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**National Accounts and Economic Statistics - International Trade Statistics**

**STATISTICAL ANALYSIS THROUGH LINKING  
INTRA TRADE REGISTER AND GENERAL BUSINESS REGISTERS**

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*The full document is only available in pdf format.*

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# **6th OECD INTERNATIONAL TRADE STATISTICS EXPERT MEETING (ITS)**

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Intra Trade Register and General  
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# 1 Introduction

German foreign trade statistics consist of two different data collection systems, the Extra and the Intra trade system. To examine data of the German Intra trade means in general having statistics about arrivals and dispatches in a partition by commodity codes and partner countries. Weight or number of items might be also of some interest. The focus of published data is on goods. Sectoral foreign trade results, meaning analysis after enterprise-referred characteristics such as turnover, number of employees or sector of activity cannot be carried out with the foreign trade data collected by the German Federal Statistical Office alone.

In order to reach sector-based results for total foreign trade statistics, it is necessary to acquire data on the declaring enterprise from other sources. The German General Business Register (GBR) contains such data and in order to produce sectoral foreign trade data it is necessary to establish a linkage between the foreign trade data on the one hand and the enterprise related data in the GBR on the other hand. This linkage can be successfully established for Intra trade statistics using the Intra trade register (so-called Intrastat Register) maintained by the foreign trade division of the German Federal Statistical Office and on the other side the GBR as the most appropriate source.

It is (so far) not possible to offer sectoral foreign trade results for Extra trade statistics in Germany as there is no Extra trade register.

Since such results are however of large interest, the Federal Statistical Office treated the topic of sectoral Intra trade for the first time in the year 2000 with a feasibility study. This study investigated whether it was possible to compile sectoral Intra trade figures by matching information from the German Intrastat Register with data of the GBR.

Intra trade in Germany amounts in the first half of 2005 to approximately 65 % of all German trade for both directions of flow and had a volume of 50 % on the arrival side and 56 % on the dispatch side before the accession of the ten new members in 2004 so that even sector-based foreign trade results which refer exclusively to intra European trade can give good indications about the sectoral-based structure of total German trade.

## 2 Methodology and procedure of the compilation process

### 2.1 Data sources

The Intrastat Register was established in 1993 to identify the enterprises, which have to declare for Intra trade statistics and to secure the intrastat declaration by sending out reminders when necessary. The Intrastat Register has been set-up according to the data of the financial administration i.e. address, ID number (represents the main component of the VAT-identification number) and the value of the Intra-European transactions of goods (derive from the advance VAT declarations at fiscal authorities). The Intrastat Register is integrated into the Intra trade data processing program in such a way, that statistical data is matched to the data coming from the financial administration.

Also in 1993 the European Union obligated the member states by a regulation to install and manage a General Business Registers. In Germany the legal basis for building up such a register was disposed in 1998. According to the federal structure of Germany there are 16 business registers, which contain the economical units for each of the Länder and one General Business Register, a copy of all Länderregisters. Since its implementation the General Business Register has improved substantially. However, it is still far from being complete and absolutely accurate. A first publication of data collected in the General Business Register was realised in the year 2004. The results are related to the reporting year 2003.

## 2.2 History

For a first project, Intra trade data for the reference year 1999 had been confronted with data from the General Business Register. At this time the GBR was still in an early state of development. For several reasons it was not possible to link data of the same reference year, therefore turn-over data from the year 1997 was used. Due to limitations in the human and financial resources during this first attempt, only the data of two German provinces ("Länder") have been analysed. Still the first results showed how a linkage could work and gave some rough results.

The linkage has been conducted with the Intrastat Register as the starting point: The units within the Intrastat Register had to be allocated to the respective units within the General Business Register. This has been the appropriate way, as the largest portion of the units within the General Business Registers is not active within foreign trade.

In the year 2002 a comprehensive study was conducted with foreign trade data of the reference year 2000 and the GBR. The amount of data and the quality of the GBR was better than in 1997, but not fully satisfying. The linking of both registers resulted in a matching quota of around 82% on arrival and dispatch side (enterprises matched compared with the total number of enterprises trading in the year 2000). It was seen as a good start for further analysis in this area. In terms of trade value this study covered roughly 75% of all German Intra trade arrivals and dispatches.

The 2004 study that will be introduced below intended to cancel out some of the drawbacks of the previous studies and it was also intended to further improve the coverage of the study by using the GBR of the reference year 2003. For the Intrastat Register the reference year 2002 was used. Compared with the last study the numeric matching quota improved from 82.9% to 89.3% on the arrival side and from 81.7% to 90.0% on the dispatch side. The trade coverage improved from 75.0% to 82.5% on the arrival side and from 75.4% to 80.9% on the dispatch side.

Although the hit rates improved considerably there are still 9.1% to 6.5% of all enterprises left which could not be matched. The main reasons for this are most probably the different update periods of the two statistical sources and the fact that the GBR is improving but remains in the build-up phase. Other reasons are the fact that the federal copy of the GBR is still lagging behind the changes in the 16 Länder GBR and the existence of companies on foreign territory which dispose of a German VAT number; they are recorded within the German Intrastat Register but not within the German GBR.

## 2.3 Identifiers within intra trade statistics

Linking two different data sources requires one **common variable** which either represents the identifier variable (primary key) of at least one of the data sets or which allows an unambiguous conjunction to this identifier, using auxiliary variables (alternate keys) where necessary. The boundaries between the both types of identification can be fluent, depending on the data sets and requisitions to an unambiguous identification. Only name and address for example often do not identify the enterprise unmistakably. One of the reasons is the existence of enterprises with different legal forms under the same name and address often having an identical owner.

### 2.3.1 Key identifier: VAT number

The VAT number is a number assigned to enterprises for the purpose of assessment for value added tax (VAT). This identification number is known to the enterprise or the respective tax consultant.

In the case of the incorporation of additional owners into an enterprise, the assigned VAT number stays unchanged. In the case of owner changes, certain changes of the legal form, insolvencies or relocations to another financial district, new VAT numbers are assigned. Sometimes, VAT numbers are also systematically changed by the Länder (singular: Land, English: federal state) due to organisational reasons. Usually only for the last case, the changes in VAT numbers are recorded in databases of the respective financial authorities. The Intrastat Register records such changes systematically. So, at first glance, a distinct identification of enterprises cannot be realised using VAT numbers of the various Länder. Theoretically, identical key numbers of the fiscal authority, identical district numbers or identical consecutive numbers can exist in several Länder. Nevertheless, the aim of unambiguous identification can be reached because at the Federal Statistical Office, the different VAT numbers have been brought to a standardised federal format. This had been done by adding one or two numeric digits to the Land-specific VAT number.

The German Intrastat Register has been set-up according to the data of the financial administration. The VAT number has been recognised as key identifier and represents the main component of the so-called register ID number. This ID number is for internal use of the Federal Statistical Office only, and is usually not known to the respective PSI (provider of statistical information). The 16-digit register ID number consists of the 13-digit VAT number and a 3-digit so-called "distinction- or appendix-number".

This distinction (or appendix-) number serves the purpose of better identification of subsidiaries (within one parent company) or of decentralised plants (within one enterprise) which individually report to Intra trade statistics and is assigned by the Federal Statistical Office upon application by the PSI in question. In total, about 15,000 distinction numbers have been assigned up to now.

### 2.3.2 Auxiliary identifiers

For each change in register ID numbers, the previous ID number is recorded in the data field "**former register ID number**". This former ID number can be used as an auxiliary identifier to

establish a link to the General Business Register (GBR) of an older reference period than the Intra trade register. It is of disadvantage in this context that the changing date is not recorded which prevents a 100 % compliance of both reference periods.

In the data field **“enterprise address”**, the name of the enterprise and other address data as street, mail box, postal code, city, telephone number etc. are recorded. These data can be seen as auxiliary identifiers as well. The drawback of these auxiliary identifiers is the possible existence of various enterprises with the same name and address but different legal forms that can not be unambiguously identified herewith.

The **“key number for third parties”** helps to identify all declarants who declare on behalf of other parties (PSI) or who are represented by others. For cases where the specified address does not match the address of the registered office, it can be assumed that it has been a declaration by a third party. So a third party's attribute should be provided when doing identification via address.

## 2.4 Identifiers within the General Business Register

Within the General Business Register (GBR), basically two types of register units can be identified: the enterprise and the local unit (plant). Only the enterprises are of interest for the compiling of sectoral Intra trade data as only they represent the survey unit of Intra trade statistics. For the GBR, an enterprise is defined as the smallest legally independent unit which disposes of an own accountancy or which effects similar records to ascertain the assets on a yearly basis. The enterprise comprises all local units except for legally independent affiliated companies et cetera. Additionally, enterprises are distinguished between single-plant-enterprises, multiple-plants-enterprise and multiple-Länder-enterprise. A multiple-Länder-enterprise is a specific form of a multiple-plants-enterprise. Problems arising through this distinction will be discussed in section 3.1.

### 2.4.1 Key identifier: (Federal) VAT number

Same as for the Intrastat Register, also the GBR contains the VAT number of the enterprises, converted to the federal format. Both federal VAT numbers (Intrastat and GBR) are identical in their format.

In case of changes within the VAT numbers, the former VAT number is recorded in the respective Länder copies of the GBR (to which the Federal Statistical Office has no access) but not in the federal copy of the GBR (used for the present project). Therefore it was not possible to use the former VAT number to increase the matching quota.

Also it might happen that one unit has different tax numbers for VAT, income taxes and business taxes. This is only an exception and traces back to the fact of different definitions of the unit in the different taxing procedures.

### 2.4.2 Auxiliary identifiers

The GBR disposes of a system-free **ID number** which allows the unambiguous identification of every register unit. This ID number has not been of any direct use for the project of compiling sectoral Intra trade data. Nonetheless, this ID number had been included in the data

sets of sectoral intra trade statistics as the analysis of some units in certain economic sectors has been done via manual check-ups within the GBR.

The GBR contains **name** and the delivery **address** and the address of the registered office if the delivery address deviates from the registered office's address.

The **legal form** of the enterprise is of importance in the case of similar enterprise names. The legal form has to be allocated to all enterprises of the GBR according to specific keys.

Enterprises, which trade within the EU, need a so-called "Umsatzsteuer-Identifikationsnummer" or **VAT Identification Number**. In Germany, the VAT Identification Number is assigned by the Bundesamt für Finanzen (BfF, Federal Tax Office) by request of the enterprises. This number enables the enterprise to deliver goods VAT-free to other enterprises within the EU owning a valid VAT Identification Number of the destination country. The Land fiscal authorities transmit to the BfF the necessary data. The BfF in return informs the Land fiscal authorities about the assigned VAT Identification Number.

Unfortunately the VAT Identification Number could not be used as the key identifier or at least as an auxiliary identifier for the present project because this number is included in the General Business Register but not in the Intrastat Register.

## 2.5 Main variables of sectoral intra trade statistics after the linkage of both data sources

### 2.5.1 Sector of activity

This data is gained by the Oberfinanzdirektionen (OFD; Regional Finance Offices of the Länder), which receives it from the local tax offices. They allocate an enterprise to a specific sector of activity according to the 'main-focus'-principle. If a unit performs several activities, the main activity (largest share to the added value) has to be specified.

The sector of activity can be codified down to the 5-digit-level; however the 2-digit-code is required at least. A change in the sector of activity key is processed after the activity of the respective unit has changed significantly and sustainable. Even with sudden relocations of activities, the key should not be changed more than once a year.

There is an extra data field specifying the sector of activity defined by the Bundesagentur für Arbeit (Federal Employment Agency). The criteria for the definition of are generally the same as those used by the OFD. Often this extra field is empty or has the same contents as the sector of activity of the OFD. Though, sometimes the classification is different and more appropriate. In this case the classification of the Bundesagentur für Arbeit was used.

### 2.5.2 Number of employees subject to social insurance

The number of employees, which are obliged to take part in the national insurance system, is taken from data issued by the Bundesagentur für Arbeit (Federal Employment Agency). This includes trainees, temporary absent employees, employed field staff, home workers as well as all part-time employees (non-converted to full time equivalents). Generally not in-

cluded are active owners and helping family members without salary and temporary workers from other enterprises (if not from the same enterprise group).

### **2.5.3 Turnover, taxable turnover**

The turnover comprises the amounts brought to account for the sale of goods and services during the accounting year, including all charges and taxes except for the VAT.

According to the respective EU Regulation, data for turnover are obligatory variables for enterprises with a yearly turnover of more than 2 million Euros. However, units without these figures are recorded as well within the GBR as there is no yearly turnover data available for newly started enterprises.

The definition for turnover used is widely in accordance to the “deliveries and other services” plus own consumption (= taxable turnover, reduced by intra-EU purchases and import volume from third countries). However, the internal turnover of the enterprises caused by transactions within their own enterprise group is not part of the taxable turnover.

The stated turnover in the GBR is composed by the estimated turnover for controlling companies and its subsidiary companies (for related problems see section 2.6) and the stated taxable turnover of all other companies.

## **2.6 Methodical problems**

As stated before, for the GBR an enterprise is defined as the smallest legally independent unit which disposes of an own accountancy or which effects similar records to ascertain the assets on a yearly basis. The enterprise comprises all local units except for legally independent affiliated companies et cetera. But there are exceptions. Legal entities, who represent own enterprises in the definition frame of the German federal statistics, are not regarded as own enterprises in the requirement of turnover tax law, if they are assigned to a subsidiary or a VAT group.

In Germany this relationship of subordination between a parent company (Organträger) and at least one subsidiary (Organgesellschaft) is called VAT group<sup>1</sup> (Organschaft). Taxation is in the hands of the parent company, as one fiscal unit. The subsidiary is legally independent, but economically, financially and organizationally depended.

In the case of VAT groups, the fiscal authorities deliver data containing the turnover of the VAT group, the name, address and sector of activity. Information on the enterprises belonging to the VAT group is not transmitted. The turnover of the subsidiary enterprises is included in the turnover data of the parent company.

This leads to the following problems:

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<sup>1</sup> VAT law allows companies under common control to be treated as a single entity for VAT purposes. This is a business facilitation measure designed to reduce the administrative burdens on businesses. The VAT group only has one VAT registration and supplies between members are disregarded for VAT purposes.

- Information about legally independent enterprises belonging to VAT-groups is missing out totally, if they are not included in some other source.
- Subsidiary companies, which were inserted into the GBR from other sources, do not have information on their turnover.
- In the GBR parent companies are shown with the turnover of the whole VAT group and not with their own turnover, which is especially critical when the parent company is not tagged as such in the data received from the fiscal authorities.
- In most cases the turnover of the VAT group is shown globally in the sector of activity of the parent company. For statistical purposes this problem is even more difficult the more heterogenic the sectors of activity of the subsidiary companies are.
- The total turnover of the VAT group is assigned to the Land where the parent company has its seat. This is not inevitably the place where the most turnover is generated.

To solve this problem the following was done: In the data material of the Bundesanstalt für Arbeit (Federal Employment Agency) used by the GBR, information about the number of employees subject to social security in local units belonging to parent companies, is included. With this the GBR has at least some information on the existence of subsidiary companies. Much more problematic was it to obtain information on the turnover of the parent companies and its subsidiary companies. The fiscal authorities know only the taxable turnover of the whole VAT group, which is defined as the turnover outside of the VAT group. That means that it does not include the turnover generated within the group. The missing information makes it difficult to identify the enterprises in its assignment as the smallest legally independent entity in the GBR. It was not adequately possible to identify parent companies or subsidiary companies until a survey<sup>2</sup> conducted with the enterprises and some data about VAT groups received from the Bundesamt für Finanzen (BfF, Federal Tax Office) led to a labelling of these units. However, it was still not possible to receive information on the turnover of the subsidiary enterprises. For this purpose an estimation procedure was developed mapping the turnover of the parent and all subsidiary companies and the internal turnover of the VAT group.

So now, subsidiary enterprises are only included in the GBR if information on their employees subject to social security is available. This is also a necessary requirement for the estimation procedure, so for all these enterprises turnover information is available. Analysing data of the GBR is still only informative to a limited extent especially when in a number of enterprises information about subsidiary enterprises is missing or the turnover is assigned to a sector of activity or a Land where it has not been produced in the first place.

For a better judging whether the problems related to VAT groups are of any importance to the GBR one can use data from the VAT statistics on the concurrency and the volume of VAT groups in Germany. The VAT statistics state for the reference year 2002, that a total of 19 659 VAT groups were active. The total number of entities subject to VAT is considered with about 2.9 Millions, which mean the VAT groups represent a share of 0.7 %. So in number these entities are quite unimportant.-However, when looking at the share of the VAT groups in total taxable turnover it becomes clear that their share of 22.9 % is quite high.

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<sup>2</sup> 25% of all enterprises in the GBR were asked in the year 2000 to verify their collected register data.

## 2.7 Linking Intra Trade Register and General Business Register

Following the analysis of the variables from both Registers, several variables from each source have been selected for the compilation process of sectoral foreign trade data. The linkage of both sources has been done via the common identifier 'VAT number'.

Initially it was intended to link the Intrastat Register of the year 2000 with the General Business Register (GBR) of the year 2003. This was not successful, as the federal copy of the GBR does not yet include a change history. This history is only available in the various Länder portions of the General Business Register to which the Federal Statistical Office has not yet any direct access. This means that changes in the VAT Number, our key identifier, are not recorded, but that the old VAT Number is simply overwritten with the new VAT Number. This caused a steep drop in the matching rate compared with our last study. Consequently for the Intrastat Register the reference years 2002 were selected and for the GBR the only available reference year 2003, which became available in March 2004.

The basic data material which used to be the source of all final tables (results) was structured as shown below:

Data field # (basic data material)	Data field description (basic data material)	Variable
1	(Reference) Year	Year
2	ID number of the enterprise	ID number assigned within the GBR
3	VAT ID number (successfully matched cases), "999999999999" (un-matched cases)	Comparison of the VAT ID number from both materials (Intra trade and GBR)
4	Sector of activity according to NACE rev. 1.1, 5-digit	Sector of activity within the GBR
5	Source code	Source code from GBR (source of information of the respective data in the GBR)
6	Type of unit (legal form)	Type of unit (GBR)
7	Status of unit	Status of unit in GBR (new entry/update/deletion etc.)
8	Commodity code, 5 digit	Commodity code (Intra trade)
9	Partner country (code)	Country code from Intra trade statistics
10	Turnover in 1 000 EUR	Taxable turnover in 1 000 EUR from GBR
11	Turnover, reference period	Turnover, reference period for turnover from GBR
12	Number of employees subject to national insurance	Employees subject to national insurance from GBR
13	Reference period (employees)	Reference period for number of employees subject to national insurance (from GBR)
14	Intra trade arrivals (resp. dispatches) in 1 000 EUR (reference year 2002 or 2003)	Intra trade statistics, value for arrivals (resp. dispatches) divided by 1 000

For the Intra trade arrivals side, 45,638 enterprises out of 51,111 have been successfully identified by their VAT numbers within the GBR which represents a numeric hit rate of 89.3% (by number of enterprises) and a trade coverage of 80.9% of the total arrivals (see

Table 1). Of the 45,565 exporters in Intra trade, 40,999 were successfully matched with the GBR which makes a numeric hit rate of 90.0% and trade coverage of 82.5%.

*Table 1: Hit rates and trade coverage, reference year 2002*

Population concerned		Intra	
		Arrivals	Dispatches
<b>All trade operators</b>	Number of foreign trade operators	51,111	45,565
	Trade coverage (%)	97.6%	98.7%
<b>Trade operators successfully matched with the BR</b>	Number of foreign trade operators	45,638	40,999
	Trade coverage (%)	80.9%	82.5%
	share as of the total number of foreign trade operators	89.3%	90.0%

### 3 Main results

After the linkage of the Intrastat Register and the General Business Register (GBR) the resulting data files for the reference years 2002 were analysed, covering the following principal variables:

- ID number of the enterprise (GBR);
- VAT number;
- sector of activity (NACE rev. 1.1; 5-digit);
- commodity code, 5-digit;
- partner country (code);
- turnover (1,000 EUR);
- number of employees;
- Intra trade values (arrivals/dispatches; 1,000 EUR).

In total, for the reference year 2002 around 67,400 enterprises were analysed which were active in Intra trade and reported it to the Federal Statistical Office. Looking at the flows, there were more enterprises importing (ca. 51,100) than exporting (about 45,600).

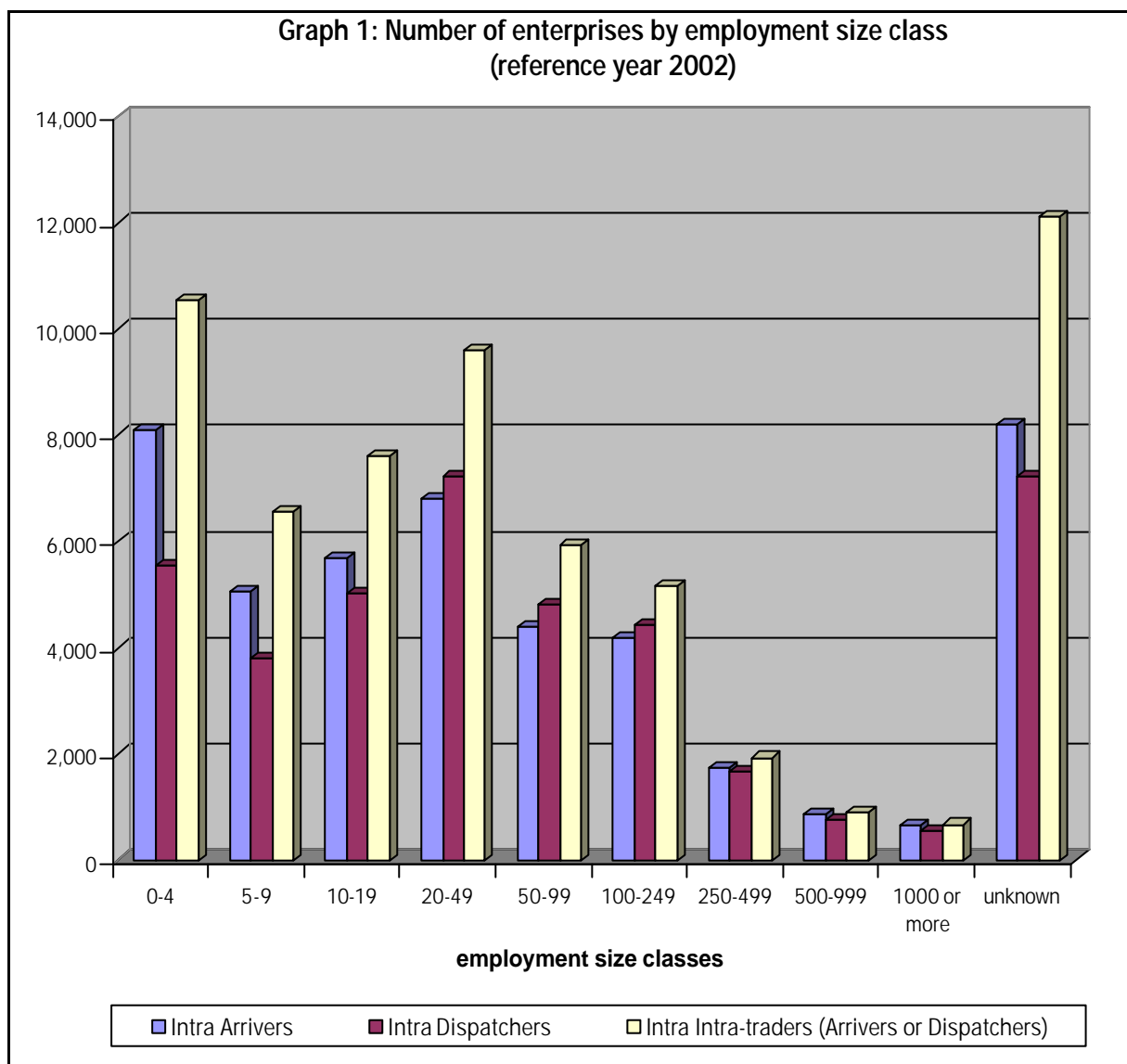
In the following subchapters the main results of the linkage process will be presented.

#### 3.1 Results by size-classes

The size of enterprises has been defined by their number of employees. Nine size classes (intervals) have been composed plus one class "unknown". Unfortunately, for the reference year 2002 one fifth of all Intra trade enterprises could not be allocated to a size-class (see graph 1) due to missing figures for employees in the GBR. Employee data is currently still missing in the (federal copy of the) GBR for some multiple-plants-enterprises and multiple-Länder-enterprises. These types of enterprises are usually enterprises of larger size.

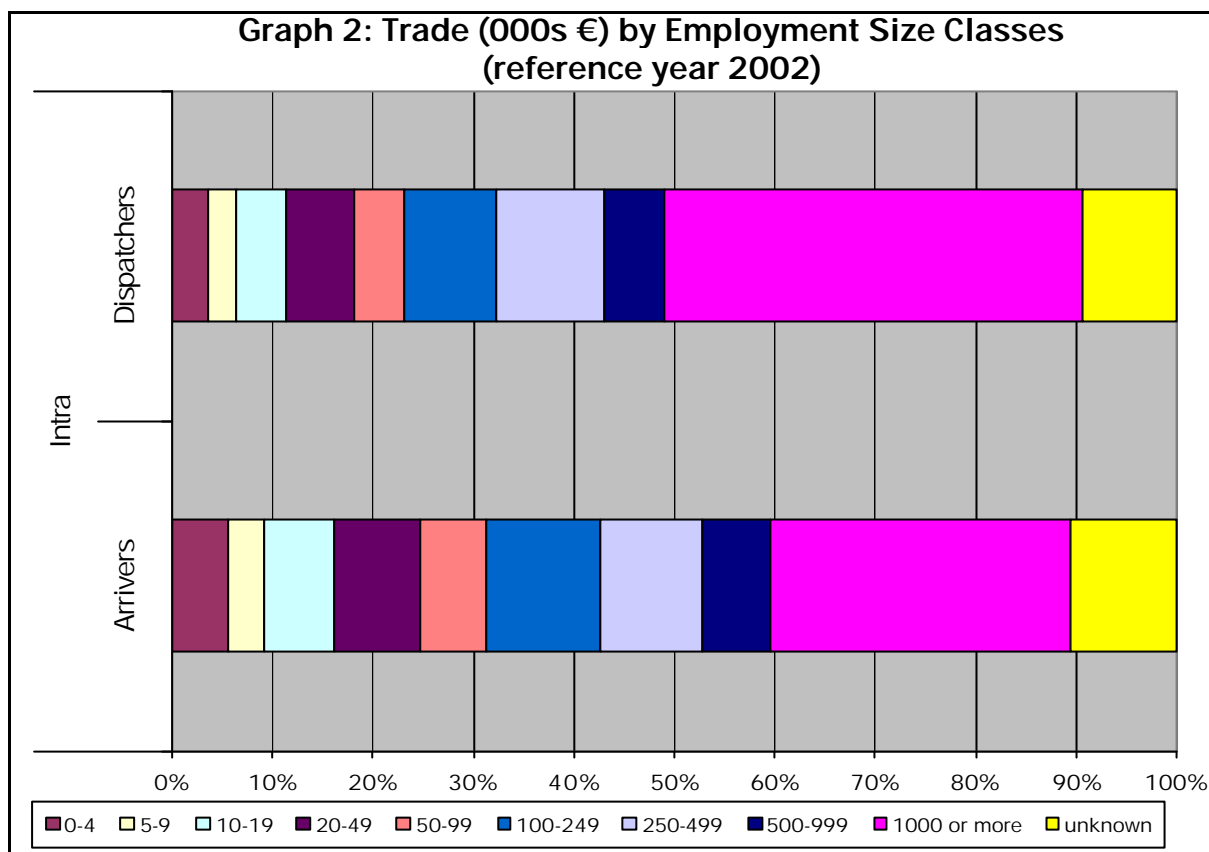
The Problem with missing employee data is typical for the federal organisation of the GBR. Usually not the enterprise but the local unit disposes data about employees subject to social insurance. In the case of multiple-plants-enterprises a summation for the whole enterprise must be carried out within the Land (federal state) whereas concerning multiple-Länder-enterprises the summation must be carried out overall concerned Länder (federal states). This means an intensive exchange of information in between the Länder which is not always working.

In our last study, the portion of unknown employees was even larger and amounted to one third of all enterprises. Furthermore for some integrated groups of companies the number of employees is not recorded "correctly" as it shows only the number of employees working for the holding of the enterprise group.



On the arrival side small enterprises with 0 to 4 employees and mid size enterprises with 20 to 49 employees had the largest share by numbers (17% and 15% respectively). However, taking the traded value (see Graph 2) the very large enterprises with more than 1,000 employees had the largest share with 30% of all arrivals, followed by the enterprises with 100 to 249 and 250 to 499 employees with 12% and 10%.

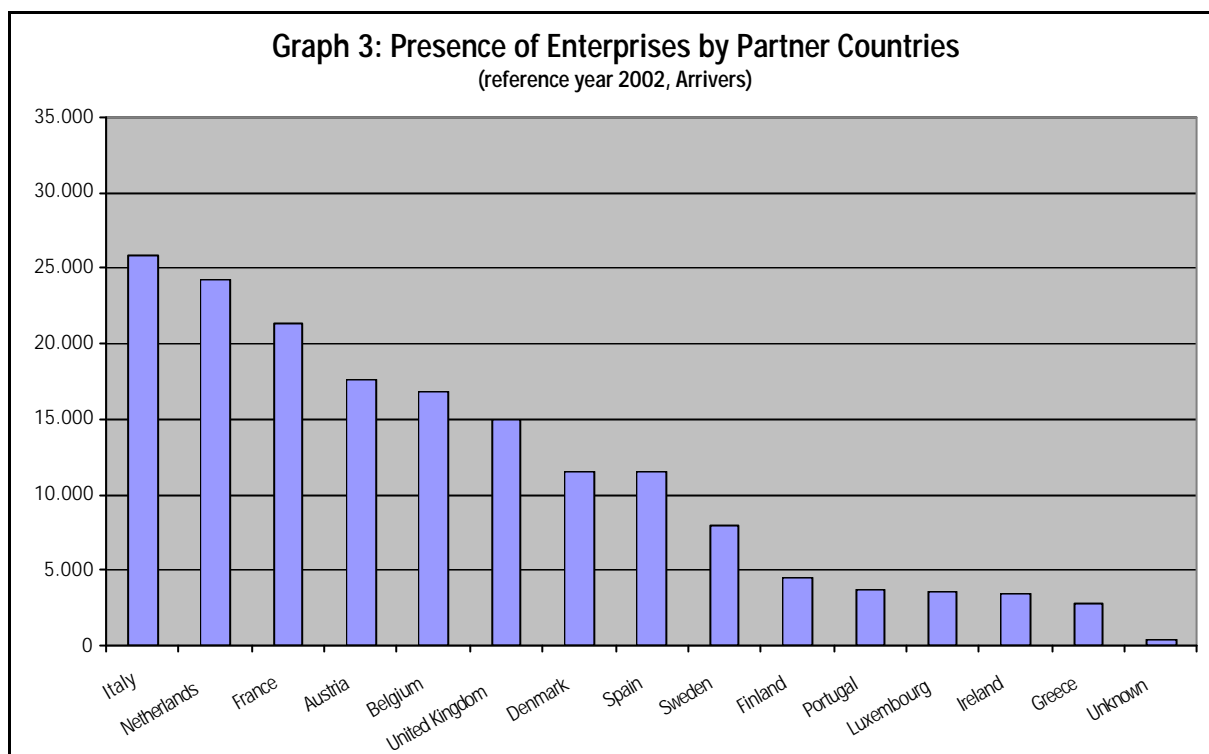
On the dispatch side mid-sized enterprises with 20 to 49 employees and small enterprises with 0 to 4 employees had the largest share by numbers with 18% and 14% respectively. But taking the trade value something similar to the arrivals can be observed. The largest share with 42% of all dispatched was held by the very large enterprises with more than 1,000 employees, followed by the enterprises between 250 and 499 employees with a share of 11%. It can be concluded, that on the dispatch side, trade is dominated by larger enterprises.



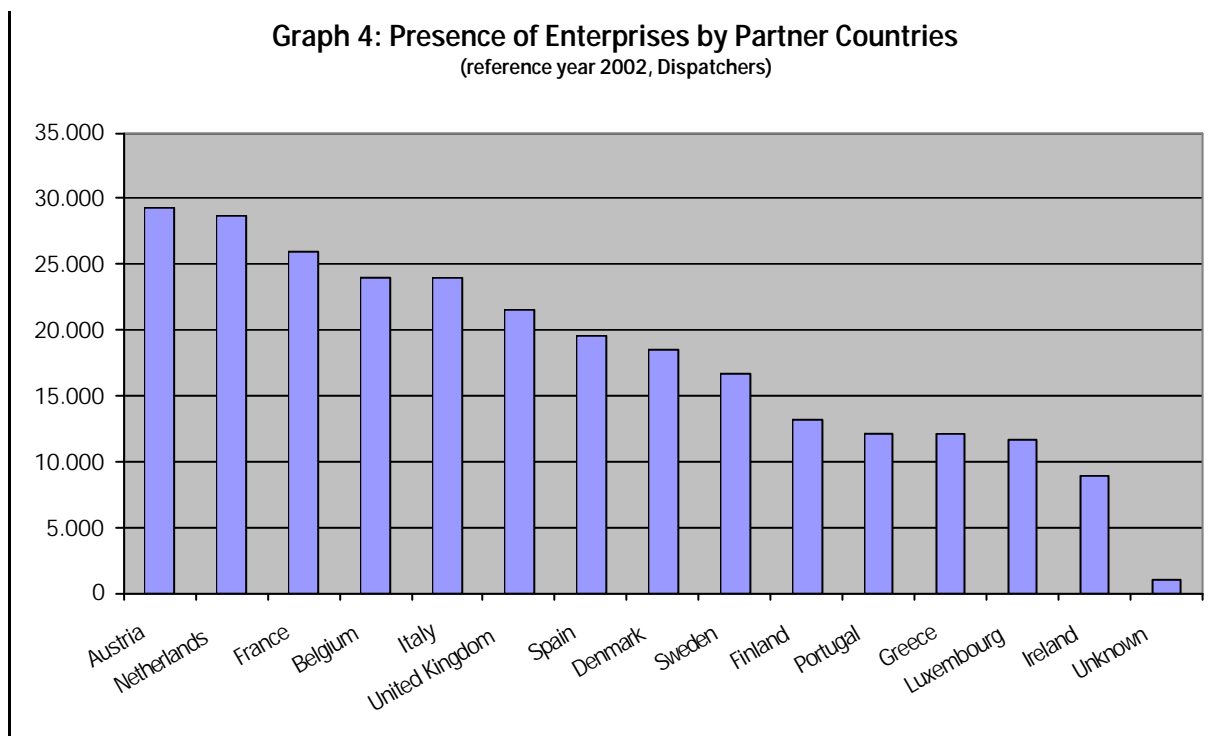
### 3.2 Presence of enterprises by EU-partner zones

This Section analyses with which and with how many partner countries the German enterprises trade within the EU. This is just a numeric analysis, which means that the trade values with each partner zone are not taken into account in this context. Double-counts of enterprises might naturally be possible or even likely here as enterprises will not necessarily conduct Intra trade with only one partner zone.

On the arrival side (see Graph 3) in the reference year 2002 Italy (with 25,887 enterprises), the Netherlands (24,217), and France (21,385) were the partner countries from which the largest amount of enterprises imported goods.



On the dispatch side (see Graph 4) in the year 2002 Austria (with 29,238 enterprises), the Netherlands (28,633), and France (26,023) were the partner countries to which the most enterprises exported.



It can be observed that in general more enterprises are involved in importing goods than in exporting goods. For every country except Italy more enterprises were exporting to it than importing from it. This presumable contradiction can be explained by the fact that enterprises usually import only from few partner countries and export to many (or even all) EU partner countries (see Table 2).

Table 2: Number of Enterprises by Partner Zones (reference year 2002)

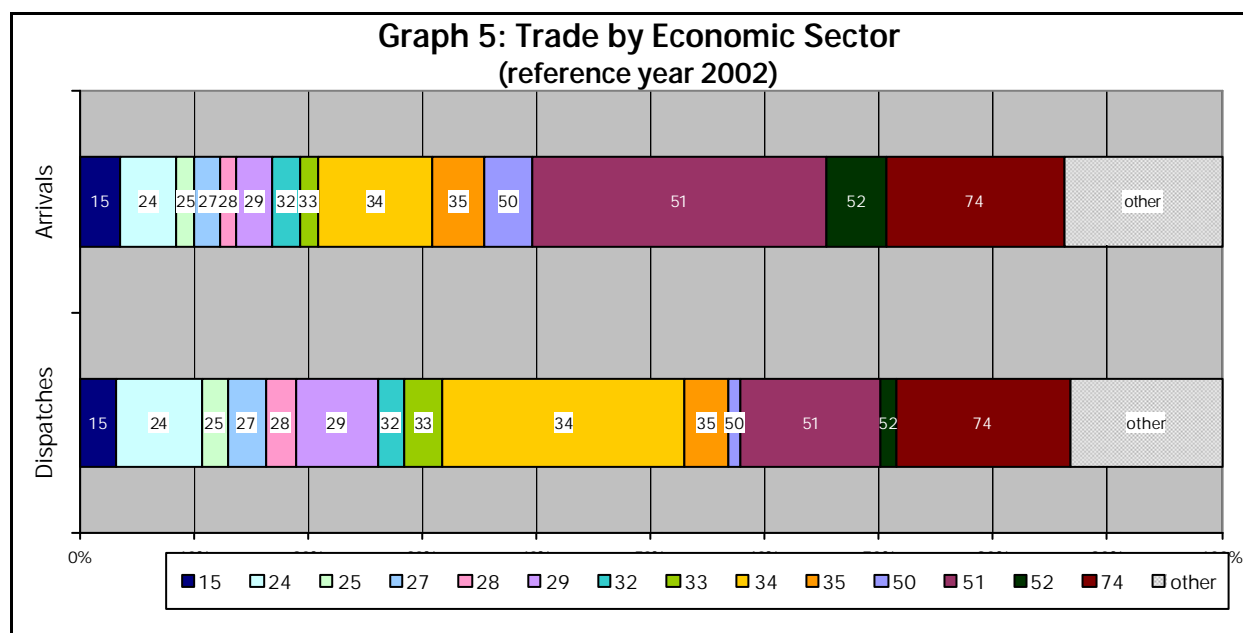
Enterprises trading with	Arrivers	Dispatchers	Total numbers of intra-EU trading enterprises
1 partner zone	14,027	6,547	13,182
2 partner zones	6,956	3,908	6,289
3 partner zones	5,425	3,240	4,946
4 partner zones	4,609	2,971	4,429
5 partner zones	3,687	2,712	3,938
6 partner zones	2,970	2,521	3,583
7 partner zones	2,404	2,443	3,479
8 partner zones or more	5,560	16,657	20,184
unknown			
<b>Total</b>	<b>45,638</b>	<b>40,999</b>	<b>60,030</b>

Namely about 41 % of all exporters traded with at least eight partner zones in the year 2002. (This is similar to the 40% observed in our last study with the reference year 2000.) This seems to be due to “economies of scale”. The more the enterprises can sell, the more they can produce, the less are their costs per unit. So the import companies can usually purchase at better prices the more they order from the same supplier, while export companies tend to expand their trading area as much as possible.

### 3.3 Trade by economic sectors (NACE)

One of the main focuses of the present study is the analysis of the Intra-trade by economic sectors (or sector of activity). This implies the turn from the transaction-based aspect by commodities to the enterprise-based aspect. This means that we did not analyse the trade of goods but the amount of trade by enterprises classified according to economic sectors. For this the NACE classification Revision v1.1 was used.

Only the 2-digit level was analysed and only in the case of economic sector 74 a detailed analysis was done in order to identify and reclassify holdings.



In the reference year 2002 for the arrival side it can be observed, that the largest economic sectors importing from other EU countries were sector 51 (*wholesale trade and commission trade, except of motor vehicles and motorcycles*) with a share of 25.6% of all imports, sector 74 (*other business activities*) with a share of 15.6%, sector 34 (*manufacture of motor vehicles, trailers and semi-trailers*) with 10.1%, sector 52 (*retail trade, except of motor vehicles and motorcycles; repair of personal and household goods*) with 5.3%, and sector 24 (*manufacture of chemicals and chemical products*) with 5.0%. These five economic sectors had a combined share of almost 62% of all imports.

For the dispatch side it can be seen, that the largest economic sectors exporting to other EU countries were sector 34 (*manufacture of motor vehicles, trailers and semi-trailers*) with a share of 21.3% of all exports, sector 74 (*other business activities*) with 15.2%, sector 51 (*wholesale trade and commission trade, except of motor vehicles and motorcycles*) with 12.2%, sector 24 (*manufacture of chemicals and chemical products*) with 7.5%, and sector 29 (*manufacture of machinery and equipments n.e.c.*) with 7.2%. These five economic sectors had a combined share of more than 63% of all exports.

On both sides, arrivals and dispatches – economic sector 74 "*other business activities*" is the second largest economic sector. What are these "*other business activities*"? Subchapter 74.1 is "*Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings*", 74.2 is "*Architectural and engineering activities and related technical consultancy*", 74.3 is "*Technical testing and analysis*", 74.4 is "*Advertising*", 74.5 is "*Labour recruitment and provision of personnel*", 74.6 is "*Investigation and security activities*", 74.7 is "*Industrial cleaning*", and 74.8 is "*Miscellaneous business activities n.e.c.*". As one can see, economic sector 74 is a real *omnium-gatherum* of very different enterprise related services. Analysing some of these enterprises, it was clear very quickly that most of the 74ers were located in chapter 74.1 and more specifically in chapter 74.15 "*Management activities of holding companies*". NACE classification 74.15 is widely used by large enterprise groups which are doing business in several economic sectors or that combine several enterprises of the same economic sector with different brand names. The three largest single enterprises in economic sector 74 were in the "real" economic sectors 29 and 34 on the dispatch side and in economic sectors 23, 29, and 34 on the arrivals side. As the results by economic sectors were a bit discontending, we tried to replace automatically the economic sector classification obtained by the Oberfinanzdirektionen with the economic sector classification of the Bundesagentur für Arbeit, which uses in some cases a different classification. A first try to do this showed very quickly that the economic sector classification by the Bundesagentur für Arbeit is not more informative than the classification by the Oberfinanzdirektionen.

Therefore, it was decided to do a manual reclassification of the economic sectors 74 and 70 (*real estate activities*), another very popular economic sector for mainly family businesses, that want to protect their real estate property and machinery by a company split-up. That means that the company is split up in a business partnership owning the grounds, the buildings, and machinery and in a limited liability company producing the products with the real estates and machinery leased from the business partnership.

### 3.3.1 Economic Sector 74

Sector 74 (*other business activities*) hosts mainly holdings of enterprise groups. In order to find out, in what business these enterprises are really in, a manual reclassification was done. In the case of sector 74 this was done for the fifty largest enterprises taking the statistical value of the arrivals and dispatches separately. The information about the "real" economic sector of these companies was deducted from the product range of each company analysing their web pages. In most cases a quite clear reclassification was possible but in some cases the selection of the main sector of activity was not very easy and maybe erroneous. (Where the share of the business activities was not published, the main activity was selected to the best of one's knowledge.)

Most of the enterprises found and reclassified on the dispatch side were enterprises with the "real" economic sector 34 (*manufacture of motor vehicles, trailers and semi-trailers*) with almost 40% of all reclassifications, followed by sector 24 (*manufacture of chemicals and chemical products*) with 23%, and sector 29 (*manufacture of machinery and equipments n.e.c.*) with 13%. On the arrival side most enterprises found and reclassified were enterprises with the "real" economic sector 34 with 35% of all reclassifications, followed by the sectors 29 and 24 with 12% each.

As mentioned before the reclassification was only conducted for the fifty largest enterprises in economic sector 74. The reclassification of these enterprises reduced the amount of trade of sector 74 by 62% on the dispatch side and by 69% on the arrival side. Considering that most enterprises found in this economic sector are generally not doing their business in this sector, analysing more enterprises would have resulted in a further reduction of the traded value by sector 74.

### 3.3.2 Economic Sector 70

As explained above sector 70 (*real estate activities*) hosts mostly family enterprises part of company split-ups. In order to find out in what business these enterprises are really in, also in this case a manual reclassification was conducted. In this case the thirty largest enterprises (taking the statistical value of the arrivals and dispatches separately) were analysed. The information about the "real" economic sector of these companies has been deducted from the product range of each company analysing their web pages. In most cases a quite clear reclassification was possible but in some cases the selection of the main sector of activity was not very easy and maybe erroneous. However, the reclassification was done to the best of one's knowledge.

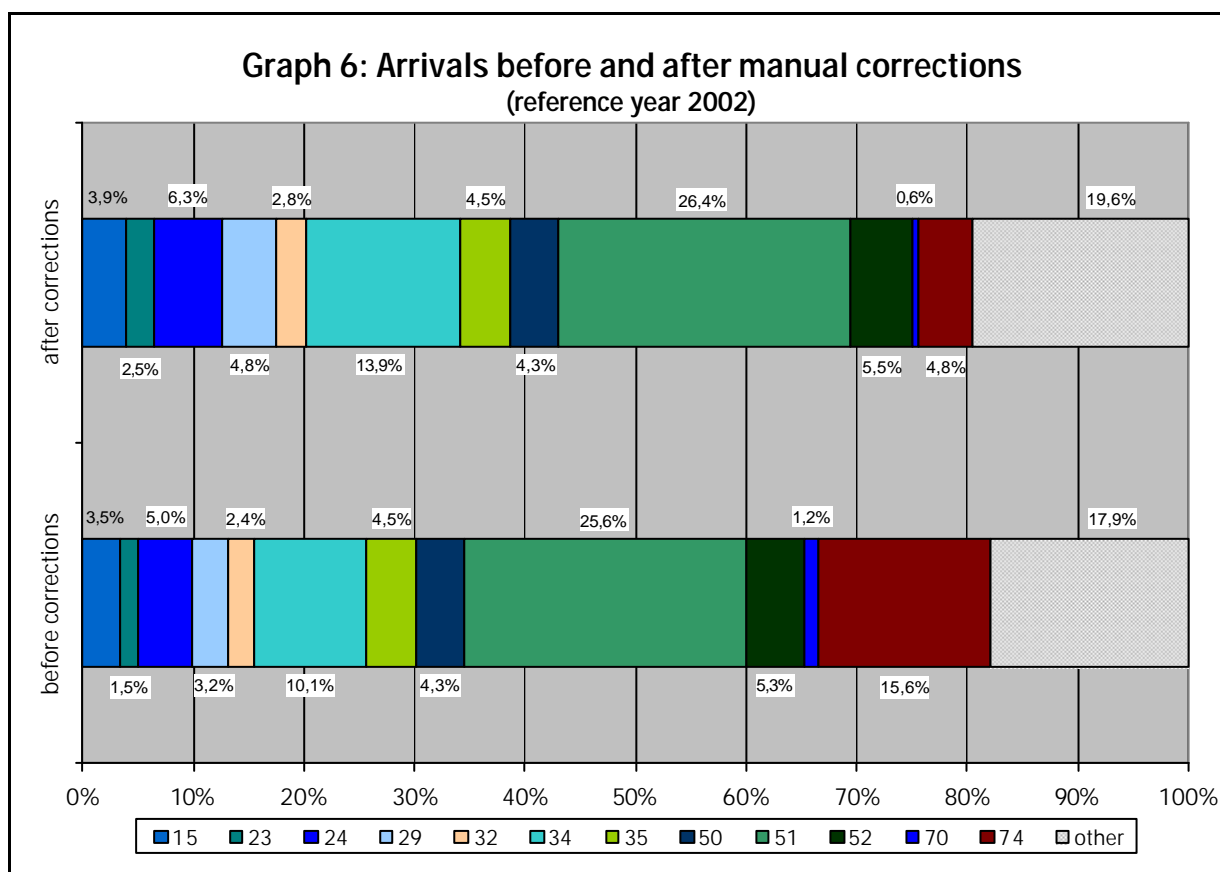
Most of the enterprises found and reclassified on the dispatch side were enterprises with the "real" economic sector 29 (*manufacture of machinery and equipments n.e.c.*) with almost 48% of all reclassifications, followed by sector 21 (*manufacture of pulp, paper and paper products*) with 16%, and sector 26 (*manufacture of other non-metallic mineral products*) with almost 6%. On the arrival side most enterprises found and reclassified were enterprises with the "real" economic sector 29 with 37% of all reclassifications, followed by the sector 22 (*publishing, printing and reproduction of recorded media*) with 11% and sector 34 with 10%.

As stated above the reclassification was only carried out for the thirty largest enterprises. The reclassification of these enterprises reduced the amount of trade in this sector by 50% on the dispatch side and by 48% on the arrival side. Considering that most enterprises found in sector 74 are generally not doing their business in real estates, analysing more enterprises would have resulted in a further decrease of the traded value.

### 3.3.3 Trade by economic sectors after manual correction

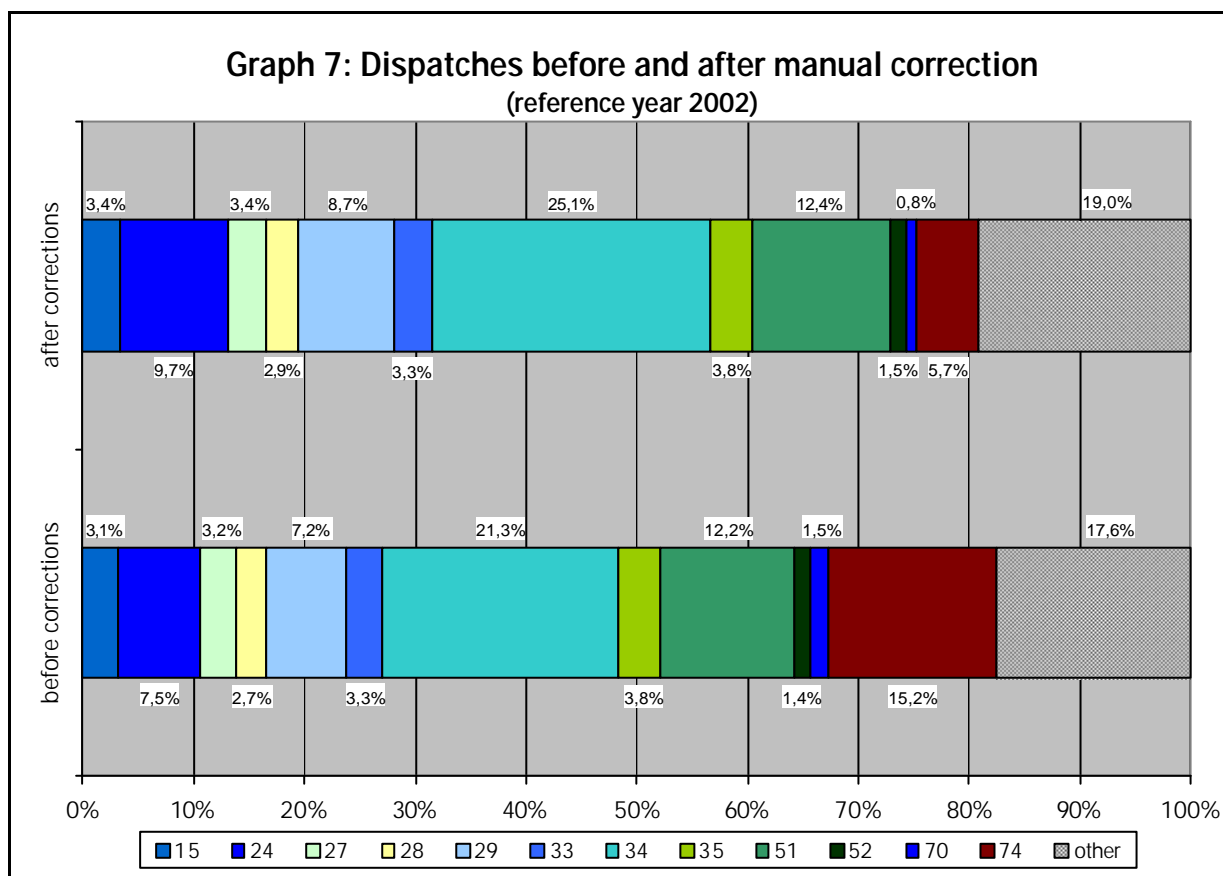
In this section an analysis of the distribution of the Intra-EU-trade by economic sectors after the manual correction of economic sectors 70 and 74 is done. As it can be seen in Graph 6, the distribution of the imports by economic sector changed considerably. The share of economic sector 74 (*other business activities*) was reduced from 15.6% of all imports to 4.8%. It has to be kept in mind that this share could have been reduced by a more comprehensive analysis of sector 74. The share of economic sector 70 (*real estate activities*) was reduced from 1.2% of all imports to 0.6%. Also here it has to be reminded that a deeper analysis could have reduced this share even further.

The largest economic sectors by level of arrivals are now economic sector 51 (*wholesale trade and commission trade, except of motor vehicles and motorcycles*) with 26.4% of all imports (was: 25.6%), sector 34 (*manufacture of motor vehicles, trailers and semi-trailers*) with 13.9% (10.1%), sector 24 (*manufacture of chemicals and chemical products*) with 6.3% (5.0%), sector 52 (*retail trade, except of motor vehicles and motorcycles; repair of personal and household goods*) with 5.5% (5.3%) and sector 29 (*manufacture of machinery and equipments n.e.c.*) with 4.8% (3.2%).



For the dispatch side this analysis is quite similar. As it can be seen in Graph 7 also the distribution of the exports by economic sector changed significantly. The share of economic sector 74 (*other business activities*) was reduced from 15.2% of all exports to 5.7%. The share of economic sector 70 (*real estate activities*) was reduced from 1.5% of all exports to 0.8%. It has to be kept in mind that this share could have been reduced by a profounder analysis of sectors 70 and 74.

The largest economic sectors by level of dispatches are now sector 34 (*manufacture of motor vehicles, trailers and semi-trailers*) with 25.1% of all exports (was: 21.3%), sector 51 (*wholesale trade and commission trade, except of motor vehicles and motorcycles*) with 12.4% (12.2%), sector 24 (*manufacture of chemicals and chemical products*) with 9.7% (7.5%), sector 29 (*manufacture of machinery and equipments n.e.c.*) with 8.7% (7.2%), and sector 74 (*other business activities*) with 5.7% (15.2%).

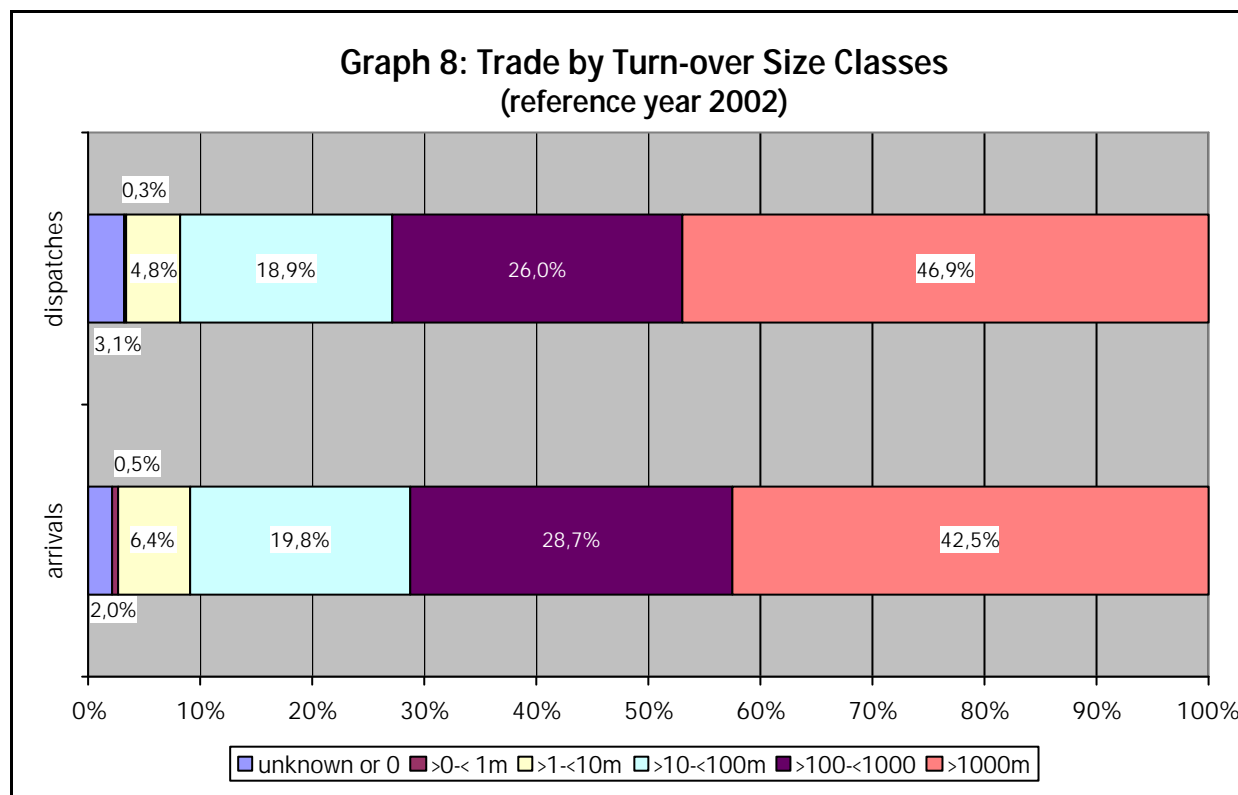


### 3.3.4 Trade by turnover

According to EU-Regulation No. 2186/93 the turnover of enterprises has to be included in the General Business Register (GBR). For this two sources are available in Germany. On the one hand primary statistics are conducted for enterprises by the statistical offices in the form of a partial census, and on the other hand secondary data is available from the Oberfinanzdirektionen (Regional Finance Offices) for all enterprises liable to VAT. Both sources do not cover all enterprises in the GBR. In order to provide turnover figures for all enterprises the turnover of the integrated groups of companies has been broken down to enterprise level by estimating the share of the turnover via the number of employees. This has been done for the first time with the GBR of the reference year 2002.

Unlike in previous studies, intra trade has been also analysed by turnover. Graph 8 shows that over 90% of all trade in the year 2002 (arrivals and dispatches) with EU-countries has been conducted by enterprises with a turnover of 10 million Euros or more.

Even the share of enterprises with a taxable turnover of one billion Euros or more is so large (over 42% for arrivals and almost 47% for dispatches) that it can be said, that Intrastat trade is only conducted by large and very large enterprises.



However, analysing the results in detail, it can be observed, that the turnover data recorded in the GBR is not always very reliable. There are enterprises that show a value of dispatches larger than the total turnover of the enterprise. This is impossible and therefore these data are invalid. The cause (also mentioned in section 2.6) is the still very limited possibilities to represent larger agglomerates of enterprises within the GBR. It can happen that a parent company of a VAT group reports all foreign trade, but that the various legally independent enterprises within the group report their turnover individually. This results in a large foreign trade and little turnover.

There are an even bigger number of enterprises importing goods from other EU countries with a larger value than their total turnover. The data of these enterprises are therefore also invalid. For each side the share of unquestionable invalid data is between 0.2 to 0.4%. But it can be assumed that the share of enterprises with invalid data is probably even larger. The share of enterprises with an unknown turnover or a recorded turnover of zero is around 0.5% for each direction of trade.

## 4 Conclusion and Outlook

This study is the third linking the General Business Register (GBR) with the Intrastat Register producing sectoral Intra trade statistics. The first study covered only a few Länder; the second covered all Länder but had an unsatisfying matching quota of only 82% of all companies trading with other EU countries and trade coverage of only 75%.

With the present study the trade coverage improved to around 81-82% and the hit rate to ca. 90%. Nevertheless, these percentages are still unsatisfying because the used key identifier, the VAT number, represents an unambiguous identifier. The main problem is that the federal copy of the GBR does not include a history of VAT number changes. This causes unnecessary decreases in the hit rate and trade coverage. For the future it is planned to build up a single GBR which will enable the Federal Statistical Office to produce sectoral trade statistics with a hopefully much larger hit rate and trade coverage than today.

For the future, when a single GBR will become available – probably in 2007 – a new study of sectoral trade would be interesting and necessary in order to see if the trade coverage and the hit rate can be improved, and to do a intertemporal analysis of the sectoral trade.

Furthermore, an improved and amended version of the GBR might also cancel out some of the drawbacks analysing enterprise-groups.