
ARTICLES

Industrial Production, International Trade and Public Finances in Cologne (XVIth and XVth Century)

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I

In the introduction to the series « Neue Wirtschaftsgeschichte » which began in 1970, the editor, Ingomar Bog, defined the series' objective « to provide more accurate findings than hitherto available in social and economic history research ». ¹ This he argued could be achieved by using analytical instruments borrowed from economics, sociology and social psychology. Little can be said against the view that by borrowing from neighbouring and theoretically more advanced social sciences it is possible to make up for the lack of theory in the study of history ²; neither is the value of such an interchange lessened by pointing out that the volumes in Bog's series do not, with few exceptions, ³ achieve the

* This paper was originally a contribution to the *Ottava Settimana di Studio* « Prodotto lordo e finanza pubblica secoli XIII-XIX », Prato, 3-9 May 1976.

¹ Preface to: WILHELM SCHÖNFELDER, *Die wirtschaftliche Entwicklung Kölns von 1370-1513. Dargestellt mit linearen Trendfunktionen samt Analyse ihrer Bestimmungsfaktoren* (NWG 1), Köln/Wien 1970.

² Cf. HANS-ULRICH WEHLER (Ed.), *Geschichte und Ökonomie*, Köln 1973, Introduction, pp. 11 ff.

³ For example in the work of Peter Hertner, *Stadtwirtschaft zwischen Reich und Frankreich. Wirtschaft und Gesellschaft Straßburgs 1650-1714*, Köln 1973.

prescribed aim of providing more accurate results. This shows that it is not sufficient simply to borrow analytical instruments, concept structures, and theories. To avoid the risk of equating what is not equal and of comparing what is not comparable and thereby losing touch with historical reality, one has to examine the possibilities for applying "alien" theories and control them constantly by testing. If necessary the theory must be changed, developed, or simplified in order not to lose its applicability.

The negative results of a relatively rigid application of economic theory are very apparent in the first volume of the « *Neue Wirtschaftsgeschichte* », a study by the economist Wilhelm Schönfelder on « *Die wirtschaftliche Entwicklung Kölns von 1370 bis 1513 (Dargestellt mit linearen Trendfunktionen samt Analyse ihrer Bestimmungsfaktoren)* ». Had the study matched the expectations aroused by the sub-title, I could have limited myself to presenting Schönfelder's results. However, his assertions, approach, and results all invite criticism on various levels — although this does not mean that the present paper will be no more than a critical discussion of Schönfelder's book.

Using Cologne as an example, Schönfelder tries to develop « a method which enables us to determine, if not an accurate estimate of a single economic system, at least its collective developmental trends over time in the Middle Ages ». He tries to do this by retrospective calculation.⁴ Although he emphasizes that it is not feasible, to calculate national product on the same basis as modern statistics of national income he uses the three classical methods for the computation of the national product based on production, distribution, and consumption, and presupposes that the results are the same in each case. This in turn, he claims, makes it possible for the trend functions obtained from these calculations to be not only descriptive by nature, but also to represent an element of control (i.e. it would not be possible, for instance, for the national income to show a tendency to decrease when at the same time consumed income shows a tendency to increase).

Schönfelder did not deal with the fundamental question, as to

⁴ SCHÖNFELDER (see n. 1), p. 2.

whether the conditions which are of unquestionable value for the determination of national income today may be considered as prerequisites for all economic units, or only for relatively large, and in particular, relatively closed systems.

By defining « Sozialprodukt » as being the most comprehensive expression of the economic performances of an economic and social system, whether a State, a region or a town,⁵ he avoids the problem of having to examine whether the urban economy of a medieval town such as Cologne can be called an economy (Volkswirtschaft) in the wider sense, thus becoming a suitable object for general economic calculations. Is the term « Volkswirtschaft » even with the addition of the adjective "historical" for the Cologne economy of the XIVth and XVth centuries not simply an anachronism? Is it at all meaningful in the case of a medieval urban economy to use calculations based on production, distribution, and consumption and to assume that they will lead to the same results or at least reveal similar trends when we are dealing with an open system of a type to be described later? The results of Schönfelder's trend calculations confirm my doubts; I will return to this point later. What remains then of the comprehensive, macroeconomic statement if the conditions do not correspond to those of modern economies? A standardized set of terms which are often misleading, and a set of criteria which underlie the study are not always convincing.

But if we leave aside Schönfelder's aims, which are simply too ambitious, as well as the national product and its development, too general, and ask instead what are the quantifiable achievements of an urban medieval economy within a given period and in certain economic sectors, there remain sufficient data and information on the processes of growth, stagnation and recession to enable plausible statements to be made on the overall development of urban economies at that time.

Schönfelder has done some important preparatory work for the quantification of gross production in trade and industry, and he deserves credit for clearly recognizing that Cologne is a very

⁵ *Ibid.* p. 1.

individual case for source material, and this has opened up new areas for research. Before the XVIth century one could not find a town in the « Deutsches Reich » better suited for a quantified study than Cologne with its wealth of records, especially the large number of municipal accounts which have been compiled so well by Richard Knipping. There are no sources of comparable volume and eloquence in any other medieval German town and the reason for this lies in the peculiarity of the Cologne finance system, especially its taxation branch.

II

While in the majority of German towns direct taxation gradually became the main source of income for municipal treasuries,⁶ direct taxation appears in Cologne in 1370/71 at the time of the weavers' rule (Weberherrschaft) for the last time, and it is not clear whether the « Schoß », a direct tax imposed at that time, had actually been levied before 1370. « *Thereafter the city based its finances almost exclusively on indirect taxation, on charges made on food consumption and fiscal exploitation of commerce and industry. There was also a certain amount of regular secondary income derived from the lease of municipal property, from fines, the Jewish protection tax, and the fees for admission to the freedom of the city* ». ⁷ The enormous amount of finance needed was raised by issuing short-term loans and — mostly in the XVth century — by annuities (entailed and life interest).

According to Knipping there were three phases in the development of indirect taxation:

« *(Indirect taxation) . . . began in the early XIIIth century with the imposition of taxes on consumption. These affected the urban population primarily, but also indirectly the goods on which*

⁶ Cf. HANS MAUERSBERG, *Wirtschafts- und Sozialgeschichte zentraleuropäischer Städte in neuerer Zeit. Dargestellt am Beispiel von Basel, Frankfurt a.M., Hamburg, Hannover und München*, Göttingen 1960.

⁷ RICHARD KNIPPING, *Die Kölner Stadtrechnungen des Mittelalters, mit einer Darstellung der Finanzverwaltung*, vol. I, Bonn 1897, p. XXII.

the taxes were raised. Being a civic regulation, however, it could not effectively be resisted from outside the city.

Subsequently taxes were levied on the use of the city's commercial facilities (weights and measures, loading gear, warehouses, haulage etc) which meant that both citizens involved in trade and outsiders were contributing to the cost of the city administration.

By the end of the XIVth century these levies had become ordinary taxes on trade and industry, and no longer implied any reciprocal obligation toward the tax-payer on the part of the city, as in the case of duties on wine, spice, drapery and Kolnische Tuch imports. All indirect taxes including the levies on commerce lost their original form and became ordinary taxes. In medieval usage they were called "assizes" and the same term was often also applied even to regular remittances ».⁸

Two kinds of tariffs were imposed, value excise (*Wertakzisen*) and excise related to weights and measures, with the latter prevailing.

Where excise revenue has been recorded in municipal account books, they can be considered as minimum revenue.⁹ One reason is that the various duties, small taxes and fines were entered only as net amounts, deductions having been made for payments and allowances to the semi-official controllers, brokers (*Unterkäufer*), measures, weighers, hauliers (*Bestätter*) etc. Secondly, towards the end of the XIVth century the custom of leasing taxes became the rule, thereby depriving the town treasuries (*Rentkammern*) of a considerable part of their former revenue. The leaseholder bought a duty at an auction and usually paid the annual rental in advance. He also had to pay for the excise personnel and make up the interest lost on the loan to the town out of the difference between rental and actual return — and he himself also wanted to make a handsome profit. On average the difference probably amounted to between 15 and 35% of the rental. Since customs duties were leased for two years at the most and the leaseholder had to declare the gross return, the rental could be fixed on a medium-term basis

⁸ *Ibid.*, p. XXII f.

⁹ *Ibid.*, p. XXIV f.

according to actual revenue. When the leaseholder was prevented from making a reasonable profit by adverse circumstances (war, blockage of the Rhine, pestilence, etc.) which happened very rarely, part of the rental was waived or he was allowed deferred payment when renewing the lease. It is obvious that the leasing of customs duties considerably limits the value of data series based on them. They can only be used to establish long-term developments and trends, but they provide little that might help explain sudden crises. The duties on wine, wine imports, and the hundredth *Pfennig* on *Drugwaren* (dry goods)¹⁰ were all very profitable excises and were never leased.

The gradual change-over to the regular leasing of customs duties around 1380 is in fact the main reason for the marked drop in the various income curves in that period. Schönfelder also notes this but cannot find a plausible explanation. In the calculation which he uses to determine the trend of the Cologne « national » product, he does not then differentiate between rates of rental and actual returns.

Finally, in analysing the customs revenue of Cologne one has to take into consideration the fact that there were both within the city and outside privileged groups who enjoyed total or partial exemption from paying excise.¹¹ First and foremost were the Cologne clergy who played an important part in the city's economy, and then the university and the nobility of the Lower Rhine region, the latter for the duration of their stay in the city. Among foreign merchants, it was particularly those from Nuremberg who enjoyed almost total exemption on a reciprocal basis.¹²

As a rule the city granted loans on taxes owed and the citizens of Cologne availed themselves of this opportunity with such regularity that returns from wine imports for example — if one wants to use them for estimating various crop yields — have to be transferred to the previous year or even to the year before that. Tax debts were recorded in special credit books; and these

¹⁰ See below.

¹¹ KNIPPING (see n. 7), p. XXIII f.

¹² HEKTOR AMMANN, *Die wirtschaftliche Stellung der Reichsstadt Nürnberg im Spätmittelalter* (Nürnberg Forschungen 13), Nürnberg 1970, p. 34.

as well as the general ledgers of the treasury (Rentkammer) with their weekly entries provide some of the most important sources available.

Cologne's finances were administered¹³ by two treasurers (Rentmeister) who were appointed for life until 1437, then for one year with the possibility of re-election after two years, which became the rule. In this way the continuity of the financial administration was ensured. Until the end of the XIVth century the *Mittwochsrentkammer*, named after its main day of opening, was the only pay office in the city. In 1394 the first subsidiary office was opened, the *Samstagsrentkammer*, which dealt with debts, annuities, rental payments, conversion of annuities and repayment of municipal debts; this office was directly responsible to the treasurers. In the beginning it had the task of administering the duties on wine imports and drugwaren, later on beer, and the revenue from the Cologne Rhine toll from 1475-94 and from bonds held by the city of Cologne. By reintroducing the excise on wine in 1417 which had temporarily been levied in the seventies and nineties of the previous century, another subsidiary pay office was created, the *Freitagsrentkammer*. Despite separate book-keeping the *Freitagsrentkammer* worked closely with the *Samstagsrentkammer* and supported the latter as well as the *Mittwochsrentkammer* with revenue from taxes on wine consumption. In the XVIth century the two subsidiary offices were joined; but it was not until the end of the Ancien Régime that an integrated finance system was re-established in Cologne.

The range of source material on the Cologne finance system in the XIVth and XVth centuries can be summarized briefly as follows: the extensive documentation which dates from 1370 with the weavers' rule, has considerable gaps on the expenditure side even more than on the revenue side although here, too, essential parts are missing. The year of revolution, 1513, which Knipping chose as the final year of his edition, marks a turning-point as far as the records are concerned, but not necessarily from the point of

¹³ Cf. KNIPPING, *op. cit.*, and CLEMENS GRAF VON LOOZ-CORSWAREM, *Das Finanzwesen der Stadt Köln im 18. Jahrhundert*, Diss. Bonn 1975 (Ms.).

view of the economic development of the city. We are nevertheless justified in concluding this study in that year. The Knipping edition covers the following main groups of records:

1. Total Income from 1370 III 13 - 1393 II 26;
2. Total Expenditure from 1370 III 13 - 1381 III 6;
3. Income of the *Mittwochsrentkammer* from 1414 III 21 - 1432 III 12;
4. Income and Expenditure of the *Samstagsrentkammer* from 1432 - 1513;
5. Income and Expenditure of the *Freitagsrentkammer* from 1432-1513;
6. Register of Municipal Debt from 1351-1513.

Additionally there are a number of smaller accounts and fragments of accounts, separately-kept accounts, deferred payment registers and particularly the weight and excise books of the so-called *Kraut- und Eisenwaage* of 1450/52 - 1509/11 which partially make up for the missing income books of the *Mittwochsrentkammer* after 1432. Knipping only makes brief reference to these day-books. Three of them covering the years 1470-78, 1478-80, and 1491-95 have been edited by Bruno Kuske in the third volume of his work « *Quellen zur Geschichte des Kölner Handels und Verkehrs* »;¹⁴ those covering the period 1491-95 have already been studied by Traugott Geering.¹⁵ The value of these sources, however, is greatly increased if they are used together with the hitherto unpublished books roughly covering the two decades from 1452-1469 and the period from 1497-1509.¹⁶

In Knipping's edition, the revenue books are, as has been mentioned, of fundamental importance for the research on gross product in trade and industry. Depending on the type of duty and the rate of tariff one can establish data series of real production

¹⁴ Bonn 1923, pp. 41 ff.

¹⁵ *Kölns Kolonialwaarenhandel vor 400 Jahren*, in « *Mitteilungen aus dem Stadtarchiv von Köln* 11 », 1887, pp. 41-65.

¹⁶ *Historisches Archiv der Stadt Köln* (Abbr.: StA Köln), *Rechnungsbücher* 36, 38. and *Rechn.* 90, 106 a.

figures, turnover volumes, money values or index values. Money values are given in units of Cologne currency which have to be adjusted to take account of inflationary developments; they have to be recalculated in relation to silver weights, which was done by Schönfelder throughout his work (cf. Table 11 and Chart 9). The shortcomings of this method are clear; on the one hand silver is not valued at a constant level in relation to gold, and on the other hand the loss of the purchasing power of the Cologne currency indicated by the curves of the values in silver by weight, appears inflated because of the declining trend of cereal and other food prices. This trend definitely lasted until 1510/11. Unfortunately there is as yet no better method for reconstructing the economic history of Cologne.

In examining gross product I want to concentrate on those sectors of trade and industry in Cologne for which longer and more complete data series can be established. Schönfelder's work will be of some help; but the usefulness of his charts and diagrams for the purpose of quotations and comparisons is limited by the fact that most of his data series are given in the form of three-year moving averages. This periodicity distorts the run of the curves to the point where it becomes impossible to fix the years of crisis and turning-points; the interval is also too short, so that even medium-term trends cannot be identified more clearly than before.

III

The overriding importance of Cologne as a medieval trade centre stemmed from two factors, the efficiency of its export industries and its international trade. After Nuremberg, Cologne was the clearest example of a medieval *Exportgewerbebund Fernhandelsstadts*. Whereas in Nuremberg¹⁷ the metal industries were more important than the textile industries, in Cologne the latter came before the metal industries and the leather and furrier's trades.

¹⁷ For Nuremberg cf. AMMANN (see n. 12) and *Beiträge zur Wirtschaftsgeschichte Nürnbergs*, 2 vols., Nürnberg 1967; for Cologne cf. FRANZ IRSIGLER, *Kölner Wirtschaft im Spätmittelalter*, in: «Zwei Jahrtausende Kölner Wirtschaft», ed. Hermann Kellenbenz, vol. I, Köln 1975, pp. 217-319.

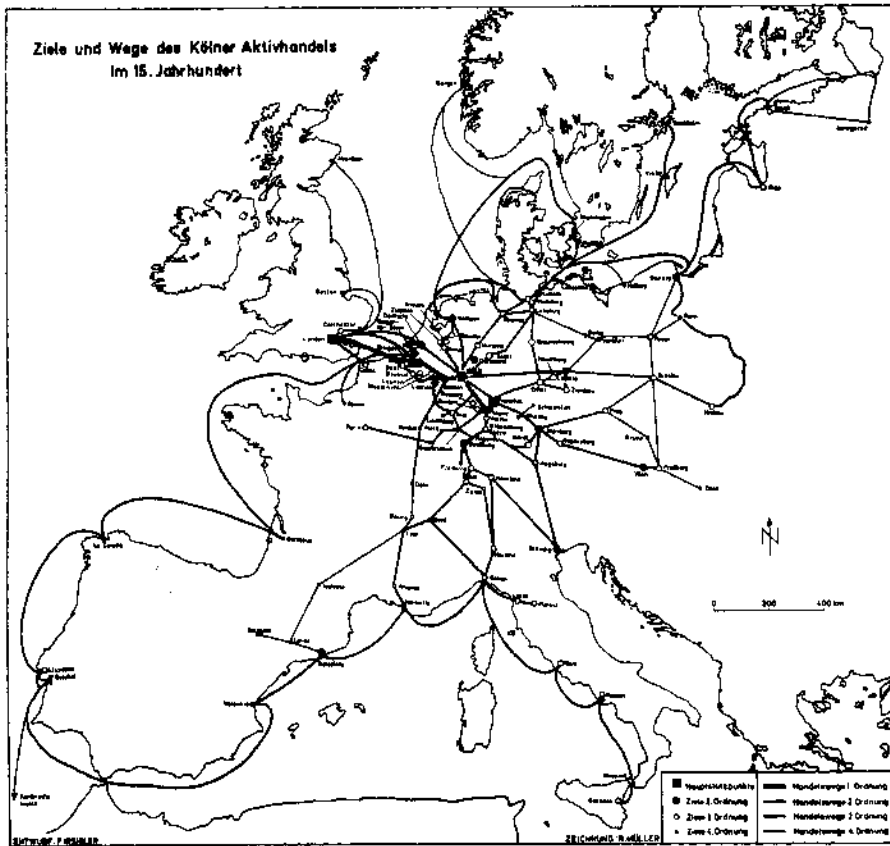
In all three sectors highly-specialized guilds orientated towards foreign markets developed at an early stage, led by the textile industry which was at an advanced stage of development because of its high degree of standardization. In principle, all Cologne's export-orientated industries endeavoured to produce goods (Kaufmannsgut) of high quality for which there was demand from citizens and foreigners alike. The term "Kaufmannsgut" illustrates the close relationship between trade and export industries which was typical of Cologne. For the sale of their goods to foreign clients, craftsmen were dependent on the merchant, but in Cologne craftsmen frequently visited fairs and entered directly into international trade as part of everyday economic life. The smooth transition from craft to trade, however, necessitated a special form of organization among craftsmen, and the centralization of production in a putting-out (*Verlag*) system which was typical of all the bigger export industries in Cologne. The efficiency and range of Cologne's international trade cannot be summarized in a few sentences, but Chart 1 gives a general impression.

Before we deal with the data series on individual crafts and trades, some basic information on population figures for the city and so indirectly on the total of the labour force must be discussed. Unfortunately the sources on this subject are inadequate because of the absence of direct taxation. It can be assumed that by the end of the first half of the XIVth century at the latest, Cologne had 40,000 inhabitants; it was therefore not only the largest city of the *Deutsches Reich* by area — 401 hectares after 1180 — but it also had the largest population. The outbreak of plague in 1349 apparently hit Cologne far less severely than the north German Hanse towns. At any rate the loss of life was quickly made up by new settlers. Towards the end of the XIVth and during the first decades of the XVth centuries, the municipal tax for the milling of cereal enables us to make an informed guess at the population figures, and it appears that they started to decline from 1390/1400 onwards.¹⁸

¹⁸ Cf. IRSIGLER, *ibid.*, pp. 225 ff.

CHART 1

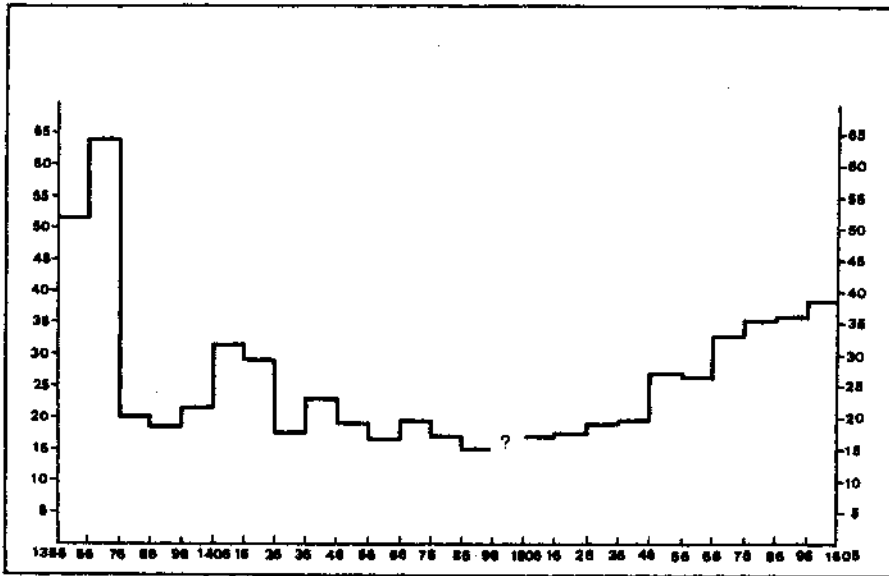
Cologne Export Trade Routes and Destinations in the XVth Century



The intake of new settlers¹⁹ which slightly decreased between 1356 and 1516 (cf. Chart 2) cannot serve as a reliable index of the population growth either (e.g. the curve is distorted in 1370/71) when the amount of money to be paid by new settlers was lowered by the weavers, and in 1421 when a doubling of the rate was expected and the curve shows a sudden upward leap. In any case only a fraction of the new settlers were recorded since most of them were content with the legal status of a Cologne inhabitant

¹⁹ *Kölner Neubürger 1356-1798*, ed. Hugo Stehkämper and Gerd Müller, vol. I, Köln 1975, p. LXII.

CHART 2
New Settlers in Cologne 1356-1605 (Ten - yearly averages)



(*Eingesessener*), and among these for example we find representatives (*Faktoren*) of the big south German trading companies. Only after 1612 were all new settlers recorded and the number of new citizens amounted to several hundred per year.

It is extremely difficult to assess the effects of the plague and other epidemic diseases which broke out in Cologne with frightening regularity. The best thing was to leave the city and stay away temporarily. Chronicle reports of 20,000 to 30,000 plague deaths in the XVth century turn out to be fictitious on closer scrutiny. Schönfelder,²⁰ however, has taken them more or less literally and has calculated a drop of 35 to 40% in the city's population between 1370 and 1470 which is much too high. An appreciable decrease up to 1470 is likely, but towards the end of the XVth century there is a renewed increase. Careful estimates made on the basis of a house register of 1487 and a chimney register of 1492 show a

²⁰ SCHÖNFELDER (see n. 1), p. 135. Cf. IRSIGLER (see n. 17), p. 226.

population figure of some 41,000.²¹ Kuske's estimate is that Cologne's population stood at approximately 45,000 by the year 1500.²²

To determine the size of the labour force it is necessary, to use comparative data from other towns. In Cologne the number of female workers was probably much higher than in other towns; it was after all the only medieval town where guilds for women (*Frauenzünfte*)²³ had begun to develop.

The various sectors of the Cologne textile industry in the XIVth and XVth centuries developed very unevenly. From the XIIIth century the *Wollenamt*, the guild of the cloth makers, showed a vigorous upward trend which in the XIVth century manifested itself in the emancipation of the Cologne weavers from the cloth merchants' guild (*Gewandschneidergilde*), in the rising of the weavers, and in the opening-up of South-eastern European markets for cloths from Cologne.²⁴

Some figures on production are available for the last third of the XIVth century, when due to the introduction of a cloth tax amounting to 1 Mark köln. per cloth in 1372 reasonably accurate figures become available. It has to be borne in mind that the number of looms for the weaving of woollen cloths was reduced to 200 after the abolition of the weavers' rule by the patricians, and to 300 between 1378 and 1382; and as a result of the "Weberschlacht" in 1371 there were also 30 masters fewer. For the years prior to 1372 the annual cloth production must be assumed to have been much higher; in the case of exportable woollen cloth,

²¹ IRSIGLER (see n. 17), p. 227.

²² BRUNO KUSKE, *Die Wirtschaft der Stadt Köln in älterer Zeit*, in: « Köln », 1948, p. 92.

²³ Cf. MARGRET WENSKY, *Die Stellung der Frau in der stadtkölnischen Wirtschaft des Spätmittelalters*, Diss. Bonn (1977); WILHELM BEHAGHEL, *Die gewerbliche Stellung der Frau im mittelalterlichen Köln*, Diss. Freiburg 1910.

²⁴ FRANZ IRSIGLER, *Die wirtschaftliche Stellung der Stadt Köln im 14. und 15. Jahrhundert. Strukturanalyse einer spätmittelalterlichen Exportgewerbe- und Fernhandelsstadt*, Habil.-Schrift Bonn 1974 (VSWG-Beiheft), ch. « Textilgewerbe und Tuchhandel ».

TABLE 1

PRODUCTION OF CLOTH FROM 1372-92 AND 1414-31/2

Accounting year	Cloths/Excise in Mk	Leasing	Weekly rate of lease
1372	10,493		
1373	9,958		
1374	10,881		
1375	9,830		
1376	9,972		
1377	11,451		
1378	9,899	X	
1379	10,226	X	
1380	9,000	X	
1381	6,154 ¹	X	
1382	6,154 ¹	X	
1383	6,154 ¹	X	162
1384	8,333	X	162
1385	7,848	X	140
1386	8,333	X	140
1387	5,947 ¹	X	140/150
1388	5,947 ¹	X	150
1389	9,278	X	150
1390	8,800	X	138
1391	11,886	X	127
1392	4,667	X	127
Averages			Mk
1372-78:	10,430		
1378-92:	7,908		
1414-31:	5,006		
1409		X	60 ³
1410		X	60
1411		X	60
1414	6,370	X	65
1415	4,606		
1416	3,772		
1417	4,200		
1418	3,389		
1419	4,660	X	54
1420	6,271	X	54
1421	5,502	X	54/51
1422	5,406	X	51
1423	5,915	X	51/61
1424	6,344	X	61
1425	3,532	X	61
1426	6,876	X	50
1427	5,250	X	50
1428	2,743 ²	X	50
1429	6,383	X	45
1430	4,680	X	45
1431	4,225	X	45
1432		X	45
1433		X	45
1448		X	45
1449		X	45
1450		X	45

Sources:

R. KNIPPING, STADTRECHNUNGEN I.

¹ Averages calculated due to the sale of excise for a certain period.² No accounts for 7 months; probably settled in 1429.³ After 13% cloth excise was reduced from 1 Mk to 6 s.

15 to 20,000 pieces (48 ells long and 2 to 3 ells wide; one Cologne ell = 57.6 cm) must have been produced.

Despite severe limits on production, the average annual output of the Cologne weavers amounted to 10,430 pieces between 1372 and 1377 and at least 8,000 cloths until 1392. The total value of one year's production can be estimated at 600,000 to 800,000 *Mark köln.* (= about 6,600 - 8,800 kilograms of silver). Only at the beginning of the XVth century, probably around 1415, does the production curve go down to approximately 5,000 cloths (1414-1432), one reason being a serious drop in sales to the southeast where the Hungarian market was lost because of the wars with the Turks and the Viennese trade monopoly (*Sperrstapel*). Another reason was the difficult economic situation of Cologne during the quarrel with the Rhenish Electors, particularly in the years 1418-19. But the production of woollen cloth was probably maintained at 4,000 to 5,000 pieces per annum throughout the XVth century (cf. Table 1).

Far more serious was the decline in the production of *Tirtey*, a cloth made of a mixture of wool and linen which was widely used in France and the Netherlands. For the warp a linen or hemp thread was used, for the weft a wool of lesser quality. This low-priced and relatively light cloth was also made into undergarments and was still produced in rural areas of the Eifel until recently; apart from linen which was cheaper still, it could also be bought by the poorer people. The *Tirteyamt* was under the control of the *Wollenamt*, and until 1429 it was permissible to weave both types of material. In the XIVth century the output of the *Tirteyer* who even had their own fulling-mill at Gierath in the *Bergisches Land*, must have been considerable; between 1372 and 1374 nearly 8,000 cloths were produced annually. Until 1392 production slowed down, then went down rapidly at the beginning of the XVth century, with only 600 cloths being produced annually around 1450 (cf. Table 2).

This is also reflected in the curve representing the excise

TABLE 2

PRODUCTION OF TIRTEY FROM 1372-92 AND 1414-31/2

Accounting year	Cloths	Weekly rate of excise/Mk
1372	7,043	—
1373	7,632	—
1374	8,844	—
1375	6,760	11
1376	6,600	11
1377	7,167	11
1378	6,654	11
1379	6,196	10
1380	6,600	10
1381	5,736	9
1382	5,400	9
1383	5,940	9
1384	5,508	9
1385	5,940	9
1386	5,400	9
1387	5,160	9/8
1388	5,280	8
1389	5,148	8/9
1390	5,496	9
1391	5,940	9
1392	5,508	9
		Mk
1398		9
1399		9
1400		9
1414	3,528	6
1415	3,816	6
1416	2,922	6
1417	3,102	5
1418	2,858	5
1419	2,995	5/5 1/2
1420	3,432	5 1/2
1421	3,260	5 1/2/5
1422	3,180	5
1423	2,330	5
1424	2,068	—
1425	1,580	—
1426	1,340	—
1427	1,552	—
1428	1,164	—
1429	1,165	—
1430	1,048	—
1431	924	—
1441		1/4
1442		1/4
1443		1/4
1444		1/—
1445		1/—

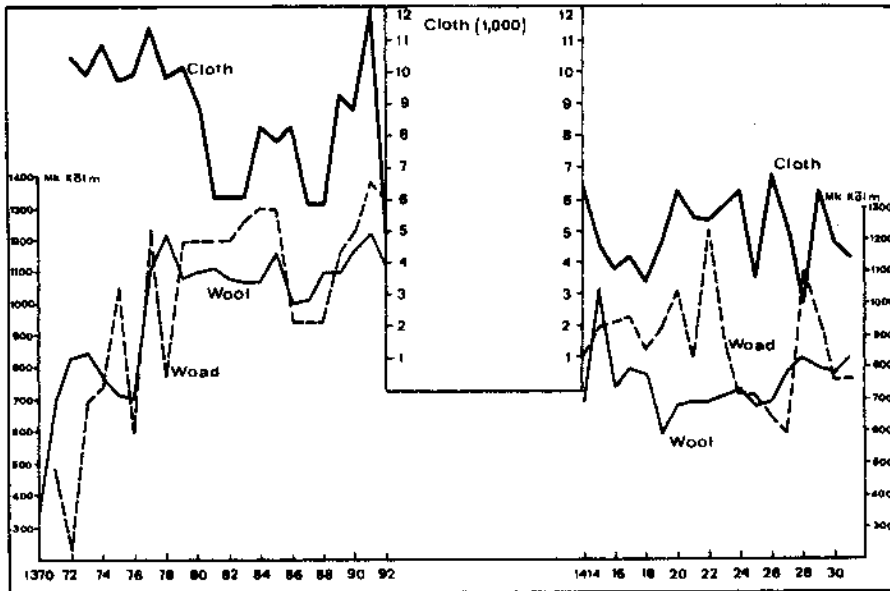
Sources:

R. KNIPPING, STADTRECHNUNGEN I.

revenue from imports of wool and woad. Marked deviations in the run of the curve, however, show the effects of leasing very clearly (cf. Chart 3).

CHART 3

Cloth Production and Excise Revenue from Wool and Woad 1370-92 and 1414-32



It would be a mistake to conclude from the decline in the production of woollen cloth that this by itself implied a recession in the economic development of Cologne. The situation could not have been easy for the workers who totalled almost 6,000 by 1370-80. It is a fact though that a proportion of the cloths, exceeding 10,000 in the seventies of that century, was not produced in Cologne but in the neighbouring cloth towns of Deutz, Düren and Münstereifel and brought to the cloth hall in Cologne to be submitted to quality checks by the Cologne weavers in their capacity as entrepreneurs.²⁵ In the XVth century the production of *Tirtey* as that of linen appears to have been taken over by rural weavers.

²⁵ *Ibidem*. Cf. IRSIGLER (see n. 17), p. 251 f.

Apart from external sales difficulties a further important reason for the decline in production was the change in consumers' tastes coupled with competition from fine English cloths²⁶ and the declining quality of Cologne cloth because of the dwindling imports of English and Flemish wool. Perhaps because of a change in climate there was also a widespread demand for lighter and finer materials such as the English cloth and especially the new material made from a mixture of cotton and linen called *Barchent*,²⁷ and *Sartuch* (*Sarroek*) in Cologne. The decline in the linen and *Tirtey* production of Cologne coincides exactly with the rise in *Sartuch* production.

The tailors of Cologne who, apart from tailors proper (*Schrö-dern*), also included trouser sellers, the so-called *Hosenmenger* (towards the end of the XIVth century they took over from the patrician *Gewandschneider* at the selling tables), actually produced ready-made garments. From 1383 to 1392 the number of individually sold cloths or cloths made into garments amounted on average to 2,627 per year, and to less than 2,000 from 1414 on. It was only in 1440 that the level of the closing years of the XIVth century was reached again. The proportion of Cologne cloth was remarkably small, being about 6% around 1440-42.

For the 29 years from 1414-1442 we have the complete names, numbers and annual turnover of the Cologne *Gewandschneider* firms: in every year between 19 and 39, or an average of 26 *Gewandschneider* were in business. Their annual turnover fluctuated on average between 49 and 99 cloths, and for the whole period it amounted to 72 cloths per year. A total of 110 firms shared in the selling of nearly 56,000 cloths. Shares in sales fluctuated across the entire scale between a single cloth and the 9,722 cloths which were sold by the firm of Waveren between 1414 and 1440. 13 firms sold over 1,200 cloths. The four

²⁶ FRANZ IRSIGLER, *Anmerkungen zu den Kölner Wirtschaftsbeziehungen mit England im 15. Jahrhundert*, in «Frühformen englisch-deutscher Handelspartnerschaft», Köln-Wien 1976, pp. 107-113.

²⁷ Cf. the detailed work to be published shortly by WOLFGANG VON STROMER, *Die Gründung der deutschen Baumwollindustrien im Spätmittelalter* (Ms.). For Cologne IRSIGLER (see n. 17), p. 252.

biggest sold 23,000 cloths and cloths made into garments, thus reaching 41.5% of the total turnover.

A sales crisis affecting the cloth industry which became very noticeable after 1410-15 did not apparently have any prolonged adverse effects on employment since there were new opportunities for weavers and weaving mill assistants in the *Barchent* industry which is first mentioned after 1370 and had developed rapidly by 1414. From the beginning, the industry was dominated by the entrepreneurs and their clients and Lombard and south German merchants seem to have played a special part in introducing this new industry. Between 1414 and 1432 annual production averaged more than 5,400 cloths, judging by the stamp duties. For each cloth, which was 52 (from 1449: 56) ells long, 7 pounds of cotton were needed, making a yearly average of 40,600 pounds. From the middle of the XVth century the minimum amount of cotton used can be calculated from entries in the deferred-payment registers of the *Kraut- und Eisenwaage* (cf. Table 3).

According to a calculation by Kuske,²⁸ actual turnover must have been 2.5 to 3 times higher than that entered in the deferred-payment register. If one doubles the figures, the production of *Barchent* in Cologne must have been at its highest in 1450-60. Then came a slight decline until 1480 due to the disruption of

TABLE 3

IMPORTS OF COTTON AND PRODUCTION OF SARTUCH
IN THE SECOND HALF OF THE XVth CENTURY

Period	Average annual imports (pounds) *	Average annual production (cloths) **	No. of years
1452-1459	32,300	9,200	8
1460-1469	25,500	7,200	10
1470-1478	17,200	4,900	9
1478-1480	12,800	3,650	2
1491-1495	20,400	5,800	4.5

* 1 pound = around 467 g.

** Calculating 7 pounds per cloth and doubling the figures.

²⁸ *Quellen zur Geschichte des Kölner Handels und Verkehrs im Mittelalter*, vol. III, Bonn 1923, p. 41.

trading activities caused by the *Mainzer Stiftsfehde* (1462 ff.) and the *Neusser Krieg* (1474-75). Renewed growth began again in 1490, and seems to have continued into the first decade of the XVIth century.

The Cologne silk industry developed even more favourably. Considerable production was achieved even during the last third of the XIVth century, judging from the existence of the silk hall (*Seidenhalle*) (by 1373 at the latest) and rapidly increasing minimum sales quota for foreign importers (1372: 12; 1395: 24; 1409: about 50 pounds).²⁹ Walter Kesinger, a merchant from southern Germany, planned to establish a Lucca silkthread mill (*Seidenzwirnmühle*) in Cologne,³⁰ and this is an indication that considerable quantities of material were being produced. From 1452 onwards the excise books of the *Kraut- und Eisenwaage* can be consulted again, and according to the entries (minimum) imports increased at a very even pace until the end of the century with the exception of the disruptions caused by the *Mainzer Stiftsfehde*:

1452 - 1459	Average	Annual	Import	about	21,200	Pounds
1460 - 1469	»	»	»	»	17,200	»
1470 - 1478	»	»	»	»	25,300	»
1478 - 1480	»	»	»	»	35,500	»
1491 - 1495	»	»	»	»	42,000	»

Using the wholesale price of raw silk in 1495 as a basis for calculations for the period 1491-95³¹ — about 250 *bescheidene Gulden* (with a silver value of about 28.4 g) per *Zentner* or 100 pounds — more than 100,000 *Gulden* worth of raw silk was being processed annually. At the end of the XVth century the total turnover of the *Seidamt* where the entrepreneurs also had

²⁹ WALTHER STEIN, *Akten zur Geschichte der Verfassung und Verwaltung der Stadt Köln im 14. und 15. Jahrhundert*, vol. II, Bonn 1893, pp. 39, 82 f., 129, 201. Cf. HANS KOCH, *Geschichte des Seidengewerbes in Köln vom 13. bis zum 18. Jahrhundert*, Leipzig 1907.

³⁰ WALTER ENDREI - WOLFGANG VON STROMER, *Textiltechnische und hydraulische Erfindungen und ihre Innovatoren in Mitteleuropa im 14./15. Jahrhundert: Walter Kesingers, Seidenzwirnmühle in Köln 1412*, in: «Technikgeschichte», 41, 1974, pp. 89-117.

³¹ KUSKE, *Quellen III* (see n. 28), p. 143.

a dominating influence as they did in the cotton production, can be estimated at around 200,000 *Gl.* (about 4,960 kg of silver) taking into account the wages of spinners, twisters, and dyers, as well as profits from sales. At the same time the minimum value of cotton imports amounted to only 2,500 *Gl.* at a rate of 12 *Gl.* per *Zentner*. This means that by 1500 the silk industry had taken first place amongst all Cologne's textile industries. The decline in the production of woollen cloth was thus amply compensated for.

Finally brief mention should be made of another branch of the textile industry, the production of thread, which also figures prominently in Schönfelder's trend calculations.³² Cologne thread, which was usually dyed blue, was used by many Cologne textile and leather craftsmen and was also exported in large quantities. Twisting was done in big mills (*Garnräder*), which were privately owned until 1372/73, but then became town property and were leased out. At first there were 12 mills; when the eight leaseholders used their monopoly to make excessive price increases, the new council restricted the number of twisting wheels to seven in 1396, while still demanding the same rental, as for 12. This was justified because the twisting machines apparently had an enormous capacity; several spindles were attached to them and they could be kept at a constant speed by way of a manually operated treadmill. Towards the end of the XVth century horses were used to keep the treadmill moving day and night. These technical and organizational innovations meant that only 4 wheels were needed in the end. It would be shortsighted therefore to assume as Schönfelder did that there was a decline in production simply because there were fewer wheels. It is even less acceptable — because of this and of the falling number of licences for looms to make woollen cloth and *Tirtey* which were not subject to tax after 1396 anyway — to conclude that « Capital stock in the textile fell between 1372 and 1500 ».³³

So far it has not been possible to make many quantifiable statements about the Cologne *leather and furrier industries*. In

³² Cf. n. 1, p. 61 f. and 112. IRSIGLER (see n. 17), p. 254.

³³ SCHÖNFELDER (see n. 1), p. 63.

the second half of the XVth century four or five hundred families were probably employed in the various leather-working crafts. About 200 families earned their living from working in the furrier trade which also showed a high degree of differentiation. In the leather industry there was even a semi-official entrepreneur (*Verleger*), known as the *Lederwirt*, who acted as a go-between for foreign tanners and craftsmen of the town.³⁴

In the Cologne metal industry where differentiation was as advanced as in Nuremberg, fewer people were employed than in the textile industry, but these included some impressive figures. If we take, for instance, the precious metal industry and consider only the number of master goldsmiths and gold-beaters (*Goldschläger*), we find that they were surpassed only by Paris and London in the Middle Ages: ³⁵

1395	122 Masters
1448-52	121 »
1470-79	120 »
1480-86	136 »
around 1500	117 »

This means that conditions were stable throughout the XVth century.

For the non-ferrous metal industry we can refer to data contained in the excise books which start in 1452. It is not certain, however, whether the imports of lead, copper, and tin were in fact processed in Cologne. There are serious doubts especially with lead (cf. Table 4).

TABLE 4

MINIMUM IMPORTS OF LEAD, COPPER, AND TIN 1452-1480 ³⁶

Period	Lead	Per Year	Copper	Per Year	Tin	Per Year	
1452-59	32,453	4,057	22,968	2,871	694	87	Zentner
1460-69	34,934	3,493	15,673	1,567	1,159	116	»
1470-78	36,945	4,105	5,585	620	916	102	»
1478-80	14,012	7,006	1,106	553	202	101	»

³⁴ IRISGLER (see n. 17), pp. 257-260.

³⁵ SCHÖNFELDER (see n. 1), p. 42.

The sharp increase in lead imports in 1470-80 seems to have been due mainly to the expanding Thuringian refining industry³⁷ which purchased large quantities of lead from Cologne. The city itself probably used between 500 and 700 *Zentner* annually. The demand for tin remained relatively stable. But copper imports fell enormously between 1452 and 1480, and there seems to have been a close connection between this and the fate of a very efficient brass furnace which was built by Thomas von Venroide from Nymwegen in the middle of the city and which had to be closed down in 1465/66 for environmental reasons.³⁸ Venroide employed 33 domestic copper-beaters and he had an annual turnover of about 10,000 *Gl.* Most probably the majority of beaters left with Venroide and settled in Aachen and the towns along the River Maas where brass was also being processed. Towards the end of the XVth century another big brass furnace was built in the city under the control of councillor Heinrich Struyss, which produced large quantities of brass wire and brass rings.³⁹ This gave new impulses to the industry but this was not however reflected in the excise data.

It should also be noted that towards the end of the XVth century, and first in the Aachen-Stolberg region,⁴⁰ it became customary to use embossing hammers (*Tieftreibhämmer*) in the production of copper and brass kettles, and to send copper and brass to the town craftsmen as semi-finished products, (i.e. plate, sheet-metal, wire, kettles etc.) rather than in a raw state as before. This division of labour between town and country also existed in the textile industry and could be found in almost all branches of the ferrous and non-ferrous metal-working industries in Cologne. The

³⁶ STA KÖLN, Rechn. 36, 38; KUSKE, Quellen III (see n. 28), pp. 41 ff.

³⁷ ERKEHARD WESTERMANN, *Das Eisleberer Garkupfer und seine Bedeutung für den europäischen Kupfermarkt 1460-1560*, Köln/Wien 1971; FRANZ IRSIGLER, *Rheinisches Kapital in mitteleuropäischen Montanunternehmen des 15. und 16. Jahrhunderts*, in: «Zeitschrift für historische Forschung 3», 1976, pp. 145-164.

³⁸ IRSIGLER, *Rheinisches Kapital* (see n. 37), p. 155.

³⁹ Struyss had business agreements with merchants in Nuremberg and the agent representing the Portuguese Kingdom in Antwerp.

⁴⁰ RUDOLF ARTHUR PELTZER, *Geschichte der Messingindustrie und der künstlerischen Arbeiten in Messing (Dinanderie) in Aachen und in den Ländern zwischen Maas und Rhein von der Römerzeit bis zur Gegenwart*, in: «Zeitschrift des Aachener Geschichtsvereins 30», 1908, p. 348.

division was necessary because there was no water power to operate hammer mills.

The Cologne iron and steel industry of the late Middle Ages owes its initial fame to armour. In the XVth and XVIth centuries there was an above-average increase in masters among the harness-makers (*Sarwörter*). Unfortunately we have no figures on production, although we get some impression of Cologne's importance as a trading centre for arms from figures concerning the import of iron gloves which were obviously not being supplied in sufficient numbers by the Cologne armourers. From 1452 to 1459 at least 17,000 were imported, among them brass gloves from Nuremberg and the Maas valley.

The defence of Neuss may have greatly increased the willingness of other towns to have an efficient artillery of their own — at any rate, as firearms were becoming more widespread so Cologne's importance increased as a market for cannon, guns, and gunpowder. The high level of gunpowder production can be seen from the sizeable imports of sulphur and saltpetre in the second half of the XVth century, which reached a peak in 1474/75.

In the XVth century the blacksmiths' gild, which was divided into 17 sub-gilds (*Untorzünfte*) in the XVIth century, probably employed about 1,000 people including journeymen and apprentices.⁴² Here again we have no exact production figures except for the panmakers; but on the time around 1500 some information is available from the weight books of the *Eisenwaage* concerning the use of raw materials in the iron and steel processing industries.

TABLE 5

IMPORTS OF SALTPETRE AND SULPHUR 1452-1495
(minimum amounts)⁴¹

Period	Saltpetre	Per Year	Sulphur	Per Year	Zentner
1452-59	519	65	389	49	Zentner
1460-69	631	63	193	19	»
1470-78	873	97	1,479	164	»
1491-95	288	64	107	24	»

⁴¹ Cf. n. 36 IRSIGLER (see n. 17), p. 268.

⁴² IRSIGLER (see n. 17), p. 268 ff.

In the pan-making industry we have a very clear example of the division of labour between the town and the surrounding countryside. To achieve this, organization of production and a relatively high level of capital investment for the establishment of hammer mills in rural areas were necessary and made the coordinating role of the commercial entrepreneur (*Verleger*) absolutely indispensable, although this could have been carried out by leading Cologne craftsmen. Forge hammers and hammer mills supplied so-called « *pannenschyven* » and « *pannensturtzen* » for finishing. These were iron sheets of varying strength, hammered and cut into the shape of a panel as required, usually about 30 cm long and 15 to 18 cm wide. *Sturzblech* which was thinner was made into lids, the panels into pans and bases of pans among other things. Towards the end of the XVth century, around 1490, this industry was flourishing as is shown on Table 6.

TABLE 6
IMPORT OF PANELS AND STURZBLECH FROM 1478/80 TO 1511
(minimum quantities)

Period	Panels			Sturzblech		
	Waagen approximately	Value (Mk)	No. of Importers	Schock appr.	Value (Mk)	No. of Importers
1478-80	240	2,616	2			
1495-96 ¹	309.5	4,043	11	15.5	962	3
1496 ²	50.5	ca. 600	1	9.5	ca. 580	1
1497	766 ³	11,112	2 ⁵	53 ⁴	3,668	2 ⁵
1498	1,516	21,982	25	75	5,158	10
1499	1,840	26,673	19	107	7,376	14
1500	1,707	24,745	18	87	6,030	11
1501	671	9,734	13	30	2,076	8
1506	467	6,776	11	62	4,282	15
1507	1,204	17,456	19	315.5	21,766	32
1508	645	9,348	17	213.5	14,730	27
1509	136	1,974	6	70	4,822	10
1511	20	294	1	12.5	856	3
Average 1497-1508 (8 years)	1,102	15,978	19	118	8,136	17

Source: Kuske III, pp. 74 ff.; StA Köln, Rechn. 90 and 106 a.

¹ Six months.

² Johann Kemper, May-December.

³ According to the average price in 1498; 14 Mk 6 s per Waage.

⁴ According to the average price in 1498; 69 Mk per Schock.

⁵ No exact value can be given because the figures available are too general.

The average annual turnover for panels, and therefore also for pans, during the period 1497-1508 can be fixed at about 120,000; during the same period 7,080 *Sturzbleche* were finished per year, not only for lids, however, but for harnesses and other products. As well as the Frankfurt and Antwerp fairs, Paris was also a favoured marketing place. The Cologne company owned by Peter Clemens von dem Kirchhof from Solingen, Johann Westphelinck, Johann Kellner and Johann Krop which specialized in exports to France via Lorraine in the years after 1500 sold more than 72,000 pans in 18 months.⁴³

In the XVth century the Cologne entrepreneurs (*Verleger*) gained absolute control of steel production at Breckerfeld and Radevormwald, and ruthlessly pursued their interests in the Altena wire industry against a local group of entrepreneurs with success. In the Olpe-Drolshagen area they built a new centre for steel, wire, sheet-metal and other semi-finished products. The inclusion of the upland region to the right of the Rhine into Cologne's economic ambit was never more marked than in the late Middle Ages.⁴⁴

V

Some of Cologne's trade figures have been mentioned earlier in connection with imports of raw material for the Cologne industries. More numerical data can be given for three particular sectors, the wine, cloth, and *drugwaren* trades, especially spices and drugs.

The Cologne wine trade is one of the best researched sectors of the city's economy.⁴⁵ Turnover figures of the "Weinhaus" of the Hanse were surpassed only by Bordeaux in its heyday. The

⁴³ IRSIGLER (see n. 17), p. 269 and n. 516.

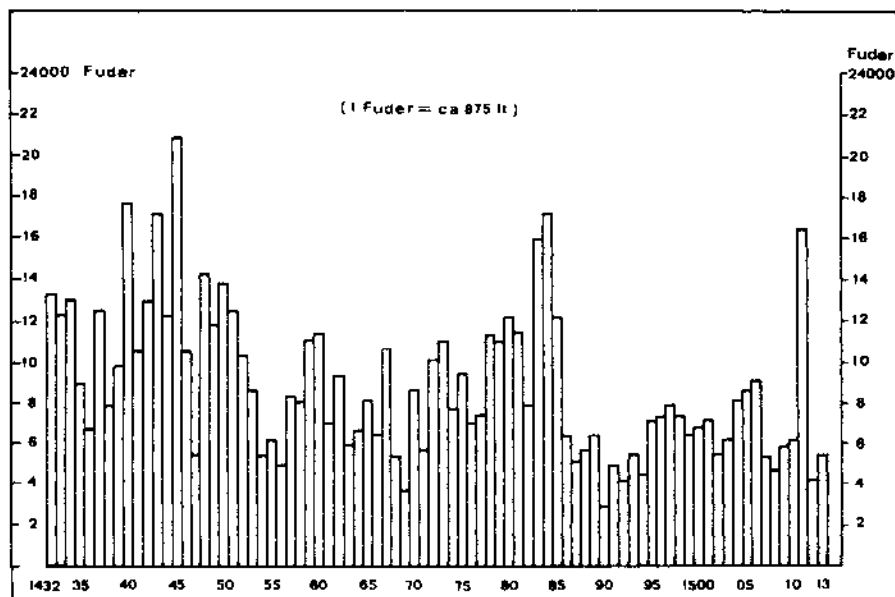
⁴⁴ IRSIGLER, *Die Wirtschaftseinheit Köln. Zur zentralitätsbildenden Kraft mittelalterlicher Exportgewerbe*, in: «Veröffentlichungen des Instituts für vergleichende Städtegeschichte Münster», Forthcoming in 1977.

⁴⁵ Cf. IRSIGLER (see n. 24), ch. «Weinhandel»; R. VAN UYTVEN, *Die Bedeutung des Kölner Weinmarktes im 15. Jahrhundert. Ein Beitrag zu dem Problem der Erzeugung und des Konsums von Rhein- und Moselwein in Nordwesteuropa*, in: «Rheinische Vierteljahresblätter 30», 1965, pp. 234-252; IRSIGLER, *Wölner Wirtschaftsbeziehungen zum Oberrhein vom 14. bis 16. Jahrhundert*, in: «Zeitschrift für die Geschichte des Oberrheins 122», 1974, pp. 1-21.

second half of the XIVth and first half of the XVth century were the golden age of Cologne's wine trade, judging by the data available. Between 1379 and 1384, for example, the average wine imports amounted to 13,830 *Fuder* or nearly 121,000 hectolitres, one *Fuder* containing 875 litres. For peak years figures were higher still, in 1395 about 20,650, in 1415 30,800, and in 1420 27,650 *Fuder*. From 1432 until 1450 the annual average was still at 12,000 *Fuder*.

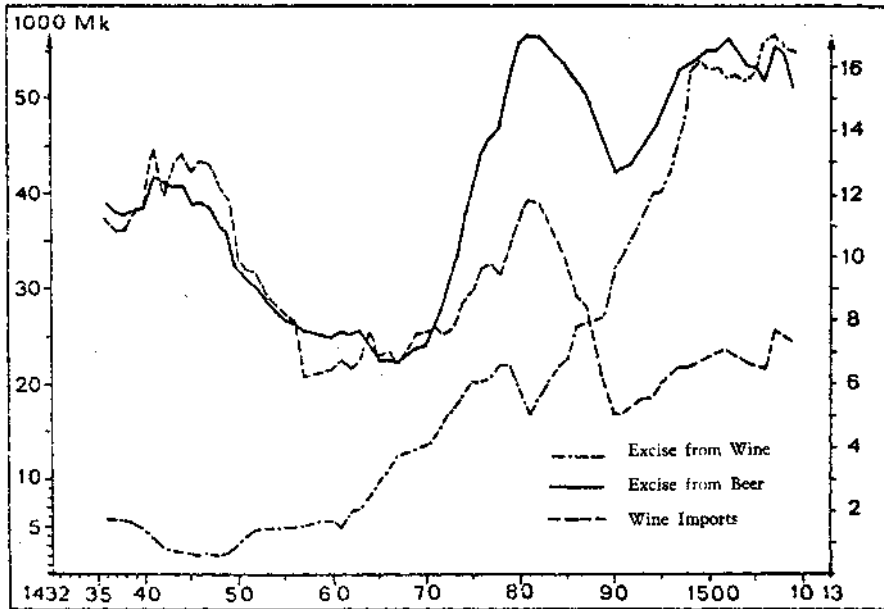
The subsequent development of Cologne's wine sales up to 1513 is shown on Chart 4: despite a brief recovery in 1484 when 152,000 hectolitres were imported, sales figures kept falling. From 1500 to 1515 average annual imports totalled 7,000 *Fuder* which was only half as much compared with the period 1379-84. Van Uytven even spoke of a « collapse of the Rhine wine trade » in the second half of the XVth century.⁴⁸ This is no doubt exaggerated;

CHART 4
Cologne Wine Imports 1432-1513



⁴⁶ *Op. cit.* p. 249.

CHART 5
Cologne Wine Imports and Excise from Wine and Beer (9 year Moving averages)



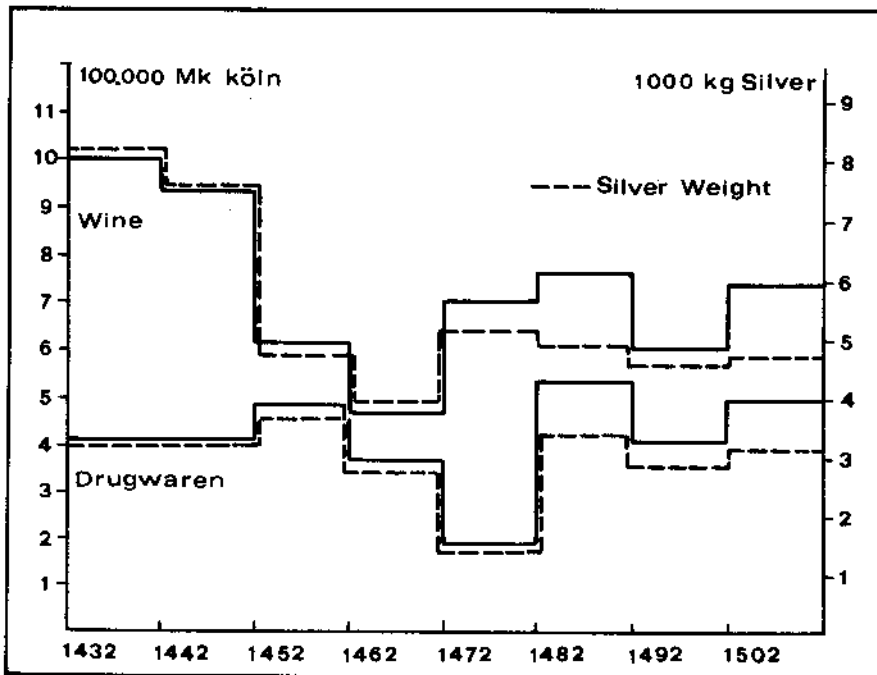
the curve reflects fundamental structural changes in the wine-growing and consumption preferences of people living in the late Middle Ages. Vine cultivation, which expanded during the XIVth century with no special attention being paid to quality, diminished in the XVth century in areas less favoured by the climate. The sour-tasting produce of these areas which had once been an everyday drink for the people of the towns of northwest Europe, became increasingly difficult to sell while hopped beer brewed with Dutch and Hanse recipes, which could also be transported and stored easily, gained ground. In Cologne this process accelerated in the 1430s, and Chart 5 showing the city's revenue from the various taxes on wine and beer illustrates this development. The downward trend of the wine trade affected other towns as well. Beer consumption in Cologne rose from 1 hectolitre per adult person per year to almost 2 hectolitres during the period 1370/92 to 1500, and the "Weinhaus" of the Hange turned into a sizeable beer town and beer-brewing became an important industry which was strong enough to support ever-increasing taxation.

Schönfelder tried to calculate the value of total turnover in the wine trade on the basis of the Cologne wine prices compiled by Knipping,⁴⁷ although these related only to first-class wines drunk in the town hall. Ordinary wine prices were probably about 50% lower, but even on this basis the turnover values were still very impressive (cf. Chart 6) and nearly always exceeded 500,000 *Mark köln.*, in 1445 1,700,000 *Mark* (about 13,935 kg silver).

As for the Cologne cloth trade, turnover figures are available for trade in English cloth and south German *Barchent*. According to the careful calculations done by Horst Buszello and Helga Heidenreich,⁴⁸ Cologne's share in Hanseatic cloth exports from England in the second half of the XVth century amounted to 25 or 30% and to 5 or 6% of the total exports of cloth from England;

CHART 6

Wine and *Drugwaren* 1432-1513 (Ten - yearly averages)



⁴⁷ SCHÖNFELDER (see n. 1), p. 15; KNIPPING (see n. 7), p. 228 f.

⁴⁸ HORST BUSZELLO, *Köln und England (1468-1509)*, in: « Köln, das Reich und Europa », Köln 1971, pp. 431-467; HELGA HEIDENREICH, *Der Kölner Handel nach England im 15. Jahrhundert*, Staatsexamensarbeit Bonn 1973 (Ms).

TURNOVER IN COLOGNE WINE SALES 1432-1513
(ten-year averages)

TABLE 7

Period	Fuder (875 l)	hl	Fuder * price (Mark)	Nominal (Mark köln.)	Silver value (kg)
1432-1441	11,052	96,705	96	1,025,000	8,200
1442-1451	12,980	113,572	65	942,000	7,550
1452-1461	7,904	69,160	80	621,000	4,700
1462-1471	6,907	60,438	77	472,000	3,950
1472-1481	9,798	85,732	72	711,000	5,150
1482-1491	8,396	73,464	100	766,000	4,900
1492-1501	6,288	55,020	107	606,000	4,600
1502-1513	6,672	58,378	109	752,000	4,750

* 50% of the average price of the town hall wine.

in absolute figures that meant 3,000 to 3,500 cloths in the two decades 1460 to 1480 except for the time of lockout from the London *Stalhof* in 1474-78. Towards the end of the XVth century the export figures probably stood at around 5,000. Unfortunately we do not know how much cloth was bought by Cologne merchants at the Brabant fairs. In Frankfurt they probably sold several thousands every year.

In the opposite direction the south German *Barchent* played a very significant part. Since most transports passed through Cologne, the excise books — beginning in 1452 — provide a fairly accurate picture, of minimum quantities (Table 8):

COLOGNE TRADE IN SOUTH GERMAN BARCHENT
IN THE SECOND HALF OF THE XVth CENTURY⁴⁹

TABLE 8

Period	1452-1459	1460-1469	1470-1478	1478-1480	Containing
Years	8	10	9	2	
Fardel	3,528	4,553	7,733	815	45 cloths
Including "gerippt"	12	?	?	?	22 cloths
Cloths total	158,484	204,885	347,985	36,675	
No. of merchants	125	124	132	59	
Annual averages of cloths	19,810	20,489	38,665	18,338	
Annual averages per merchant	158	165	293	310	

⁴⁹ Sources: cf. n. 36.

The table shows steady increases after 1452 and a rapid surge after 1470. This development was interrupted only in 1478/80 by the *Neusser Krieg* and the boycott by the Rhenish Electors against the newly-introduced Cologne Rhine toll. The sale price for a *Fardel* most likely amounted to 80-120 *Gulden*. This means that the annual turnover of the decade beginning 1470 amounted to at least 70-100,000 *Gulden* (about 2,065-2,950 kg silver). Compared with turnover in the *Barchent* trade, Cologne's own production looks small. Cologne was nevertheless an important *Barchent* town. This is further evidence of the outstanding position of Cologne in the transit trade between southern Germany and northwest, Europe which was maintained during the XVth century and even strengthened in other branches of trade.

The total turnover in the Cologne *Drugwaren* trade can be calculated fairly accurately from municipal revenue between 1432 and 1513 (cf. Charts 6 and 7). The 1% excise on value (2% from August 1487) had to be paid on the wholesale price, and from the end of the XVth century, there were special, more favourable tariffs on certain goods, especially metal. Using ten-year averages we get the following picture (cf. Chart 6):

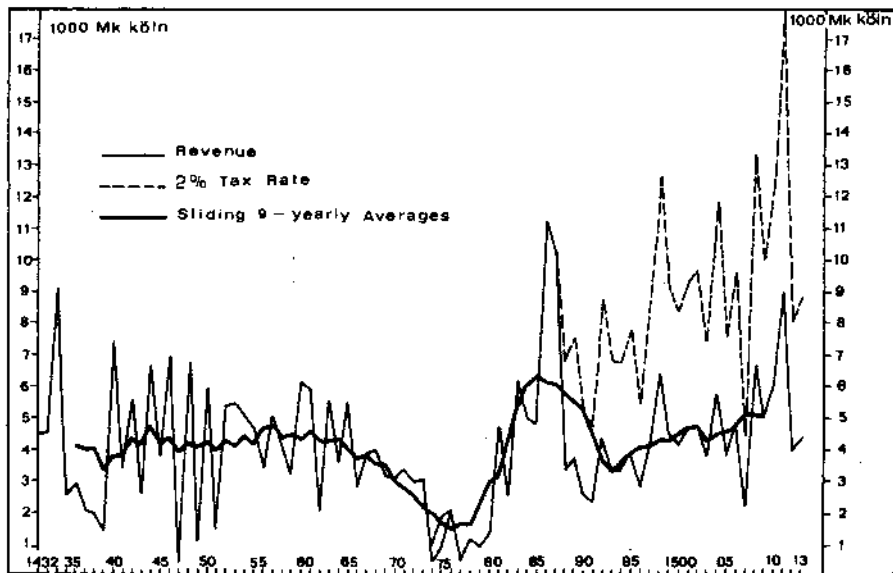
TABLE 9

DRUGWAREN TURNOVER IN COLOGNE 1432-1513
(ten-year averages)⁵⁰

Period	Nominal (Mark köln.)	Silver value (kg)
1432-1441	408,000	3,266
1442-1451	410,000	3,284
1452-1461	486,000	3,690
1462-1471	371,000	2,747
1472-1481	187,000	1,385
1482-1491	542,000	3,461
1492-1501	416,000	2,893
1502-1513	503,000	3,177

⁵⁰ Knipping I (see n. 7).

CHART 7
Revenues from Excise or *Drugwaren* 1432-1513



The disruptions to the Cologne trade in the decades 1460/70, which have already been mentioned, are again very apparent.

When interpreting the curve of *Drugwaren* turnover a number of special aspects have to be taken into account. The excise on *Drugwaren*, which was essentially a tax on spices (*assisia specierum*) at the end of the XIVth century, during the subsequent century gradually turned into a tax which was levied on the varied raw materials which were used in the Cologne textile, leather and metal industries [i.e. silk and cotton for textiles, dyestuffs (except woad) and other chemicals, paper, fine wood, hide and furs, wax, metals, and even potter's clay and hops]. Unfortunately the increase in value of these materials after they had been processed by Cologne craftsmen cannot be calculated. In his trend calculation Schönfelder placed the *Drugwaren* turnover on the consumption side, but this is not justified for the period 1432-1513, at least, since the character of a tax on consumption had almost been lost. The dubiousness of his calculations is particularly apparent at this point.

Because in the XVth century prices for many spices, drugs and raw materials for textiles fell drastically — most of all sugar prices —⁵¹ it can be assumed that the real quantity of goods increased, with turnover remaining at a constant level. We have already shown that this was the case for the silk and *Barchent* trade, for which the deferred-payment registers of the *Kraut- und Eisenwaage* supplied the necessary data. In the second half of the XVth century, an average of 3-400 firms were engaged in the *drugwaren trade*. At least 120 of the 360 people registered in the excise book for 1452-59 traded in spices. In the following decades the number of merchants fell slightly; also there was considerable concentration among the leading group of merchants. The development of the trade in spices which were bought and sold in Cologne in larger quantities is indicated on Table.¹⁰

The most striking fact — apart from the typical deviations — was the growth of annual sugar imports (minimum amounts):

1452 - 59:	11,900	Pounds	per	year
1460 - 69:	5,200	»	»	»
1470 - 78:	13,000	»	»	»
1478 - 80:	7,200	»	»	»
1491 - 95:	23,000	»	»	»

In general, the development of the spice trade is more or less consistent with that of the total *Drugwaren* trade, and upward and downward trends levelled off in the long run.

VI

What conclusions about the overall development of Cologne's economy can be drawn from these data? First it should be mentioned that the data and data series submitted could and should be supplemented.⁵² Various aspects of price development should definitely be taken into account, and only data series on cereal and wine prices are available. There was a long-term fall in real (silver weight) cereal prices until 1510/11. With wine prices a similar trend can be observed. Regrettably, sources on wages are scarce

⁵¹ IRSIGLER (see n. 17), p. 293.

⁵² Cf. IRSIGLER, *Die wirtschaftliche Stellung* (n. 24).

ANNUAL SPICE TURNOVER IN COLOGNE 1452-1495

Type of spice	1452-59 pounds p.a.	%	1460-69 pounds p.a.	± %	1470-78 pounds p.a.	± %	1478-80 pounds p.a.	± %	1491-95 pounds p.a.	± %
Ginger	8,219	100	8,164	— 0.7	5,894	— 28.3	4,286	— 47.9	4,675	— 43.1
Mackin (ginger)	776	100	670	— 13.7	384	— 50.5	424	— 45.5	301	— 61.2
Pepper	13,941	100	9,690	— 30.5	5,637	— 59.6	7,023	— 49.6	8,573	— 38.5
Sugar	6,354	100	985	— 84.5	120	— 98.1	—	—	—	—
Brotzucker (hard sugar)	1,583	100	959	— 39.4	4,236	+ 167.6	2,103	+ 32.8	10,076	+ 536.5
Melzucker (sugar syrup)	2,181	100	1,676	— 23.2	2,981	+ 36.7	425	— 80.5	10,227	+ 368.9
Cassuyn (cane sugar)	1,775	100	1,588	— 10.5	5,567	+ 213.6	4,669	+ 163.0	3,297	+ 85.7
Saffron	446	100	230	— 48.4	293	— 34.3	199	— 55.4	106	— 76.2
Caraway	4,027	100	3,737	— 7.2	2,460	— 38.9	1,534	— 61.9	2,212	— 45.1
Almonds	3,009	100	1,320	— 56.1	1,357	— 54.9	503	— 83.3	1,149	— 61.8
Onion seeds	4,034	100	1,421	— 64.8	1,851	— 54.1	—	—	2,515	— 37.7
Rice	5,363	100	3,448	— 35.7	7,029	+ 31.1	5,746	+ 7.1	1,403	— 73.8
Nutmeg, ground	840	100	704	— 16.2	311	— 62.9	600	— 28.6	245	— 70.8
Nutmeg, whole										
Mace										
Aniseed	1,000	100	318	— 68.2	44	— 95.6	209	— 79.1	335	— 66.5
Cloves	464	100	834	+ 79.7	494	+ 6.5	280	— 39.7	449	— 3.2
Cinnamon	414	100	761	+ 183.8	909	+ 219.6	336	— 18.8	250	— 39.6
Bay leaves	870	100	357	— 59.0	116	— 87.0	—	—	205	— 76.4
Wurmkraut (Anthelmintic)	199	100	92	— 53.6	47	— 76.4	15	— 92.5	8	— 96.0
Coriander	50	100	82	+ 64.0	—	—	81	+ 62.0	167	+ 334.0
Drugwaren excise (Mk)	4,560	100	4,270	— 6.4	2,000	— 56.1	2,026 ¹	— 55.6	3,840	— 15.8

Source: StA Köln, Rechn. 36, 38 and Kuske III, pp. 141, ff.

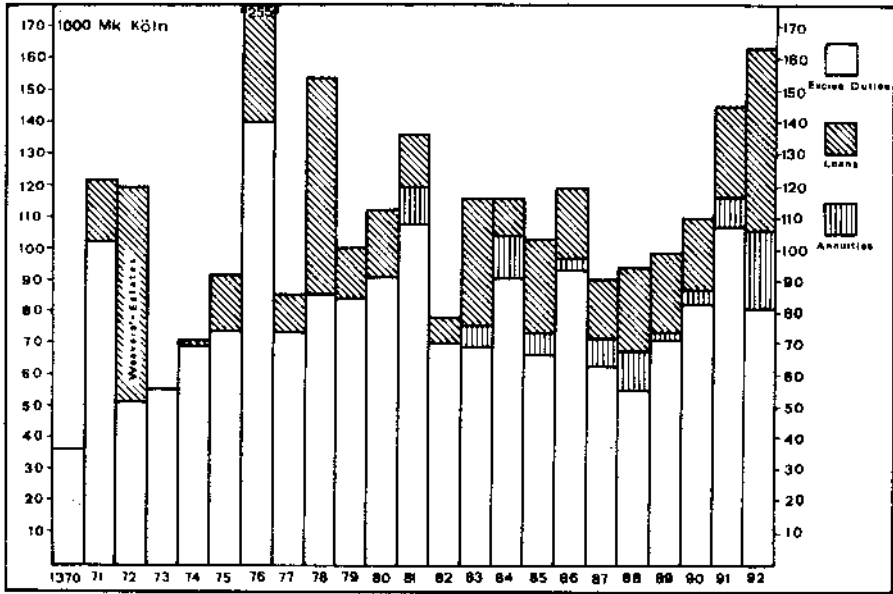
¹ Average for the period 1478-1481.

and make it impossible to check the calculations in silver weight. The records on excise revenue would have to be complete if we were to apply short and medium-term fluctuations — which are only available for the agricultural sector with the appearance in 1444 of a series of autumn prices —⁵³ to the overall economic development of the city. However, the revenue books of the *Mittwochsrentkammer* which are essential for the determination of the “ordinary” budget are missing. But even if this were not so a considerable number of methodological difficulties would arise, since not all excise duties were levied for the same length of time and some excise rates fluctuated considerably. The period 1370 to 1392 for which the total revenue is known, is too short for an assessment of trends. Generally speaking, development was influenced by the high costs of the so-called *Schöffenkrieg* in 1375/76 which lead to new excise duties being levied. In other words the curve only appears to indicate a favourable development in Cologne’s economy (cf. Chart 8).

The data on individual sectors are more useful for the description of long-term development trends, and show that the great crisis of the late Middle Ages hardly made itself felt in Cologne. The economic development of the city was characterized not by crisis but by structural change. In the textile industry, the decline of woollen cloth production was common to broad regions of northwest Europe and was offset in Cologne by the rise of *Barchent* and silk weaving. For the metal industry, the second half of the XVth century was clearly a period of economic boom in spite of temporary difficulties in copperbeating. The decrease in the wine trade and consumption was offset by the rapid expansion in the beer and brewing industry. These were not symptoms of crisis, but an indication of structural changes which were not limited to Cologne. Fundamental structural changes were also occurring in international trade as a result of increased attendance at fairs. This served to attract direct trade relations with southern

⁵³ Cf. DIETRICH EBELING · FRANZ IRSIGLER, *Getreideumsatz, Getreide- und Brotpreise in Köln 1368-1797*. ERSTER TEIL: *Getreideumsatz und Getreidepreise*, Köln-Wien 1976, pp. LIII-LV.

CHART 8
Total Revenue of the City of Cologne 1370-1392



and eastern Europe without decreasing the volume of trade. In fact a higher degree of security and export trading opportunities for craftsmen, created the conditions necessary for the expansion of stable trade relations.

All the turnover figures we have discussed are helpful, but there is no better proof of the expansive power of Cologne's economy in the XVth century than the inclusion of the productive capacity of the craftsmen living in the small towns and rural areas surrounding Cologne.

Through high capital investment by merchants and entrepreneurs an intensive division of labour developed between town and country based on semi-finished goods produced in the country — resulting in a new, bigger « *Wirtschaftseinheit Köln* » which would be a suitable topic for a macroeconomic study, but unfortunately the data available are not adequate.

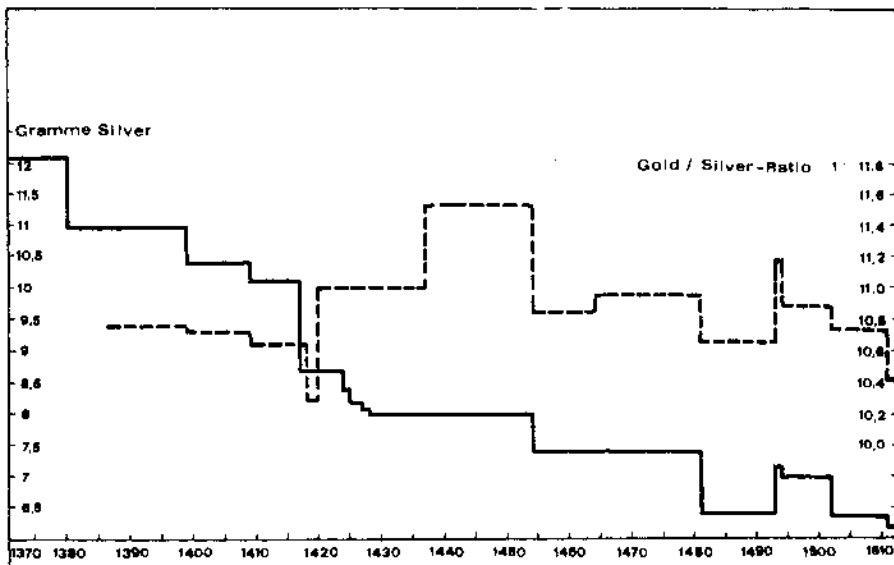
Cologne's economy was vulnerable to external disturbances. This was the reason, for instance, why after a time of slight recession in the first half of the XVth century, the distinct upward

movement between 1440 and 1460 was interrupted and not resumed until the last decades of that century. The *Neusser Krieg* ruined the city's finances, but not the merchants and craftsmen of Cologne for any length of time. As long as northwest Europe was relatively peaceful, its roads, rivers, and markets safe and its coinage system intact, the economy of Cologne kept flourishing. Nearly all short- or medium-term crises in the XIVth and XVth centuries originated partially or entirely from structures and events beyond the economic activities and intentions of the citizens of Cologne.

In order to deflate the Cologne money of account in the second half of the XVth century, Schönfelder used the calculation for light silver money made by Kruse.⁵⁴ The treasuries also used heavy silver coins (*Raderalbus*) as a standard, especially towards the end of the XVth and at the beginning of the XVIth century and, for example,

CHART 9

Silver Weight of the Mark Kölnisches Payment and Gold/Silver Ratio 1370-1512



⁵⁴ Cf. ERNST KRUSE, *Kölnische Geldgeschichte bis 1386 nebst Beiträgen zur Kurhheinischen Geldgeschichte bis zum Ende des Mittelalters* (Westdeutsche Zeitschrift, Ergänzungsheft 4), Trier 1888, p. 120/121; Knipping I (see n. 7), pp. XXVI-XXX; ALFRED NOSS, *Die Münzen der Erzbischöfe von Köln 1306-1547*, Köln 1913, p. 321.

TABLE 11

FINE SILVER VALUE OF THE MARK KÖLN. PAGAMENT AND THE KURRENT-GULDEN AS WELL AS THE GOLD SILVER-RATIO 1370-1513
(according to E. Kruse and A. Noss)

Year	Silver weight of the Mark (g)	Silver weight of the Gulden (g)	Gold-silver ratio
1370	12.14	37.4	
1380	10.94		
1386	10.96	36.540	1:10.761
1399	10.42	35.588	1:10.716
1409	10.12	34.583	1:10.648
1417	8.72		
1418	8.70	26.618	1:10.305
1420	8.70	30.730	1:11.066
1424	8.40		
1425	8.22		
1427	8.10		
1428	8.04		
1432	8.00		
1437	8.00	30.016	1:11.530
1454	7.40	29.568	1:10.850
1464	7.40	29.568	1:10.964
1481	6.39	28.755	1:10.666
1493	7.18 *	28.728	1:11.179
1494	7.00 *	27.984	1:10.885
1502	6.37 *	27.612	1:10.738
1511	6.19 *	26.832	1:10.429

* Heavy silver coins.

kept the exchange rate of the *Gulden* at 6 *Mark* 6 *Schilling* at a constant level from 1492 to 1512. For deflating purposes, the second method of calculation is therefore preferable. This means, however, that between 1370 and 1511 the fine silver value of the *Mark kölnisches Pagament* did not fall from 12.14 g to 3.10 g but merely to 6.19 g. This also has a considerable bearing on trend analysis. The drop from 12.14 g to 6.19 g (49%) is comparable to the exchange ratio of *Gulden* and *Schilling*, the latter being used as money of account (1370: 1:36; 1511: 1:78 - a loss of 54%).