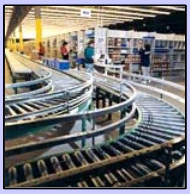
The European Pharmaceutical Wholesale Industry:

Structure,Trends, and socio-economic Importance



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The European Pharmaceutical Wholesale Industry:

Structure, Trends, and socio-economic Importance

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Executive Summary

This study presents the results of an independent study conducted by the IPF – Institute for Pharmaeconomic Research - as commissioned by the European Association of Pharmaceutical Full-line Wholesalers (GIRP).

The purpose of the study was to highlight the role of pharmaceutical wholesalers within the pharmaceutical sector, as the tasks performed by the industry are often overlooked in political and public debate. Thus, the study predominantly aims to draw a comprehensive picture of the pharmaceutical wholesale industry, outlining its structure, its socio-economic importance and the trends that have shaped the branch in the past and are likely to have a dominant impact within the next few years.

Key Findings

Pharmaceutical full-line Wholesaling: Core Indicators

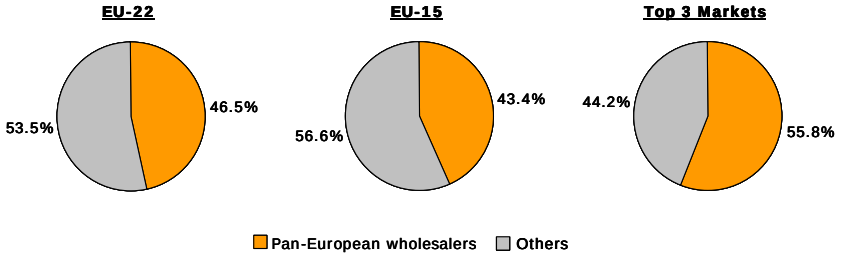
- The pharmaceutical wholesale industry is a small but vital branch within the pharmaceutical sector. In 2004, about 673 full-line wholesalers throughout the European Union[1] met the challenge to supply medicines safe, rapid and continuous to more than 450 million people in the 22 countries observed. With more than 104 billion EUR the pharmaceutical wholesale industry's turnover is not far behind Portugal's GDP of 135 billion EUR.

- A tight distribution network of 1,458 warehouses is the foundation of a continuous, safe and rapid supply of pharmaceuticals within the EU-22.

- Over the last decade, increasing competition induced companies to consolidate in order to reap economies of scale. In 2004, the 3 biggest European pharmaceutical wholesale companies together had a market share of more than 46% in the EU-22 and a market share of more than 55% in Germany, France and the UK.

[1] The study covers all countries of the European Union, except Cyprus, Malta and Slovakia. These three countries have been excluded from the analysis, since in Cyprus and Malta pharmaceuticals are distributed by agents (no full-line wholesalers) and Slovakia, where due to the fact that an association representing exclusively pharmaceutical full-line wholesalers is only in creation, the basis for reliable data is not sufficient.

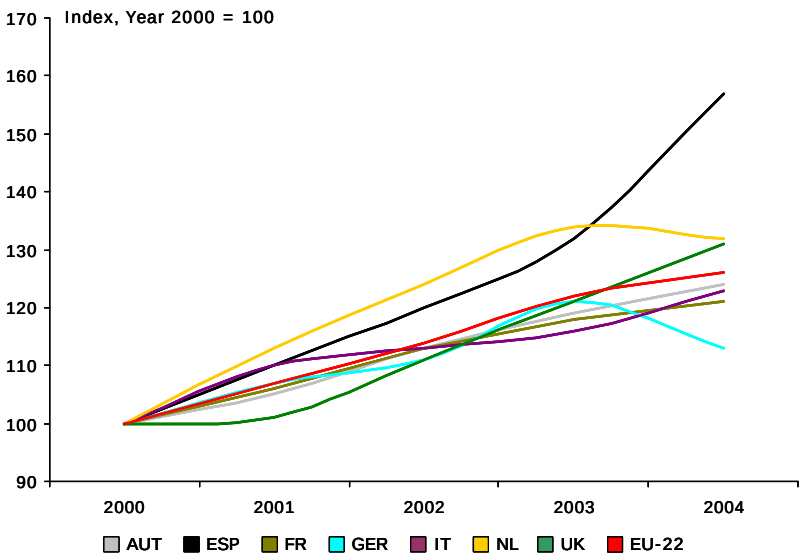
A: Market Share of the top-3 European Pharmaceutical full-line wholesalers, 2004



Source: Alliance Unichem 2004, Celesio 2004, Phoenix 2004, GIRP data

- Wholesale market growth (EU-22) declined continuously since the year 2000 as a reaction to tightened cost-containment measures and increasing generic penetration. Amongst others, especially the German market was hit hardly by drastic margin-cuts.

B: Development of full-line Wholesalers' Sales, 2000-2004



Source: GIRP data, IPF research

- In 2004, more than 65,738 people, measured in full time equivalents, were employed with pharmaceutical wholesalers in the EU-15. This is a minus of 875 employees compared to 2000. The reduction in the number of employees is a direct result from ongoing market consolidation.

The macroeconomic Impact: Generating Value Added and Employment

- The impact of the pharmaceutical wholesale industry is not limited to the branch's sales and employment. Through the wholesalers' links with their supplying industries value added and employment are generated in the economy as a whole.

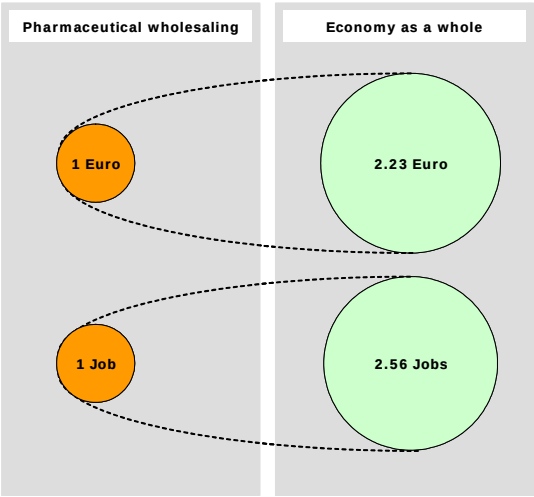
- In 2003, full-line wholesalers in just 7 European countries (Austria, France, Germany, Italy, the Netherlands, Spain and the UK), which represent about 78% of the European pharmaceutical market on a 22 country basis, generated a total value added of 8,547 million Euros.

- Altogether, pharmaceutical wholesalers had a significant macroeconomic impact. Each Euro invested by the pharmaceutical wholesale industry generated a further 2.23 Euros in the economies of the 7 countries surveyed in the analysis.

- In the same period of time, pharmaceutical wholesaling generated and maintained about 143,638 jobs in these countries.

- By creating 2.56 jobs for each working place in the pharmaceutical wholesale industry, the multiplying impact of full-line wholesalers on employment exceeds the industry's impact on value added. Thus, on an EU-15 basis, the pharmaceutical wholesale industry generated and secured 167,485 jobs in 2003.

C: Aggregate Multiplying Effects on Employment (FTE) and Value Added in AUT, ESP, FR, GER, IT, NL, UK, 2003

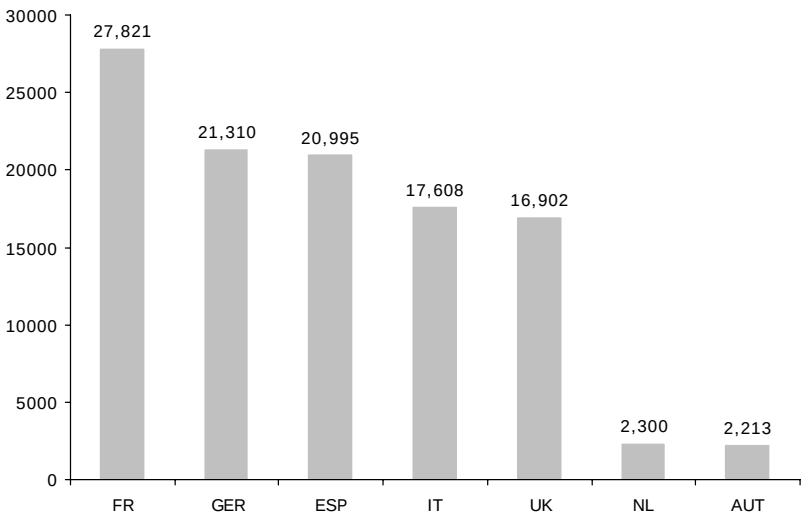


Source: EUROSTAT 2003, IPF research

Efficiency in Pharmaceutical Distribution

- In the 22 European countries observed, patients may obtain their medicines required at more than 133,000 retail pharmacies, 8,300 hospital pharmacies and 5,700 dispensing doctors. Other types of distributors at the retail level, such as drugstores, are currently not of importance on an overall European level.

D: Number of Dispensing Units [1], 2004

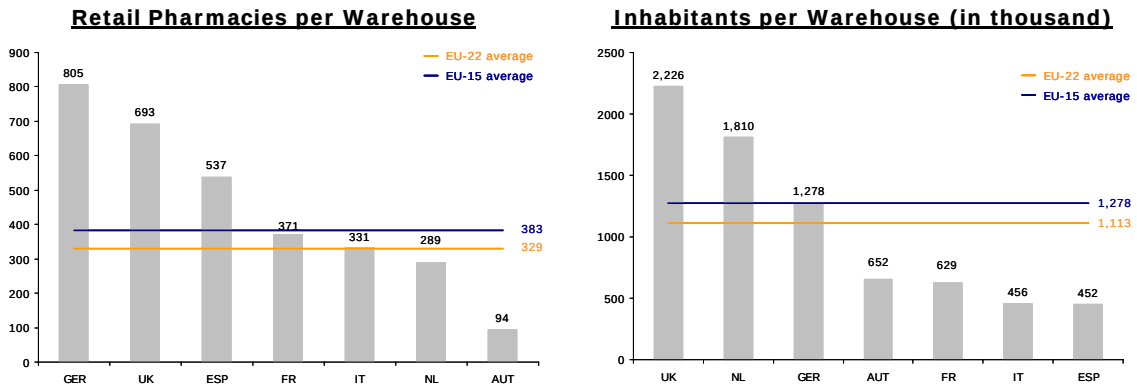


[1] Includes retail pharmacies, hospital pharmacies and dispensing doctors

Source: GIRP data 2004, IPF research

- 673 full-line wholesalers in the EU form the spine of pharmaceutical distribution, as they distribute the full range of pharmaceuticals using a tight net of around 1,458 operating sites. On average, one distribution centre serves 329 retail pharmacies and 1.11 million patients.

E: Retail Pharmacies and Inhabitants per full-line Wholesalers' Warehouse, 2004



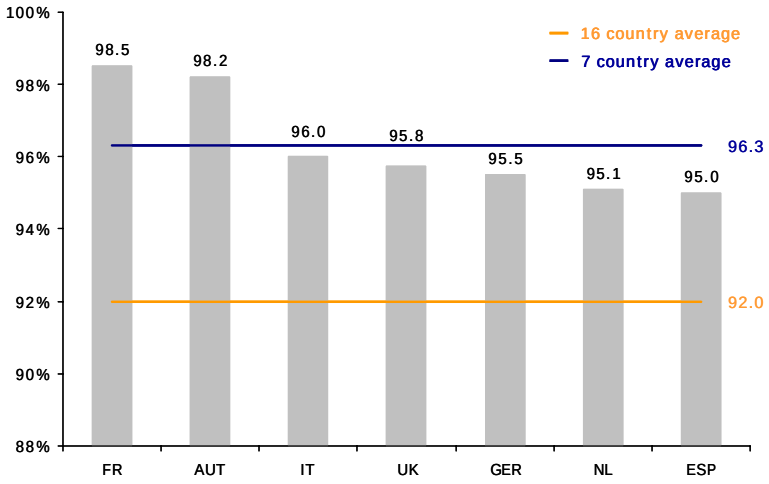
Source: GIRP data, IPF research

- The full-line wholesale industry's contribution to the overall efficiency of the pharmaceutical distribution chain is greatest where a combination of a wide product range combined with low inventory capacities, high order frequencies and the need for immediate delivery of products out of stock generates demand for high-end specialist logistic solutions, as is especially the case with retail pharmacies.

- As competition increases, the industry is forced to enhance its efficiency. Modern information technologies are applied to optimize order processes and the flow of products, thus saving cost.

- The patients directly benefit from a wide product range, vast storage capacities and the application of state-of-the-art technologies, as these factors guarantee the commissioning of 96.3% of all orders received just within 30 to 45 minutes of time.

F: Order Fill Rate (percent), 2004



Source: IPF research

- Low commissioning times are the prerequisite for delivery frequencies of up to 5 times a day.

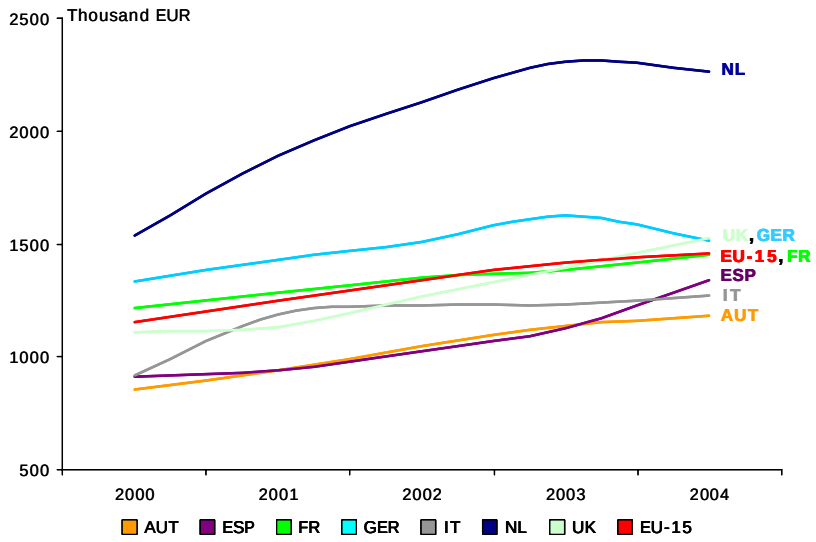
- Furthermore, full-line wholesalers are obliged to comply with strict regulations ensuring that medicines delivered meet high quality standards, thus enhancing patients' security.

- These standards are not only met in "ordinary" times, but also in times of crises like pandemic, avian flu or accidents setting free nuclear radiation. In addition, wholesalers are also important partners in preventing bio-terrorism by monitoring and tracking critical substances.

- On an EU-15 level, productivity rose by 26.8% between 2000 and 2004 (5.3% p.a.).

- In the Netherlands and in Germany, productivity decreased since 2003 due to drastic cost-containment measures by 2% and 7% respectively.

G: Development of full-line Wholesalers' Productivity, 2000-2004



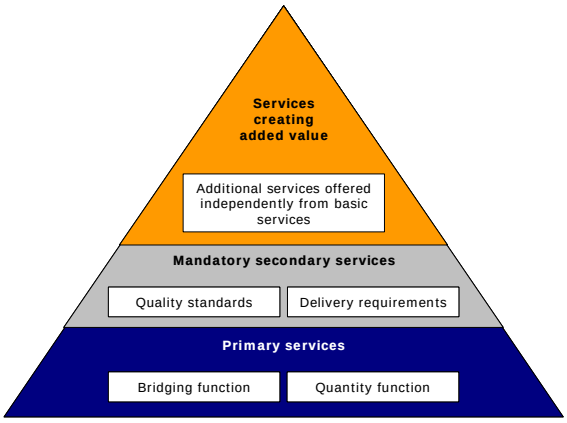
Source: GIRP data, IPF research

- On a macroeconomic perspective, the use of intermediaries enhances efficiency in the pharmaceutical distribution chain by limiting the number of transactions necessary to secure a fast and continuous supply of medicines. In 2004 the number of delivery-transactions amounted to 28 billion. Without pharmaceutical wholesalers, this number would increase dramatically to unconceivable 528 billion transactions a year.

New Business Models: Services creating Added Value

- Tough competition forced wholesalers to reorganize processes, cut cost and introduce new business models, improving the branch's efficiency and competitiveness.

H: Service Spectrum provided by Pharmaceutical Wholesalers



Source: IPF

- Thus, the distribution of pharmaceuticals has by far become more than merely delivering the right product to the right place at the right time. Services creating added value for manufacturers and pharmacies have become the most important competitive factor in pharmaceutical wholesaling giving companies the opportunity to stand out against their competitors.

- The expansion of services creating added value is unanimously regarded as one of the most important trends shaping the wholesale industry.

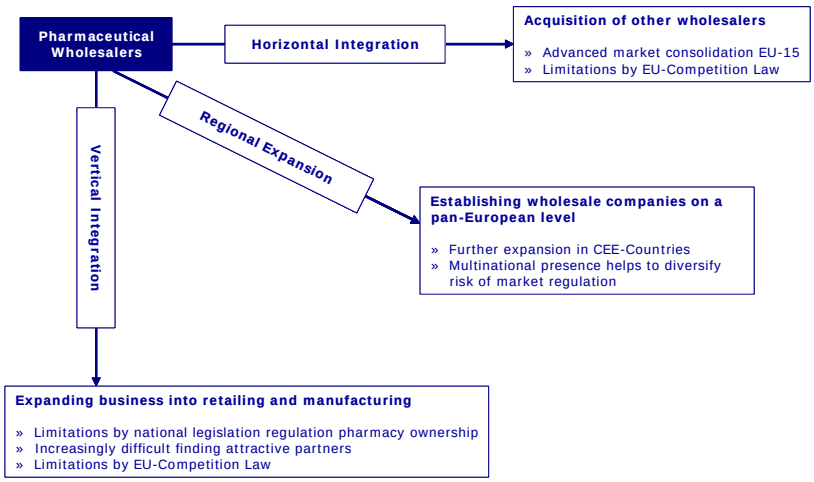
- The currently fragmented market structure enhances the establishment of networks driving wholesalers more and more to become health care providers. Within these networks, information will be a key factor for success.

- As wholesalers are in the unique position to hold a wide range of data related to markets, products, manufacturers, retailers, etc. information based services and data management will successively become the most important competitive factor for the industry.

Difficult Times for Pharmaceutical Wholesalers: Threats to the Branch's Profitability do not endanger the Supply with Medicines

- Pharmaceutical wholesalers have been facing tough times, as drastic cost containment policies implied by national health care authorities cut prices and margins therefore increasing competition within the branch. This resulted in a process of market consolidation, vertical integration and regional expansion.

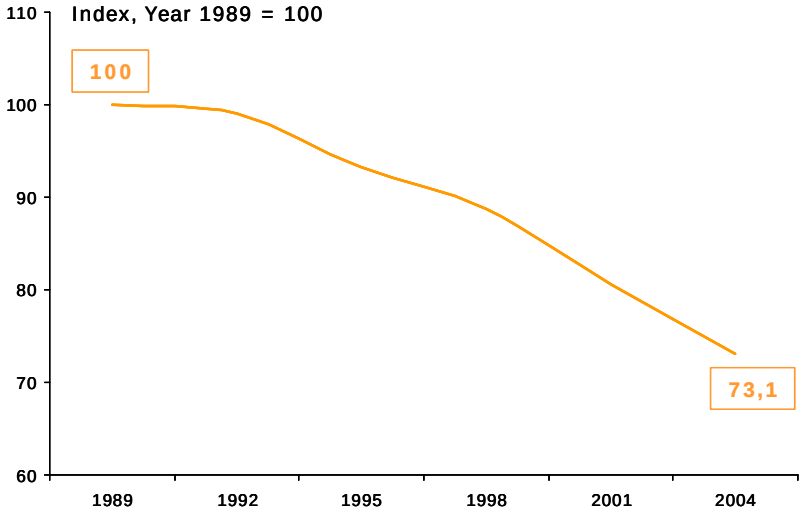
I: Structural Trends in Pharmaceutical Wholesaling



Source: IPF

- Almost all EU-countries have implemented measures regulating wholesale margins either directly or indirectly (e.g. price fixing, average pricing). Increasing public health care expenditures put wholesalers' margins under pressure, reducing them dramatically since the beginning of the 1990s by approximately 27%.

J: Development of Wholesale Margins on Pharmacy Purchase Prices in AUT, ESP, FR, GER, IT, NL, UK, 1989-2004



UK: claw backs excluded

Source: IPF research, GIRP data 2004

- Although wholesalers in the past successfully reorganized business processes, the drastic cut in margins led to a situation, where the cost of some services wholesalers are obliged to render, are not covered anymore.

- Effects of innovation on pharmaceutical market growth is somewhat dampened in the wholesale market, because highly innovative medicines are predominantly sold in the hospital market which is dominated by direct sales, leaving an average market share of only 8.5% to wholesalers.

- The efficiency – and thus the functioning of the pharmaceutical supply chain - of pharmaceutical wholesaling is further endangered by the continuous increase in direct sales especially in context with generics.

Future Bottlenecks and strategic Considerations

- As European governments are likely to continue to struggle to consolidate their budgets, additional cost-containment measures in the health care sector are likely to be implemented in the near future.

- Consequently, wholesalers' margins will face a further decline due to lower manufacturing prices and changes in the assortment towards a larger share of low-price generic products.

- For wholesalers, the situation becomes dramatic, since margins are decreasing and, at the same time, the number of services offered to manufacturers and pharmacies is increasing.

- The range of services offered is not only a consequence of competition, but is also determined by public service obligations. Thus, costs of many services offered are (or are likely to become) not covered by margins anymore.

- In the past, wholesalers reacted to these challenges by restructuring their business-processes. Although the use of information and automation technologies, as well as outsourcing-strategies has helped them to reduce operating cost, the space for rationalization is already becoming narrower.

- Other strategies, like horizontal integration, are also reaching their limits, as competition laws restrict further mergers and acquisitions in some European countries.

- Entering new markets, especially the retail markets, offered wholesalers the chance to improve their efficiency and competitiveness. Again, competition laws more and more prove to set a limit to forward integration.

- A third strategy that could improve the wholesalers' situation would involve the regional expansion of pharmaceutical wholesalers. Currently, pharmaceutical wholesaling is predominantly a national business, since a single market for pharmaceuticals is far from being achieved. The reduction of market entry barriers e.g. in form of divergent pricing regulations could help to improve the efficiency of pharmaceutical distribution.

- So, from a policy-making point of view, reducing public spending on pharmaceuticals by simply reducing margins for distributors seems to be too short-sighted. More consciousness on the costs occurring in the distribution of medicines would be desirable.

- In close cooperation with supply chain partners and with national and EU health care authorities full-line wholesalers could contribute in efforts to reallocate and therefore optimize health care expenditure. The nomination of GIRP as one of 10 permanent members in the new G-10 process is an important step towards integrating supply chain issues into overall health care policy considerations.

1 Introduction

It is general knowledge that medicines are developed and produced by the pharmaceutical companies and then, made available for patients by pharmacies. It is little known that between production and retail distribution, there exists a sophisticated network of pharmaceutical wholesale distribution. Since pharmaceutical wholesalers are engaged in business-to-business operations, their contribution to the functioning of the overall health care system is often not perceived by politicians or the public. This study aims to shed light to the functions performed by pharmaceutical wholesalers. So far, only unbalanced evidence about this industry, known mostly to insiders, exists. Highlighting the importance of this branch is all the more relevant as the European health care systems are facing considerable challenges in the years ahead. Hence, also the pharmaceutical wholesale industry undergoes profound structural changes. Since the mid-90s, European health care authorities are increasingly struggling to contain public health care spending, thereby focusing especially on ways to curb expenditures for pharmaceuticals. The various cost-containment measures implemented led to a massive decline in pharmaceutical wholesalers' margins. But not only cost-containment measures have been a menace to the industry in recent years. Marginally growing or even decreasing price levels of "old" drugs available in the market and the lack of a significant number of blockbuster drugs in the manufacturers' pipelines further increase the pressure on wholesalers' competitiveness. Furthermore, many blockbusters are facing patent expiration in the years to come, enhancing generic penetration in addition to market regulations promoting the selling of generic drugs.

Triggered by these developments, a process of market consolidation was ignited, reducing the number of wholesalers significantly, thereby increasing market concentration. But as the remuneration for buying pharmaceuticals from manufacturers and selling them to pharmacies has significantly decreased over the last decade, wholesalers had to adopt new strategies, like vertical integration up and down the supply chain and regional expansion. Despite these challenging changes within the branch, pharmaceutical wholesalers were not only able to maintain the delivery of high quality distribution services, but rather wholesalers extended the number of services provided to manufacturers and pharmacies beyond mere logistic solutions. The additional services offered, create added value for the supply chain partners, therefore enhancing the efficiency of pharmaceutical distribution.

Against this background, this study focuses on highlighting the role of pharmaceutical wholesalers within the pharmaceutical sector of the economy. It attempts to draw a comprehensive picture of the pharmaceutical wholesale industry, outlining its structure, its socio-economic importance and the trends that have shaped the branch in the past and are likely to have a dominant impact in the next few years.

Besides exploitation of official statistical figures, the analysis is mostly based on questionnaires sent out by the IPF, the Institute for Pharmaeconomic Research.

2 Approach and Methodology

Purpose of the Study

The purpose of the study was to highlight the role of pharmaceutical wholesalers within the pharmaceutical sector, as the tasks performed by them are often overlooked in political and public debate. Thus, the study predominantly aims to draw a comprehensive picture of the pharmaceutical wholesale industry. The analysis focused on the following questions:

- What is the pharmaceutical wholesale industry's position in the European pharmaceutical sector and how can it be represented by core indicators?
- How did the wholesale industry evolve since the 1990s and what were the most influencing factors shaping the industry?
- What is the wholesale industry's contribution to overall economic performance, that is, how much value added and jobs are created by pharmaceutical wholesalers?
- What services are provided by pharmaceutical wholesalers and how do they create added value for customers up and down the pharmaceutical supply chain and for the patients?
- What driving factors and trends are likely to change pharmaceutical distribution in the years to come?

Data Source

The data for the analysis are exploited on a European, a national and a company-based level. Thus, the paper covers all countries of the European Union, except Cyprus, Malta and Slovakia. These three countries have been excluded from the analysis, since in Cyprus and Malta pharmaceuticals are distributed by agents (no full-line wholesalers) and Slovakia, where due to the fact that an association representing exclusively pharmaceutical full-line wholesalers is only in creation, the basis for reliable data is not sufficient. Hence, the majority of the data refer to EU-22. As the markets not observed are rather small, the results of the analysis claim to be representative for all 25 countries of the EU. Special focus (by way of an in-depth analysis) was laid on the presentation of the biggest European pharmaceutical wholesale markets, France, Germany, Italy, the Netherlands, Spain and the UK (in alphabetic order). In addition Austria became part of this in-depth analysis.

The data necessary for the macroeconomic analysis was obtained from different sources. First, a questionnaire was directed to the national pharmaceutical wholesalers' associations in Austria, France, Germany, Italy, the Netherlands, Spain and

the UK. Second, data were provided by the European Association of Pharmaceutical Full-line Wholesalers (GIRP), consisting of GIRP's annual statistics. The data obtained by the questionnaire and the GIRP-file were supplemented by EUROSTAT, WHO, IMS Health data and further internet and literature research. In addition, the results of expert talks complete the information provided.

The following notes have to be considered when reading the study:

- The analysis made focus on the year 2004. But as some of the macroeconomic investigations are based on EUROSTAT data, which are only available until 2002 at latest, these analyses have a deviant time horizon. In addition, some data for the "new" EU-member states are not provided by EUROSTAT, often limiting the results presented to the EU-15.

- The results presented relate to full-line wholesalers operating on a national and regional level.

- The number of employees in pharmaceutical wholesaling as displayed in this study is only an extrapolation, because comprehensive data on employment are only available for GIRP-members and not for non-members. No data on employment could have been obtained for the "new" EU-members.

- The wholesale industry's sales are computed on a pharmacy purchase price level before rebates and without value added tax.

In addition to the macroeconomic data, company-based data were used to highlight processes and services provided by pharmaceutical wholesalers. The inputs for these analyses were obtained by a second inquiry directed at full-line wholesalers in Europe. The company-data are presented on an aggregated level, so none of the statements in this report can be attributed to any of these companies individually.

Course of the Analysis

In order to answer the questions above, the following analyses have been conducted:

- A general overview of the pharmaceutical sector in Europe is given at the beginning of the report.

- The structure of the branch and its development are described by the core indicators market structure, sales and employment with respect to factors influencing these indicators.

- The macroeconomic impact of the pharmaceutical wholesale industry was calculated for the 7 countries which were part of the in-depth analysis. The analy-

sis is based on an extended Leontief input-output model. The overall macroeconomic impact of the wholesale industry is presented by multipliers (see Annex).

- The efficiency of pharmaceutical distribution as a whole was examined, with a special focus on wholesaling. The analysis includes macroeconomic efficiency indicators as well as company related indicators aimed at highlighting the processes implemented to secure the steady provision of medicines.

- The performance of the pharmaceutical wholesale industry was then compared to the performance of 24 other wholesale industries within the European Union, using EUROSTAT data (see Annex).

- Furthermore, the contribution of the pharmaceutical wholesale industry to the overall efficiency of the pharmaceutical distribution chain was examined by a model based on the hypothesis that the number of transactions in a vertical distribution system depends on the presence or absence of intermediaries in the distribution chain.

- Concluding, the structural change of the branch is outlined; especially focusing on the growing importance of added value services is a competitive edge in the wholesale market. How the provision of services is able to create value in the supply chain is demonstrated by a number of short case studies.

- The study ends with an outlook on future trends governing the European health care systems which may influence the future of pharmaceutical wholesaling.

3 The Role of the Pharmaceutical Wholesale Industry within the Pharmaceutical Sector

In many ways the pharmaceutical sector is vital to the society and the economy as a whole. On the one hand, the development and production of medicines is innovative, making the business prone for economic policies targeted at promoting research and development and establishing high-quality work places in order to stimulate economic growth. On the other hand, the innovation of medicines helps to improve the people's quality of life. An improved overall state of health in turn has a positive impact on the development of the economy as a whole: "only healthy people are also wealthy people".

Despite the important contribution of the pharmaceutical sector as a whole to the economic development, the analysis predominantly focuses on the pharmaceutical manufacturing industry. The crucial question of how medicines are supplied from manufacturers to pharmacies is not often tackled, therefore disregarding the contribution of a well organized distribution system to the functioning of the overall health care system. As intermediaries in the pharmaceutical supply chain, wholesalers enhance the efficiency of pharmaceutical distribution by bridging distances and time, delivering medicines demanded several times a day. Along with this basic function go several additional (free) services provided by wholesalers, which generate added value for manufacturers as well as for distribution partners in the retail sector. In a highly competitive environment, mainly these added value services make the industry valuable for the functioning of a country's health care sector.

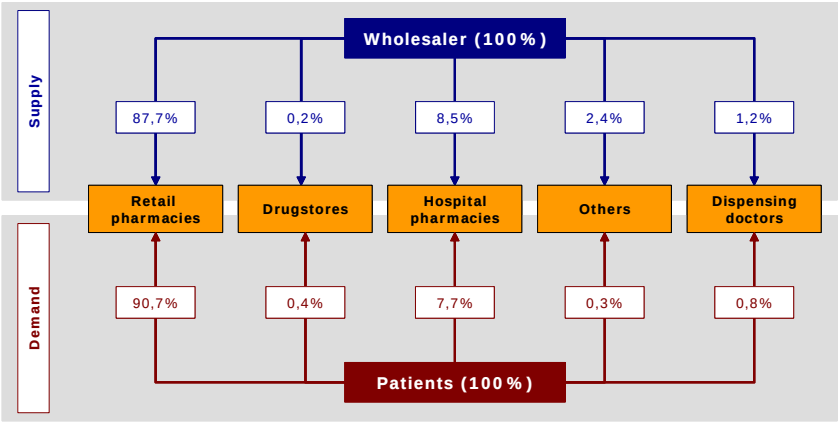
Figure 1: Functions of Wholesalers

Source: IPF

The wholesale industry's contribution to the overall efficiency of the pharmaceutical distribution chain is greatest where retailers, like retail and hospital pharmacies or dispensing doctors, are facing a wide product range combined with low inventory capacities, high order frequencies and the need for immediate delivery of products out of stock. These special needs generate demand for high-end specialist logistic solutions, as is especially the case with retail pharmacies. They are by far the most common type of dispensing units in all European countries, making them the most important clients for the wholesale industry. Almost 88% of the

medicines distributed by wholesalers are sold to pharmacies, followed by hospital pharmacies with 8.5%.

Figure 2: Percentage of Medicines (Quantity) distributed by full-line Wholesalers, EU-22, 2004



Source: GIRP data, IPF research

The wholesale industry is an important, but only a small branch within the European Union. Thus, the outstanding denotation of the branch as link between the pharmaceutical industry and retail pharmacies, hospital pharmacies and others allowed to dispense medicines is often overlooked in political and public debate on the pharmaceutical sector.

The pharmaceutical wholesale industry is a small but vital branch within the pharmaceutical sector. In 2004, more than 670 full-line wholesale companies throughout the 22 countries of the European Union observed met the challenge to supply medicines safely, rapidly and continuously to more than 450 million people.

Table 1: Players in the Pharmaceutical Sector in the EU-15, 2002[2]

	Manufacturing Industry	Wholesale Industry	Pharmacies
Companies	3,597	426	113,919[3)]
Employees	505,432[1)]	65,217	599,867[3)]
Sales (million €)	169,633[2)]	87,373	113,393[3)]

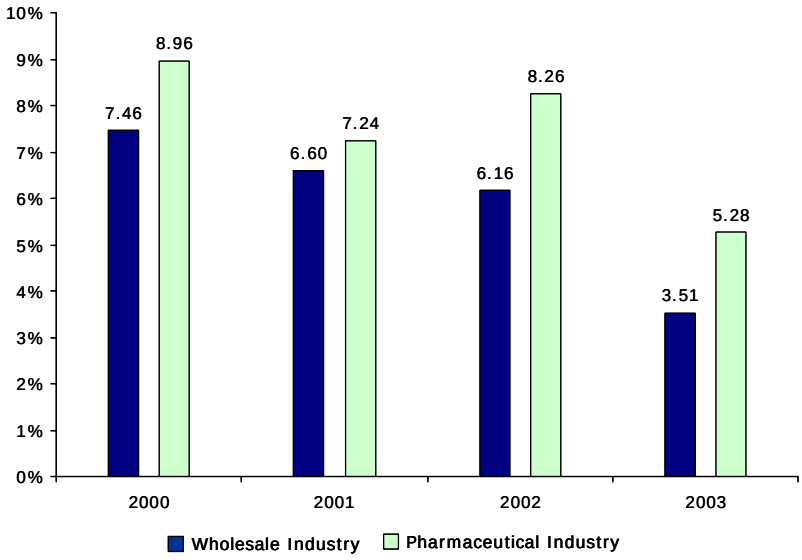
1) No data for Luxembourg available; Belgium, Greece and UK values for 2001
2) No data for Luxembourg available
3) Belgium, France, UK values for 2001

Source: EUROSTAT, GIRP data, HAPC 2005, Walter et al. 2005

[2] Latest data available from EUROSTAT

From 2000 to 2003 the manufacturing industry's sales in the EU-15 member states grew by 8.3% annually. In the same period of time, the wholesale industry's growth developed slightly slower reaching an average annual growth rate of 6.5%. These high average growth rates mask the fact, that the manufacturing industry's growth rate was actually curbed by 3.7 percentage points until 2003. Evidently, this development also had a negative impact on the wholesale industry. In the same period of time, the wholesale market growth rate was reduced by 3.9 percentage points to 3.5%. The stronger decline in wholesalers' market growth may be explained by cost-containment measures implemented by national health care authorities, deteriorating margins.

Figure 3: Average Annual Growth Rates in Sales of the Pharmaceutical Industry and the full-line Wholesale Industry in the EU-15, 2000-2003

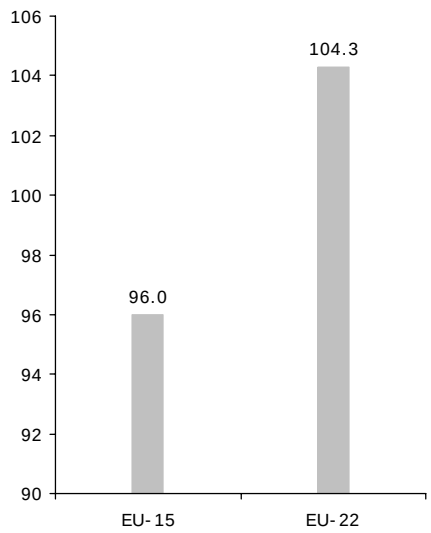


Source: EUROSTAT, GIRP data

In 2004, pharmaceutical wholesalers in the EU-15 earned a total turnover of 96,004 million EUR. The enlargement of the EU by 10 countries extended EU-wide wholesale sales to 104,306 million EUR.

To give an impression on the economic importance of the branch, 2004 wholesale sales are not far behind Portugal's GDP, reaching 135,035 million EUR.

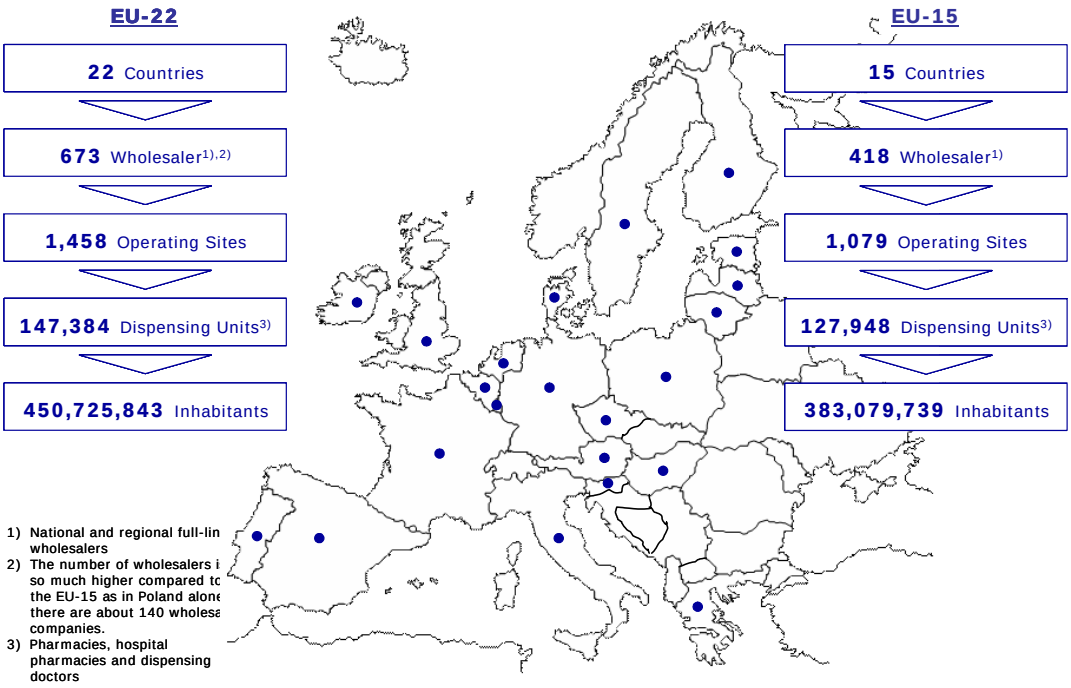
Figure 4: Total full-line Wholesalers' Sales (billion EUR), 2004



Source: GIRP data, IPF research

This enormous amount was generated by only 673 wholesale companies operating 1,458 warehouses in the EU-22, serving about 147,000 dispensing units and more than 450 million European citizens.

Figure 5: Dimensions of Pharmaceutical Wholesaling, 2004



Source: EUROSTAT, GIRP data, IPF research

4 Core Indicators of the Pharmaceutical Wholesale Industry

The analysis of the socio-economic importance of the European pharmaceutical wholesale industry should at first be highlighted by calculating economic core indicators providing insight into the structure of the industry. The focus of the analysis lies on the examination of the market structure, sales and employment within the industry with regard to trends that have shaped the industry in the last decade.

4.1 Market Structure

Pharmaceutical markets throughout the European Union show a high degree of diversity in regulation which also affects the organization of the pharmaceutical distribution system. Most important to the distribution of pharmaceuticals are so-called full-line wholesalers, as they carry the complete assortment of medicines available in one country. Furthermore, full-liners provide a wide range of added value services to manufacturers and retailers, thereby also creating benefits for the final customers of medicines – the patients. Basically, full-liners operate under two different types of distribution systems: the one-channel and the multi-channel system. Under a one-channel regime pharmaceutical companies conclude an exclusive distribution agreement for their product range with one single wholesaler, whereas under a multi-channel system products are carried by all wholesalers at the same time. The EU-member states have established a multi-channel distribution system, except Sweden and Finland.

Other types of wholesalers are short-line wholesalers. They only offer a limited product range and do not provide such a wide range of services like full-line wholesalers do. In several countries, pharmaceutical wholesalers are legally obliged to provide the full range of products to pharmacists, thus prohibiting short-line wholesaling. Such regulations, for instance, do exist in France, Italy, Belgium, Greece, Portugal or Spain and in some of the new eastern member states of the EU, but these laws are regularly not enforced. So the market share of full and short-line wholesalers in the European pharmaceutical wholesale markets can be interpreted as being a result of different public service obligations.

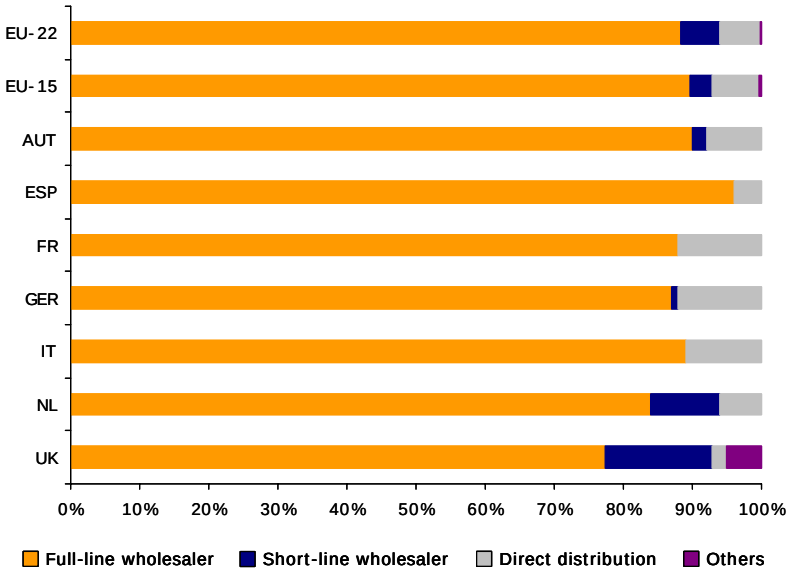
Full-line wholesalers either operate on a national or regional level that is, they either have established nation wide distribution networks with strategically placed warehouses throughout a country or they only serve retail pharmacies, hospitals and other dispensing sites in a limited geographical area.

In recent years, parallel trade has become a key issue within the pharmaceutical markets throughout the European Union. Parallel traders take advantage of regulated prices in the market, importing medicines from low-price countries to high-price countries, thus maximizing their profits. Parallel trade is a highly controversial topic within the EU. Those who are in favor of parallel trade expect a positive impact on competition and customer prices. On the other hand, manufacturers try to restrict or even prohibit imports of medicines from low-price countries, fearing losses.

Searching for new ways to cut cost, manufacturers started to outsource their logistics and related services. Pre-wholesalers increasingly provide these specialist services, like warehousing, storage, distribution, and financial administration to the pharmaceutical industry. In many cases, pre-wholesale services are offered by full-line wholesalers, thereby becoming the prolonged arm of the manufacturers, as they hold their stocks in consignation.

The distinctions made above are not exclusive, as combinations of activities are possible.

Figure 6: Share of different Distributors in the Pharmacy Market [1], 2004



1) The segmentation of the market results from different public service obligations.

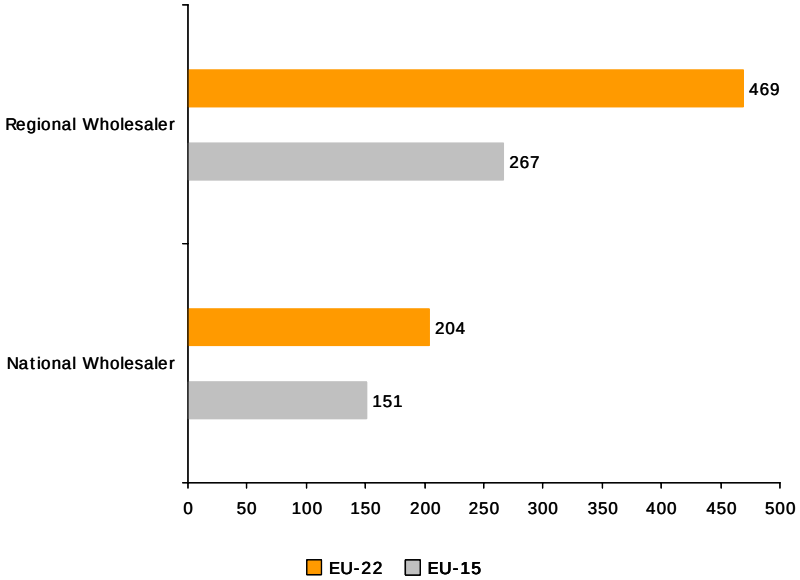
Source: GIRP data

The overall importance of full-line wholesaler within the pharmaceutical distribution chain is displayed in Figure 6. Between 75% (UK) and 96% (Spain) of medicines supplied to retail pharmacies are delivered by full-line wholesalers. In this respect, short-liners are of minor importance to the distribution system, holding about 3.2% of the market on an EU-15 average. Since 2000, the short-liners' market share dropped slightly by 0.73 percentage points, whereas full-line wholesaling and direct distribution became more important, gaining 1.15 and 0.87 percentage points. The extension of the analysis to the new EU-members suggests

that short-line wholesalers are of greater importance in these countries, as their market share increases to 5.7% on an EU-22 level.

Within the European pharmaceutical sector 673 full-line wholesalers performed the task of supplying medicines in 2004. About 30% of them were operating on a nation-wide level, whereas the vast majority of wholesalers operated only regionally.

Figure 7: Pharmaceutical full-line Wholesalers in the EU-15/22, 2004

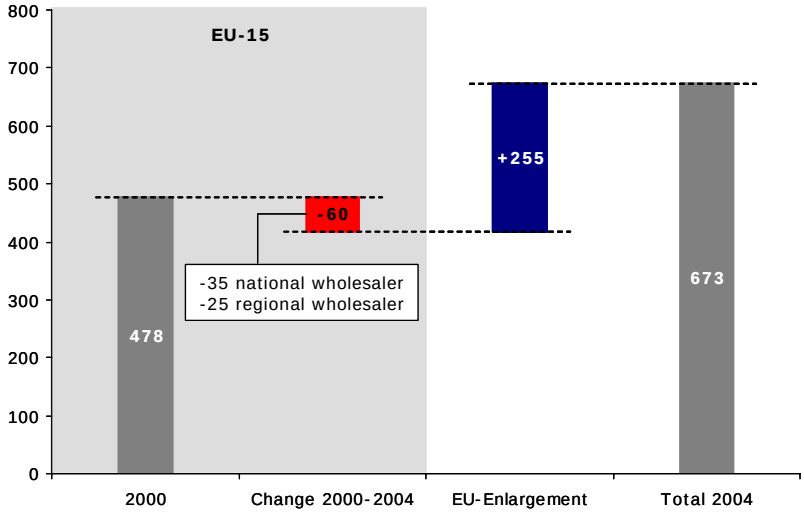


For France, wholesalers operating in the overseas-departments were not considered.

Source: GIRP data, IPF research

Pharmaceutical wholesalers operate in a market that has changed dramatically since the early 1990s. In the corollary of increasing market regulation aimed at reducing public spending on pharmaceuticals, the wholesale industry came under pressure triggering a process of market consolidation. The last decade saw a massive decline in the number of pharmaceutical wholesalers throughout the continent. This process, however, seems to have slowed down in the last few years. From 2000 to 2004 the overall number of full-line wholesalers operating on a national level decreased within the EU-15 from 186 to 151. A detailed breakdown of the development of the number of wholesale companies shows, that this decline may be traced to market consolidation in Italy. All in all, the number of national full line wholesalers decreased by 35 between 2000 and 2004, whereas the number of regional wholesalers has been reduced by 25 to 267.

Figure 8: Change in the Number of full-line Wholesalers in the EU-22, 2000-2004



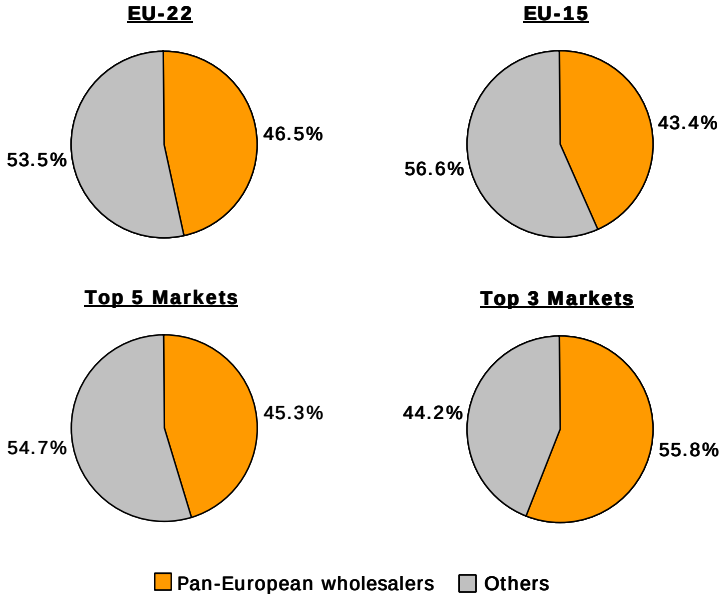
[1)] Number of regional wholesalers in IT and ESP for 2000 are estimates

Source: GIRP data, IPF research

Since the beginning of the 1990s, the number of pharmaceutical wholesalers in the "old" EU operating on a national level dropped from almost 600 to only 151 firms. This is a consequence of cost-containment measures leading to increasing competition, which induces companies to consolidation in order to reap economies of scale.

The pressure on the industry's competitiveness made the attainment of economies of scale an important issue for the branch, triggering acquisition activities in the market. The calculation of concentration coefficients reveal, that Europe's three biggest pharmaceutical wholesalers in 2004 together had a market share of about 43.4% in the EU-15 and around 46.5% in the EU-22 respectively. Germany, France, the UK, Italy and Spain, the five biggest European pharmaceutical markets, had a market share of 45.3%. In the top-3 markets (Germany, France, the UK), these three companies even held 55.8% of the market.

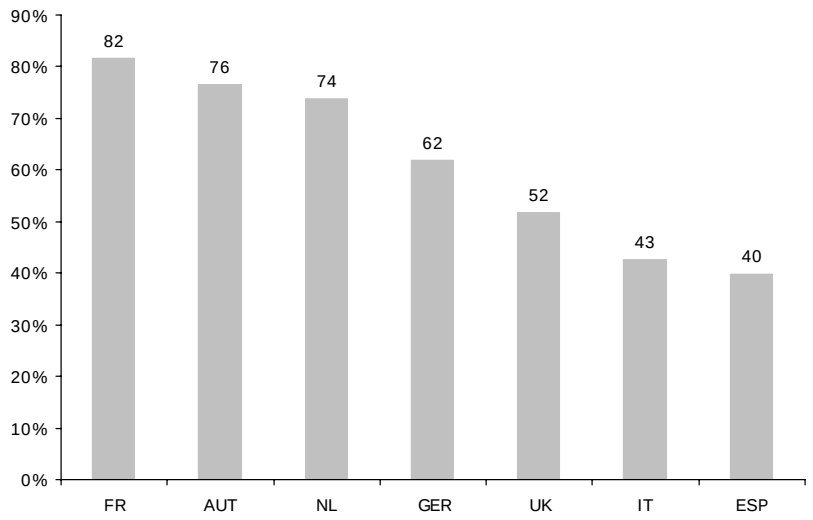
Figure 9: Market Share of the top-3 European Pharmaceutical full-line Wholesalers, 2004



Source: Alliance Unichem 2004, Celesio 2004, Phoenix 2004, GIRP data

The process of market concentration has not progressed uniformly within the EU-member states. Whereas the number of wholesalers in Austria dropped by the number of 2 (out of 10) since 1992, Poland has seen a reduction of as much as 480 companies in the same period of time (IMS 2002). Still, Poland has the highest number of wholesalers in its pharmaceutical sector. Consolidation has also reached southern Europe, especially Italy, reducing the number of wholesale companies to 92 in 2004. The high number of businesses suggests these markets to be subject to further acquisition activities in the near future. In western and northern Europe, the number of companies remained relatively stable, indicating an already high level of market concentration, with only isolated acquisition activities to be expected in the near future.

Figure 10: Market Share of the 3 leading full-line Wholesalers per Country (CR 3), 2004



Source: Alliance Unichem 2004, ANZAG 2004, Celesio 2004, GIRP data, IPF research, Phoenix 2004,

As competition increases, market consolidation is under way. Companies seek to reap economies of scale to preserve their competitiveness. In 2004, the three biggest pharmaceutical wholesalers held more than 46.5% of the European market (EU-22).

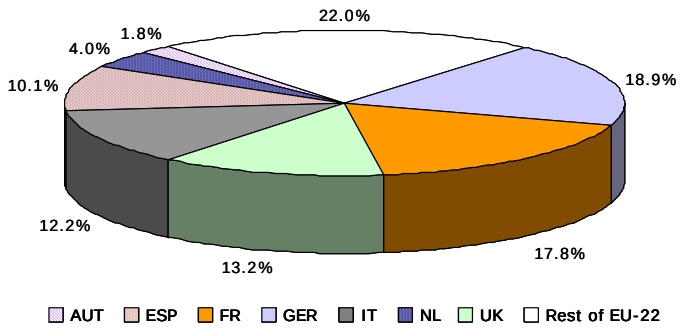
4.2 Sales

The pharmaceutical wholesale industry generated sales[3] of more than 104 billion EUR in the EU-22 in 2004. About 92% of these sales the industry generated in the countries of the "old" EU. The former communist eastern European countries, which have joined the EU in May 2004, hold roughly 8% of the total European wholesale market.

Austria, France, Germany, Italy, the Netherlands, Spain and the UK together generated sales of 81.37 billion EUR, holding a market share of 78% in the EU-22. Thus, analysis made on this 7-country basis can claim to be representative for the whole market consisting of 22 countries. The biggest market was Germany with sales of 19.70 billion EUR, followed by France and the UK with 18.54 and 13.75 billion EUR respectively. In the accession countries, the pharmaceutical wholesale industry generated sales of 8.30 billion EUR, of which almost 50% were earned in Poland. Despite the dominant position of the Polish market in this region, from a European point of view (EU-22) Poland's market share of 3.90% is comparatively small.

[3] Sales were computed on a wholesale or pharmacy purchase price basis before rebates and without VAT.

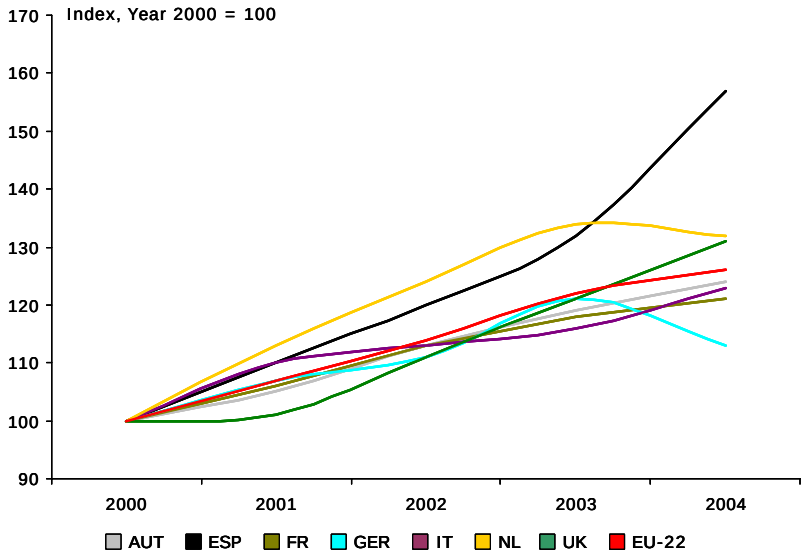
Figure 11: Market Share of AUT, ESP, FR, GER, IT, NL, UK in EU-22 full-line wholesalers' sales, 2004



Source: GIRP data, IPF research

The development of absolute sales figures indicates a steady growth of the pharmaceutical wholesale market by 26.27% from 2000 to 2004. However, the different national markets developed very inconsistently over the last few years. Whereas total wholesale sales grew steeply in Spain, the market in other countries like the UK, France or Austria grew only moderately. After several years of growth, the Dutch market showed a downturn in sales in 2004. A similar development can be found in Germany, although the market used to grow not as strong as the Dutch one did until 2003. But the drop in sales in 2004 hit the German wholesale industry harder than wholesalers in the Dutch market.

Figure 12: Development of full-line Wholesalers' Sales, 2000-2004



Source: GIRP data, IPF research

Table 2: Development of full-line Wholesalers' Sales (Index, Year 2000=100), 2000-2004

Country	2000	2001	2002	2003	2004
AUT	100	105	113	119	124
ESP	100	110	120	132	157
FR	100	106	113	118	121
GER	100	107	111	121	113
IT	100	110	113	116	123
NL	100	113	124	134	132
UK	100	101	111	121	131
EU-22	100	107	114	122	126

Source: GIRP data, IPF research

Although wholesaler' sales were rising in absolute terms in most of the countries, total market growth-rates (EU-22[4]) have been constantly declining from 7.12% in 2000/2001 to about 6.70% for 2002/2003. In 2003/2004 the growth rate deteriorated by almost 3 percentage-points to currently 3.77%. This heavy reduction is mainly caused by a sharp decline in market growth in Germany and in the Netherlands in 2004. In both countries the market was shrinking by 6.64% and 1.87% respectively since 2003. In the UK, in France and in Austria market growth also slowed down, confirming the overall trend since 2001. However, the wholesale markets in these countries were still growing.

Wholesale market growth declined continuously since the beginning of the new millennium, as a reaction to tightened cost-containment measures, new pricing schemes, and generic-penetration. Still, in 2004, pharmaceutical wholesalers' sales in the EU-22 accounted for more than 104 billion Euros.

[4] Estimate

4.2.1 Influencing Factors on Wholesalers' Sales

Pharmaceutical market growth, and therefore the wholesale industry's competitiveness, is influenced by a set of different interacting factors, as represented in Table 3.

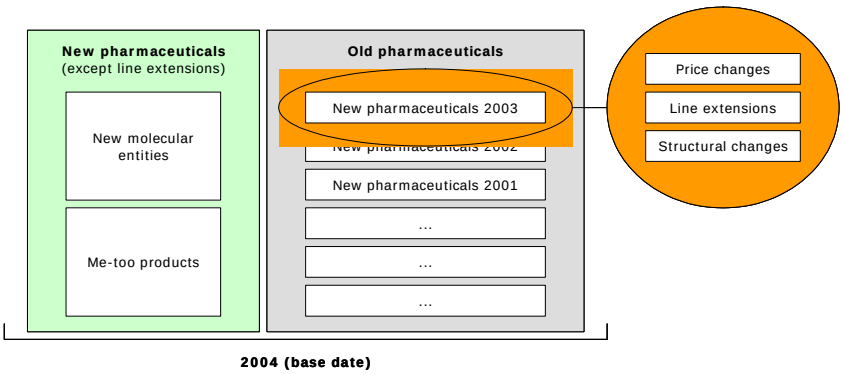
Table 3: Factors influencing Pharmaceutical Wholesalers' Sales

Factor	Trend
Development of prices for "old" pharmaceuticals[5]	Falling
Development of prices for "new" pharmaceuticals	Steep increase
Line extension (product diversification)	Not assessable
Structural changes	Not assessable
Development of margins[6]	Falling
Quantity of consumption	Slow increase
Share of non-pharmaceutical products	Increase
Mail order systems, direct delivery	Increase

Source: IPF, IMS Health

The first four factors, the so-called elements of growth (IMS Health), measure the impact of changes in prices of products launched in the market before the base period, the impact of line extensions and the impact of structural changes on pharmaceutical sales. The effects of the launch of new molecular entities and me-too products on pharmaceuticals' sales are documented by the development of prices of new pharmaceuticals. The following sections will refer to these elements of growth in more detail.

Figure 13: Elements of Growth



Source: IMS Health, IPF

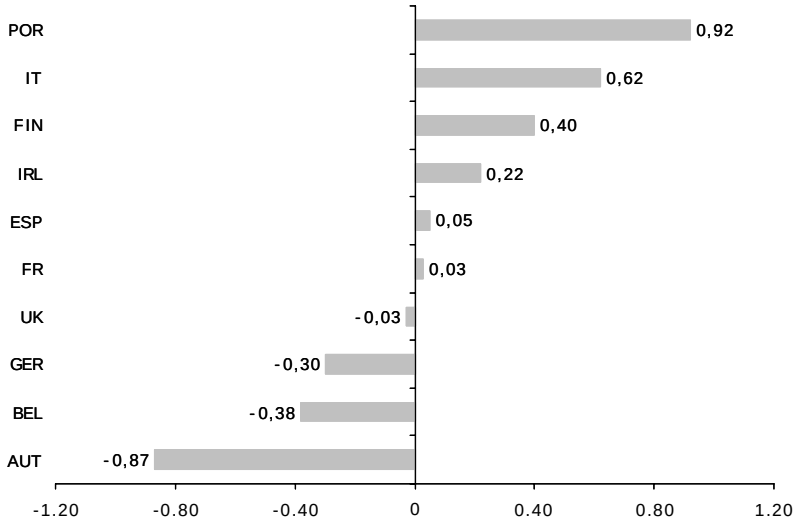
[5] It may be observed that in some countries a price-index of ex-factory prices exhibits a flat, if no negative development. In any case, it is significantly lower than the development of the consumer-price index.

[6] The terms mark-up and margin are often used similarly. However, the mark-up is calculated on basis of the ex-factory price (bottom-up calculation), whereas margins denote the spread between the ex-factory price and the pharmacy purchase price (top-down calculation).

4.2.1.1 The Influence of Prices for "old" Pharmaceuticals and the Influence of the Development of Wholesale Margins

This section investigates price changes for medicines that have been authorized to be marketed in the past, i.e. these products are available for at least one year. Prices have developed inconsistently between 1993 and 2002 within the countries of the EU-15. Whereas price changes on average contributed to 0.92 percentage points annually to pharmacy market growth in the Portuguese market, the impact of price changes on overall pharmaceutical market growth has been negative in a fairly large number of countries.

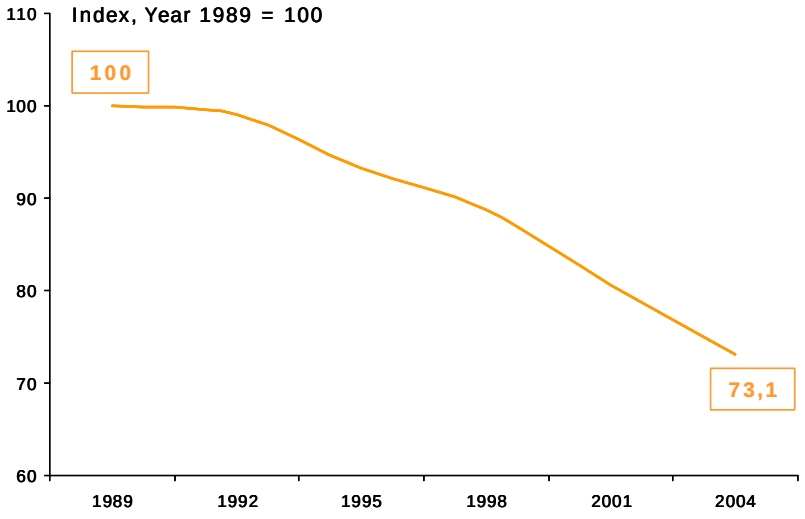
Figure 14: Contribution (percentage points) of Price Changes (national Currencies) of Medicines launched in the Market before the Base Date (2003) to Annual Pharmacy Market Growth, 1993-2002



Source: Walter 2003

This development reflects the effects of market regulation and cost-containment measures implemented by governments in order to reduce overall public health care spending since the beginning of the 1990s. Measures implemented had a negative impact on wholesalers' margins in general. For wholesalers, this decline turned out to be a problem, because they almost have no possibility to influence their profits. On the one hand, wholesalers can not influence the quantity of medicines demanded and on the other hand prices are widely regulated by national authorities.

Figure 15: Average Development of average Wholesale Margins on Pharmacy Purchase Prices in AUT, ESP, FR, GER, IT, NL, UK, 1989-2004



UK: claw backs excluded

Source: IPF research, GIRP data

In most European countries, wholesale margins are at least regulated indirectly by the state, e.g. via price fixing and/or average pricing. Margins represent an average value which should cover wholesalers operating cost of distribution and still leave space for (regulated) profits. The fact that wholesalers' sales have increased in the past, must not leave the impression of a highly prosperous branch, since the improvement of turnover is solely the result of productivity gains due to successful reorganizations of business processes in the past. But having reached a high level of operational efficiency, productivity gains constantly got smaller since 2000 (see p.46). All in all, the drastic cut in margins led to a situation, where the cost of some services wholesalers are obliged to render, are not covered anymore.

Measures influencing margins directly and indirectly reduced wholesalers' margins dramatically since the beginning of the 1990s by approximately 26.9%. This means that e.g. a wholesale margin of 15% in 1989 would have decreased by 3.53 percentage points to 11.47% until 2004.

4.2.1.2 The Influence of Prices for "new" Pharmaceuticals

The entry of new, innovative medicines into the market led to a consistent increase in prices on ex-factory bases. Consequently, sales' growth in the pharmaceutical market is triggered by innovation. However, innovation does not automatically significantly improve wholesalers' sales, as many highly innovative drugs, especially biotechnologically produced molecules, are not sold in the phar-

macy market, but exclusively in the hospital market in which wholesalers only have a market share of 8.5%.

> The effects of innovation on pharmaceutical market growth is somewhat dampened in the wholesale market, because highly innovative medicines are predominantly sold in the hospital market which is dominated by direct sales.

In addition to highly innovative pharmaceuticals, there is another class of medicines, so-called me-too drugs; variations of existing medications coming off patent. Prices of such drugs are likely to move along the overall development of pharmaceutical prices. Still, wholesalers' earnings do not grow infinitely due to digressive margin-calculations and the introduction of price caps.

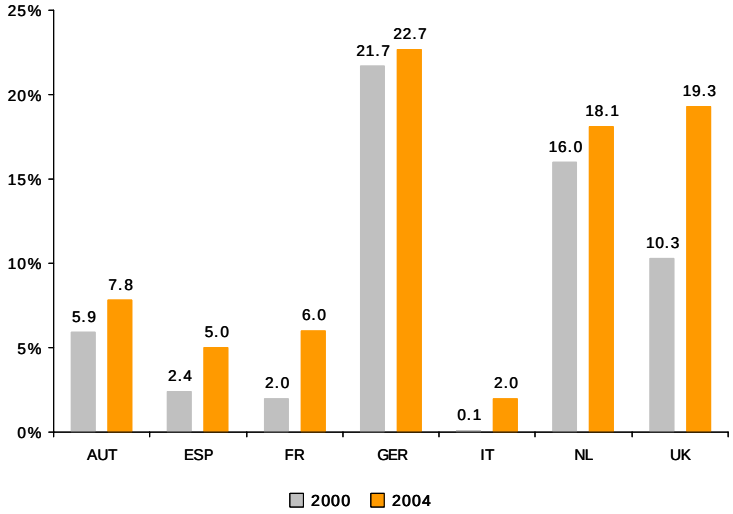
4.2.1.3 Structural Changes and Line Extensions

Structural changes refer to any kind of substitution of medicines, the introduction of new therapeutic treatments (as long as these are not classified as "new" products) or changes in prescribing habits. In this respect, the penetration of generics may be defined as a further factor influencing the competitiveness of the pharmaceutical wholesale industry.

The effects of the rise in the use of generics on pharmaceutical wholesalers in Europe are not evaluated consistently. In the UK, for instance, generics attract lower gross margins than branded products due to different reimbursement regulations. On the other hand, generics require lower discounts to pharmacies leaving higher net margins for wholesalers (CSFB 2004). Still, one has to consider that due to a lower price level[7], margins on generics in absolute terms are also low. In addition, operating costs for distributing generics are the same as for all other medicines on stock. Thus, overall net margins on generics in absolute terms in some countries are even below one Euro.

[7] Generic medicines sell at a 20-80% price differential to the patent expired brand (EGA 2005).

Figure 16: Market Share (in Sales) of Generics in Total Pharmaceutical Market, 2000/2004



Source: STADA 2000/2004

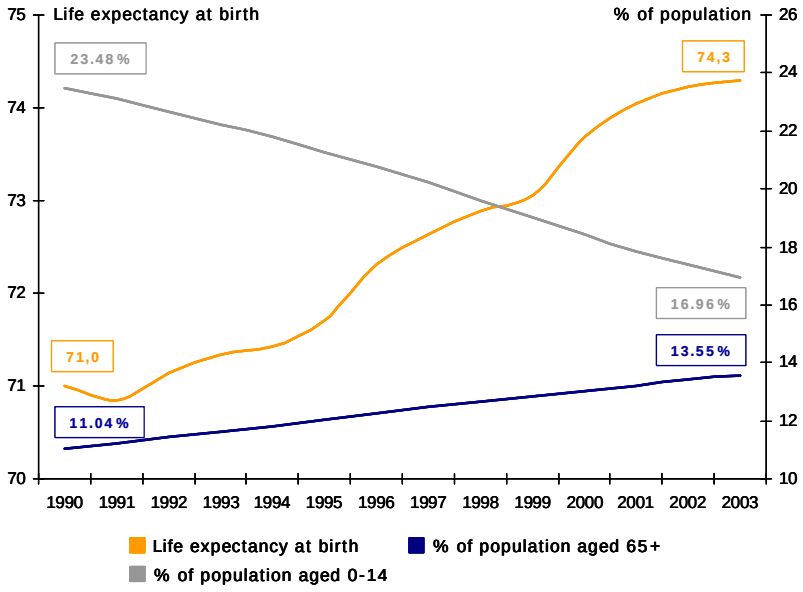
Lower discounts and higher margins, however, might not be enough to set off possible losses because of an increase in direct sales in connection with generics, as manufacturers offer high rebates in kind, making wholesale-procurement unattractive to pharmacies. Furthermore, the growing number of generic drugs in the market is likely to intensify competition between manufacturers causing price-competition in the generics market to heat up.

As an increasing number of blockbuster drugs is facing patent expiration in the near future and health care payers seek way to curb health care spending, generic penetration is expected to accelerate. Again, wholesalers' competitiveness is endangered, as high rebates in kind make direct sales more attractive to customers.

4.2.1.4 The Influence of the Level of Consumption

Despite the development of pharmaceutical prices, drug consumption influences wholesalers' sales. Demographic changes, like an increasing life expectancy or changes in the structure of the population have a strong impact on overall demand for pharmaceuticals. In addition, the further improvement of the health care systems of the new EU-member states is to be expected to increase demand for pharmaceuticals, as similar developments have been observed in southern European countries, like Greece, after they joined the European Union.

Figure 17: Demographic Changes in the EU-22, 1990-2003



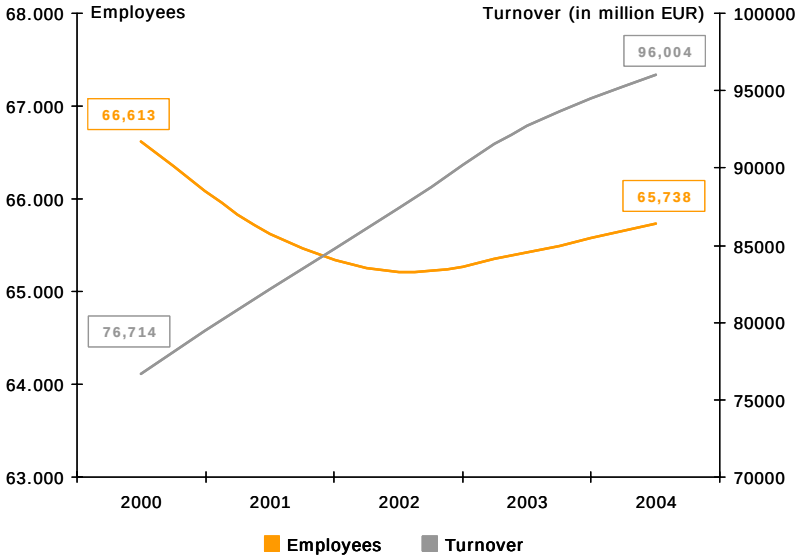
Source: WHO European Health for All Database

As third factor influencing the overall level of consumption, medical progress must be identified. As biotechnological, genomic and proteomic sciences advance, new ways for the treatment of diseases are discovered. Consequently, pharmacological therapy can be applied in cases where in the past there was no treatment at all, or, for example, surgery was needed.

4.3 Employment

From 2000 to 2004, employment in the pharmaceutical wholesale sector of the EU-15 went down by 875 from 66,613 to 65,738 working places, measured in full time equivalents (FTE). The downturn in the number of employees is the direct result of market consolidation, reducing the overall number of wholesalers, especially in Italy. Employment reached a low in 2002, improving constantly since then, although sales growth was reduced from 2003 to 2004 from 6.16% to 3.51%. From a managerial point of view, the diverse development of sales and employment dampens the branch's productivity. But from an economic-policy point of view the development was positive, since pharmaceutical wholesalers created additional jobs despite a difficult market situation.

Figure 18: Development of Sales and Employment (FTE) of Pharmaceutical full-line Wholesalers [1)] in the EU-15, 2000-2004

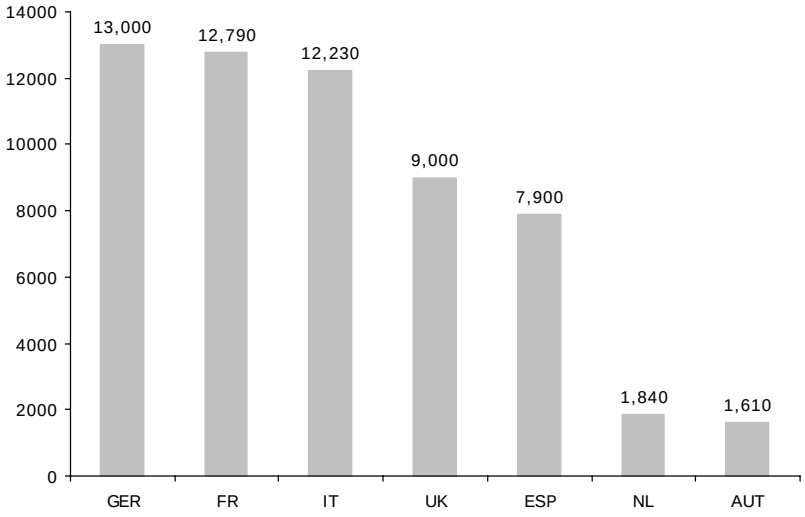


[1)] Estimates for UK and NL

Source: GIRP data 2004, IPF research

The six biggest wholesale markets (in terms of sales) France, Germany, Italy, the Netherlands, Spain and the UK employed around 83% of the staff engaged in pharmaceutical wholesaling in the EU-15 in 2004.

Figure 19: Employees (FTE) at Pharmaceutical full-line Wholesalers, 2004

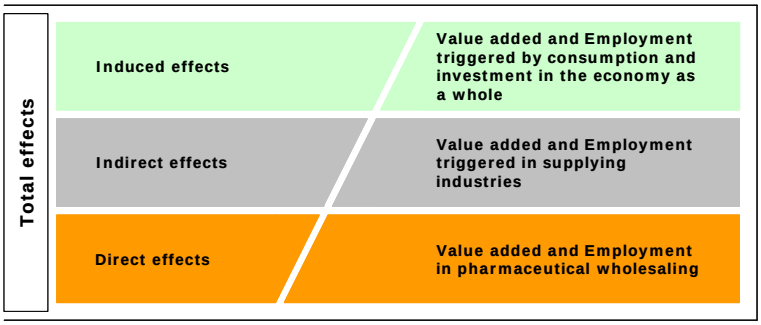


Source: GIRP data, IPF research

5 The Macroeconomic Impact of the Pharmaceutical Wholesale Industry

- This section provides an examination of the macroeconomic impact of the pharmaceutical wholesale industry in addition to the analysis of economic core indicators. This impact is measured in terms of value added and jobs created by the industry in Austria, France, Germany, Italy, the Netherlands, Spain, and the UK using Input/Output-analysis by applying an extended Leontief-model. The strength of input-output analysis lies in its ability to take into account the importance of interdependencies that exist between sectors in an economy. It is these interdependencies that give rise to economy-wide multiplier effects when there is a change in economic activity.

Figure 20: Macroeconomic effects I



Source: IPF

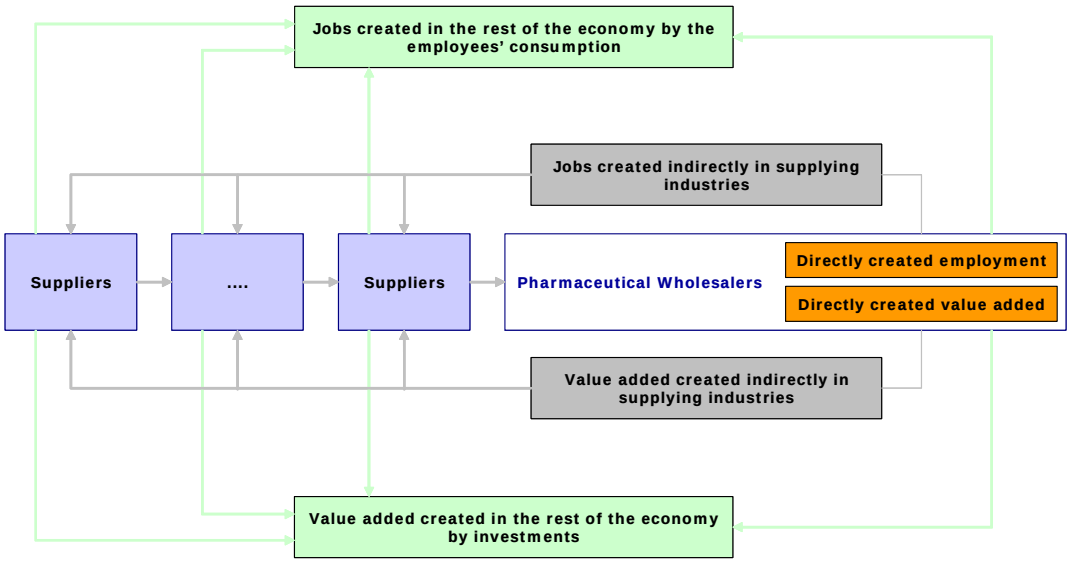
The model is based on a national concept, i.e. the effects of imports and exports are not observed. The model analyzes economic effects generated on three different levels:

- ***Direct effects*** on value added and employment are created within the wholesale industry by its operations.

- To perform their tasks, pharmaceutical wholesalers need, for instance, electricity, conveyors, IT-services etc. and – of course - pharmaceuticals. Because of the various links of the wholesale sector to its supplying industries, pharmaceutical wholesaling generates jobs and value added in these preliminary sectors. As these sectors are linked to other supplying industries as well (e.g. drug manufacturers need chemicals, production facilities, etc), value added and jobs are also created there and so on. The sum of these economic effects is referred to as ***indirect effects***.

- The third kind of effects to be analyzed is ***induced effects***. The first source of induced effects is consumption by employees of the wholesale and its supplying industries, i.e. they spend their salaries to finance their living, buy clothes, food, etc.. Consumption therefore helps generating value added and jobs in business sectors apart from the wholesale industries, its suppliers and the suppliers' suppliers. The second source of induced effects comes from investments made by pharmaceutical wholesalers and preliminary industries.

Figure 21: Macroeconomic Effects II



Source: IPF

5.1 Generating Value Added

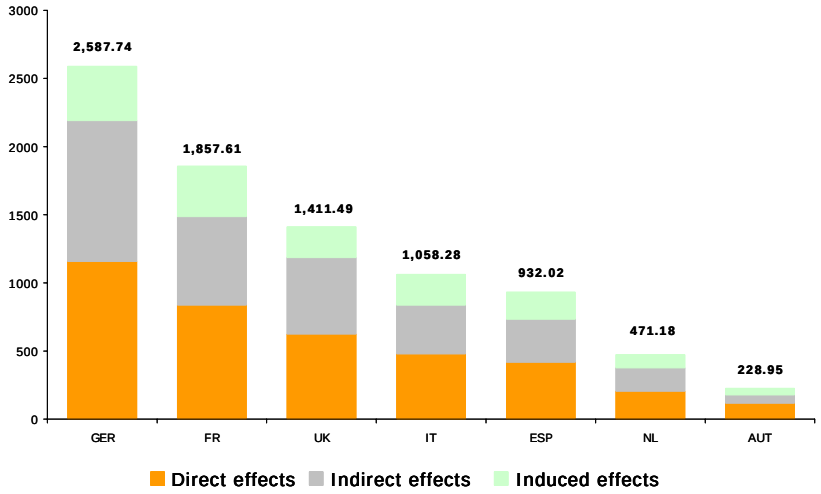
Value added in each stage of production is defined as the difference between the value of the output and the value of the inputs purchased from other firms[8]. The concept of calculating value added is closely related to the production value of goods. Therefore, producing industries generate higher value added than service industries. To avoid double counting, the value of goods for re-sale is not considered when calculating the direct value added for the service industries. In the case of the pharmaceutical wholesale industry this means that the value of medicines and non-medicines sold to different customers is not considered for computing the branch's value added, because they have already been considered when calculating value added for the manufacturers' industries. Therefore, pharmaceuticals are part of the indirect effects created by the wholesale industry. Still, the services rendered by the industry to manufacturers and retailers create value added.

In the 7 countries regarded (representing a market share of 78% in the EU-22), the pharmaceutical wholesale industry generated a total value added, i.e. the sum

[8] For a more precise definition see p.64

of direct, indirect and induced effects, of about 8,547 million EUR in 2003. Out of total value added, Germany alone accounts for a share of 30.3% or 2,588 million EUR. Due to a dramatic cut in wholesalers' margins by about 50% in 2004, the overall macroeconomic impact of the German pharmaceutical wholesale industry was drastically reduced to 1,302 million EUR.

Figure 22: Value Added generated by full-line Wholesalers (million EUR), 2003

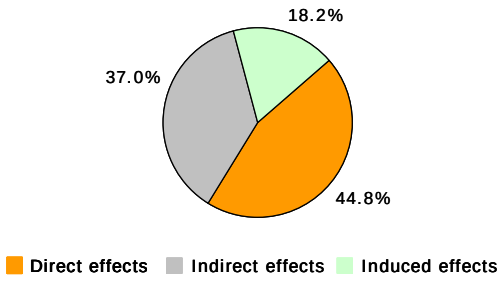


Source: EUROSTAT, IPF research

Pharmaceutical wholesalers' activities generated a total value added of 8,547 million Euros in 2003. More than 55% of this value is created through the branch's links with other sectors of the economy.

The share of direct effects in national total value added ranges from 43.4% in the Netherlands (204.34 million EUR) to 50.0% in Austria (114.49 million EUR). On average, direct effects had a share in total effects of 44.8% (3,833 million EUR). The contribution of indirect effects to total effects reached 37.0% on average. All in all, the pharmaceutical wholesale industry in the 7 countries examined, created 3,160 million EUR value added indirectly by its relations to supplying industries.

Figure 23: Average Share of Direct, Indirect and Induced Effects in Total Value Added in AUT, ESP, FR, GER, IT, NL, UK, 2003



Source: EUROSTAT, IPF research

Induced effects accounted for 18.2% of total effects on average. Investments caused by the wholesale industry and its supplying industries in the overall economy accounted for 1,554 million EUR in 2003.

Table 4: Macroeconomic Effects on Value Added, 2003

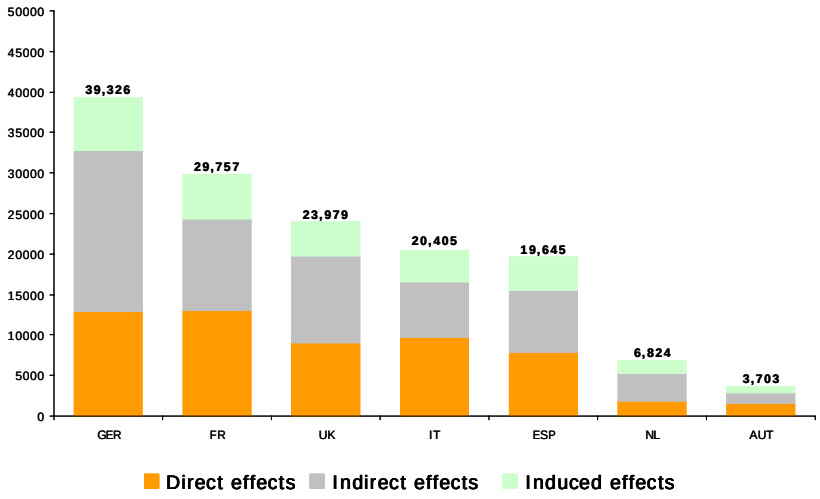
Country	Direct Effect	Indirect Effect	Induced Effect	Total Effect
AUT	114.49	63.49	50.98	228.95
ESP	416.74	318.57	196.71	932.02
FR	836.38	650.20	371.03	1,857.61
GER	1,155.83	1,038.72	393.19	2,587.74
IT	482.38	352.93	222.97	1,058.28
NL	204.34	175.67	91.16	471.18
UK	623,18	560.04	228.28	1,411.49

Source: EUROSTAT 2003, IPF research

5.2 Generating Employment

In 2003, the activities of the pharmaceutical wholesale industry in Austria, France, Germany, Italy, the Netherlands, the UK and Spain helped to generate 143,638 jobs in these countries. Again, the number of jobs created reflects the size of the pharmaceutical wholesale industry in the various countries. Therefore, most jobs were created in Germany with 39,326 employees, of which 12,952 were directly employed by pharmaceutical wholesalers, followed by France with 29,757 jobs and the UK with 23,979 jobs created. All in all, 56,040 people were directly employed in the pharmaceutical wholesale sector. Further 60,978 jobs were created indirectly by the industry's business relations with supplying sectors.

Figure 24: Employment (FTE) generated by full-line Wholesalers [1], 2003

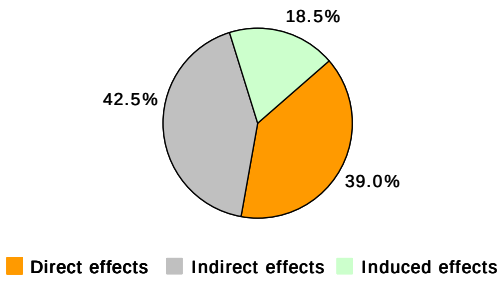


[1] Estimates for UK and NL

Source: EUROSTAT, IPF research

143,638 jobs depend on the pharmaceutical wholesale industry; about 61% of these in other sectors of the economy.

Figure 25: Average Share of Direct, Indirect and Induced Effects in Total Employment (FTE) in AUT, ESP, FR, GER, IT, NL, UK, 2003



Source: EUROSTAT, IPF research

With a share of 18.5% (26,621 employees) in total effects, induced effects are relatively low. The weak transmission of the branch on total employment is due to the low number of staff directly employed by pharmaceutical wholesalers. The industry's high sales-per-employee suggests that the pharmaceutical wholesale industry is very capital-intensive resulting in low consumption effects in the economy as a whole.

Table 5: Macroeconomic Effects on Employment (FTE), 2003

Country	Direct Effect	Indirect Effect	Induced Effect	Total Effect
AUT	1,608	1,229	867	3,703
ESP	7,896	7,628	4,121	19,645
FR	12,992	11,286	5,479	29,757
GER	12,952	19,836	6,538	39,326
IT	9,758	6,844	3,803	20,405
NL	1,834	3,460	1,529	6,824
UK	9,000[1)]	10,695	4,284	23,979

[1)] UK data from 2004

Source: EUROSTAT, IPF research

5.3 Multiplying Effects

The application of multipliers helps to interpret the results presented in the previous sections. Basically, the multiplier gives information on the overall value added and number of jobs created by an industry in the economy as a whole if one currency unit is invested and one job created in the sector regarded.

Therefore, 1 EUR invested in the pharmaceutical wholesale industry generates 2.23 EUR in the seven countries examined. A detailed breakdown on the country-multipliers reveals interesting results. In Austria, pharmaceutical wholesalers had the least impact on the economy in terms of value added, whereas the impact was highest in the NL with a multiplier of 2.31.

Table 6: Multiplying Effects on Value Added and Employment (FTE), 2003

	AUT	ESP	FR	GER	IT	NL	UK
Multiplying Effects on Value Added	2.00	2.24	2.22	2.24	2.19	2.31	2.26
Total Multiplying Effects on Value Added	**2.23**						
Multiplying Effects on Employment	2.30	2.49	2.30	3.04	2.09	3.72	2,66
Total Multiplying Effects on Employment	**2.56**						

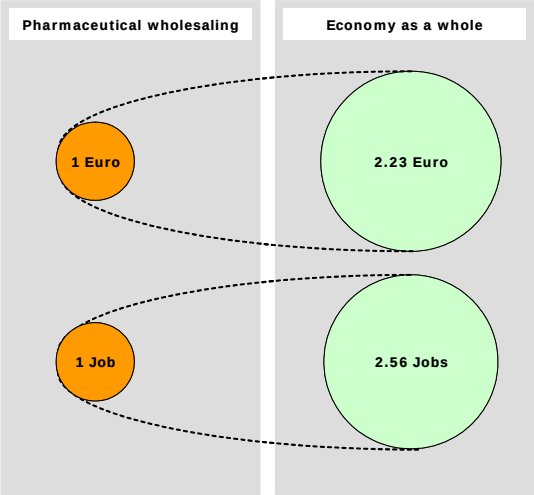
Source: EUROSTAT, IPF research

Every single Euro invested in the pharmaceutical wholesale sector creates 2.23 Euros in the European economies.

Each additional job offered by pharmaceutical wholesalers generates 2.56 additional jobs in the economy as a whole.

When taking a glance at the industry's impact on employment in terms of multipliers, The NL clearly is in the lead, creating 3.72 jobs in the economy for each job created in the wholesale industry. Germany ranges second place, while the Italian pharmaceutical wholesale industry is at the end of the ranking only generating 2.09 jobs for each job created in the sector. Together, all countries generated 2.56 times as much employment in the economy compared to their industry. The relation of the job multipliers of the wholesale industry to the overall productivity of the economy causes the extraordinary high values for the multipliers in the Netherlands and Germany. On an EU-15 basis, the pharmaceutical wholesale industry generated and secured 167,485 jobs in 2003. The effects for the EU-15 are not so much higher than those calculated for the 7 countries above, since 86% of the EU-15 staff is employed in these countries.

Figure 26: Aggregate Multiplying Effects on Employment (FTE) and Value Added in AUT, ESP, FR, GER, IT, NL, UK, 2003



Source: EUROSTAT, IPF research

Additionally, it is interesting to compare the wholesale industry's multipliers to those of other industries. As comparator, wholesalers of food and beverages[9] were chosen. In 2003, the food wholesale industry in the 7 countries examined before had a multiplying effect of 2.47 on value added, therefore exceeding the corresponding multiplier of pharmaceutical wholesalers. This result is a consequence of pharmaceutical wholesalers being price takers. The highest multiplier on value added was created by the food wholesale industry in Italy (3.65), the lowest in Spain (2.17). In these countries, multiplying effects of the pharmaceutical wholesale industry are 2.24 (Spain) and 2.19 (Italy).

With 2.56, the overall multiplying effects on employment are higher in pharmaceutical wholesaling than in food wholesaling (2.09). Every job in food wholesaling

[9] EUROSTAT classifies wholesale of food and beverages under the NACE-group g513. This group also contains data on the wholesale of tobacco (g5135) for which the data has been adjusted.

in Italy creates 2.94 jobs in the Italian economy, whereas only 1.60 jobs are created in Spain.

Table 7: Multiplying Effects of the Food Wholesale Industry on Value Added and Employment (FTE), 2003

	AUT	ESP	FR	GER	IT	NL	UK
Multiplying Effects on Value Added	2.36	2.17	2.63	2.00	3.65	2.36	2.31
Total Multiplying Effects on Value Added	**2.47**						
Multiplying Effects on Employment	2.18	1.60	2.28	1.88	2.94	2.35	2.12
Total Multiplying Effects on Employment	**2.09**						

Source: EUROSTAT

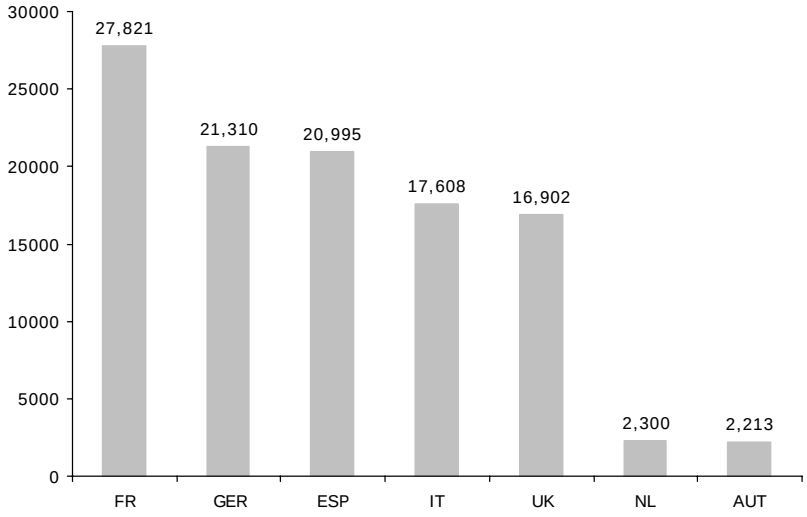
6 Efficiency Indicators

An industry's efficiency may be evaluated using a wide variety of indicators. In the case of pharmaceutical wholesaling, efficiency is best measured by examining how the industry achieves the complex task of distributing medicines. The performance of the industry is therefore investigated by its ability to maintain a country-wide, rapid and continuous supply with pharmaceutical products.

6.1 Bringing Medicines to the Patients

Patients are primarily interested in getting the medicines needed at an affordable price. Furthermore, they expect them to be available at places near by. A tight net of dispensing units, like retail pharmacies, hospital pharmacies and dispensing doctors, secures this availability at the last stage of the distribution chain. In recent years some countries eased their laws regulating the dispersion of pharmaceuticals for certain products, so medicines may also be purchased in drugstores, supermarkets, gas-stations etc. Still, their market share is negligible on a European level.

Figure 27: Number of Dispensing Units [1], 2004



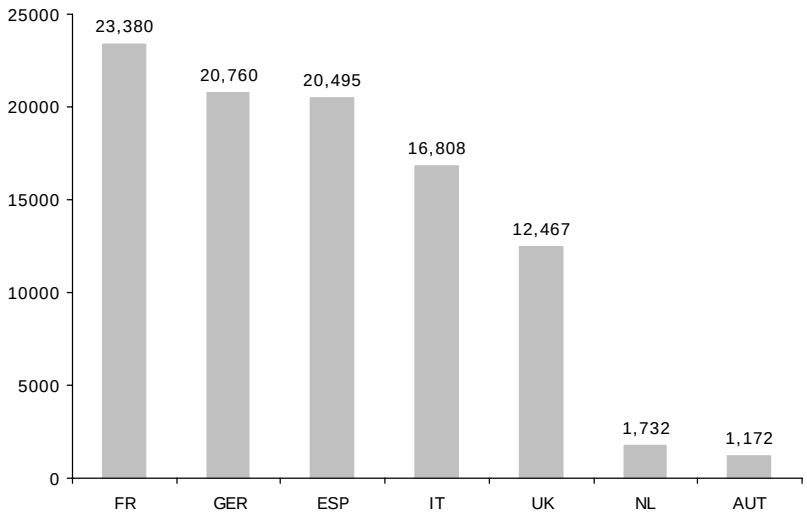
[1] Includes retail pharmacies, hospital pharmacies and dispensing doctors

Source: GIRP data, IPF research

In 2004, there was a total number of 147.384 retail pharmacies, hospital pharmacies and dispensing doctors responsible for the distribution of medicines to the patients in the EU-22. The number of dispensing units ranges from 147 in Luxem-

burg to 27,821 in France. Germany and Spain with 21,310 and 20,995 dispensing units each reach 2nd and 3rd place.

Figure 28: Number of Retail Pharmacies, 2004



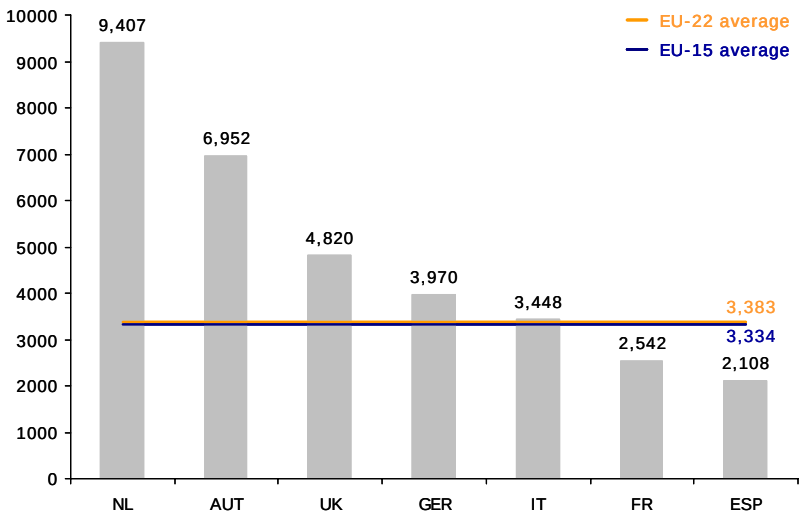
Source: GIRP data, IPF research

In all countries surveyed, retail pharmacies are the most important type of dispensing units. Almost 91% of all medicines delivered to patients were sold in pharmacies making them the main clients for pharmaceutical wholesalers. The highest concentration of pharmacies is to be found in Spain and in France with 2,108 and 2,542 inhabitants per pharmacy. Italy is placed near the EU-22 average of 3,383 inhabitants per pharmacy. Quite surprisingly, with 3,970 and 4,820 inhabitants per pharmacy Germany's and the UK's network of pharmacies is not as tight as the European average. In the Netherlands and Austria, the smallest countries accounted for in the in-depth analysis, one pharmacy serves 9,407 and 6,952 inhabitants.

Retail pharmacies are the most important places for patients to get their medicines. 88% of the medicines sold are delivered by pharmaceutical wholesalers.

The reasons for these results are manifold but can be sought in different supply-structures which have historically evolved, in diverging topographical structures of the countries, in regional population-density and the importance of other dispensing units besides retail pharmacies. Whereas there are no dispensing doctors in most European countries, they play an important part in the Netherlands, Austria and the UK, supplementing the distribution system in these countries. In France on the other hand, only a few doctors are allowed to dispense medicines to the patients. However, France has a comparatively large number of hospital pharmacies providing medicines.

Figure 29: Inhabitants per Retail Pharmacy, 2004



Source: GIRP data, IPF research

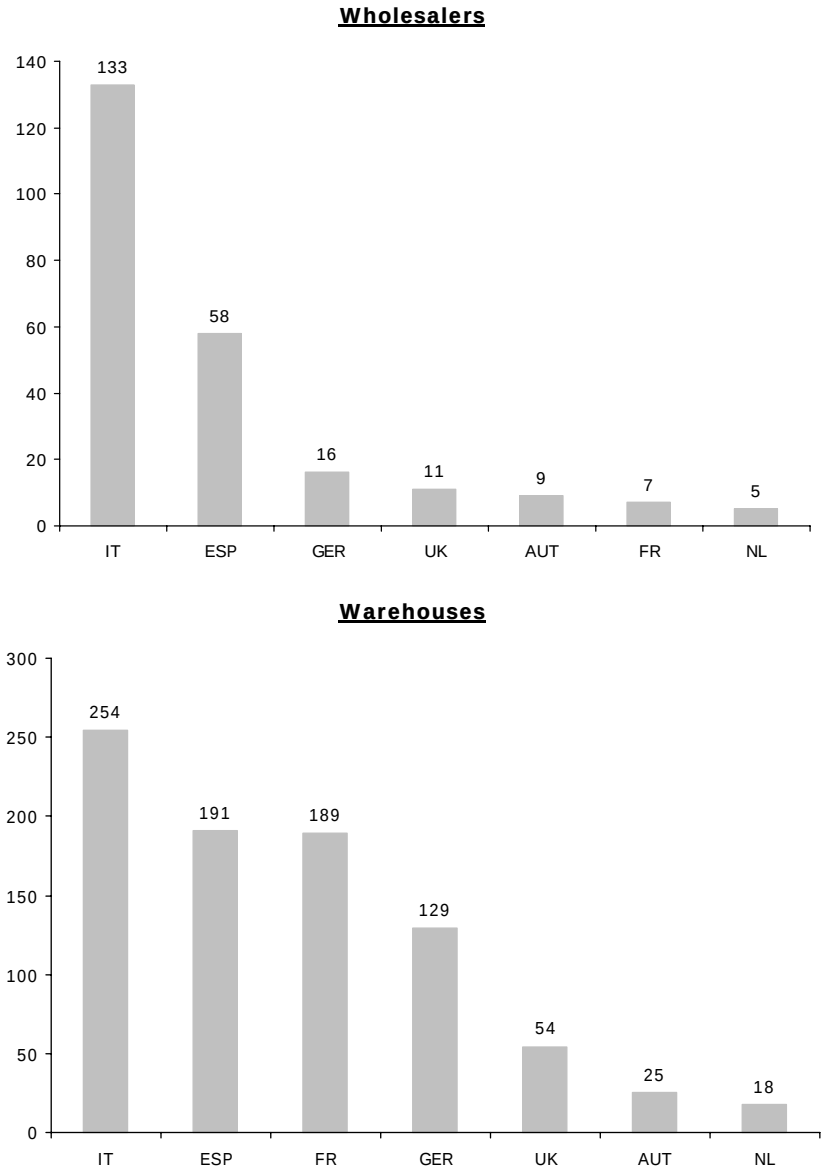
Patients expect their medicines to be available at their pharmacy whenever they need them. However, they do not ask how such a high service level is to be obtained. The task of providing a reliable and rapid supply system is executed by pharmaceutical wholesalers. This raises the question, whether the use of intermediaries in the distribution chain is efficient.

The 673 full-line wholesalers in the EU-22 are the spine of pharmaceutical distribution, as they distribute the full range of pharmaceuticals using a network consisting of 1,458 operating sites.

In 2004, 673 full-line wholesalers operated 1,458 warehouses within the European Union (EU-22) to secure a fast, reliable and country-wide supply of medicines. On a 22-country average, there were 35 wholesalers owning 73 warehouses. With 133 full-line wholesalers Italy proves to be an outlier. This extraordinary high value suggests that the phase of market consolidation, which started a few years ago, is likely to continue in the near future. Italy also registers the highest number of warehouses. The warehouse-to-wholesaler ratio only amounts to 2.76 in Italy whereas in France one full-line wholesaler operates 27 warehouses on average[10], in Germany 8.05 and in the UK still 4.91 warehouses are run by a single wholesaler.

[10] For France, wholesalers operating in the overseas-departments were not considered.

Figure 30: Number of full-line Wholesalers and Warehouses, 2004



For France, wholesalers operating in the overseas-departments were not considered.

Source: GIRP data, IPF research

It's not so much the absolute number of warehouses determining the efficiency of the distribution of pharmaceuticals by wholesalers, but their range[11]. The Netherlands, for instance, is a small country with only 18 operating sites run by full-line wholesalers, but with a range of only 6,921 sq km. the country ranges third place.

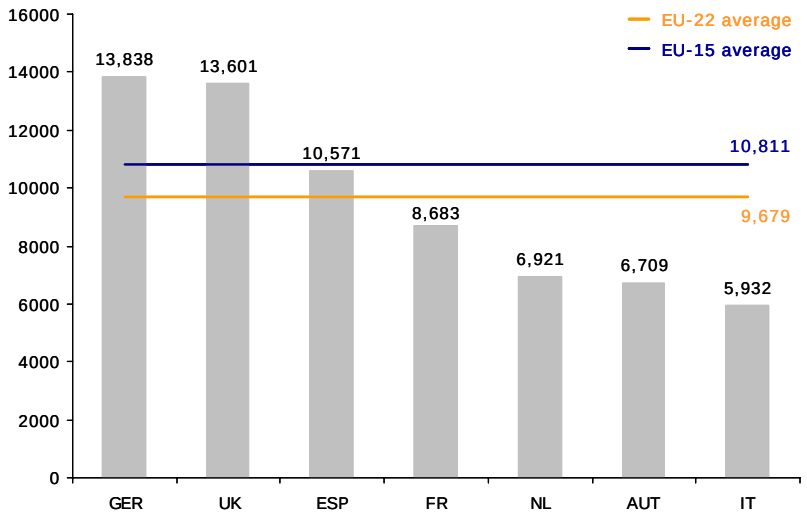
[11] When calculating the range of a full-line wholesalers' warehouse, simply dividing the country size by the number of warehouses underestimates their true range, because the fact that competition between different wholesale companies leads to the duplication of the distribution network, is neglected. Therefore, the range of warehouses was calculated considering the existence of several (parallel existing) distribution networks operated by different wholesalers in one country. The same assumptions are valid for the calculation of retail/hospital pharmacies per warehouse and inhabitants per warehouse (see p. 38).

The excessively high number of warehouses in Italy consequently results in small areas to be supplied by one warehouse.

National full-line wholesalers can only perform their task using a tight net of 1,458 up-to-date distribution centres, on average (EU-22) covering a range of 9,679 sq km each.

Discrepancies in the range of wholesalers' warehouses in different countries are again the result of many factors, like historically grown structures, geographical facts and different levels of market concentration.

Figure 31: Range per full-line Wholesalers' Warehouse in sq km, 2004



Source: GIRP data, IPF research

The range of warehouses is an indicator measuring the wholesale industry's ability to fulfill its function to bridge distances. By relating the number of operating sites to the number of retail pharmacies the wholesale industry's level of coverage can be determined. The results show that in Austria one warehouse on average serves 94 pharmacies whereas 805 pharmacies are supplied by one full-line wholesaler's warehouse in Germany.

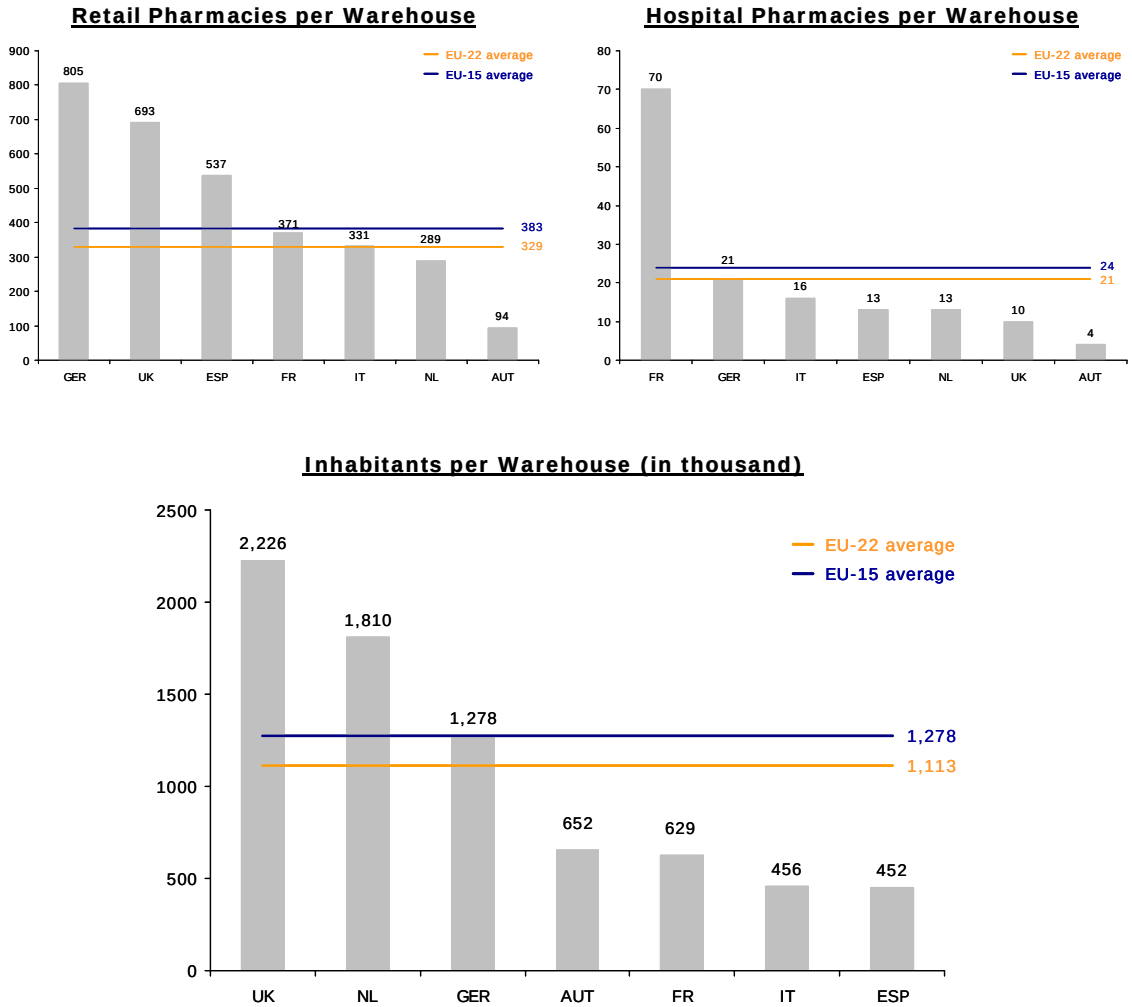
In the EU-22 (2004), one warehouse on average serves 329 retail pharmacies, reaching 1.1 million patients each.

From a methodological angle it is necessary to mention that these average values not truly reflect reality. For instance, no distinctions between rural and municipal areas are made, therefore disregarding the fact that wholesalers' operating areas measured in square kilometers are larger in the country than in cities. On the other hand, the number of patients served by one warehouse is higher in densely populated areas than in the country. Another fact not displayed in the average

values is that pharmacies often have more than one supplying wholesaler or wholesalers' warehouse.

By combining the results of the analysis of the number of inhabitants per pharmacy with the number of pharmacies supplied per operating site, the number of inhabitants (and therefore potential patients) reached per warehouse can be determined. The higher the figures, the more efficient the distribution system is. With 2.2 million people per warehouse the UK proves to be most efficient, followed by the Netherlands with more than 1.8 million people and Germany with 1.3 million inhabitants supplied by one national wholesaler's operating site. The results suggest that efficiency is highest in countries having already reached a high level of market consolidation.

Figure 32: Retail/Hospital Pharmacies and Inhabitants per full-line Wholesalers' Warehouse, 2004



Source: GIRP data, IPF research

One characteristic of the pharmaceutical wholesale industry is the high number of deliveries carried out daily to supply retail pharmacies with medicines. On a 22 country basis 2.36 deliveries were carried out per day on average. Not considering

the new EU-members this value increases to 2.70 times a day. In most of the countries, retail pharmacies are supplied between 1 and 3 times a day. In Finland and Sweden, wholesalers on average only ship medicines once per day. With up to 5 deliveries per day, the average delivery-frequency is highest in Austria and Spain.

Pharmaceutical wholesalers help reducing pharmacies' inventories by providing just in time delivery: Pharmacies receive orders given, up to 2.7 times a day on average.

6.2 Wholesaling: Benefits for the Patient

Although pharmaceutical full-line wholesalers are engaged in business-to-business operations, patients directly benefit from services provided by them. Primarily, these benefits are directly connected to the logistic services provided. The maintenance of an efficient, low-cost network of distribution centers is the foundation of a Europe-wide fast and continuous supply of medicines, ensuring that even very slow moving – but nonetheless vital - medicines are available at dispensaries closest to the patient. In most European countries, public service obligations are placed on wholesalers to guarantee permanently an adequate range of medicinal products to meet the requirements of a specific geographical area and to deliver the supplies requested within a very short time over the whole of the area in question (Directive 2001/83/EC, amended by Directive 2004/27/EC, Title VII Wholesale Distribution).

But the patients' benefits from the existence of pharmaceutical full-line wholesalers are not limited to logistics. Another very important (but often overlooked) task of wholesalers is to ensure that medicines delivered still meet the high quality standards set up for the manufacturing industry when the products are handed over to the patient. Supply chain safety is mainly ensured by full-line wholesalers' compliance with the principles and guidelines of Good Distribution Practice published by the Commission of the European Communities (94/C63/EC). A cornerstone of the enhancement of patients' security is the collection and destruction of outdated medicines and the maintenance of reliable recall procedures, guaranteeing that recalled products are removed from sales and stored in isolated places.

Patients do not only benefit from the efficient distribution network and services provided by full-line wholesalers in "normal" times. Based on its logistics-expertise and on emergency plans, wholesalers are well prepared to encounter crises and threats like avian flu or pandemic. In both cases, European pharmaceutical wholesalers can ensure fast, Europe-wide supply of all the medicines required to cope with these diseases. The same is true for the distribution of iodine tablets in case of nuclear accidents or terrorist attacks with nuclear material. Generally, the pharmaceutical wholesalers' role in fighting terrorism, especially bio-terrorism, has increased over the last years. The wholesale industry is not only prepared to sup-

ply remedies (as far as they exist) in the worst case, but the industry also is heavily engaged in the prevention of crises by monitoring and tracking critical substances, thereby cooperating closely with government authorities.

Based on emergency plans, full-line wholesalers are capable of delivering medicines needed in case of pandemic, nuclear accidents or avian flu. The industry is also engaged in combating bio-terrorism, since critical substances are constantly monitored and tracked.

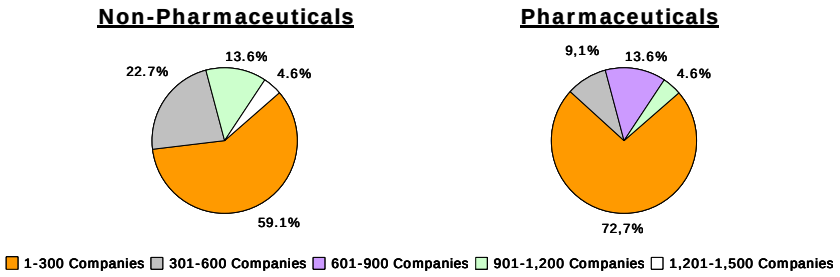
6.3 Procurement, Warehousing, and Distribution

The following sub-sections provide results on the pharmaceutical wholesalers' supply chain management. The data required for the analysis made was thoroughly obtained by an inquiry of leading pharmaceutical wholesale companies throughout the European Union. The returned questionnaires from wholesale companies located in 16 countries represent a total market share of 50%. The results display average values on a country basis in order to guarantee confidentiality of the company data.

6.3.1 Procurement

In 2004, pharmaceutical wholesalers covered by the second inquiry procured medicines from at least 50 to more than a thousand manufacturing companies. In general, 72.7% of the wholesale companies surveyed had a maximum of 300 medicines-suppliers. Especially in northern and Eastern Europe, the number of suppliers is comparably low whereas it is clearly above the average in Germany, Austria and Spain.

Figure 33: Number of Suppliers, 2004



Source: IPF research

In a highly competitive environment, wholesalers increasingly regard manufacturers as customers who not only demand excellent transportation services but overall expert logistics solutions.

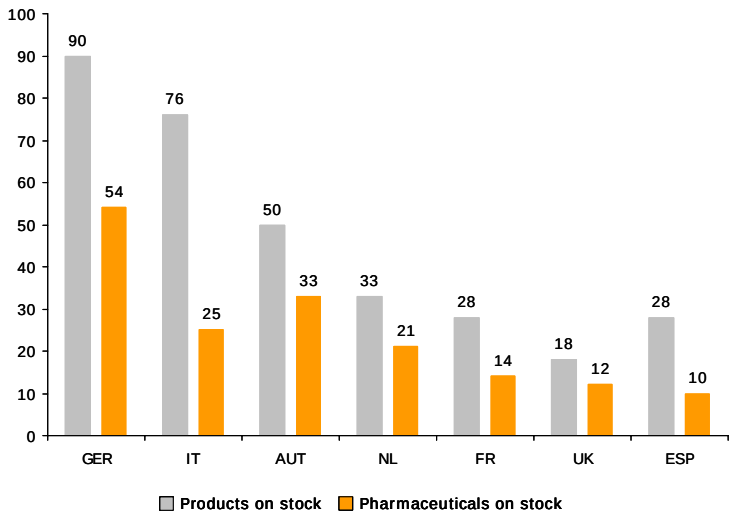
On average, medicines are ordered from manufacturers from 2.5 times a month in the UK up to 4.5 times in the NL. In case of special need order-frequencies for certain products are, of course, higher. In some northern European countries, order frequencies of some companies exceed the average up to 3 times.

The relationship between the pharmaceutical industry and wholesalers is affected by the provision of services by the latter creating added value for manufacturers. The most important of these services are related to marketing activities and promotional support, the provision of sales and inventory statistics but also assistance at product launches or offering logistics services of clinical trials. As these services form an integrative part in the relationship with manufacturers, it is widely expected within the industry that the importance of such services is likely to rise considerably in the near future as competition between wholesalers, but also between pharmaceutical companies, is speeding up. In times of increasing direct distribution and a strained relationship between manufacturers and wholesalers in the debate on supply quota systems, services more and more become the crucial competitive factor in pharmaceutical wholesaling.

6.3.2 Warehousing

Items on stock ranged from 6,000 to more than 90,000 depending on the size of the market and the number of pharmaceuticals[12] authorized to be marketed. On a European average, wholesaler stock 29,151 different items, of which 49% are pharmaceuticals. The share of medicines within the product range differs considerably from country to country, depending on the number of pharmaceuticals allowed for marketing.

Figure 34: Pharmaceuticals and non-Pharmaceutical Products on Stock (in thousand), 2004



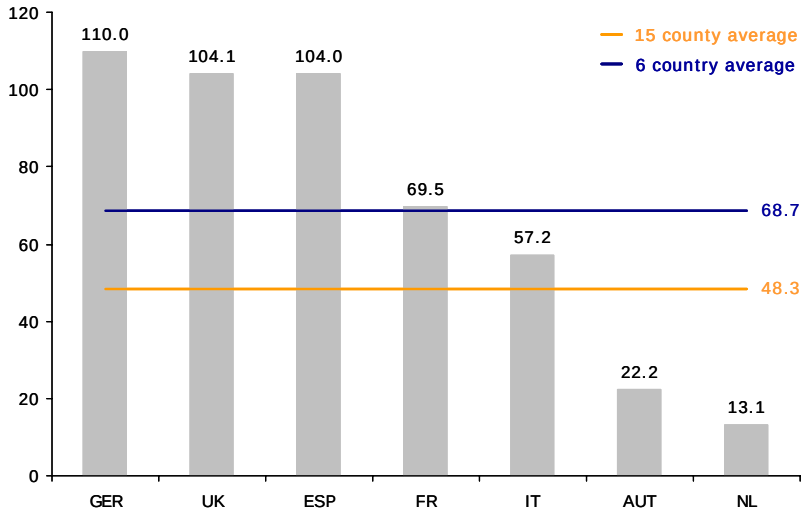
Source: IPF research

[12] The term pharmaceuticals denotes all Rx and OTC products. Para-pharmaceuticals are classified as non-pharmaceuticals.

Germany has the most medicines on stock since no other country has so many different drugs available. The share of pharmaceuticals in total products on stock is highest in Austria, followed by the Netherlands, the UK and Germany.

For the storage of the different items sold, wholesalers on average uphold an inventory capacity of 68.7 thousand square meters per company if only the countries of the in-depth analysis are considered. The value drops to 48.3 thousand square meters if the scope of the analysis is widened.

Figure 35: Average Storage Capacities of leading Pharmaceutical Wholesalers (thousand square meters), 2004

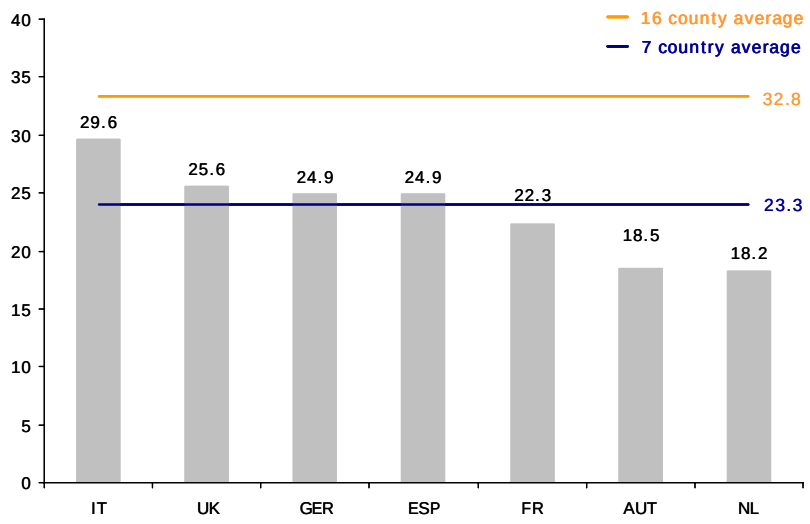


Source: IPF research

In Germany, France, the UK, Italy, Spain, the Netherlands and in Austria goods on average stay on stock for about 23.3 days. Inventory turnover is fastest in the Netherlands with just 18.2 days on average, whereas it is slowest in Italy with 29.6 days. In some of the new EU-member states, inventory turnover is considerably lower, reaching up to more than 60 days on a country-average. Thus, the 16 country average rises to 32.8 days.

Pharmaceutical wholesalers do manage quite complex flows of goods since demand for specific medicines varies considerably. Demand for medicines used for the treatment of influenza, for instance, are a good example for such goods, as it varies seasonally. So inventory turnover is not only quite different from product to product, reaching from a month to only a few days, but also changes during specific time periods (e.g. demand for medicines to treat influenza will rise in autumn and winter).

Figure 36: Inventory Turnover (in days), 2004



Source: IPF research

On the other hand, pharmaceutical products are in many ways special products, since high quality standards must be met to secure drug safety and therefore also patient safety. Thus, many products require special handling, such as permanent cooling. Other products, like narcotics or other chemical substances, need to be stored separately according to EU and national legislation. The share of products requiring special handling in total products on stock ranges from about 1% in Spain to around 9% in the Netherlands.

The whole process of commissioning orders is highly automated, using state of the art information technologies, like EDI-systems for taking orders. In 2004, about 92% of all orders placed with pharmaceutical wholesalers were made using EDI-technology. Orders are automatically transmitted to the warehouses, where the different items are assembled either using an order picking, batch picking or night picking approach. Order picking means that only quantities are picked to satisfy one specific order. Batch picking on the other hand is a picking process, where enough quantity is picked to satisfy the demand of multiple orders. The batch is later sorted by order and/or delivery address.

European wholesalers predominantly use order picking systems. Batch picking is only used by 19.4% of the companies, supplementing order picking processes. Night picking is also rarely used (25.8%), since pharmacies are supplied several times a day. Most often, orders that are to be delivered to other warehouses are picked over night.

Modern information technologies are applied to optimize order processes and the flow of products, thus saving cost.

Picking items is either done manually or automatically. The latter picking method is used for top-selling high rotation products, as long as their physical characteris-

tics do not cause problems with the automats, e.g. glasses, large package size or products requiring special handling, like narcotic substances. Such products are usually picked by hand. Hand picking is also used in small warehouses, where the use of automated systems would prove to be too expensive. In 2004, pharmaceutical wholesalers on a 7-country base on average picked 47% of items ordered automatically. There are, however, significant regional differences in the use of automated picking systems. In some eastern European countries, items are almost exclusively picked by hand. Considering these countries, only 33% of all items ordered are picked automatically. But also within the countries of the in-depth analysis, the use of automatic picking systems varies heavily, ranging from a little more than 10% to 65%.

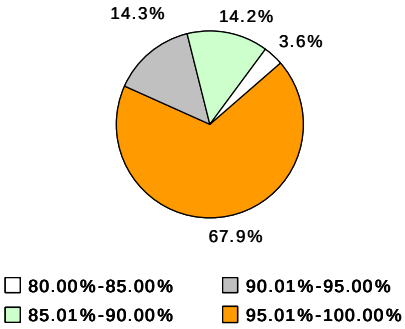
With competition still rising, further rationalizations are to be expected in warehousing. This development goes hand in hand with the employment of new technologies, such as radio frequency systems. Another important technology-related issue is the extension of the use of technologies to survey and control the flow of the product. Despite technology-induced changes, changes in the distribution chain in some countries also demand new logistic solutions, like scanning, tracking and tracing, reducing delivery times

6.3.3 Distribution

In 2004, a pharmaceutical wholesale company on average received 13,181 orders per day. Within Germany, France, the UK, Italy, Spain and the Netherlands, the average rises to 23,357 orders per day, ranging from 2,700 in the Netherlands to 64,700 in Germany. Well organized processes and the use of modern technology help to enhance the efficient handling of these orders. At its best, it takes only 30 to 45 minutes from placing an order to its shipment. In countries predominantly using hand picking, commissioning time automatically rises. The same is true if night picking systems are applied.

An important indicator to evaluate the efficiency of pharmaceutical distribution by wholesalers is the order fill rate that is, the wholesalers' ability to execute orders received immediately. 67.9% of the companies achieved an order fill rate of more than 95%, some of them even reaching as much as 99%. A further 14.3% of the wholesale companies can meet between 90% and 95% of orders received immediately. Only 3.6% of the companies had an order fill rate below 85%. These results are interesting insofar, as many pharmaceutical wholesalers in the new EU-member states provide the same high service level as full-line wholesalers in the rest of the EU.

Figure 37: Order Fill Rate, 2004

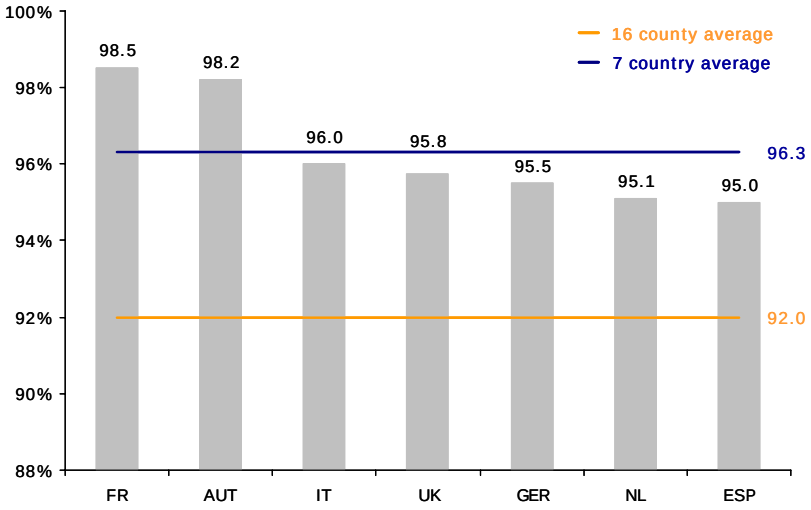


Source: IPF research

On a country average, France has the highest order fill rate, executing 98.5% of all orders immediately. Austria ranges second with 98.2%. Germany's order fill rate of "only" 95.5% might be interpreted as a result of manufacturers' supply quotas. The manufacturer induced shortage of supply with medicines also causes Spain's order fill rate to be just at 95%. As these figures only display country averages, it should be mentioned explicitly that there are several full-line wholesaler who can execute almost 100% of all orders received immediately.

A wide product range and vast storage capacities enable wholesalers to execute 96.3% of all orders received immediately just within 30 to 45 minutes time.

Figure 38: Order Fill Rate (percent), 2004



Source: IPF research

The wholesale industry heavily relies on its ability to maintain the steady supply of different dispensing units with medicines. In order to fulfill their obligation, wholesalers predominantly (90.3%) rely on their own or leased transporters. In 48.3% of the cases, the owned/leased fleet of transporters is aided by assigned freight

forwarders. Couriers on demand are only used by 29.1% of the companies, especially in emergency situations. The strong reliance on own transporters makes wholesalers more independent and helps to uphold the high delivery frequencies.

The provision of services to retailers is as much of importance as the offering of such services to manufacturers, as pharmaceutical wholesaling moves from a price to a service focus. Most of the added value services offered to pharmacies are related to marketing and promotional activities. In recent years, especially internet based services, like online ordering or product information, have become widespread.

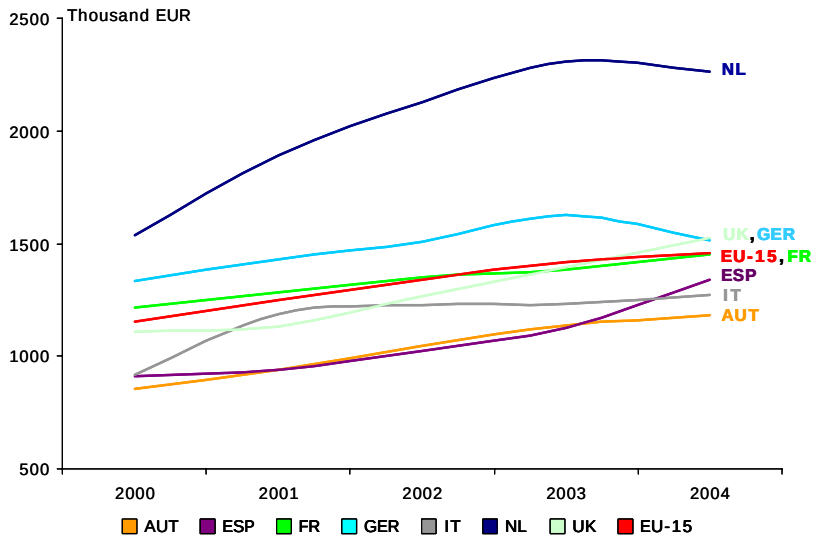
> The distribution of pharmaceuticals is more than merely bringing the product to the right place at the right time, as additional services help creating added value for supply chain partners. To do so, the development and provision of tools to control and to enhance the flow of information becomes essential. It's not only the right product, at the right place, at the right time anymore, but the right information, in the right form, at the right place at the right time.

From the arrival of medicines at the wholesalers' warehouses to bulk-breaking, storage, order-picking to loading and shipping, wholesalers have developed procedures guaranteeing the compliance with high quality standards to enhance patient safety. Without them, this security would be endangered, since manufacturers are not responsible for the correct handling of their products once they have left their warehouses and pharmacies often lack the capacities and the expertise to ensure product safety along the distribution chain.

6.4 Productivity

Chapter 4.3 revealed that sales and employment in the pharmaceutical wholesale industry developed positively in the last few years. Overall productivity, as measured as the ratio between sales and the number of employees, also improved on a national and on an overall EU-15 level. Even so, productivity developed quite inconsistently in different markets.

Figure 39: Development of full-line Wholesalers' Productivity, 2000-2004



Source: GIRP data, IPF research

Table 8: Full-line Wholesalers' Productivity (thousand EUR), 2000-2004

	2000	2002	2004
AUT	855	1,049	1,182
ESP	914	1,023	1,338
FR	1,213	1,349	1,450
GER	1,336	1,507	1,515
IT	918	1,224	1,271
NL	1,538	2,126	2,266
UK	1,111	1,267	1,527
EU-15	1,152	1,340	1,460

Source: GIRP data 2004, IPF research

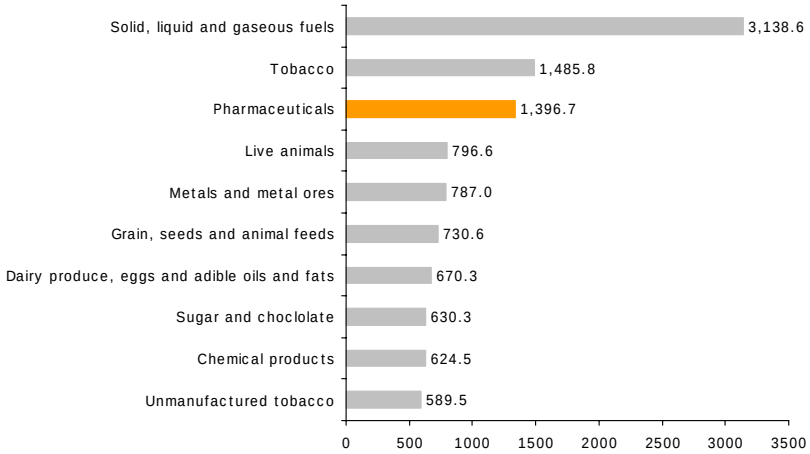
The Dutch market, for instance, saw a strong increase in productivity from 2000 to 2003. In 2004, however, cost-containment measures resulted in a reduction of sales, thus curbing productivity. A comparable development might be surveyed for Germany, where recent health care reforms put the wholesale industry under pressure. On the other hand, productivity in Spain was boosted since 2002.

6.5 Comparison to other Wholesale Industries

In this section the pharmaceutical wholesale industry is compared with other wholesale industries on an overall EU-15 level. The analysis thereby focuses on the number of companies, the number of working places established, sales and productivity. The examination is based on EUROROSTAT-data for the 15 member-countries of the European Union in 2002[13].

The direct comparison of the pharmaceutical wholesale industry[14] with other wholesale branches, as defined by the NACE-classification[15] system applied by EUROSTAT, reveals, that pharmaceutical wholesaling is a highly productive business. Measured by sales per employee, the pharmaceutical wholesale industry's performance is outstanding. With more than 1.3 million EUR the industry ranges 3rd just behind fuels-wholesalers with 3.1 million EUR sales generated per employee and the tobacco wholesale industry with 1.5 million EUR per employee.

Figure 40: Top 10 Wholesale Industry's Ranking by Productivity (in thousand EUR), EU-15, 2002



Source: EUROSTAT, GIRP data, IPF research

Yet, wholesale in fuels is not quite comparable to other wholesale branches because of the vast quantities traded and the strong exposition of fuel-prices to political, economic and environmental crises and speculations. Leaving the branch aside, pharmaceutical wholesaling becomes the 2nd ranking wholesale industry within the European Union measured in terms of productivity.

[13] EUROSTAT does not provide any data on wholesale branches in Greece. Thus, the following analyses only refer to the data of 14 countries. However, it can be assumed that the missing Greek data do not have a significant impact on the results presented.

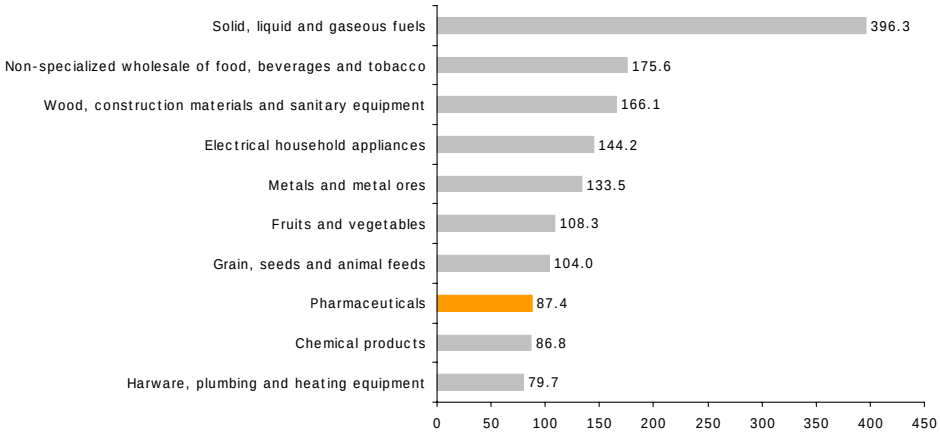
[14] Using EUROSTAT classification, group g5146 also contains data on wholesale of medicinal products. To circumscribe the two wholesale industries, data obtained from the GIRP data-file and the inquiry was applied.

[15] A complete reference list of the NACE-classes' names can be found in the annex to this study on page 67.

With sales of 1.3 million EUR per employee pharmaceutical wholesaling shows the third highest productivity of all wholesaling branches within the European Union and is more than twice as high as productivity in wholesale of chemical products.

Although being a comparably small industry pharmaceutical wholesalers' total sales amounted to almost 88 billion EUR in the EU-15 in 2002, ranging 8th place. For the reasons mentioned above, wholesale of solid, liquid and gaseous fuels and related products leads the ranking. With about 396 billion EUR, the industry exceeded pharmaceutical wholesalers' sales 4-times. Leaving this branch aside again, non-specialized wholesale of food, beverages and tobacco becomes the most profitable branch in European wholesaling, with sales almost twice as much as pharmaceutical wholesalers'.

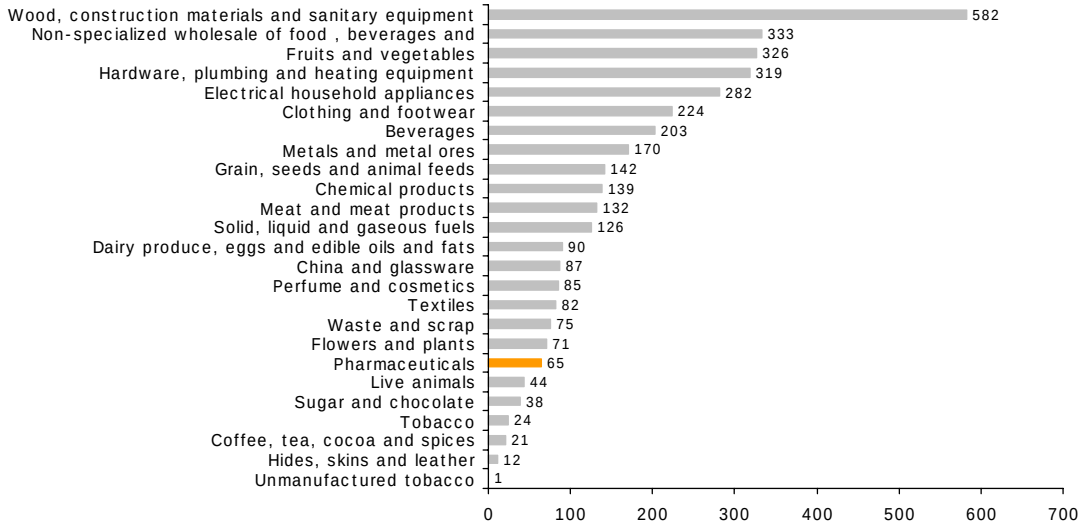
Figure 41: Top 10 Wholesale Industry's Ranking by Sales (in billion EUR), EU-15, 2002



Source: EUROSTAT 2004, GIRP data 2004, IPF research

Employing around 65,000 people in 2002, the pharmaceutical wholesale industry only ranged 19th. The comparably low number of employees places pharmaceutical wholesalers around wholesalers of flowers and plants, textiles and live animals. The top-ranking wholesale industries by the number of working places are wholesale of wood, construction materials and sanitary equipment employing more than 581,000 people and the non-specialized wholesale of food beverages and tobacco with almost 333,000 people employed.

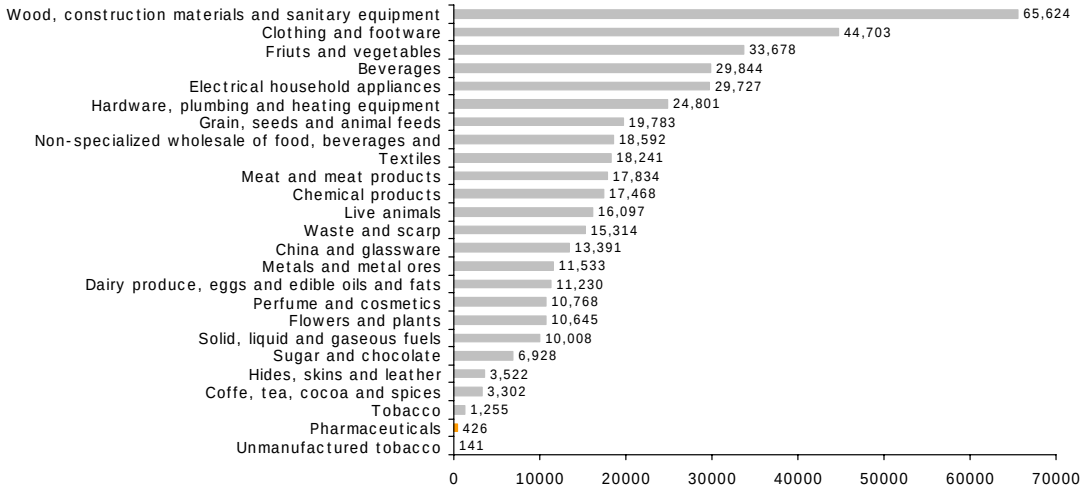
Figure 42: Employment in Wholesaling (in thousand), EU-15, 2002



Source: EUROSTAT, GIRP data, IPF research

Measured by the number of companies, the pharmaceutical wholesale industry with 426 companies in 2002 was the second smallest industry in the EU-15, ranging only in front of wholesale of unmanufactured tobacco with 141 businesses and just behind wholesaling with tobacco products (1,255 companies).

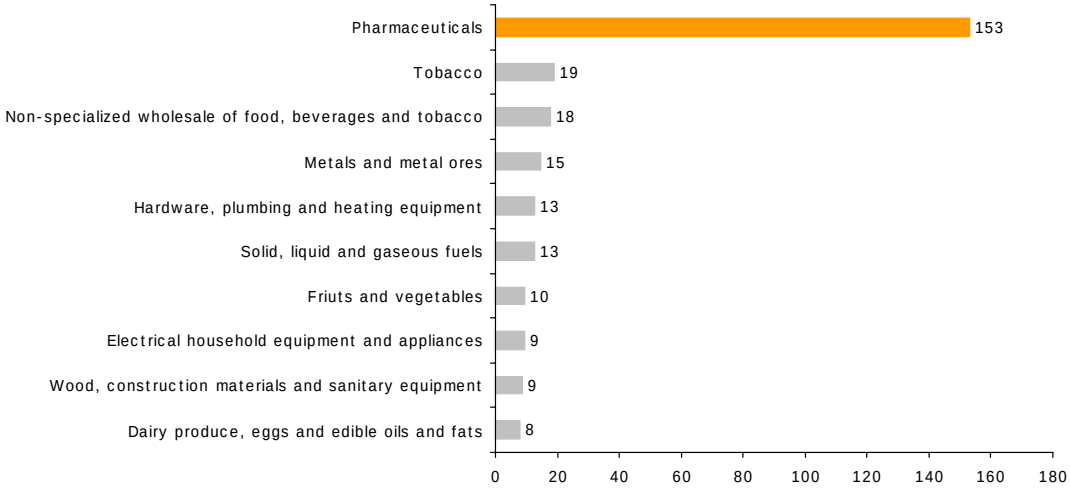
Figure 43: Number of Wholesale Companies, EU-15, 2002



Source: EUROSTAT, GIRP data, IPF research

The low number of pharmaceutical wholesale companies throughout the European Union indicates a very high level of market consolidation. This makes the industry an important employer. Whereas other wholesale branches employed between 3 and 19 people per company, one pharmaceutical wholesaler employed 153 humans in 2002.

Figure 44: Top 10 Wholesale Industry's Ranking by Employees per Company, EU-15, 2002



Source: EUROSTAT, GIRP data, IPF research

The figures given above not only reveal a high level of market concentration; they also suggest an extraordinary high degree of efficiency of the pharmaceutical wholesale industry.

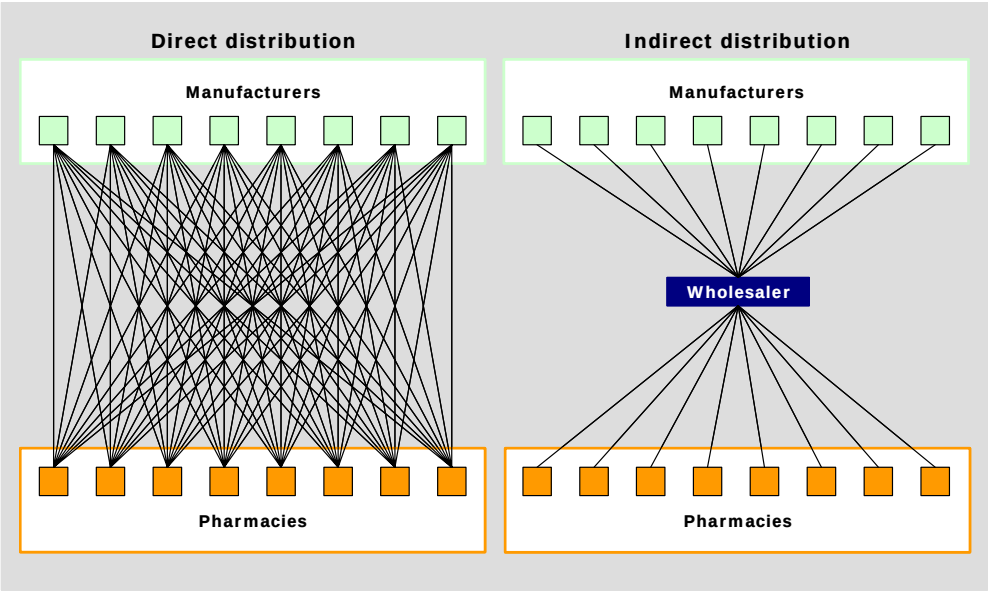
6.6 The Distribution Chain with and without Wholesalers

The previous section measured the efficiency of the pharmaceutical wholesale industry by indicators that are related to the industry's ability to provide medicines whenever and wherever they are needed. The results of the analysis support the presumption that the existence of the branch increases effectiveness in pharmaceutical distribution. Still the question remains, whether the existence of wholesalers improves the efficiency of the pharmaceutical distribution chain as a whole or if the supply of medicines would be faster, more reliable and/or cheaper without intermediaries.

The simple answer to this question is no. One of the most important functions of wholesalers is the pooling of orders. In the case of pharmaceuticals, pharmacies order all the products they need by one wholesaler who pools the incoming orders before transferring them to the manufacturers. So the use of a wholesaler helps to reduce the number of contacts[16] and therefore transaction cost between the agents at the opposite ends of the distribution chain. If pharmaceuticals were supplied directly instead, each pharmacy would have to get in contact with each manufacturer in order to obtain a complete assortment of medicines.

[16] Contact/Transaction refers to deliveries.

Figure 45: Distribution Systems with and without Intermediaries



Source: GÜMBEL 1985

Based on these simple considerations the number of transactions saved by the use of intermediaries within the pharmaceutical distribution chain was calculated. In a first step, the number of transactions per year between wholesalers and pharmacies and between wholesalers and manufacturers were calculated. The analysis focuses on 20 countries because the average number of deliveries per day could not be obtained for Luxembourg and Slovenia. In these 20 countries there are 132,838 retail pharmacies which are supplied 1 to 5 times a day by 194 national pharmaceutical wholesalers who obtain the medicines ordered from about 4,063 manufacturers[17] of medicines once a week. Given these inputs, a total of 28.3 billion transactions are conducted between the agents of the distribution chain each year.

Today, the continuous supply of medicines involves more than 28 billion transactions between pharmacies, wholesalers and manufacturers each year. Without wholesalers, this number would increase dramatically to unconceivable 528 billion transactions a year.

The number of transactions in the scenario without wholesalers was computed ceteris paribus, i.e. all assumptions made remained unchanged, despite the fact that there are no wholesalers and pharmacies and manufacturers would have to get in contact with each other directly. Under these circumstances, the number of transactions carried out per year explodes to about 528.0 billion. Therefore, the

[17] EUROSTAT data not only comprises enterprises, i.e. institutional units in its capacity as producers of goods and services, but also their permanent establishments.

use of intermediaries reduces the number of transactions to be carried out by 499.7 billion.

To establish the same number of transactions in the scenario without wholesalers, deliveries to pharmacies would have to be cut dramatically to 2.7 deliveries per week. This equals a reduction of around 77% to 91%; depending on how often pharmacies are supplied by wholesalers a week.

The use of pharmaceutical wholesalers as intermediaries within the distribution chain enhances the efficiency of the overall distribution system. Without wholesalers, the number of transaction would rise dramatically and so would transaction cost. In the final consequence, these additional costs would have to be borne by the patients in form of higher prices for medicines, as manufacturers and retailers would shift costs incurred and health care payers are not likely to compensate higher prices fully as cost-containment is currently the dominant strategy with respect to pharmaceuticals.

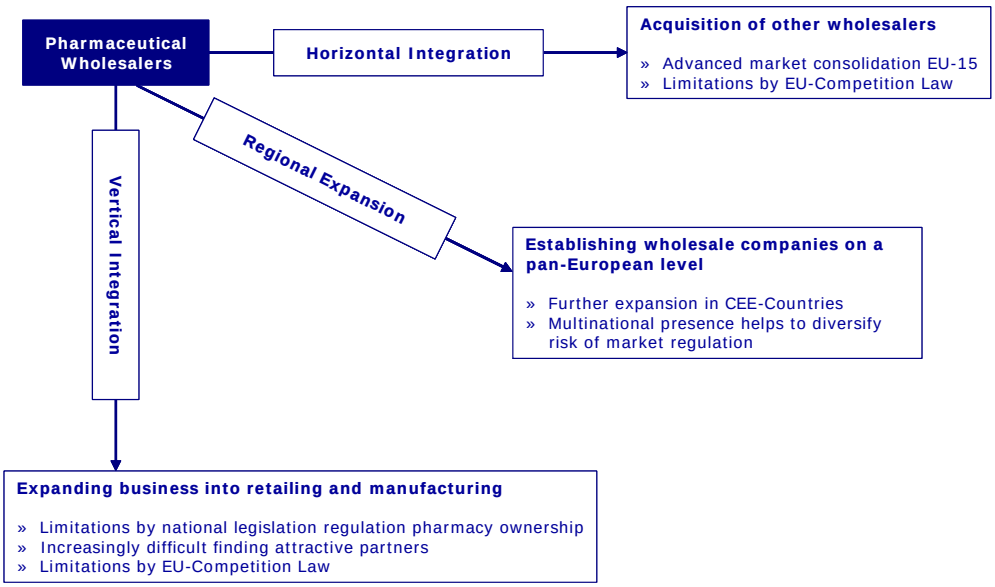
In addition, pharmacies as well as manufacturers lack the capacities to abandon pharmaceutical wholesalers in favor of direct distribution. Consequently, the whole distribution system would have to be re-organized, again inducing cost. The pharmaceutical industry would have to develop new logistics- and order-processing systems. Furthermore, delivery frequencies would be reduced. This implies that shortages in supply, especially with rarely demanded products are more likely to occur. Generally, pharmacies would have to invest massively in the dismantling of storage facilities.

However, a reduction of the number of shipments will not solve the problem of the high number of transactions and cost involved, as more than 145,000 dispensing units still would place their orders individually. The problem could only be solved satisfactorily if orders were pooled, e.g. by purchasing-co-operations. But this again would only lead to the establishment of independent intermediaries in the long run.

7 Structural Changes in Pharmaceutical Wholesaling

Changes in national market regulations, decreasing margins and increasing competition were the driving factors behind the drastic structural change within the European pharmaceutical wholesale industry in the last 10 to 15 years. This change had two dimensions: increasing market concentration and the growing relevance of services offered.

Figure 46: Structural Trends in Pharmaceutical Wholesaling

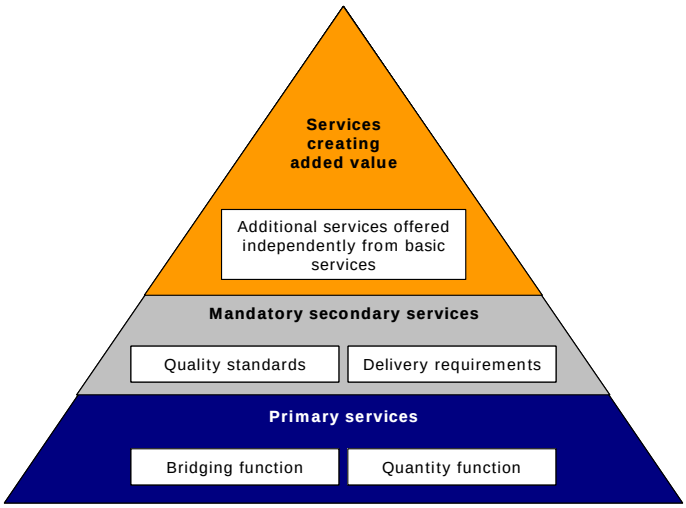


Source: IPF

Market concentration increased considerably, leaving only 141 national full-line wholesalers (EU-15, 2004) in the market compared to about 600 at the beginning of the 1990s. But with horizontal integration reaching its limits due to competition-laws, wholesalers also started to expand vertically, by integrating manufacturing activities and/or retail activities into their business. In the past, wholesalers became especially attracted by the positive development of the pharmacy market. Changes in legislation in many European countries allowing multiple pharmacy ownership supported the wholesalers' efforts of integrating pharmacies into their businesses by establishing chains. As to the wholesale sector, size is also a critical factor in retailing. Strong expansion of wholesalers in the pharmacy sector in recent years increasingly makes it more difficult to find partners at attractive locations. Hand in hand with vertical and horizontal integration goes the trend of regional expansion. Although the European pharmaceutical markets are far from being harmonized, pharmaceutical wholesalers started to leave national borders behind in order to act on a pan-European level. The benefits from such a strategy

are derived by diversifying the risks on wholesalers' profitability incurred by different national market regulations and other market-related risks. Though concentration in the wholesale market has grown considerably, further horizontal integration may be expected in the new EU-member states but also in countries projected to join the EU in the near future.

Figure 47: Service Spectrum provided by Pharmaceutical Wholesalers



Source: IPF

As a consequence of this development, the importance of business models offering services along the whole supply chain has grown significantly. The wholesalers' service-spectrum may be split into three parts:

- Primary services of the branch
- Mandatory secondary services
- Added value services

Primary services are related to the core business of the industry, thus relating to the traditional logistics-functions of bridging time and space. In addition, a quantity function is exerted by buying large quantities, bulk-breaking and selling smaller units, thereby improving the efficiency of the pharmaceutical distribution chain by a degression of cost. Patients directly benefit from these primary services, as full-line wholesaler have established an efficient, low-cost network of distribution centers securing a Europe-wide fast and continuous supply of medicines, even of slow moving products.

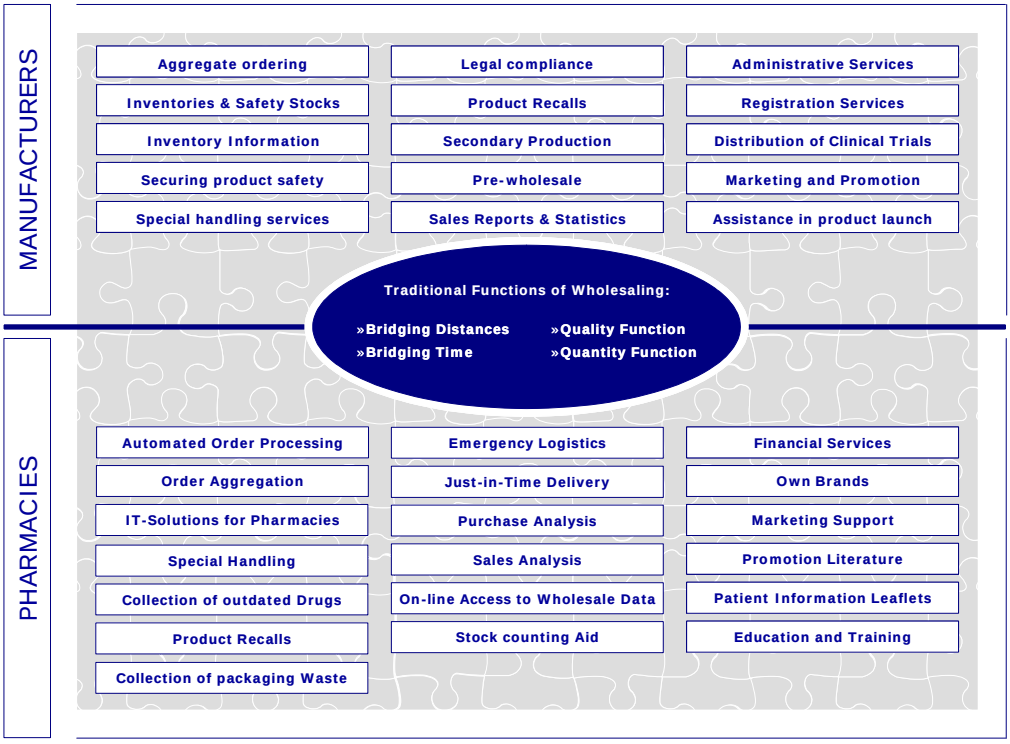
These primary (basic logistics) services are supplemented by mandatory secondary services related to securing the high quality standards of the products distributed. This quality function is chiefly observed by the principles and guidelines of Good Distribution Practice published by the Commission of the European Communities (94/C63/03) and Directive 2004/27/EEC amending Directive 2001/83/EEC. The guidelines and the Directive stipulate special requirements for staff qualification, documentation, receipt, storage and delivery of medicinal prod-

ucts, and the return of defective and non-defective drugs. The patients benefit from these secondary services, as they can be sure that all medicines still meet the high quality standards set up for the manufacturing industry when they are sold to him in the pharmacy.

> Value added services are the most important competitive factor in pharmaceutical wholesaling giving companies the opportunity to stand out from their competitors.

The provision of primary and secondary services expresses pharmaceutical wholesalers' legal and moral obligation to deliver medicines wherever and whenever they are needed most. The commitment to improve the patients' medical conditions gave rise to the most striking structural change in pharmaceutical wholesaling, as wholesalers have evolved from merely transporting goods from A to B thereby maintaining product quality to overall health care providers by offering exclusive, on-demand services creating added value for manufacturers, retailers and the patient.

Figure 48: Services offered by Pharmaceutical Wholesalers



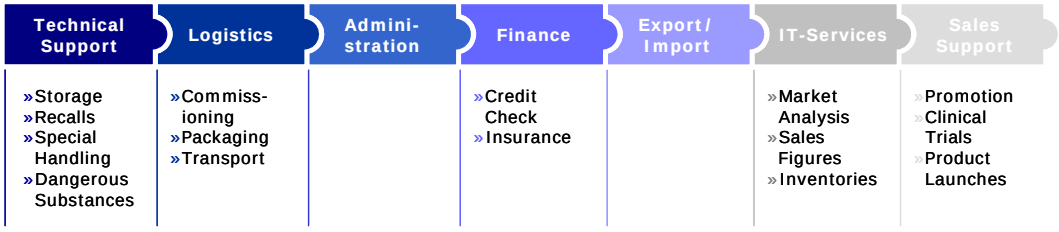
Source: IPF research

Services provided by pharmaceutical wholesalers create added value at their customers because they help them to focus exclusively on their core business. For manufacturers, such services comprise:

- Enhancing efficiency in pharmaceutical distribution (28 billion transactions carried out versus 477 billion without wholesalers)
- Holding inventories
- Inventory information
- Securing product safety
- Special handling of dangerous substances
- Legal compliance
- Product recalls
- Secondary production
- Sales reports and statistics
- Administrative services
- Registration services
- Distribution of clinical trials
- Product promotion and marketing
- Assistance in product launch
- Pre-wholesale services

The European pharmaceutical industry is currently striving to rationalize production and distribution costs. As direct distribution to pharmacies and other dispensing sites is economically not reasonable because of the dispensing units' limited inventory capacities and the high number of daily deliveries performed by full-line wholesalers, manufacturers increasingly are searching for ways to outsource their logistics, thereby relying on expert services provided by pharmaceutical wholesalers also engaged in pre-wholesale activities. These specialist services range from technical to administrative to sales support.

Figure 49: Pre-Wholesale Services



Source: Phoenix 2004

Especially for the three pan-European wholesale companies, pre-wholesaling has become a very important business-field, tightening the bonds between wholesalers and manufacturers with the latter benefiting from the use of the wholesalers' European-wide distribution networks. How important services to manufacturers, such as pre-wholesaling, has become over the years, can be illustrated by Celesio's decision to integrate all services into a separate business division in 2004 (CELESIO 2004).

Besides expert knowledge, technical capacity and reliability, the importance of individualization of services provided has risen significantly in recent years. Pre-wholesaling is no exception to this rule. Based on market information and sales data gathered in its wholesale operations, Phoenix provides tailored market analysis for its pre-wholesale clients: Sales figures are presented not only on an overall market basis, but also interpreted by e.g. region, customers, product launches or promotional activities (PHOENIX 2004).

The relationship between manufacturers and wholesalers are not only tightened by broadening pre-wholesale services offered, but also by co-operations in the production of pharmaceuticals, especially generic drugs.

Closer cooperation between manufacturers and wholesalers also creates benefits for pharmacies and for the patients. A good example illustrating how wholesalers act in the interest of patients is provided by Alliance Unichem, which has developed an exclusive range of generic products under the brand Almus in the UK. The medicines are produced by licensed manufacturers, and sales are supported by marketing related services offered by Alliance Unichem to retailers. The patients benefit from competitive prices, consistency of specification and reliable availability (ALLIANCE UNICHEM 2004).

Services creating added value are also provided for the wholesalers' clients. Such services comprise:

- Automated order processing and order aggregation
- Reduction of inventories by just-in-time delivery up to 6 times a day
- High service levels (almost 100% of all orders received are executed the same day)
- Special handling for difficult pharmaceuticals
- Collection of outdated drugs
- Product recalls
- Collection of packaging waste
- Emergency deliveries
- Purchase and sales analysis
- IT-solutions for pharmacies
- Stock counting aid
- Financial services (terms of payment, loans, insurance, consultancy)
- Own brands (generics)
- Marketing programs (sales analysis, patient information leaflets, shop design, promotion literature)
- Staff education and training

For wholesalers the use of modern information technology offers additional ways to provide services to pharmacies. Internet services do not only comprise detailed specifications on (new) products, but also provide information on their availability, price and delivery time. Online ordering has become only a matter of course.

Wholesalers provide websites for pharmacists giving information on all available products, including detailed product information. Pharmacists see which products are available in the closest warehouse and can order them immediately. Price changes are also documented. In addition, pharmacists get information on new drugs available.

IT platforms implemented by wholesalers help enhance pharmacies' inventory control. Pharmacies can order medicines electronically. The system is flexible enough to allow orders given to be adjusted if necessary. The goods are delivered together with an electronic invoice that ensures an automatic entry of goods into the pharmacies' inventory management system.

Most of the services offered are related to marketing and promotional activities. Sales analysis, pharmacy-staff training and education, customer brochures etc. have already become basic added value services provided by pharmaceutical wholesalers.

Wholesalers support pharmacists to optimize the "facing" in the pharmacies' customer sections and the prescription counter. Stock adjustments help to optimize the utilization of the pharmacies limited storage capacities and help reduce the actual time necessary for finding and picking medicines, reducing the time patients spend in the pharmacy.

Nonetheless, pharmaceutical wholesalers also provide assistance related to pharmacies' logistics, pharmacy management or financial management. Services in this field comprise management of the clients' accounts receivables and offering individual terms of payment.

Special agreements with financial institutes support pharmacists financing their shops. Furthermore, pharmacists have access to special consultancy and offers in questions related to their private pension and asset management.

The expansion of services creating added value is unanimously regarded as one of the most important trends shaping the wholesale industry. But not only is the

number of services expected to rise. Also their level of individuality will increase as new forms of distribution, e.g. the direct distribution from wholesalers to the patients, are expected to become an important issue for the wholesale industry in the near future.

Voluntary co-operation programmes for the customers of Celesio's Austrian Wholesaler Herba Chemosan, offers a range of services for independent pharmacists. Amongst others, it helps to optimise processes, offers training sessions and full-service consultations for pharmacy refits as well as a flexible marketing package under the name of Apoimage (CELESIO 2005).

8 From Distribution to knowledge-intensive Health Care Provision

Over the last decade, the pharmaceutical wholesale industry has been shaped by a variety of factors likely to maintain their influence. The ongoing rise in public health care spending will result in further cost-containment measures implemented by national governments. Recent trends in pricing, like the extensive application of international price comparisons for ex-factory prices, will dampen drug prices and therefore reduce absolute margins even further. Moreover, many pharmaceuticals have already lost, or are likely to loose their coverage by national reimbursement schemes, as these are reformed. Consequently, such medicines are less demanded.

Here and there, attempts towards direct distribution can be observed. In some countries, the market share of directly distributed pharmaceuticals has risen over the last years. However, one may reflect on the fact whether this “cherry-picking” in distribution is beneficial to the patients.

Another factor of direct distribution comes from an increase of mail order distribution. However, as this form of distribution is rigorously controlled by national health care authorities and important questions regarding the safe use of medicines ordered are not answered yet, mail order can not be identified as an alternative to the wholesale industry.

Faced with these threats, wholesalers adopted mainly the following strategies to cope with increasing competition and the deterioration of external factors:

- Increasing their market share to generate economies of scale
- Vertical integration to generate economies of scope
- Regional diversification
- Developing business models based on the provision of services.

With respect to the last strategy, it seems that the pharmaceutical wholesale industry is currently undergoing the same trend as manufacturing industries in the 1980s, when industry related services started to gain relevance. In this context, the wholesale industry provides an interesting case as a service industry which is developing towards an expanding service provider by adopting a thoroughly service-oriented strategy in addition to its traditional distribution function. In combination with the other three strategies implemented, the provision of added value services along the pharmaceutical distribution chain contributes in blurring the traditional boundaries between production, distribution and retailing. The establishment of European-wide distribution and service networks increasingly pushes

pharmaceutical wholesalers in the role of health service providers, as is already the case in the UK, the Netherlands or Norway, where pharmaceutical wholesalers have already become partners with Health Service Centers. For the functioning of these partnerships information will be a key factor for success. As wholesalers are in the unique position to hold a wide range of data related to markets, products, manufacturers, retailers, etc. information based services can support health care authorities' efforts to optimize health care expenditure.

On a policy-making level neglecting the wholesale industry within the health care sector would mean to underestimate one of the major players. So far, on a national level, the focus of political discussion was almost solely laid on the role of the pharmaceutical manufacturing industry and its contribution to health care as well as the development of innovative medicines. But also on a European-wide level, pharmaceutical distribution has not yet been in the forefront of debates on optimizing health-care provision.

In order to find new approaches and develop new strategies towards the pharmaceutical sector, an expert group, the so-called G-10, was established by the end of 2000. The Group had the objective to establish consensus between key stakeholders on ways to improve competitiveness of the pharmaceutical sector in Europe. In addition, these strategies should foster European public health targets. But the group almost exclusively focused on the development of pharmaceuticals and the competitiveness of the manufacturing industry (EUROPEAN COMMISSION 2002). However, the recommendations formulated also affect the distributors and especially the wholesalers of medicines. In particular, the recommendations on the improvement of pricing and reimbursement processes to speed-up the process of market authorisation and on enhancing competitiveness in the generics and OTC-markets strongly touch the interests of pharmaceutical wholesalers. Underestimating the importance of a smoothly functioning supply chain, the Group unfortunately was not able to recognize the importance of pharmaceutical wholesalers as a crucial link between the manufacturing industry and the patient. The existence of the current distribution system is vital to the European health care sectors, as pharmaceutical wholesalers help to reduce transaction cost, to secure a safe, rapid and continuous supply of medicines and to help generating value along the pharmaceutical supply chain by providing services for free. But the wholesale industry has to offer even more than that, and this is information. An improved access to information for patients is one of the key-targets of the European public health strategy. Pharmaceutical wholesalers can definitely support the European Commission in this task, because the industry generates and provides unique market and product related information as independent or integrative service provided to supply chain partners, which also are of interest for health care providers. In this perspective, pharmaceutical wholesalers are prepared to become vital and reliable partners to policy makers as well, trying to find strategies and solutions for the current and future challenges in the European pharmaceutical sector together with policy makers, the manufacturing industry, members of mutual health funds and patient-representatives.

It is therefore positive to acknowledge that the role and importance of the pharmaceutical wholesale industry has been perceived by policy makers. Represented by GIRP, full-line wholesalers have recently been invited as a permanent member of the new G-10 process launched this year.

ANNEX

8.1 Input-Output Analysis

Input-output analysis focuses on the examination of the flow of goods and services between industries and its impact on overall demand for labor and capital within an economy.

Within the concept a distinction between final demand and intermediate demand has to be made. Final demand embraces goods and services sold to the final customers, whereas intermediate demand refers to inter-industry trading. Together, these two types of demand result in total demand in various sectors of the economy.

Final demand directly creates value added and jobs in the industry regarded. These effects are therefore called direct effects. Final demand also influences the level of intermediate-demand for goods and services provided by supplying industries, therefore stimulating investment and labor in these sectors. These effects are referred to as indirect effects. Direct and indirect effects only observe direct supplier-customer relations. But increase in employment also radiates in other sectors, due to consumption and investment (induced effects).

Value added is defined as the value of a company's output minus the value of the intermediate goods purchased from supplying industries. Therefore, the calculation of value added is closely related to the production value. For trading-industries, production value is computed as follows:

	Turnover
+	*Capitalized production*
-	*Goods and services for resale*
+ / -	*Changes in stocks of finished products and work in progress*
=	***Production value***

In a second step, value added at factor cost is calculated using the following top-down scheme:

	Production value
-	*Carriage forward*
-	*Purchase of material for processing*
-	*Operating cost*
-	*Low value assets*
-	*Taxes and fiscal charges*
+	*Subsidies*
=	***Value added at factor cost***

Therefore, value added at factor cost embraces:

- Net operating surplus
- Wages and salaries
- Intermediate consumption
- Charges on production
- Depreciation

Leontief's input-output-model provides the methodological basis for the examination of the flow of goods and services between different sectors of the economy. According to *Pischner 1976*, the model is based on an economy with n sectors of the economy. The total production value x of sector i comprises goods and services supplied by sector i to sector j (intermediate goods) and goods and services provided by sector i for final consumption (y).

(1)
$$x_i = \sum_{j=1}^{n} x_{ij} + y_i$$

Equation (1) may also be expressed by the matrix

(2)
$$x = \sum_{i=1}^{n} x_j^{'} + y \quad with\ x_j^{'} = \left(x_{1j}, x_{2j}, ..., x_{nj}\right)$$

The production functions Leontief's model is based on are given in equation (3).

(3)
$$x_{ij} = a_{ij} \cdot x_j \quad with\ i = 1, 2, ..., n$$
$$j = 1, 2, ..., n$$
$$a_{ij} \ldots input - coefficient$$

The input-coefficients are put together in matrix A, resembling the cost-structure of the economy. Each element a_{ij} of matrix A displays the value of intermediate goods procured by sector j. Therefore, a_{ij} can be interpreted as direct effect of production generated in sector i by producing the quantities of intermediate goods demanded by sector j.

(4)
$$A \cdot x = \sum_{i=1}^{n} x_j^{'}$$

The Leontief-equation is obtained by substituting equation (4) in (2).

(5)
$$x = A \cdot x + y \quad with\ 0 \leq a_{ij} \leq 1$$

Given the constraint in equation (5) the solution to the model is

(6)
$$x = (E - A)^{-1} \cdot y$$
$$x = C \cdot y$$

$$E \ldots Identity\ matrix$$
$$C \ldots Leontief\ inverse$$

The Leontief-inverse C measures all production effects induced by final consumption. Any element c_{ij} shows how many units of intermediate goods of sector i need to be obtained to produce one unit in sector j.

By multiplying $(E - A)^{-1}$ with the vector of final consumption ΔC_0 the induced production ΔX_0 might be computed in addition.

(7)
$$\Delta X_0 = (E - A)^{-1} \cdot \Delta C_0$$

8.2 Baligh-Richartz Effect

By analyzing vertical market structures Baligh and Richartz in the 1960s discovered a law, proving that the use of intermediaries is efficient even if they induce higher cost than a direct contact between manufacturers and retailers would (GÜMBEL 1985).

In an economy with m producers, n consumers and no intermediaries, the number of contacts is $m \cdot n$. Supposing that no matter how many producers and customers are in the market, costs of contact are constant and equal 1. Total cost of contact therefore is $C_T = m \cdot n$.

When introducing one intermediary in the distribution chain the number of transactions and costs are reduced to $C_T = m + n$. Therefore, costs are reduced by $(m \cdot n) - (m + n)$.

Potential savings from the existence of intermediaries is growing dramatically with the number of producers and customers because of the multiplicative effects of direct distribution. Suggesting perfect competition, the benefits of introducing intermediaries are reduced with the installation of further middle-man until $m \cdot n = a \cdot (m + n)$ with a representing the number of traders. Therefore, with $a = \frac{m \cdot n}{m + n}$ companies in the market as much costs occur as if the goods were traded directly.

8.3 NACE-Classification

For the comparison of the performance of the pharmaceutical wholesale industry with other wholesale sectors, NACE-classifications used by EUROSTAT were applied. In total, 25 wholesale industries were used for the calculations, namely the industries described by the classification numbers g512 to g5157. The g518-group was not considered, due to a lack complete of data. In addition, classes summarizing wholesalers which are not part of other groups (g5138, g5147 and g5156) were not considered in the calculations. Group number g5146, which is related to pharmaceutical wholesaling, also contains data on wholesale of medicinal products. To circumscribe the two wholesale industries, data obtained from the GIRP data-file and the inquiry was applied.

List of NACE-classifications applied in the analysis:

g5121	Wholesale of grain, seeds and animal feeds
g5122	Wholesale of flowers and plants
g5123	Wholesale of live animals
g5124	Wholesale of hides, skins and leather
g5125	Wholesale of unmanufactured tobacco
g5131	Wholesale of fruits and vegetables
g5132	Wholesale of meat and meat products
g5133	Wholesale of dairy produce, eggs and edible oils and fats
g5134	Wholesale of alcoholic and other beverages
g5135	Wholesale of tobacco products
g5136	Wholesale of sugar and chocolate and sugar confectionery
g5137	Wholesale of coffee, tea, cocoa and spices
g5139	Non-specialized wholesale of food beverages and tobacco
g5141	Wholesale of textiles
g5142	Wholesale of clothing and footwear
g5143	Wholesale of electrical household appliances and radio and television goods
g5144	Wholesale of china and glassware, wallpaper and cleaning materials
g5145	Wholesale of perfume and cosmetics
g5146	Wholesale of pharmaceutical goods
g5151	Wholesale of solid, liquid and gaseous fuels and related products
g5152	Wholesale of metals and metals ores
g5153	Wholesale of wood, construction materials and sanitary equipment
g5154	Wholesale of hardware, plumbing and heating equipment and supplies
g5155	Wholesale of chemical products
g5157	Wholesale of waste and scrap

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