | 84 106 | 29 533 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 29 | 484 | 25 | 46 | 15 | 28 | 54,6 | 57 338 | 31 157 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 40 | 3 660 | 220 | 457 | 119 | 394 | 48,1 | 107 624 | 32 380 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 272 | 46 376 | 3 131 | 6 241 | 1 401 | 6 046 | 50,2 | 130 370 | 30 220 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 5 | 164 | 9 | 15 | 5 | 12 | 61,5 | 72 171 | 29 872 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 14 | 193 | 14 | 20 | 6 | 19 | 69,2 | 97 410 | 30 949 |
| 3280 | M.o. other machinery and equipment | 35 | 858 | 46 | 89 | 27 | 78 | 52,0 | 90 594 | 31 488 |
| | Total 3) | **484** | **55 651** | **3 622** | **7 266** | **1 695** | **7 037** | **49,9** | **126 447** | **30 451** |
| **3260** | **M.o. gearwheels, gears, bearings, etc.[2]** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | | | | | | | | | |
| 3220 | M.o. mach. tools for working met. etc. | 27 | 832 | 42 | 60 | 26 | 55 | 69,9 | 65 918 | 31 723 |
| 3230 | M.o. textile mach. and sewing mach. | 8 | 1 312 | 92 | 135 | 40 | 125 | 68,3 | 95 385 | 30 625 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 10 | 308 | 16 | 28 | 10 | 20 | 56,9 | 65 027 | 32 309 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 9 | 109 | 8 | 13 | 4 | 13 | 59,6 | 122 057 | 33 577 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | | | | | | | | | |
| 3260 | M.o. gearwheels, gears, bearings etc. | 236 | 73 538 | 3 981 | 6 452 | 2 278 | 6 019 | 61,7 | 81 850 | 30 976 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 5 | 315 | 18 | 31 | 10 | 35 | 57,3 | 110 473 | 32 093 |
| 3280 | M.o. other machinery and equipment | 19 | 470 | 26 | 46 | 15 | 48 | 56,1 | 102 743 | 32 652 |
| | Total 3) | **415** | **82 128** | **4 496** | **7 331** | **2 546** | **6 980** | **61,3** | **84 994** | **30 999** |
| **3270** | **M.o. machinery for use in other specific branches of industry[2]** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 6 | 24 | 1 | 3 | 1 | 3 | 44,5 | 143 689 | 28 776 |
| 3220 | M.o. mach. tools for working met. etc. | 49 | 2 202 | 109 | 175 | 69 | 138 | 62,5 | 62 565 | 31 194 |
| 3230 | M.o. textile mach. and sewing mach. | 16 | 58 | 4 | 6 | 2 | 5 | 67,8 | 90 534 | 30 114 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 47 | 3 455 | 176 | 342 | 110 | 213 | 51,4 | 61 720 | 31 770 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 10 | 145 | 11 | 19 | 5 | 17 | 57,3 | 115 849 | 33 018 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 14 | 250 | 19 | 35 | 8 | 35 | 54,6 | 140 333 | 30 815 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 4 | 4 | 0 | 0 | 0 | 0 | 62,7 | 77 686 | 30 460 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 401 | 60 614 | 3 929 | 6 624 | 1 913 | 6 356 | 59,3 | 104 854 | 31 558 |
| 3280 | M.o. other machinery and equipment | 46 | 2 010 | 137 | 215 | 65 | 196 | 63,7 | 97 517 | 32 107 |
| | Total 3) | **677** | **73 327** | **4 642** | **7 915** | **2 312** | **7 376** | **58,6** | **100 584** | **31 530** |
| **3280** | **M.o. other machinery and equipment[2]** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 35 | 11 571 | 710 | 1 851 | 358 | 1 819 | 38,4 | 157 190 | 30 959 |
| 3220 | M.o. mach. tools for working met. etc. | 98 | 1 819 | 103 | 164 | 61 | 125 | 62,7 | 68 444 | 33 561 |
| 3230 | M.o. textile mach. and sewing mach. | 27 | 749 | 64 | 95 | 24 | 74 | 67,0 | 99 040 | 32 399 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 148 | 5 678 | 370 | 638 | 194 | 383 | 58,0 | 67 519 | 34 181 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 112 | 8 384 | 704 | 1 233 | 298 | 1 063 | 57,1 | 126 734 | 35 522 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 70 | 1 754 | 135 | 278 | 58 | 269 | 48,7 | 153 518 | 33 152 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 29 | 635 | 41 | 69 | 21 | 54 | 59,8 | 84 986 | 32 771 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 68 | 2 335 | 177 | 290 | 79 | 268 | 61,0 | 114 706 | 33 952 |
| 3280 | M.o. other machinery and equipment | 1 602 | 237 468 | 15 010 | 28 850 | 8 203 | 25 333 | 52,0 | 106 680 | 34 543 |
| | Total 3) | **2 717** | **315 673** | **20 476** | **40 203** | **10 784** | **36 199** | **50,9** | **114 672** | **34 162** |
| **32** | **Mechanical engineering[2]** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 355 | 54 983 | 2 997 | 7 567 | 1 617 | 7 013 | 39,6 | 127 551 | 29 415 |
| 3220 | M.o. mach. tools for working met. etc. | 1 294 | 135 686 | 7 833 | 12 462 | 4 468 | 11 701 | 62,9 | 86 234 | 32 929 |
| 3230 | M.o. textile mach. and sewing mach. | 314 | 50 241 | 2 780 | 4 528 | 1 499 | 4 262 | 61,4 | 84 839 | 29 828 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 1 180 | 100 510 | 6 419 | 12 004 | 3 336 | 10 547 | 53,5 | 104 932 | 33 194 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 862 | 99 738 | 6 656 | 12 645 | 3 465 | 11 723 | 52,6 | 117 540 | 34 740 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 509 | 53 850 | 3 667 | 7 304 | 1 643 | 7 166 | 50,2 | 133 075 | 30 514 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 343 | 76 253 | 4 155 | 6 735 | 2 365 | 6 269 | 61,7 | 82 214 | 31 016 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 626 | 67 255 | 4 380 | 7 387 | 2 131 | 7 180 | 59,3 | 106 758 | 31 684 |
| 3280 | M.o. other machinery and equipment | 2 040 | 253 190 | 15 953 | 30 560 | 8 725 | 27 087 | 52,2 | 106 984 | 34 458 |
| | Total 3) | **9 053** | **1 011 336** | **61 046** | **114 647** | **33 037** | **107 030** | **53,2** | **105 830** | **32 667** |

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| Classification No.1) | Sector of activity of the KAUs (M.o. = Manufacture of) | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per person employed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | | Mill. DM | | | | % | DM | |
| **3210 M.o. agricultural machinery, agricultural tractors[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 208 | 39 707 | 1 977 | 5 215 | 1 217 | 4 787 | 37,9 | 120 564 | 30 662 |
| 3220 | M.o. mach. tools for working met. etc. | . | . | . | . | . | . | . | . | . |
| 3230 | M.o. textile mach. and sewing mach. | – | – | – | – | – | – | – | – | – |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 19 | 977 | 65 | 114 | 33 | 75 | 56,8 | 77 081 | 33 948 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 22 | 381 | 26 | 49 | 13 | 34 | 53,8 | 88 209 | 35 384 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 25 | 937 | 47 | 133 | 30 | 102 | 35,1 | 108 373 | 32 516 |
| 3260 | M.o. gearwheels, gears, bearings etc. | . | . | . | . | . | . | . | . | . |
| 3270 | M.o. mach. for use in other specific branches of ind. | 7 | 379 | 21 | 47 | 13 | 41 | 44,8 | 107 778 | 33 588 |
| 3280 | M.o. other machinery and equipment | 39 | 1 407 | 84 | 165 | 48 | 141 | 50,6 | 100 093 | 34 291 |
| | Total 3) | **418** | **50 458** | **2 532** | **6 430** | **1 567** | **5 853** | **39,4** | **116 001** | **31 051** |
| **3220 M.o. machine-tools for working metal and the like[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 10 | 44 | 3 | 7 | 1 | 9 | 46,8 | 196 836 | 32 178 |
| 3220 | M.o. mach. tools for working met. etc. | 994 | 125 546 | 8 098 | 13 146 | 4 401 | 12 243 | 61,6 | 97 521 | 35 057 |
| 3230 | M.o. textile mach. and sewing mach. | 17 | 190 | 14 | 23 | 6 | 24 | 61,0 | 123 506 | 33 722 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 68 | 949 | 78 | 134 | 34 | 119 | 58,6 | 125 844 | 35 626 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 41 | 576 | 48 | 90 | 21 | 83 | 53,2 | 144 011 | 37 134 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 19 | 222 | 19 | 38 | 8 | 39 | 50,2 | 176 931 | 34 123 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 31 | 1 346 | 97 | 154 | 46 | 195 | 63,0 | 145 126 | 34 095 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 49 | 711 | 62 | 107 | 25 | 125 | 58,0 | 175 959 | 35 249 |
| 3280 | M.o. other machinery and equipment | 100 | 1 549 | 120 | 221 | 56 | 253 | 54,2 | 163 412 | 35 986 |
| | Total 3) | **1 572** | **145 069** | **9 077** | **14 882** | **5 044** | **14 220** | **61,0** | **98 026** | **34 773** |
| **3230 M.o. textile machinery and sewing machines[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | . | . | . | . | . | . | . | . | . |
| 3220 | M.o. mach. tools for working met. etc. | . | . | . | . | . | . | . | . | . |
| 3230 | M.o. textile mach. and sewing mach. | 215 | 48 836 | 2 771 | 4 497 | 1 575 | 4 345 | 61,6 | 88 981 | 32 245 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 20 | 819 | 45 | 88 | 28 | 74 | 50,8 | 90 665 | 34 066 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 7 | 197 | 13 | 23 | 7 | 20 | 55,0 | 103 754 | 35 507 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | . | . | . | . | . | . | . | . | . |
| 3260 | M.o. gearwheels, gears, bearings etc. | . | . | . | . | . | . | . | . | . |
| 3270 | M.o. mach. for use in other specific branches of ind. | 19 | 1 168 | 72 | 134 | 39 | 148 | 53,7 | 126 771 | 33 705 |
| 3280 | M.o. other machinery and equipment | 27 | 693 | 40 | 75 | 24 | 82 | 53,8 | 117 732 | 34 410 |
| | Total 3) | **365** | **55 002** | **3 109** | **5 124** | **1 775** | **4 940** | **60,7** | **89 824** | **32 278** |
| **3240 M.o. machinery for the food, drink and tobacco industries, etc.[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 32 | 1 429 | 100 | 201 | 46 | 262 | 49,8 | 183 644 | 32 324 |
| 3220 | M.o. mach. tools for working met. etc. | 58 | 2 028 | 120 | 187 | 71 | 185 | 64,0 | 90 986 | 35 217 |
| 3230 | M.o. textile mach. and sewing mach. | 18 | 497 | 34 | 53 | 17 | 57 | 64,7 | 115 229 | 33 875 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 787 | 87 000 | 5 883 | 10 818 | 3 114 | 10 215 | 54,4 | 117 410 | 35 789 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 42 | 834 | 54 | 115 | 31 | 112 | 47,1 | 134 361 | 37 303 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 31 | 750 | 61 | 114 | 26 | 124 | 53,5 | 165 074 | 34 279 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 8 | 26 | 2 | 3 | 1 | 4 | 63,3 | 135 401 | 34 250 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 44 | 663 | 48 | 88 | 23 | 109 | 54,5 | 164 168 | 35 409 |
| 3280 | M.o. other machinery and equipment | 90 | 5 049 | 257 | 635 | 183 | 770 | 40,5 | 152 462 | 36 150 |
| | Total 3) | **1 261** | **107 478** | **6 875** | **12 908** | **3 809** | **12 545** | **53,3** | **116 718** | **35 439** |
| **3256 M.o. equipment for the iron and steel industries, etc. (excl. construction machinery)[2]** | | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors | 8 | 159 | 12 | 21 | 5 | 27 | 54,4 | 166 643 | 33 792 |
| 3220 | M.o. mach. tools for working met. etc. | 37 | 3 912 | 213 | 345 | 144 | 323 | 61,7 | 82 563 | 36 816 |
| 3230 | M.o. textile mach. and sewing mach. | 10 | 85 | 6 | 9 | 3 | 9 | 71,2 | 104 562 | 35 413 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. | 61 | 4 570 | 305 | 542 | 171 | 487 | 56,3 | 106 541 | 37 413 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) | 571 | 84 867 | 5 692 | 11 161 | 3 310 | 10 347 | 51,0 | 121 922 | 38 996 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 49 | 3 242 | 239 | 469 | 116 | 486 | 50,9 | 149 792 | 35 835 |
| 3260 | M.o. gearwheels, gears, bearings etc. | 19 | 543 | 31 | 52 | 19 | 67 | 60,1 | 122 866 | 35 805 |
| 3270 | M.o. mach. for use in other specific branches of ind. | 15 | 171 | 12 | 22 | 6 | 25 | 57,2 | 148 970 | 37 017 |
| 3280 | M.o. other machinery and equipment | 95 | 6 695 | 412 | 804 | 253 | 926 | 51,3 | 138 348 | 37 791 |
| | Total 3) | **1 026** | **123 441** | **7 928** | **15 419** | **4 710** | **14 727** | **51,4** | **119 306** | **38 155** |

1) Industrial Classification of Economic Activities, Edition 1979 - Version for Statistics of Production Industries (SYPRO), brief descriptions. - 2) The economic classification refers to main groups of the enterprises to which the KAUs belong. - 3) Incl. KAUs not belonging to mechanical engineering.

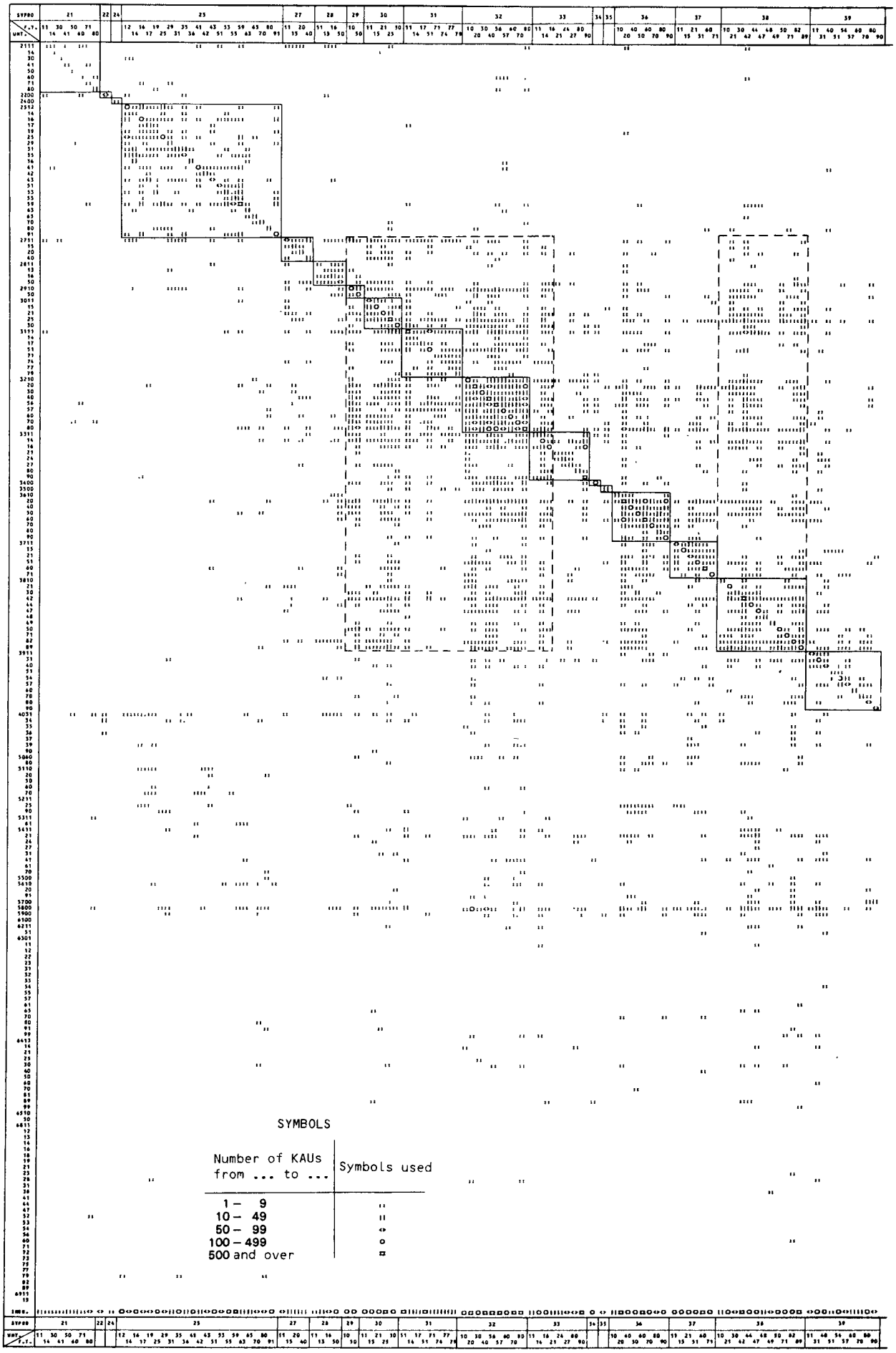
KIND-OF-ACTIVITY UNITS BY SELECTED BRANCHES OF ACTIVITY OF THE ENTERPRISES AND OF THE KAUs IN 1980

| Classification No.1) | Sector of activity of the KAUs (M.o. = Manufacture of) | KAUs | Number of employees | Census value added | Total production value | Wages and salaries | Turnover | Net ratio | Turnover per person employed | Total wages and salaries per person employed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | | Mill. DM | | | | % | DM | |
| **3257** | **M.o. construction machinery, machinery for the preparation of building materials and similar machines2)** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors ..... | 14 | 192 | 9 | 25 | 6 | 29 | 35,6 | 150 638 | 30 736 |
| 3220 | M.o. mach. tools for working met. etc. ... | 16 | 203 | 11 | 18 | 7 | 15 | 64,9 | 74 633 | 33 486 |
| 3230 | M.o. textile mach. and sewing mach. ..... | 4 | 13 | 1 | 1 | 0 | 1 | 68,1 | 94 519 | 32 210 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. ..... | 25 | 472 | 28 | 56 | 16 | 45 | 51,1 | 96 308 | 34 030 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) ..... | 47 | 3 829 | 242 | 499 | 136 | 422 | 48,5 | 110 212 | 35 469 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 289 | 47 525 | 3 340 | 6 817 | 1 549 | 6 435 | 49,0 | 135 405 | 32 594 |
| 3260 | M.o. gearwheels, gears, bearings etc. .... | 6 | 428 | 23 | 41 | 14 | 48 | 57,1 | 111 065 | 32 567 |
| 3270 | M.o. mach. for use in other specific branches of ind. ..... | 13 | 198 | 15 | 25 | 7 | 27 | 61,4 | 134 662 | 33 669 |
| 3280 | M.o. other machinery and equipment ..... | 39 | 980 | 54 | 117 | 34 | 123 | 46,4 | 125 060 | 34 373 |
| | Total 3) ..... | **515** | **58 734** | **3 849** | **7 868** | **1 925** | **7 446** | **48,9** | **126 774** | **32 778** |
| **3260** | **M.o. gearwheels, gears, bearings, etc.2)** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors ..... | | | | | | | | | |
| 3220 | M.o. mach. tools for working met. etc. ... | 28 | 835 | 49 | 70 | 28 | 49 | 69,7 | 58 567 | 33 822 |
| 3230 | M.o. textile mach. and sewing mach. ..... | 9 | 1 371 | 90 | 134 | 45 | 102 | 67,7 | 74 172 | 32 534 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. ..... | 9 | 154 | 10 | 18 | 6 | 12 | 58,3 | 75 576 | 34 372 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) ..... | 15 | 120 | 9 | 15 | 4 | 10 | 59,4 | 86 486 | 35 826 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 234 | 74 926 | 4 340 | 6 891 | 2 465 | 6 530 | 63,0 | 87 156 | 32 894 |
| 3260 | M.o. gearwheels, gears, bearings etc. .... | 4 | 3 | 0 | 0 | 0 | 0 | 66,4 | 105 673 | 34 007 |
| 3270 | M.o. mach. for use in other specific branches of ind. ..... | 16 | 1 432 | 85 | 164 | 50 | 141 | 51,4 | 98 138 | 34 719 |
| 3280 | M.o. other machinery and equipment ..... | **409** | **83 285** | **4 883** | **7 813** | **2 740** | **7 368** | **62,6** | **88 472** | **32 901** |
| | Total 3) ..... | | | | | | | | | |
| **3270** | **M.o. machinery for use in other specific branches of industry2)** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors ..... | 7 | 32 | 2 | 4 | 1 | 4 | 45,9 | 129 257 | 30 829 |
| 3220 | M.o. mach. tools for working met. etc. ... | 55 | 2 554 | 119 | 212 | 86 | 164 | 56,2 | 64 040 | 33 588 |
| 3230 | M.o. textile mach. and sewing mach. ..... | 16 | 110 | 7 | 11 | 4 | 9 | 63,1 | 81 104 | 32 309 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. ..... | 52 | 3 211 | 198 | 358 | 110 | 265 | 55,3 | 82 639 | 34 134 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) ..... | 13 | 184 | 13 | 23 | 7 | 17 | 56,4 | 94 569 | 35 578 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 16 | 373 | 27 | 51 | 12 | 43 | 53,2 | 116 187 | 32 693 |
| 3260 | M.o. gearwheels, gears, bearings etc. .... | 5 | 328 | 16 | 30 | 11 | 31 | 54,7 | 95 302 | 32 666 |
| 3270 | M.o. mach. for use in other specific branches of ind. ..... | 414 | 65 914 | 4 571 | 7 884 | 2 226 | 7 616 | 58,0 | 115 549 | 33 772 |
| 3280 | M.o. other machinery and equipment ..... | 50 | 2 000 | 118 | 226 | 69 | 215 | 52,2 | 107 310 | 34 478 |
| | Total 3) ..... | **719** | **80 122** | **5 363** | **9 359** | **2 706** | **8 777** | **57,3** | **109 544** | **33 772** |
| **3280** | **M.o. other machinery and equipment2)** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors ..... | 38 | 12 958 | 718 | 1 832 | 421 | 1 875 | 39,2 | 144 710 | 32 464 |
| 3220 | M.o. mach. tools for working met. etc. ... | 86 | 2 711 | 166 | 252 | 96 | 194 | 65,8 | 71 696 | 35 369 |
| 3230 | M.o. textile mach. and sewing mach. ..... | 24 | 682 | 46 | 73 | 23 | 62 | 62,1 | 90 799 | 34 022 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. ..... | 149 | 5 674 | 377 | 710 | 204 | 525 | 53,1 | 92 518 | 35 943 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) ..... | 102 | 8 601 | 617 | 1 193 | 322 | 911 | 51,7 | 105 875 | 37 484 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 65 | 2 271 | 163 | 347 | 78 | 295 | 47,0 | 130 077 | 34 427 |
| 3260 | M.o. gearwheels, gears, bearings etc. .... | 24 | 727 | 43 | 74 | 25 | 78 | 57,7 | 106 695 | 34 398 |
| 3270 | M.o. mach. for use in other specific branches of ind. ..... | 55 | 2 403 | 145 | 322 | 85 | 311 | 45,0 | 129 363 | 35 562 |
| 3280 | M.o. other machinery and equipment ..... | 1 590 | 238 899 | 15 730 | 30 241 | 8 673 | 28 701 | 52,0 | 120 138 | 36 306 |
| | Total 3) ..... | **2 669** | **319 091** | **21 095** | **41 388** | **11 465** | **39 783** | **51,0** | **124 678** | **35 931** |
| **32** | **Mechanical engineering2)** | | | | | | | | | |
| 3210 | M.o. agr. mach., agr. tractors ..... | 324 | 54 600 | 2 826 | 7 315 | 1 700 | 7 003 | 38,6 | 128 266 | 31 144 |
| 3220 | M.o. mach. tools for working met. etc. ... | 1 296 | 138 303 | 8 800 | 14 273 | 4 851 | 13 206 | 61,7 | 95 485 | 35 072 |
| 3230 | M.o. textile mach. and sewing mach. ..... | 311 | 51 785 | 2 969 | 4 801 | 1 673 | 4 609 | 61,8 | 89 002 | 32 302 |
| 3240 | M.o. machinery for the food, drink and tobacco industries, etc. ..... | 1 190 | 103 826 | 6 989 | 12 837 | 3 714 | 11 818 | 54,4 | 113 825 | 35 775 |
| 3256 | M.o. equipment for the iron and steel ind., etc. (excl. constr. mach.) 2) ..... | 860 | 99 588 | 6 714 | 13 168 | 3 851 | 11 957 | 51,0 | 120 060 | 38 673 |
| 3257 | M.o. constr., build. mat. & sim. mach. 2). | 504 | 55 456 | 3 907 | 7 988 | 1 824 | 7 539 | 48,9 | 135 940 | 32 887 |
| 3260 | M.o. gearwheels, gears, bearings etc. .... | 332 | 78 386 | 4 556 | 7 249 | 2 583 | 6 958 | 62,8 | 88 769 | 32 946 |
| 3270 | M.o. mach. for use in other specific branches of ind. ..... | 621 | 71 610 | 4 948 | 8 631 | 2 425 | 8 403 | 57,3 | 117 337 | 33 867 |
| 3280 | M.o. other machinery and equipment ..... | 2 046 | 258 704 | 16 900 | 32 648 | 9 389 | 31 350 | 51,8 | 121 182 | 36 293 |
| | Total 3) ..... | **8 954** | **1 022 677** | **64 711** | **121 192** | **35 742** | **115 660** | **53,4** | **113 096** | **34 949** |

1) Industrial Classification of Economic Activities, Edition 1979 - Version for Statistics of Production Industries (SYPRO), brief descriptions. - 2) The economic classification refers to main groups of the enterprises to which the KAUs belong. - 3) Incl. KAUs not belonging to mechanical engineering.

Diagram 1

Kind-of-activity units in
of enterprises in mining
Classified number



SYMBOLS

| Number of KAUs from ... to ... | Symbols used |
|---|---|
| 1 – 9 | · |
| 10 – 49 | ∥ |
| 50 – 99 | ◇ |
| 100 – 499 | ○ |
| 500 and over | ▫ |

mining and manufacturing
and manufacturing 1980
by sectors

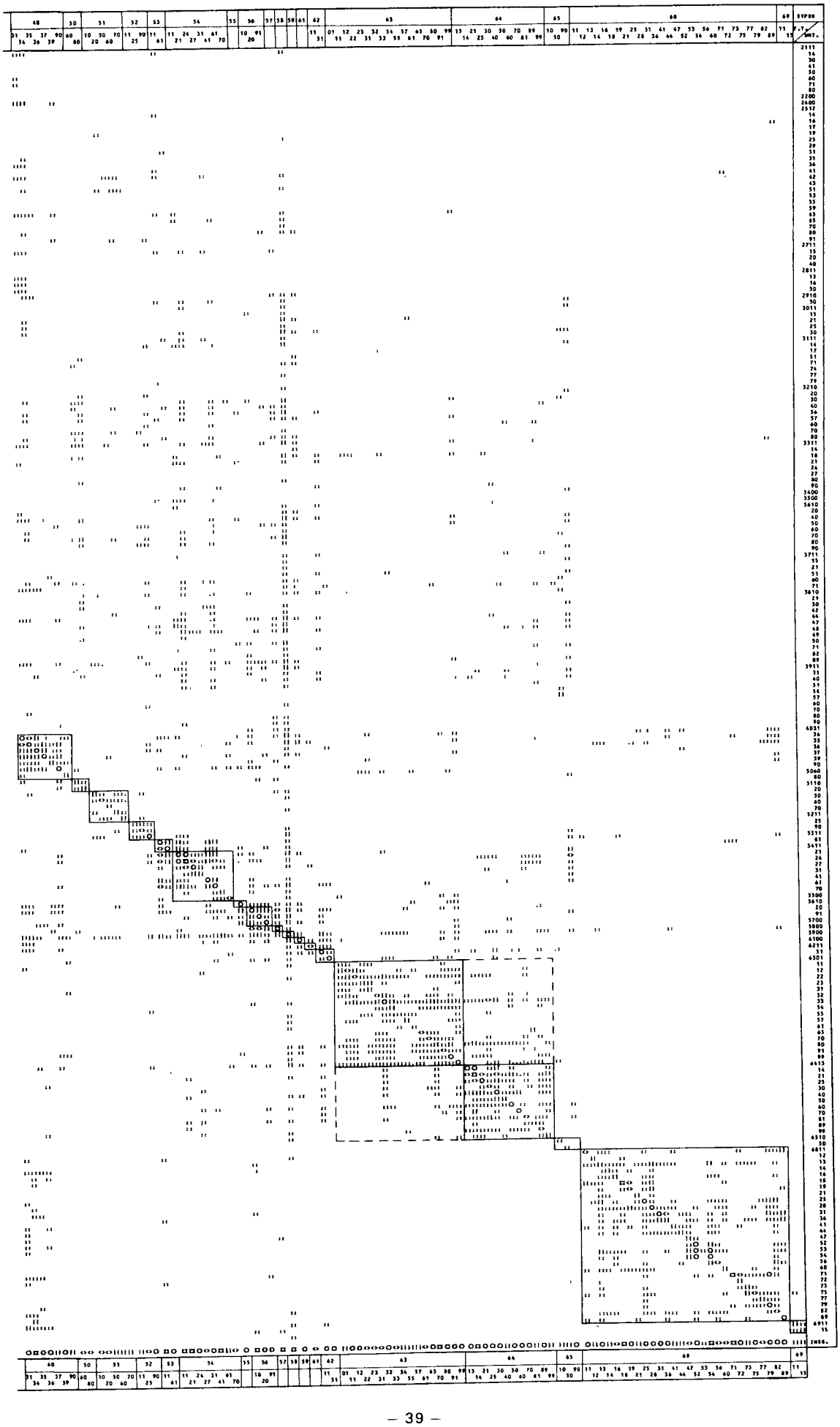
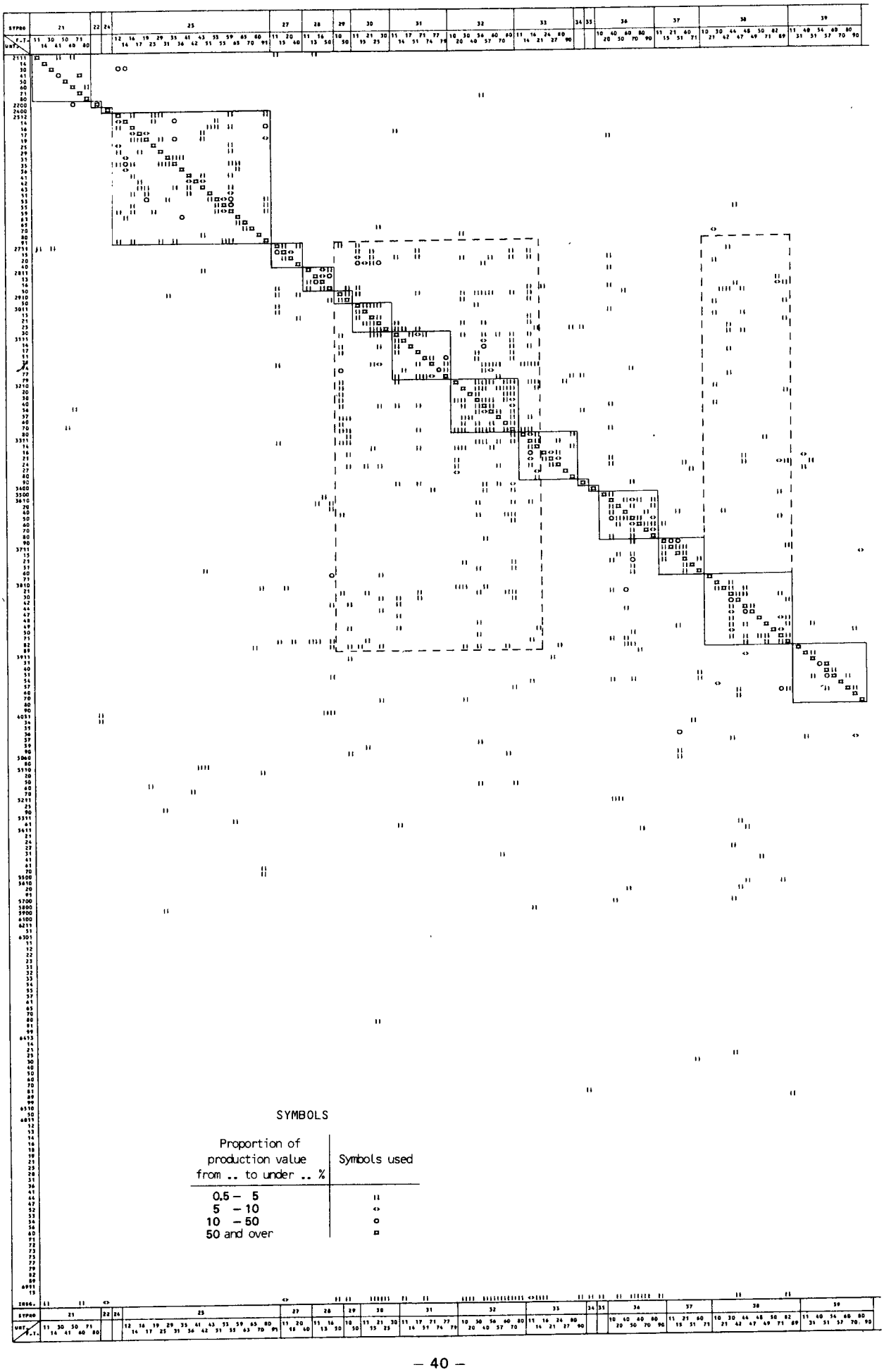


Diagram 2

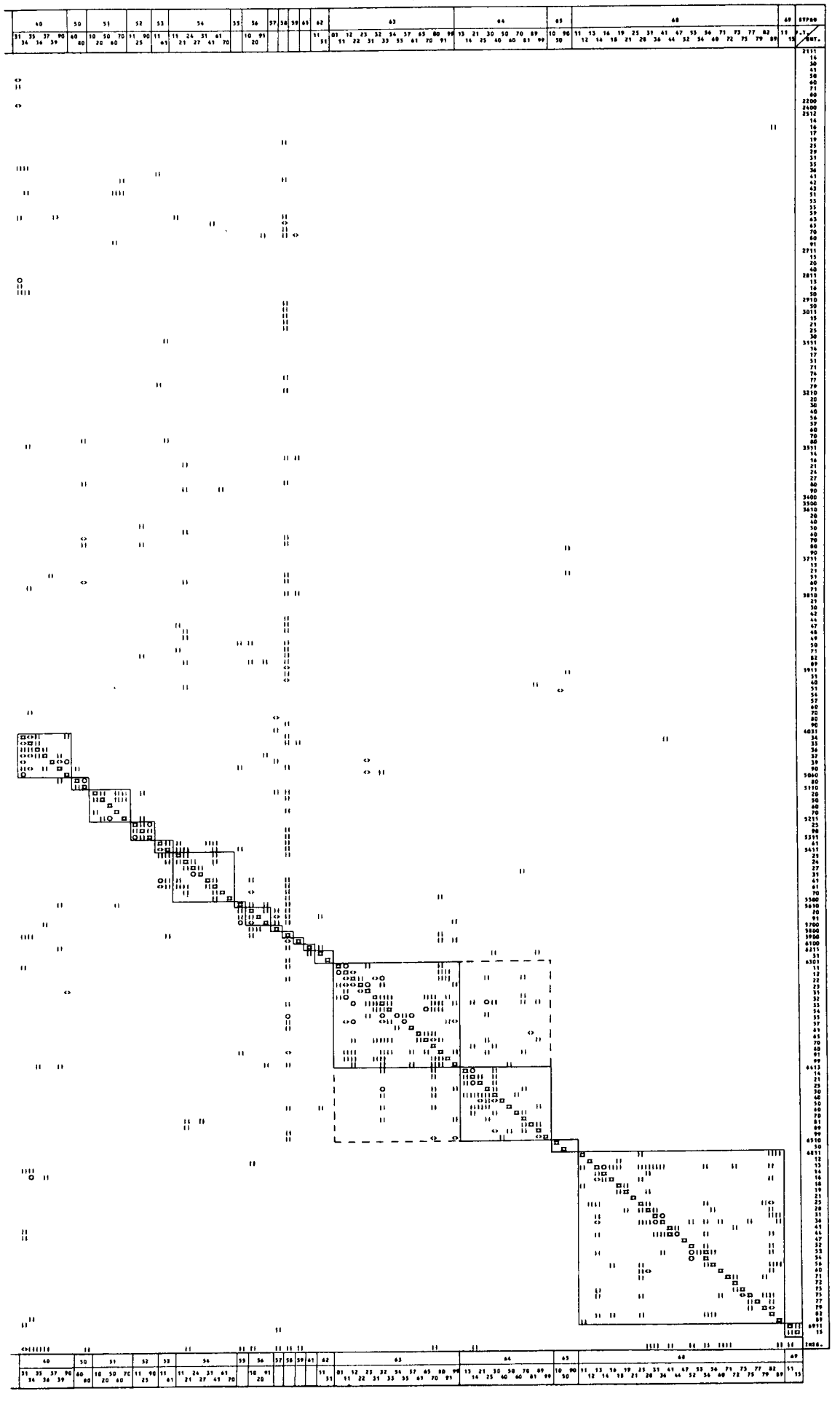
Kind-of-activity units in
of enterprises in mining
Classified proportion of production
by



SYMBOLS

| Proportion of production value from .. to under .. % | Symbols used |
|---|---|
| 0.5 – 5 | " |
| 5 – 10 | ‹› |
| 10 – 50 | o |
| 50 and over | ▫ |

mining and manufacturing
and manufacturing 1980
value in the enterprise value
sectors



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| 32 | Employment Statistics |
| 33 | Reform of Statistics of Production Industries |
| 34 | Distributive Trades |
| 35 | Price Indices, Base 1976 |
| 36 | Statistical Information System of the Federation |
| 37 | Surveys and Registers |
| 38 | Indices of Production and Productivity |
| 39 | Concentration Statistics |
| 40 | Kind-of-Activity Units in Mining and Manufacturing |

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