



# 10

## Glossary of Sources

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## Which Material to Study? Sources for Premodern Economic History

This glossary provides a concise overview of all the sources used in the reviewed sample studies (see Chaps. 6, 7 and 8). The variety of sources used in studies on premodern economy is large: historiographical texts, artefacts, archaeological sources, legal sources, administrative and business documents, as well as letters, theological texts and databases are among them, showing how close the economy is interconnected with all parts of society. In spite of the difficulty of combining the sources used in the reviewed sample studies into individual genres and systemising them, we decided to build a system to enhance the usefulness of our book. The introductory work by Goetz (2012) still prevails for the German-speaking historiography. Our system follows his structure as much as possible, although in Goetz's comprehensive work not all sources found in our reviewed sample studies are mentioned. In addition to Goetz, the work of Brauer (2013) was used, which discusses additional source genres. To

facilitate the quick looking-up of keywords, the sources and source genres are arranged alphabetically under eight main categories. We have placed the individual source keywords into these main categories. They mirror account our approach to economic history and highlighting source genres that have proven to be particularly productive in the reviewed sample studies for economic history.

Not every singular source which is examined in the reviewed sample studies is described here. As a general rule, similar sources have been grouped into categories. Of these categories, only those are included in the glossary which occur in more than one reviewed sample study and which have a special relevance to economic history. Here like in the whole book it becomes clear that German-speaking economic history has a clear focus on the premodern town: Many of the sources were written in an urban context.

Each entry provides a concise definition of the respective type of source, as well as some generalised information on its form, structure and content. Each entry also summarises the sources' usefulness and value for research. In many cases, we also name edited examples, in order to help our readers to look for specific and informative source material if interested in certain types of sources. For further specification of how a specific source can be studied and which applications exist, you are invited to consult the linked reviewed sample studies.

## Administrative Documents

### **Annuities (Letters–Ledgers–Urban Accounts) (Angela Huang)**

Annuities (*Renten*) appear in many contexts. Annuities were sold for capital against an annual payment. Life annuities ended with the death of all stated beneficiaries. Perpetuities (*Ewigrenten*), at first perpetual, were normally redeemable and transferable. Annuities can be easily distinguished from other credit instruments (e.g. temporary loans) by the phrase that the seller “has sold and is selling in this letter” the capital given.

Annuities are mainly, but not exclusively, an urban phenomenon. They are mainly documented in the following source types:

1. As highly formalised annuity letters, stating the type of annuity, the seller, the buyer (often including information about his social status and origin), the capital and annual payment, the due date(s) of payments and occasionally the place of payment, sometimes the security given by the seller as well as the conditions for the redemption of the annuity. The letter concludes with a closing protocol ('eschatocol') confirming the contract, mentioning the seal given below and dating the contract.
2. In annuity ledgers, documenting the issuing of the contract and/or the contract history (cessions, redemptions and payments). The contract is either given in full text or abbreviated.
3. In urban accounts that normally list annuity sales as part of the extraordinary income, only giving very basic information, for example, the capital, the buyer, the amount and dates of the payout. Payments are listed in a separate section of the expenses.

The different sources documenting annuities have primarily been used to study social strata (information on buyers), urban households and public debts (in relation to annual urban income and expenses over time) and market integration (interest rates).

Annuity contracts can be employed in both qualitative and quantitative research. They can be used to analyse individual buyers in context with other sources, social groups, guilds or practices like endowments in microhistorical studies (see sections on micro-history and micro-exemplary method, Chap. 9). Time series of isolated information like interest rates or the origins of a buyer can be analysed by way of descriptive or analytical statistics, using geographic information systems (GIS) or tools for social network analysis (see respective entries in Chap. 9). However, the sources require the use of literature and further source material for contextualisation.

See reviewed sample studies 45, 46, 51, 57, 61.

## Accounts

In the Middle Ages, accounts were kept by very different people, groups of people and organisations. Premodern accounts did not follow the logic of today's calculations and did mostly serve as memory aids or control mechanisms. Since accounts are a particularly fruitful source for economic history, they are discussed in special detail here. Moreover, accounts are regarded as highly reliable for research, since they record actual income and expenses. Accounts are sometimes already serially handed down in the Middle Ages. However, the loss rate is relatively high, especially for accounts which quickly lose their value. The calculations offer the opportunity to explore the economies of those who ran them. Moreover, questions of money and goods transactions can be investigated, thus scrutinising the way of doing business and conducting trade; it can be investigated how households were managed, and if the calculations were handed down serially, quantitative analyses may be possible. Also, accounts, depending on how they are created and structured, can provide data for prosopographic studies and network analyses.

See reviewed sample studies 2, 3, 9, 13, 14, 27, 68.

### Customs Accounts (Angela Huang)

Customs accounts are central fiscal documents for research on commodity trade. They were compiled by different fiscal authorities, namely urban or royal, and for overland, river and overseas trade. Port customs accounts documenting overseas trade are probably the most studied type of customs accounts and of particular importance to the study of premodern trade as they are the only serial source on large-scale and long-distance commodity trade. Accounts documenting the different English customs, the Sound Toll of the Danish crown and the Pound Toll Books compiled by Hanse towns to finance common projects, allow us to quantify long-distance trade and to reconstruct main patterns of trade in terms of trade routes and commodities. Whereas the London Customs Accounts (<https://www.hansischergeschichtsverein.de/london-customs-accounts>, last accessed on 14 November 2018) and the Sound Toll Books (<http://soundtoll.nl/index>

[php/en/over-het-project/sonttol-registers](http://php/en/over-het-project/sonttol-registers), last accessed on 14 November 2018) have recently been made accessible online, quite a few port books, for example of Baltic towns, remain unedited (see Jahnke 1998).

Port customs accounts are either organised chronologically and/or by ports of origin/destination. They typically give the name of the skipper, list the owners or charterers of the goods, and furthermore give a more or less detailed account of the goods and their value and the customs paid. Less often the customs accounts state the port of origin or the destination—this is often derived from the composition of the goods on board of a ship.

An important restriction of port customs is that they are silent on land trade. Particularly for this type of account, it is crucial to understand the context of the imposition of the respective customs and the exact function of the accounts. Especially temporary duties, like the Hanse Pound Toll, are often levied due to political conflicts and therefore unsafe waters, circumstances that influence commodity flows and transaction costs. Certain commodities or groups of merchants were often exempted from customs. Some accounts only list the total value of the shipments, while others, like the London Customs Accounts, are very detailed when it comes to the commodities. Quite a few port books do not give dates for individual shipments, but only allow a rough chronology of the ingoing and outgoing traffic. The merchants listed in the accounts can often be either the owner or the charterer of the goods. Finally, it is next to impossible to estimate the degree to which smuggling took place.

See reviewed sample studies 36, 37.

### **Household Accounts (Tanja Skambraks)**

Household accounts are pragmatic sources stemming from the context of household administration. Most of them survive from late medieval noble or bourgeois households, where stewards were in charge of documenting the income and expenses on a daily, weekly or monthly basis. The accounts were audited every year, mostly at Michaelmas (29 September). A huge amount of source material from England has been edited and studied, mostly with regard to living standards (Dyer 1989; Woolgar 1992, 1993) of

the households of lower and higher nobility, as well as some bourgeois households. For late medieval and early modern German households, there are single case studies related to the questions of administration and representation (Fouquet 2014), mostly of noblemen. The accounts in an ideal form mention a date or week followed by the two categories ‘income’ and ‘expenditure’ and a daily or weekly sum spent or earned. Under those headings we find more subcategories, for instance, specific foodstuffs, luxury articles, wax, wages for household members, clothing, gifts received or given, travel expenses, expenses for horses and building work. The accounts inform us about the consumption patterns of a certain household leader and his *familia* allowing for a reconstruction of household organisation and administration techniques, personnel and its social structure. Household accounts are a valuable source for the study of living standards and the demesne economy on the one hand, but they are also highly informative on questions of everyday life, festive culture and social coherence. To make them as fruitful as possible, they should be studied in a comparative approach.

See reviewed sample studies 37, 42.

### **Merchants’ Books (Ulla Kypta)**

Medieval merchants kept a record of their business dealings by writing them down in their books. These books cannot be regarded as accounts in the modern sense of the word, but rather as an aide memoire. Merchants wrote down what they bought and sold, whom they lent money to and from whom they borrowed a sum, and what letters of exchange (see the respective keyword) they issued and accepted. Some books were written down chronologically, others were subdivided in thematic accounts, for instance into accounts for trade to a certain city or for the affairs of the societies the merchant was a part of. Chronological accounting notes were sometimes reworked into separate books, which gave an overview of, for example, all the debts or all the exchange transactions. A prominent example are the books of the Hanseatic merchant Hildebrand Veckinchusen (see Lesnikov 1973; Lesnikov et al. 2013; for other Hanseatic merchants see Mollwo 1901; Nirrnheim 1895; and for Ulrich Meltinger, a merchant from Southern Germany, see Steinbrink 2007). It was only very rarely that a

merchant drew a balance for a subaccount or for a certain year of his business dealings, and double-entry bookkeeping was not widely known during premodern times. When larger trading companies emerged in Germany during the late fifteenth and early sixteenth centuries, more complex systems of accounting were employed to deal with the different branches (Geffcken and Häberlein 2014). Since merchants' books tell us about the goods, the partners and trading routes of a merchant, they can be scrutinised to study the variety and prices of commodities, networks of partners as well as networks of cities. But we cannot use the merchants' books to grasp the whole of a merchant's commercial activity, or to calculate his overall wins and losses, because no complete series of accounts from a single merchant or a trading company has survived up to today.

See reviewed sample studies 3, 8, 16, 17, 26, 37, 45, 59.

### **Monastery Accounts (Julia Bruch)**

The composition of accounting books from premodern times is determined by the accounting organisation. Monastic accounts follow the logic of monastic organisation and generally record income and expenses of the entire monastery as well as individual monastic offices. The earliest monastic accounts from the German-speaking region have been handed down from the thirteenth century. The early ones are accounts written in coherent text flow. From the fourteenth century onwards the accounting books increasingly separate income and expenditure and draw up balance sheets.

The accounts rarely form a series of similar entries. Often the individual entries are not reliably created according to the same pattern, the income dates differ greatly or the entire monastic organisation was not recorded, which makes statistical or comparative evaluations more difficult. In addition, different currencies, dimensions and weights are often used, which does not make it easier to evaluate the accounts.

Monastery accounts are determined by the specific organisational form of the monastery or the religious order. Thus, the accounts also serve to control the individual monasteries and are forms of communication of power structures (see, e.g. the Kaisheimer accounting book Bruch 2013).

See reviewed sample studies 1, 27, 29, 43, 52.

## Urban Accounts (Julia Bruch)

Urban administrations also kept accounts of various kinds, which are useful sources of urban economy. There, the municipal treasurer (e.g. *Rentmeister* and *Baumeister*—the source names differ), the scribe of the chamber or the town scribe wrote down income and expenditures of money and natural resources, depending on the administrative development of the town and its resources. The city's income mostly consisted of duties and taxes, such as from agricultural property, whereas the expenditures were often used for the fortification of the city, for the city officials, for mercenaries, the maintenance of infrastructure and so on. As a rule, the accounts do not show the entire city budget, but only cover subareas according to their own logic, which must be considered in the analysis. The difficulty with these sources lies in the fact that they have rarely been edited and that many treasures are dormant in the archives. Digital editions of these city accounts have proved to be particularly useful in recent years, such as the edition of the Basler city accounts (<http://gams.uni-graz.at/context:srbas>; last accessed on 9 November 2018) or the edition of the Augsburger Baumeisterbücher (<https://www.augsburger-baumeisterbuecher.de/>; last accessed on 9 November 2018). In both examples, not only serial sources have been handed down, but also edited as such, and the edition projects offer a connection to current discussions in digital humanities.

See reviewed sample studies 18, 21, 23, 27, 28, 34, 46, 61.

## Inventories (Tanja Skambraks)

Inventories are lists of personal mobile and immobile belongings of private persons and institutions, like churches or manors, which were written down for various reasons. In the case of persons, these lists enabled the distribution of belongings after the person's death and thus prepared the post-mortem settling of debts and regulated inheritance. The information on the listed objects like household goods, books, silverware, jewellery, clothing, weapons or furniture can be very detailed—depending on the respective writer and household management. In some cases, the inventories were written post-mortem. Some list the objects' value in

money, while others give detailed descriptions of their appearance and condition, thus pointing to the value their owners attributed to them (Smail 2016). Inventories by institutions—as memory tools—enabled members to control the community’s belongings and treasures, relevant to preventing or detecting theft and fraud. In the case of manorial inventories naming livestock, agricultural equipment and buildings, they are closely connected to early medieval registers and land-rolls (*Urbar*).

From inventories, we can learn much about the types of objects people and communities possessed and considered as valuable, as well as their material value. We also learn about inheritance practices, since in some cases the possessors already named the heirs of specific objects, often household members, relatives and neighbours (Howell 2010). Thus, inventories are closely related to wills.

See reviewed sample studies 8, 14, 52.

## Minutes of Town Meetings (Ulla Kypta)

The cooperation of towns constituted an important feature of the political landscape of the late medieval Holy Roman Empire. These cooperations could be formalised into proper leagues of towns such as the Rhenish League of Towns (*Rheinischer Städtebund*), which also included princes; or certain cities could agree to cooperate on defence or economic policy for a number of years, like Basel, Freiburg/Breisgau and Strasbourg, who renewed their agreement roughly every three years. Other towns met on a frequent, albeit not regular, basis without any contract underlying their cooperation, such as the Hanse towns. In many cases records of the meetings of these towns survive. Minutes from the meeting of Southern German towns are edited in *Die Urkunden und Akten der oberdeutschen Städtebünde vom 13. Jahrhundert bis 1549*, and the meetings of Northern German towns are provided in the Hanserezeesse (accessible online: <https://www.hansischergeschichtsverein.de/hanserezeesse>).

Towns discussed a number of issues concerning their economic policy: How to secure trading routes, how to stop pirates, how to make sure that coins kept their value, how to protect their citizens from lawsuits in other towns, how to make sure that customs would not reach a level at which trade would stop and so on. The records can also be analysed to study urban networks: Which cities cooperated, who was informed of the meetings?

The minutes of a meeting of towns, however, did not constitute binding laws. They had to be implemented into urban law, and not every city that attained the meeting automatically transformed the minutes into urban law.

See reviewed sample studies 26, 33.

## Pawn Registers (Tanja Skambraks)

These sources, mostly surviving as bound paper manuscripts written in chronological order, stem from bookkeeping institutions or individuals. Italian examples show the double-entry system, that is, they state the act of pawning a pledge for money on one folio and its redemption on the opposite page. Besides the sums borrowed, we find the names or/and professions of the debtors involved in the transaction. Thus, pawn registers provide valuable information on the social background of minor economic actors. Firstly, pawn registers allow qualitative analysis of the actors involved as well as the materiality of pawnbroking. We learn about the numerical and ideal value attributed to certain objects—mostly everyday objects—as value storages.

Secondly, quantitative analysis in a long-term perspective is also possible, for instance, when we look at the numerical distribution of the different objects (which groups of objects were pawned often/rarely) and the development of pawnbroking activities over time, for example, during different seasons of the year or—even longer—over several decades.

Since these sources were written by and from the perspective of the creditor, pawn registers remain silent about the debtors' motivation and circumstances or the use of the money. Furthermore (and according to medieval church law), they also avoid stating the paid sums of interest, so that researchers have to use different sources, like statutes, to obtain relevant data.

See reviewed sample study 60.

## Rural Registers (Julia Bruch)

In addition to accounts, premodern rural administration left registers (*Urbar*), which are closely linked to manorialism (*Grundherrschaft*),

the predominant form of government in rural areas. These rural registers mainly dealt with the systematic recording of claims to property and taxes (*Abgaben*). In contrast to accounts, these contain claims, not actual incomes and expenses, whereby the boundary to accounts can be fluid. Registers of this kind were already known in the Early Middle Ages. Earlier German-speaking research distinguishes between these directories according to content criteria, like tax rolls (*Heberegister*), estate books (*Güterbücher*), stock books (*Lagerbücher*) or registers of the entire property (*Polyptychon*). Among researchers, it is controversial whether rural registers can be seen as records of social and economic facts and can thereby be statistically evaluated. In this case, they provide many possibilities for researching the system of manorialism in all its facets, including social groups that rarely appear in the sources, such as the unfree. Other researchers understand these registers as purely normative sources and thus examine only the claims, not the actual administration. Nevertheless, they provide insights into rural administrative practice, into the relationship between the individual actors in manorialism, into ownership structures, types of taxes and the use of the written word in rural administration, and are an indispensable source for agricultural history (Goetz 2012, 176–183; Brauer 2013, 45–51).

See reviewed sample study 5.

## Urban Administrative Sources (Julia Bruch)

Similar to today, the administration of a late medieval town produced a large number of written records besides urban accounts. Those administrative documents are usually distinguished according to their content into, for instance, tax lists, asset lists, house lists and citizen's books. These sources can be used to analyse questions about taxation and ownership, stratification of the population, analyses of names and so on. It should be borne in mind that in most of these sources only certain parts of the population are mentioned (Goetz 2012, 183–185). I would like to draw particular attention to the city books, because this source group is very common and because it makes up a large part of the tradition. The term 'city book' is a collective term for books from premodern cities and towns, which can

contain all kinds of sources written in an urban administrative context. These are primarily urban law (*Stadtrecht*), urban orders, urban accounts, council records, court minutes, urban certificates, important charters, partly narrative sources, chronicle news, to name only the most important. Like in chronicles, a whole series of information can be combined here; the books must be read carefully. They represent the perspective of the urban council and its administration. They are especially useful for research on the urban economic order; for example trade fair orders and market orders, and regulation of taxation. In addition, transfers of properties might be recorded in city books (for example the Cologne *Schreinsbücher*) as well, which among other things allow insights into ownership and property distribution. Also, purchase transactions taken up there are of special interest for economic history. Now and then one finds price lists or within the council minutes court judgements. The source type is hence also of importance for qualitative questions. There is a digital directory of all premodern city books for the German-speaking areas, which greatly facilitates research on this source type (Goetz 2012, 184–185; <https://www.stadtbuecher.de/>).

See reviewed sample studies 2, 3, 7, 8, 10, 15, 16, 25, 26, 31, 34, 35, 46, 68.

### **Tax Lists (Ulf Christian Ewert)**

In the late medieval town taxes were raised, typically on the wealth of citizens. Tax payment was recorded, and for numerous towns and cities in Germany tax lists have survived. However, the entries in such lists only encompass those inhabitants of the town who owned certain assets and had a certain (usually larger) amount of wealth. This is because the duty to pay taxes in medieval towns was based on wealth and assets, not on income as it is today. Therefore, we mainly find house owners as well as craftsmen practising a craft as a master, because this also often coincided with ownership of the respective craft shop. As a consequence, only a select and relatively wealthy group of all inhabitants can be grasped by studying this type of record, and poor people are usually not recorded. However, not paying taxes (and thus not being recorded) was not automatically due to poverty. Town inhabitants could also fail to be brought onto a tax list because they had a certain privilege and were

exempted from taxation or they were subject to an exceptional rule. In general, the tax regulations of medieval towns make tax lists an inappropriate source for the reconstruction of population size, the share of underprivileged and poor people living in the town, or inequality in general. This notwithstanding, they allow an analysis of house ownership, an analysis of the dwelling conditions of the more privileged and wealthy people in the town, as well as an estimation of the distribution of wealth for this smaller group. In addition, the spatial distribution of craft shops and working places in the town can be—at least in part—reconstructed by making use of tax lists. Sometimes—this is the case for late medieval Greifswald—surviving town books (see “Urban Administrative Sources”) may also give information on the ownership of real estate and houses.

See reviewed sample studies 13, 16, 18, 49, 55.

## Archaeological Sources (Ulrich Müller)

Archaeology studies the material expressions of economic behaviour at different scales. Their analyses cover topics ranging from the local micro level to the global macro level. Archaeological sources are mainly obtained by excavations. Generally, one differentiates between finds (artefacts, ecofacts and biofacts) and features. Features comprise, for example, earth layers or earth discolorations (layers) and walls or pits (structures). Furthermore, the relationships between finds and layers or between finds themselves (e.g. coins stuck together in a coin hoard; see the respective keyword) are also considered as features. For the creation of a temporal, relative sequence, stratigraphical laws are normative.

In addition, non-archaeological methods (e.g. geophysics, GIS and network analyses, see Chap. 9) generate data for archaeological studies. Data concepts emphasise the empirical character of archaeology. Primary and secondary data are part of the archaeological record (Buccellati 2017), which involves ‘the body of physical (not written) evidence about the past’ in the sense of ‘material culture’ (objects made by, used by or associated with humanity) or ‘the material remains of the past’ (the archaeological record as the ‘fossilised’ product of physical, cultural and taphonomic processes) and all documentations.

See reviewed sample studies 20, 37, 39, 41.

## Coin Hoards (Sebastian Steinbach)

A hoard is a collection of valuable goods (i.e. jewellery or coins). Normally it is buried in the ground (treasure) with the intention of the former owner to recover it in the future. Usually for some reason—such as forgetfulness, physical displacement or unexpected death—the owner is unable to return to and recover the hoard, which then is found by archaeologists, metal detector hobbyists or even private individuals.

One has to differentiate in general between single finds—one isolated object or several objects unconnected to each other but within one specific area (i.e. a settlement or church)—and hoards—an intentional accumulation of valuable objects. But there are also lots of categories related to the function (i.e. treasure or gift) or location (i.e. graves, churches or urban settlements) of the object/s.

Hoards and single finds of coins are important sources for the money supply in certain regions, the circulation and usage of currencies or the social status of their former owners. Also they can be part of cultural heritage (i.e. funeral rites or religious offerings) and used as a source of information about daily life, behaviour or faith. Coin hoards can be analysed with statistical or metrological methods (see Chap. 9) such as the description of the value (content or face value of the coins included), the period of accumulation or the geographical space in which the currencies circulated.

Without written information, it is difficult to tell anything about the intentions and reasons of the former owner to hide his coins and especially the different objects (currencies, coin types or values) included.

See reviewed sample study 54.

## Artefacts (Julia Bruch)

Artefacts are understood as the entire material and immaterial world created by humans; in addition to abstract cultural creations such as works of literature or musical compositions, domesticated animals and plants can also be understood as ‘artefacts’. In addition to artefacts, all natural things are summarised under the term ‘things’

(Eggert 2014). Things can be handed down in the original or in the form of reproductions and illustrations. They can be used for very different questions regarding cultural history and also be fruitful sources for economic historical analyses. Products can, for example, allow conclusions about production operations, or tally sticks can be used to analyse pre-modern accounting systems and procedures (see the entry on tally sticks). Natural resources and their handling can be interesting objects for the investigation of questions about technical and environmental history. Material things are investigated far more often than immaterial things. The investigation of material things is limited, if the context of the preserved thing is no longer reconstructable, due to the fact that many things are handed down as unique specimens. Therefore, the source value of such unique specimen is not representative (see further Samida, Eggert and Hahn 2014).

See reviewed sample studies 6, 12, 14, 37, 40.

## Coins (Sebastian Steinbach)

A coin is a small and usually round piece of precious metal used as a medium of exchange, legal tender and mass media. Coins can be found as single pieces in public or private collections or in coin hoards as an archaeological accumulation of objects.

These are normally standardised (total weight, fine weight, diameter and appearance) and produced in large quantities by a minting authority (i.e. a state, city, bishopric or duchy) in a specified workshop (mint). The value of a coin can be specified and guaranteed by an authority (face value) or depending on the precious metal content (content value). In premodern times, where coins were usually made of precious metal (gold, silver or copper), the value of different currencies was a mixture of content value (changing metal content) and face value (fixed exchange rates).

One has to differentiate between ‘coins of account’ (*Rechenwährung*)—a unit of money that does not exist as a real coin, but helped to figure prices over longer distances—and ‘real coins’—a unit of money that exists as a material object and is used in daily payments. Sometimes, coins of account and

real coins can be expressed in the same term (name of a currency), making it difficult to decide which kind of coin is referred to in a written source. Coins are important sources not only for questions of money supply or money circulation, but also for the representation of rulership or various topics of cultural studies (religious belief, clothing, symbols etc.). Coins (material objects) have to be connected to written sources, such as counting books or minting ordinances, or to archaeological surveys of coin finds/hoards to receive more information about the used coinage within one region or exchange rates between different currencies.

See reviewed sample studies 54, 66.

### **Pictorial Sources (Julia Bruch)**

Before addressing the material world in general, cultural studies first turned to images as objects of investigation; this was called ‘iconic’ or ‘pictorial turn’. What is subsumed under the term ‘image’ is controversial. In contrast, there is consensus that one should examine not only paintings but also images, no matter how they were produced or what is shown on them. Moreover, in art studies and art history, one no longer only examines the products of high art. Rather, the boundaries between high and low art are increasingly dissolved. Pictures survived usually as originals in museums and collections or as later reproductions (Eggert 2014; Schulz 2014). In order to make these fruitful for economic historical questions, for example, to infer from a painting of a premodern market event the processes that actually happened on a market, one needs the tools of art history. There is obviously a temptation to analyse pictures as images of reality, but such an investigation would be inadmissible according to art historical understanding. Consideration must always be given to the context in which the image was created, who produced it, who commissioned it, what kind of image conventions were used and so on. Nevertheless, images can enrich economic studies, either as an object of investigation itself (e.g. the art market and production methods) or by analysing and evaluating the significance for a socio-economic group to be described in more detail.

See reviewed sample studies 14, 37, 40.

## Tally Sticks (Tanja Skambraks)

Tally sticks (lat. *taleal/tallia*) are wooden instruments of control and proof used in administrative economic contexts from the eleventh to the twentieth century all over Europe (Kuchenbuch 1999, 2002; Wedell 2011). Noble households, tradesmen and labourers in towns as well as peasants in villages used these sticks (often made of hazel wood of different lengths, consisting of one single piece or two interlocking bits) to document different kinds of numerical information. These included measures and values of services and taxes in the context of the manorial system, credit or labour services, billing in retail trade or wages in urban and rural milieus.

People engraved them with—mostly locally valid—incisions and notches or wrote on them (e.g. *exchequer tallies*): sometimes additional information or even short texts enhancing the legal value of these objects. Thus, they could function as proof in court cases—playing a role comparable to diplomas or letters of exchange. Typologically, they are connected to trademarks, seals, coins or stamps. In spite of their great formal and content-related diversity, they were overall pre-metric and pre-literal objects of quantification, sometimes very closely linked to written sources, like account sheets or diplomas, to which they were sometimes fixed. The use of tally sticks provided cheap and mobile ways of short-time documentation for economic actors. For researchers, they form a part of the materiality of economic transactions in the contexts of credit, production and markets in all social strata.

See reviewed sample study 67.

## Databases (Ulla Kypta)

Databases might seem like an odd choice of source type. But a number of historians today are occupied with compiling databases, and these databases can be used not only by themselves (see the reviewed sample studies 30 and 38 in Chap. 7), but also by other researchers. In a database, a large quantity of data is stored and classified. They often come as Excel or Access files. This data can be analysed by employing advanced quantitative statistical techniques, for example a regression analysis. A database can also be

useful for researchers who want to cross-check the results of their own (quantitative or qualitative) case study with data from other cases (see entry on the micro-exemplary method in Chap. 9). In a database, historical data is classified into categories. Thus, some of the details pertaining to the specific historical case always get lost (see entry on classification, Chap. 9). When working with a database, one should always check how the data was obtained and compiled and so make sure that it can yield meaningful results. A good example for an openly accessible database is the receipts and expenditures of the city of Basel for the years 1535–1610: The data can be selected according to needs, it can be downloaded as Excel files, and every data point can be traced back to the entry on the manuscript, which is directly accessible in digitalised form: <http://gams.uni-graz.at/context:srbas>.

See reviewed sample studies 21, 24, 30, 31, 38, 45, 48, 57, 64.

## Historiographical Sources

### Chronicles (Julia Bruch)

The most interesting chronicles for economic historians are not those which report on times long past according to a world-historical scheme, but those mixed texts which include contemporary historical reports, for example (commented) price lists, weather observations and everyday occurrences in premodern towns and their markets.

These are usually handed down as bound codices, sometimes conceived as a whole book and written in one go, and sometimes conceived as expanding object and continuously supplemented. Especially in the latter manuscripts, blank pages and later additions from other hands can be expected. As a rule, the entries relevant to economic history are snapshots that cannot be evaluated in series. One can take climate data from them, data for prosopographies or network analyses (see Chap. 9), on the cultural life of economic institutions (see the reviewed sample studies 7 and 14 in Chap. 7) on ownership, forms of taxation or disasters, on resilience measures and urban or courtly order. Like all other narrative sources, conscientious source criticism is necessary (see “Source Interpretation/Hermeneutics” in Chap. 9); the sources are highly subjective and usually pursue a certain narrative struc-

ture, they want to teach, present a status quo as particularly worth preserving, and are often biased and judging (Brauer 2013, 93–105).

See reviewed sample studies 1, 3, 7, 8, 14, 23, 31, 33, 34.

## Legal Sources

### Charters (Julia Bruch)

A charter is a written document, which is certified and composed in accordance with a special form and documents a legal transaction (Goetz 2012, 135). Those documents are not always a mirror of valid law, but rather represent legal claims and have evidentiary force. This is the reason why such documents were falsified in a not inconsiderable number. As a consequence, a separate auxiliary science branch, diplomatic (in German *Diplomatik*), developed for the evaluation of original documents. Those documents of legal transactions were delivered either as original charter, as a certified copy with the whole text (*vidimus*) or as a part of the text in another charter (*transumpt*) or a part of the text in a book. Such a book is called register, if the person or organisation who issues the document registers it (like the *Papstregister*), or chartular (*Kopialbuch*), if the person or organisation receiving the document registers it (Goetz 2012, 136–138). A special form of charters are the privileges for merchants, cities or Jews (see the entry on privileges). Many charters have notes on the backside (*Dorsualvermerk*), which give information about the person or organisation who sends and who receives the document and about the date and content. Especially deeds of sale (*Verkaufsurkunden*) offer an important insight into the economic sector of monasteries, courts or cities, for example. The rather conservative research reconstructs (mainly from series of charters) properties or property claims of monasteries, courts, persons like kings and so on, and the development of properties. From series of charters, one can also reconstruct a travel route of the person issuing the document. Newer questions also concern the composition of charters and their use in ritualised contexts. A series of documents can also be used to reconstruct connections to other organisations and individuals (see “Network Analysis” and “Prosopographic Analysis”, Chap. 9).

See reviewed sample studies 1, 2, 7, 8, 27, 32, 49, 68.

## Contracts (Stephan Köhler)

This entry deals with private contracts. (For political and constitutional contracts see keyword: charter). Contracts in private law constitute mostly legal obligations like rents or loans. In a broader sense, a contract is the concordant will (*consensus*) of two or more persons or contracting parties in order to establish a legal commitment. Contractual obligations varied enormously in the Middle Ages from area to area and underwent many changes within the period of hundreds of years.

Most contract forms derived from Roman law. But there were also other contracts, which were purely medieval creations (i.e. *commenda* or *sendeve* in medieval trade). Written contracts survived in many different material forms (see entries on charters, notary registers, diplomas and mortgage notes) and often included means of authenticating the document (i.e. seals, *signetum*). The legal force of these contracts is also reflected in their internal form. Hence, it is necessary to understand the legal techniques of the time. Since the sources themselves are legal documents, historians are advised to read the fine print, so to say, and take legal clauses seriously. Wills and trade, credit and sales contracts are essential sources for economic history and affected all facets of mercantile and industrial activities. While trade contracts provide a snapshot of a merchant's activities, contracts between mintmasters and minting authorities, for example, are valuable sources for craftsmanship and the quantities of coins to be struck within a certain mint and their total/fine weights as well as the loans of the mintmaster (*Schlagschatz*) and his labourers or the technical equipment of a workshop.

See reviewed sample studies 11, 12, 51, 52, 58, 59, 61, 63, 66.

## Mortgage Notes (Christian Scholl)

Mortgage notes are usually issued as charters by a debtor and indicate the sum the debtor must pay back to a moneylender by a specific time. Mortgage notes also provide information on the height of the default interests (*damnum*), which become due when the debtor cannot pay back

the sum by the time agreed upon; in the Holy Roman Empire, the default interests commonly consisted of two pence (*Heller*) per pound and week. Most medieval mortgage notes do not, however, contain information on the original level of interests.

Furthermore, mortgage notes say something about what happens when the debtor is unable to pay back both the loan and interests. According to a customary clause, for example, the creditor has the right to seize the house or other personal belongings of the debtor. Other security clauses determine that no public authority, for example the king, a prince, a bishop or a city council, can free the debtor from his obligation to pay back his loan. There are also clauses that oblige the debtor to go to a tavern or inn and stay there until the debt is paid. A clause like this increased pressure on the debtor because he had to pay further money for his lodging in a foreign place as long as he had not paid back his loan.

See reviewed sample studies 47, 51, 62.

## Privileges (Ulla Kypta)

Two types of privileges were shaping the institutions of trade: privileges for merchants and for towns. The first type was mostly granted to a group of merchants, sometimes to individuals. The ruling body, whether a prince or a town council, guaranteed the merchants certain rights which reduced the insecurity of their business operations. For example, in a privilege the ruling body could assure the merchants that they would get compensation for goods which had been stolen, or it could freeze tariffs at a certain level, or it could assure the merchants that they would get help in enforcing debts. Privileges often contained special conditions for the trade of the privileged group: Hanseatic merchants in Bruges, for example, were allowed to unload their goods on holidays, and urban personnel such as brokers or wagers were allowed to demand no more than a certain fixed wage of Hanseatic merchants.

The second type was granted to a town: The king or other overlord allowed the town to establish a market at certain times of the year. This was often combined with the promise not to grant a similar right to a city nearby, or with the so-called staple right: The staple right compelled

merchants who passed a town or its surroundings to display their goods for a certain number of days and to offer them for sale. Towns were often allowed to establish a special court for merchants during the time of a fair, and merchants were granted safe passage to enable them to come safely to the fair or market. Privileges allow us to analyse the institutions of trade such as the times of trading, the organisation of the urban scales or stores houses, or urban personnel such as brokers or money changers. Urban networks and trading connections can be constructed by studying which merchants enjoyed privileges in which cities. Privileges are normative sources. They state the rights that should be granted to a group of merchants or a town, but they cannot tell us if these rights were respected in practice or if they were even claimed. Hanseatic merchants, for example, kept complaining about the violation of their rights in Bruges by the urban personnel. Privileges were issued as diplomas and survived because they were kept by the receiving party.

See reviewed sample studies 10, 27, 49.

## **Privileges for Jews (Christian Scholl)**

Privileges for Jews were issued as charters by the Christian patrons of the Jews, especially the rulers of the Holy Roman Empire and local lords such as bishops or city councils. Privileges contain the social, religious and economic rights. They guarantee, for example, the protection of the Jews, their rights to possess landed property, to exercise their religion and to exercise a trade, either as traders of goods or money.

In the period between the first settlement of the Jews in Medieval Germany (tenth/eleventh centuries) and the pogroms of the Black Death (1348–1349), privileges were usually granted for the respective Jewish community as a whole or, as in a famous privilege by Emperor Frederick II of 1236, for all Jews within the Empire. After 1350, an increasing number of privileges were issued for individual Jewish moneylenders, which weakened the autonomy of the Jewish communities considerably.

For economic historians of the Later Middle Ages, these privileges are important because they inform us about the conditions according to which Jews were allowed to lend money against interest; some of them regulate, for example, the level of the interest rates the Jews were allowed

to demand. Since they are normative, it is, however, often difficult to deduce from privileges alone how the Jews were actually doing business as moneylenders.

See reviewed sample study 53, 62.

## **Wills (Max-Quentin Bischoff)**

From the Late Middle Ages onwards, wills were preserved in large numbers. Town burghers of different social strata began to set down the disposition of their possessions after death in writing, initially in Latin and since the late fourteenth century increasingly in local vernaculars. Testaments usually survived in the archives of town councils as single pieces of parchment; many of them have been published in charter books (*Urkundenbücher*, see entry on urban administrative sources). As legal acts, testaments are written in a very schematic language: an identification of the testator is followed by the various bequests, usually divided into two sections, with the first concerning ecclesiastical institutions and alms to the poor and the second individuals such as family and friends. Witnesses and executors and the date of writing are stated in the closing paragraph.

Testaments are valuable sources for qualitative as well as quantitative analyses: they provide rare information about different kinds of personal relationships and how they are expressed in value. The individuals and institutions mentioned shed light on extensive personal networks. The mass of possessions listed in these documents can give some indication of economic wealth and forms of asset investments. However, testaments usually did not include goods on which the legal heirs had a statutory claim (so-called immovable goods). Thus wills cannot provide a full picture of what an individual possessed.

See reviewed sample studies 14, 17, 26, 32.

## **Court Records**

### **Court Records (Urban) (Benjamin Hitz)**

Legal instances were an important factor in the administration of pre-modern towns, for penal justice as well as for civil disputes. The latter are

of interest here. As Signori points out, all cities developed practices of recording various kinds of legal procedures (Signori 2015, 15). In general, court records are in the form of codices, sometimes differentiated according to the procedure. The extensive use of courts by contemporaries led to the creation of large serial collections of sources (see Piant 2007 for France). Urban courts were often operating alongside or even in competition with other court instances, for example, ecclesiastical courts and special institutions for foreigners (see Fusaro 2014 for Venice and Rothmann 2008 for justice during trade fairs). To name one concrete example, in Basel we find a huge variety of court records proving the differentiated development of written culture in civil jurisdiction. These court papers comprise so-called *Urteilsbücher*, *Fertigungsbücher*, *Vergichtbücher/Konfessate*, *Kundschaften*, *Frönungen and Verbote*, *Verrechnungen* and *Beschreibbüchlein* (Signori 2015). Recurrent subjects of litigation were debts (probably the most frequent reason to go to court, see Signori 2015; Groebner 1993; Nicholas 2007), inheritance (Signori 2001), wage conflicts (Simon-Muscheid 2004) or bankruptcy (Safley 2000). Civil courts did not only settle conflicts but also served as the public recordkeepers of transactions, agreements, procurations and debts (e.g. see Nicholas 2007). As institutions, courts provided securities for commercial deals and thus helped lower transaction costs (Greif 2006; Dijkman 2011, 238). Recent research has focussed on the right perspective to choose when reading court records. The use of justice was an active choice by its users (Dinges 2000), who should be seen as actors (Cerutti 2004, 27–27; Johnson 2014) capable of shaping the ‘culture of law’ (Cerutti 2004, 30). All in all, court records provide rich sources about commerce from an everyday perspective, which have not attracted much attention up to now: “Economic and social historians have only recently begun to analyse the everyday activities of courts” (Fusaro 2014, 146). Difficulties arise due to the sheer mass of material held in court archives (see Piant 2007) and the focus on problems and conflicts in court records (Smail 2003, 17). Because of the differences of tradition, comparative studies are often difficult to carry out (Signori 2015, 15).

See reviewed sample studies 3, 8, 16, 26, 31, 32, 37, 44, 51, 53, 55, 56, 60, 63.

## Court Records of Villages (*Haderbücher*) (Tanja Skambraks)

Haderbücher (German: *hadern* = to negotiate, to quarrel) are protocols of various length stemming from medieval lay courts. By solving everyday conflicts, these courts were essential guarantees of peace within their communities. The documents inform us about the reasons, actors, negotiations and solving of economic conflicts in the context of local lower jurisdiction: matters of inheritance, boundary disputes, selling regulations, pawning and land lease, misappropriations, fraud, unrendered services and payments, as well as cases of violence and insults are dealt with. The most prominent ones stem from Ingelheim (near Mainz in Germany) from the years 1387 and 1534 and are the earliest serial source of jurisdiction in a German middle-sized town and its surrounding villages. They are kept in the form of bound volumes in the archive of Ingelheim. Four volumes have been edited and two more are available online (Marzi 2011; <https://www.haderbuecher.de>).

The protocols tell us about conflicts in the economic spheres of trade, crafts and agriculture involving a wide range of actors, like knights, patricians, clergymen and women and peasants. Thus, they enable us to describe and analyse more precisely the economic and social networks of people in the rural or semi-rural sphere (<https://www.haderbuecher.de>; last accessed on 25 October 2018).

See reviewed sample studies 38, 50.

## Law Books (Stephan Köhler)

Law is in its function, form, field of application and content a universal instrument for permanently or temporarily arranging regulations between (different) groups of people. One peculiar problem of analysing premodern law is the problem of law in (more or less) stateless societies, resulting in shared jurisdictions all over Europe (Taylor 2015, 859). The most important influences on medieval law codes derived from Roman law. In Europe, after the collapse of the Roman Empire, a ‘vulgar’ Roman and a Romano-Germanic law developed in the different areas. These new forms of law differed from the learned law of roman jurists and the imperial

constitution and stimulated much change. Of utmost importance was the revival of Roman law in the Middle Ages after the so-called Renaissance of the twelfth century. Furthermore, two new traditions were added to the older ones: the canon law of the Church and the so-called *Lex Mercatoria* dealing with commerce, which is, however, no written codex of law, but rather a term to denote the shared customs of merchants (Pryor 1981, 1–20).

Law codes survived in many different forms like charters, city books, deeds, privileges, statutes or sumptuary laws to mention but a few (see respective keywords). New Institutional Economists have focused on analysing the importance of reliable legal systems that minimised risks and transaction costs and also made the outcome of trade and other business activities more predictable (Epstein 2009, 72; North 1990; Greif 2002, 2006). One has to keep in mind that written law codes are often based on much older oral traditions and customary law. Law codes often deal in detail with commercial activities and regulated trade, credit and even production. However, law codes, being normative sources, only tell us one part of the story, and leave out the actual practices of commerce, which can be reconstructed from other sources like *Haderbücher*, merchant books, merchant letters or notary registers (see respective entries).

See reviewed sample study 4.

## Letters of Exchange (Tanja Skambraks)

Letters of exchange have two basic functions and emerge in two different types: one type is a written document promising the payment of a certain sum of money at another place in another currency for a product or service, making them a secure method of money transfer excluding the rather insecure transportation of actual coins over long distances. Thus, they are an instrument of payment in trade between two merchants and an agent/banker in long-distance trade. The second type—the letter as source of credit in moneylending transactions—describes the loan of funds to a debtor (taker) by a creditor (principal/deliverer) via a third party (agent/drawee) as an instrument of credit. Due to the difference in value of one currency in another place (*permutatio pecuniae*), there is the chance for profit because of the different exchange rates involved in the transaction (arbitrage in different cities or *cambium seccum* in the same place).

Therefore, letters of exchange can also be instruments of speculation. The earliest known letters of exchange stem from Geneva in the second half of the twelfth century, as notarial acts show. They were used to finance the crusades. Shortly after this, fairs like those in Champagne fostered the professionalisation and development of this technique (see Denzel 1994, 2008; Munro 1991).

In the credit transfer the transaction typically involves four parties:

City A: the deliverer (=principal)

lends money to/buys a cambium from

City B: the taker (=principal)/City B: payer/drawee (agent of B)

who actually pays back the loan to A for B in local currency after three months' usance.

City B = payee (agent of A) buys a *recambium* for the deliverer (with profit)

See reviewed sample studies 48, 57.

## Notary Registers (Stephan Köhler)

Notaries were officials empowered by a public authority (king, church, city) and charged with the duty of redacting legal documents for anyone who needed them. As persons of public authority, they were obliged to archive their cartularies. What is usually referred to as 'notary contracts' are in fact short entries (*notulae, imbreviaturae*) that are written down in notarial registers, preliminary to the rendering of a full contract (*instrumentum publicum*). Cartularies were written both in Latin and later, from the fourteenth century onwards, in vernacular languages.

The data provided by the registers yields the full spectrum of medieval society: there are marriage and dowry, trading, leasing and apprenticeship contracts, testaments, loans, sales, and promises of payment written down in the registers, thus making the registers a valuable economic source.

However, because not all cartularies survived and because it is evident that many contracts were not written down for various reasons (small sums involved, short running time etc.), the statistics based upon these sources remain an ‘approximation minimum’ at best (Doehaerd 1941, 44). Besides, lots of contracts written down in the cartularies are crossed out. This could have several different meanings (contract cancelled or handed over to another notary), depending on the habits of the notary. One has to keep in mind that not all editions supply all the cancellation clauses and sometimes references to the manuscript are unavoidable.

See reviewed sample studies 8, 51.

## Minting Ordinances (*Münzordnungen*) Sebastian Steinbach

The Imperial minting ordinances (*Reichsmünzordnungen*) were attempts at unifying the various coins (see the respective keyword) and currencies within the territories of the Holy Roman Empire in the sixteenth century. Four of these ordinances were acclaimed in 1524 (Esslingen), 1551, 1559 and 1566 (Augsburg). They tried to regulate the striking, appearance and ratio of silver (*Guldiner* and *Taler*) and gold (*Gulden* and *Dukaten*) coins by fixing their fine metal weight, image, inscription and exchange rates. One major decision was the declaration of the Cologne Mark (approximately 234 grams) as the general standard for calculating coin weights. The minting ordinances of the sixteenth century differentiated between ‘imperial coins’ (*Reichsmünzen*) with validity all over the Holy Roman Empire (usually coins of higher value) and ‘local coins’ (*Landmünzen*) with validity only within a certain territory (small change, i.e. in Saxony, Bavaria or Brandenburg). Apart from that, various territories of the Holy Roman Empire had their own minting ordinances.

The ordinances help to calculate the total weight, fine weight and exchange rates between currencies of different states, although they cannot tell us anything about the daily practice of the use of money (coins). Minting ordinances are normative (legal) sources for the regulation of currencies, which must be compared to the everyday use of coins as it is reflected, for instance, in coin hoards. Additionally, other written sources, such as letters, reports and protocols of the negotiations which led to the final

minting ordinance, can be consulted to get information about the interests and aims of the involved political or territorial parties (i.e. counts, dukes, bishops or city councils).

See reviewed sample studies 59, 66.

### **Statutes (Tanja Skambraks)**

Statutes are normative texts issued by organisations like towns, religious orders, churches, universities, synods, crafts and guilds, fraternities and hospitals—often from an urban context. In many cases, they survive as parts of urban legislation and would have been kept together with the institutions' most precious belongings in specific rooms or shrines. Thus, a good number of late medieval statutes survive. Their content consists of a prologue, explaining the foundation, aims and leading personalities, followed by a number of chapters or articles. Statutes regard a variety of topics, among which we also find regulations of economic matters, like funding, fundraising and administration of funds, payments of administrators and officials, bookkeeping and control by audits. Furthermore, they show the relationships between certain members of society and inform about the distribution of power and systems of sanction. Late medieval institutions often reworked and renewed their statutes, adapting to necessities and social changes. Being normative texts, statutes are limited in their information content depicting an 'ideal' rather than 'real' practices and everyday situations. If they are complemented by pragmatic sources, like account books, they are valuable for studying the regulative practices, personnel and organisation of many economic institutions. See further Drossbach (2009), Daniels (2013, 207–219) and Henn (1999, 288–295).

See reviewed sample studies 3, 7, 10, 11, 12, 14, 15, 16, 24, 37, 56.

### **Sumptuary Law (Tanja Skambraks)**

The term sumptuary law comprises late medieval normative and regulative texts enacted by urban authorities (e.g. councils or bishops) or other

secular authorities (e.g. kings or princes) aiming at the suppression of excessive consumption of luxury goods, like precious clothes, jewellery or wine, spices and meat. The exchange of gifts at festivities, like births, weddings or funerals, was also one topic of late medieval sumptuary laws. The underlying idea was on the one hand to avoid economic crisis through bankruptcy of individual members of the society, on the other hand, to maintain the distinctive features and thus the status of social groups, especially the urban elite who became challenged by newcomers from lower social strata wearing precious materials, like silk, lace, gold or diamonds, and thus blurring those distinctions. In the context of rising incomes in successful trading towns, more people could afford to dress in costlier clothes and consume better food. The cardinal sins of *avaritia* (greed), *gula* (gluttony) and *luxuria* (lust) played a prominent role in the medieval thinking about economy as well as in secular politics trying to fight them. The great number of these sources shows that their effect on peoples' behaviour was rather small.

The sources, in German towns often closely linked to urban police orders and orders concerning clothing (and maybe part of city books) on the European courts associated with court orders (*Hofordnungen*), give very detailed information on clothing and fashion. Studied together with contemporary pictures and, for instance, household accounts, they provide valuable insights into standards of living and developments in fashion in premodern times. See further Hunt (1996), Kovesi (2008) and Wilson (2017).

See reviewed sample study 17.

## Village By-Laws (*Weistümer*) (Niels Petersen)

The idea that a kind of natural law or order of things can be found by judges and the community deciding special cases, forms the basis of rural legislation in the Late Middle Ages and early modern times. It could be changed over time (*Besserung*) or differ from village to village. While original legislations in towns or even the Reich can be regarded as similar forms, researchers use the term *Weistum* almost

exclusively for rural findings of law, thus following the collection of Grimm (1840–1878). *Weistum* as a term stems from the middle Rhine and Moselle region, while these acts were called *Offnung*, *Landrodel*, *Ehaft* or *Ruge* in other regions. They are also related to the rural court records (*Haderbücher*). The structure of these sources is similar: typically, there would be a formalised question about a certain circumstance at the beginning, which leads to a discussion and then the finding of a certain right or obligation of the cooperative village community. This means that these findings were always locally bound. It appears that while the findings, or arbitrations, themselves were undertaken by local jurors or judges of the village community, it was often the territorial authorities that initiated them and made sure they were documented. It is still uncertain how accurately the surviving written *Weistümer* mirror the proceedings of the sessions in the villages. Usually *Weistümer* would deal with questions of taxpaying and soccage, manorial relations as well as relations between peasants and over the common ground (*Allmende*). The central collection of *Weistümer* is still Grimm (1840–1878).

See reviewed sample studies 19, 27.

## Business Documents

### Merchants' Books See Administrative Documents

#### Merchants' Handbooks (Ulla Kypta)

Merchants' handbooks comprised useful information for a merchant who travelled to or did business with partners at various European (and sometimes even Asian and African) cities. The information is typically classified according to regions and towns. The author, who was a merchant himself, listed information on the currencies that could be used in the respective town, on weights and measures and how they corresponded to weights and measures elsewhere, on prices and exchange rates, cargo routes and rates, and on the trade practices that were in place at this specific trading location. Sometimes the author added some general remarks about the life and duties of a merchant, but these parts are generally very short. Merchants'

handbooks thus provide us with all the information which they originally prepared for their colleagues; they also tell us about premodern weights, measures, currencies and so on. Merchants' handbooks give an impression of which regions and cities a premodern merchant could consider trading with, and they allow us to see what kind of information was important for him if he planned to start trading with this particular region or city. We have to keep in mind that we are not able to check whether the information given in a merchant's handbook was correct: for example, exchange rates could change quite quickly, so it is not clear if the rate cited in a book was meant as a snapshot of a certain moment in time or if it was supposed to give a ballpark position of the exchange rate. Furthermore, the information was compiled by a single merchant with his individual point of view and individual channels to obtain that information: A handbook by another merchant might have looked different.

The first and most famous merchant's handbook was written by the Florentine Francesco Balducci Pegolotti (c. 1340). Most merchants' handbooks, however, stem from the early sixteenth century, for example the book by Matthäus Schwarz who was working for the Fugger family in Augsburg (Westermann and Denzel 2011). A bibliography of the merchants' manuals written between 1470 and 1600 that have been printed can be found in Hooek and Jeannin (1991).

See reviewed sample studies 17, 48, 58, 65.

### **Merchants' Letters (Ulla Kypta)**

Medieval merchants were constantly writing letters. After merchants became sedentary during the Commercial Revolution, letters kept them in contact with their business partners in other trading cities. Only a small part of a merchant's letter was conversational in the sense of a modern letter, asking about the health and discussing political news. The largest part consisted of a report of his own business activities in so far as they concerned the addressee: Which goods did he send to the town where the other merchant was present, did he have to issue a letter of exchange (see the respective keyword) that the addressee would have to pay and so on. Merchants also discussed the business activities they transacted for each other: One told

the other which goods he would be able to buy and send to him, and asked him to buy certain goods to send back. Thus, merchants' letters contain information about the flow and quality of goods, about prices and price fluctuations, and about the networks of merchants and their rules and routines. Merchants' letters also offer a glimpse of the mind set of merchants, of their worries and hopes, and the way they dealt with their everyday tasks. The perspective of a letter, however, is the subjective perspective of a merchant and thus not always reliable. Furthermore, in most cases only one side of the conversation has survived. It is not easy to put the information into context. The most famous letter collection from the Middle Ages stems from Francesco di Marco Datini: roughly 140,000 letters of his communications across Europe were stored in his house in Prato. Another famous letter collection are the Geniza documents with about 1,000–1,200 commercial letters from the medieval Islamic world (Goldberg 2012). About 500 letters to the Hanseatic merchant Hildebrand Veckinchusen have survived and are edited and accessible online via Wikisource.

See reviewed sample studies 3, 22, 26, 32, 40, 45.

## Travel Books (Ulla Kypta)

Premodern merchants travelled a lot: Even after they became sedentary during the Commercial Revolution, they visited different fairs and markets to meet other merchants or to find out about new business opportunities. However, merchants seldom wrote extensive reports on their travels, at the most they included some practical advice for travelling in a merchants' handbook (see the respective keyword). One of the most famous exceptions are the travel reports by the venetian merchant Marco Polo who gave an account of his travels through the Mongolian empire, which comprised a large part of Asia (accessible online: <https://archive.org/details/bookofsermarcopo001polo> and <https://archive.org/details/bookofsermarcopo002polo>).

Other travellers put their experiences down in writing as well, for example pilgrims who visited Rome, Jerusalem, Santiago or one of the hundreds of other places of pilgrimage in Europe. Knights and diplomatic envoys travelled between different courts. Their reports tell us

about the layout and natural conditions of the land or city which the traveller visited, about its resources and the economic activities performed there, about its infrastructure and about the special habits and customs in place. Travel reports give an impression of how people moved around Europe in premodern times: how transportation was organised, how expensive it was, which roads they travelled, where they stayed for the night, how they got their bearings in foreign surroundings and so on. This information helps us to understand how the journeys of merchants and the shipping of goods across Europe could work. Travel reports should be read with care since they were written by individuals with their specific interests and perspectives. Moreover, they were often composed after the journey or reworked to a literary work; hence, not all information contained in the reports should be regarded as necessarily accurate. A very interesting collection of travel reports by German travellers can be found in Reichert (2009).

See reviewed sample study 3.

## Guilds' Books (Julia Bruch)

Under the category guilds' books or guilds' files, as these sources are sometimes called (Goetz 2012), a whole number of sources are summarised that have emerged from the legal and administrative sphere of guilds. In these guilds' records, there are legally relevant acts such as statutes, orders, privileges, quality standards for the guild's products, and rules for the production and distribution of these goods, but also the records of everyday administration such as lists of masters, registers of journeymen, lists of taxes, lists of fines, accounts, historiographical notes and much more.

These sources offer insights into urban craftsmanship and its corporate associations. They can be used for a whole series of questions and methods: They provide material for prosopographic and network analyses (see Chap. 9), for example, or for questions concerning the organisation of production and distribution of goods, the political and social function of guilds and their integration into the city and beyond. Guilds' books are rarely serially handed down and even rarer than serial city books, which is why quantitative methods can usually only be applied over shorter periods of time. Especially rich is the

guild tradition in cities with a guild constitution like Strasbourg (von Heusinger 2009).

See reviewed sample studies 7, 8, 12.

## Theological Sources

### Theological Tracts and Sermons (Tanja Skambraks)

Medieval theologians and lawyers from the twelfth century onwards were dealing with economic issues in their writings as one part of their thinking about the fundamental values of society. These sources, like theological tracts or sermons, which are often edited or available in digitalised form, tackle topics like usury and interest or the common good and are most valuable for the exploration of contemporary business ethics. Authors like Bernardino da Siena, Thomas Aquinas or Petrus Iohannes Olivi were keen observers of a flourishing economy in high and late medieval cities. As preachers and confessors of the urban elite, they closely followed new economic developments and the problems of new social groups, like merchants, and they used their skills to communicate their ideas to a wider audience, whereas their more sophisticated tracts became included in the canon law.

The form of these tracts very often follows the dialectic form of the scholastic question, with one hypothesis or question being followed by the pros and cons of this question—leading to a final synthesis. Thus, these sources are not an easy reading for a twenty-first century audience and require a good knowledge of Latin.

Nevertheless, they give most valuable insights into the discourse on economy, on economic thinking and economic norms. They also prove that friars were actively participating in developing norms and regulations by reflecting on the economic and social changes of their time. Thus, the history of economic ideas also helps to understand the economic practices and their development better; see further Langholm (2004) and Todeschini (2004).

See reviewed sample studies 3, 57.

## References

- Brauer, Michael. 2013. *Quellen des Mittelalters*. Paderborn: Schöningh.
- Bruch, Julia. 2013. *Die Zisterze Kaisheim und ihre Tochterklöster: Studien zur Organisation und zum Wirtschaften spätmittelalterlicher Frauenklöster mit einer Edition des „Kaisheimer Rechnungsbuches“*. Berlin: LIT Verlag.
- Buccellati, Giorgio. 2017. *A Critique of Archaeological Reason. Structural, Digital, and Philosophical Aspects of the Excavated Record*. Cambridge: Cambridge University Press.
- Cerutti, Simona. 2004. Microhistory. Social Relations Versus Cultural Models? In *Between Sociology and History. Essays on Microhistory, Collective Action, and Nation-Building*, eds. Anna-Maija Castrén, Markku Lonkila, and Matti Peltonen, 17–40. Helsinki: Suomalaisen Kirjallisuuden Seura.
- Daniels, Tobias. 2013. Vita Communis in der Fremde, Mobilität und Wissenstransfer: deutsche Handwerker und ihre Statuten in Italien vom 14. bis zum 17. Jahrhundert. *Römische Quartalschrift für christliche Altertumskunde und Kirchengeschichte* 108: 207–219.
- Denzel, Markus A. 1994. “La Practica della Cambiatura”. *Europäischer Zahlungsverkehr vom 14. bis zum 17. Jahrhundert*. Stuttgart: Steiner.
- . 2008. *Das System des bargeldlosen Zahlungsverkehrs europäischer Prägung vom Mittelalter bis 1914*. Stuttgart: Steiner.
- Dijkman, Jessica. 2011. Debt Litigation in Medieval Holland, 1200–1350. In *Law and Long-Term Economic Change. A Eurasian Perspective*, eds. Jan Luiten van Zanden and Debin Ma, 221–243. Stanford: Stanford Economics and Finance.
- Dinges, Martin. 2000. Justiznutzung als soziale Kontrolle in der frühen Neuzeit. In *Kriminalitätsgeschichte. Beiträge zur Sozial- und Kulturgeschichte der Vormoderne*, eds. Andreas Blauert and Gerd Schwerhoff, 503–544. Konstanz: UVK.
- Doehaerd, Renée. 1941. *Les relations commerciales entre Gênes, la Belgique et l'Outremont d'après les archives notariales génoises aux XIIIe et XIVe siècles. Volume 1. Introduction*. Brussels/Rome: Palais des Académies/Academia Belgica.
- Drossbach, Gisela, ed. 2009. *Von der Ordnung zur Norm: Statuten in Mittelalter und Früher Neuzeit*. Paderborn: Ferdinand Schöningh.
- Dyer, Christopher. 1989. *Standards of Living in the Later Middle Ages. Social Change in England 1200–1520*. Cambridge: Cambridge University Press.
- Eggert, Manfred K.H. 2014. Artefakte. In *Handbuch Materielle Kultur. Bedeutung – Konzepte – Disziplinen*, eds. Stefanie Samida, Manfred K.H. Eggert, and Hans Peter Hahn, 169–173. Stuttgart: Metzler.

- Epstein, Steven A. 2009. *An Economic and Social History of Later Medieval Europe, 1000–1500*. Cambridge: Cambridge University Press.
- Fouquet, Gerhard. 2014. Geldgeschäfte im Auftrag des römischen Königs. Eberhard Windeck, Brügge, Lübeck und König Sigmund (1415–1417). *Zeitschrift für Historische Forschung* 41 (3): 375–399.
- Fusaro, Maria. 2014. Politics of Justice/Politics of Trade: Foreign Merchants and the Administration of Justice from the Records of Venice's *Giudici del Forestier*. *Mélanges de l'école française de Rome: Italie et Méditerranée modernes et contemporaines* 126 (1): 139–160.
- Geffcken, Peter, and Mark Häberlein, eds. 2014. *Rechnungsfragmente der Augsburger Welser-Gesellschaft (1496–1551)*. *Oberdeutscher Fernhandel am Beginn der neuzeitlichen Weltwirtschaft*. Stuttgart: Steiner.
- Goetz, Hans–Werner. 2012. *Proseminar Geschichte: Mittelalter*. Stuttgart: UTB.
- Goldberg, Jessica L. 2012. The Use and Abuse of Commercial Letters from the Cairo Geniza. *Journal of Medieval History* 38 (2): 127–154.
- Greif, Avner. 2002. Institutions and Impersonal Exchange. From Communal to Individual Responsibility. *Journal of Institutional and Theoretical Economics* 158 (1): 168–204.
- . 2006. History Lessons: The Birth of Impersonal Exchange: The Community Responsibility System and Impartial Justice. *The Journal of Economic Perspectives* 20 (2): 221–236.
- Grimm, Jacob. 1840–1878. *Weisthümer*, 6 parts. Göttingen: Dieterich.
- Groebner, Valentin. 1993. *Ökonomie ohne Haus. Zum Wirtschaften armer Leute in Nürnberg am Ende des 15. Jahrhunderts*. Göttingen: Vandenhoeck & Ruprecht.
- Henn, Volker. 1999. Die Statuten der Bauernbank von St. Severin vom 12. Juni 1384. In *Quellen zur Geschichte der Stadt Köln*, eds. Wolfgang Rosen and Lars Wirtler, vol. 1, 288–295. Köln: J. P. Bachem.
- Hook, Jochen, and Pierre Jeannin, eds. 1991. *Ars Mercatoria. Handbücher und Traktate für den Gebrauch des Kaufmanns 1470–1820, Band 1: 1470–1600*. Paderborn: Schöningh.
- Howell, Martha C. 2010. *Commerce Before Capitalism in Europe, 1300–1600*. Cambridge: Cambridge University Press.
- Hunt, Alan. 1996. *Governance of the Consuming Passions: A History of Sumptuary Law*. London: Macmillan Press.
- Jahnke, Carsten. 1998. Pfundzollrechnungen im Ostseeraum. Bestand und Fragen der Auswertung. In *Die preußischen Hansestädte und ihre Stellung im Nord- und Ostseeraum*, eds. Zenon Hubert Nowak et al., 153–170. Torun: Uniwersytet Mikołaja Kopernika.

- Johnson, Tom. 2014. The Preconstruction of Witness Testimony. Law and Social Discourse in England before the Reformation. *Law and History Review* 32: 127–147.
- Kovesi, Catherine. 2008. Women and Sumptuary Law. In *Fashion. Critical and Primary Sources, Vol. 1: Late Medieval to Renaissance*, ed. Peter McNeil, 110–129. Oxford: Berg Publishers.
- Kuchenbuch, Ludolf. 1999. Kerbhölzer in Alteuropa. Zwischen Dorfschmiede und Schatzamt. In *The Man of Many Devices Who Wandered Full Many Ways*, eds. Balazs Nagy and Marcell Sebök, 303–325. Budapest: CEU Press.
- . 2002. Pragmatische Rechenhaftigkeit? Kerbhölzer in Bild, Gestalt und Schrift. *Frühmittelalterliche Studien* 36: 469–490.
- Langholm, Odd. 2004. Wirtschaft/Wirtschaftsethik V. Kirchengeschichtlich V/2. Mittelalter. In *Theologische Realenzyklopädie*, eds. Gerhard Krause and Gerhard Müller, vol. 36, 153–159. Berlin: De Gruyter.
- Lesnikov, Michael P., ed. 1973. *Die Handelsbücher des hansischen Kaufmanns Veckinchusen*. Berlin: De Gruyter.
- Lesnikov, Michael P., Walter Stark, and Albrecht Cordes, eds. 2013. *Die Handelsbücher des Hildebrand Veckinchusen. Kontobücher und übrige Manuale*. Köln: Böhlau.
- Marzi, Werner, ed. 2011. *Das Ober-Ingelheimer Haderbuch 1467–85*. Alzey: Rhein Hessische Druckwerkstätte.
- Mollwo, Carl. 1901. *Das Handlungsbuch von Hermann und Johann Wittenborg*. Leipzig: Dyk.
- Munro, John H.A. 1991. The Central European Silver Mining Boom, Mint Outputs, and Prices in the Low Countries and England, 1450–1550. In *Money, Coins and Commerce: Essays in the Monetary History of Asia and Europe*, ed. Edouard van Cauwenberghe, 119–183. Leuven: Leuven University Press.
- Nicholas, David. 2007. Commercial Credit and Central Place Function in Thirteenth-Century Ypres. In *Money, Markets and Trade in Late Medieval Europe. Essays in Honour of John H.A. Munro*, eds. Lawrin Armstrong, Ivana Elbl, and Martin Elbl, 310–348. Boston: Brill.
- Nirrnheim, Hans, ed. 1895. *Das Handlungsbuch Vickos von Geldersen*. Hamburg: Leopold Voss.
- North, Douglass Cecil. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Piant, Hervé. 2007. Des procès innombrables. Éléments méthodologiques pour une histoire de la justice civile d'Ancien Régime. *Histoire & Mesure* 22: 13–38.

- Pryor, John H. 1981. *Business Contracts from Medieval Provence. Selected Notulae from the Cartulary of Giraud Almaric of Marseilles, 1248*. Toronto: The Pontifical Institute of Mediaeval Studies.
- Reichert, Folker. 2009. *Quellen zur Geschichte des Reisens im Spätmittelalter*. Darmstadt: wbg.
- Rothmann, Michael. 2008. Schulden vor Gericht. Die Frankfurter Messegerichtsbarkeit und der Messeprozess in Mittelalter und beginnender früher Neuzeit. In *Die Reichsstadt Frankfurt als Rechts- und Gerichtslandschaft im Römisch-Deutschen Reich*, eds. Anja Amend, Anette Baumann, Stephan Wendehorst, and Steffen Wunderlich, 285–303. München: De Gruyter.
- Safley, Thomas M. 2000. Bankruptcy, Family and Finance in Early Modern Europe. *Journal of Economic History* 29 (1): 53–75.
- Samida, Stefanie, Manfred Eggert, and Hans Peter Hahn. 2014. *Handbuch Materielle Kultur. Bedeutungen, Konzepte, Disziplinen*. Stuttgart: Metzler.
- Schulz, Martin. 2014. Bilder. In *Handbuch Materielle Kultur. Bedeutung – Konzepte – Disziplinen*, eds. Stefanie Samida, Manfred K.H. Eggert, and Hans Peter Hahn, 184–188. Stuttgart: Metzler.
- Signori, Gabriela. 2001. *Vorsorgen – Vererben – Erinnern. Kinder- und familienlose Erblasser in der städtischen Gesellschaft des Spätmittelalters*. Göttingen: Vandenhoeck & Ruprecht.
- . 2015. *Schuldenwirtschaft. Konsumenten- und Hypothekarkredite im spätmittelalterlichen Basel*. Konstanz: UVK.
- Simon-Muscheid, Katharina. 2004. *Die Dinge im Schnittpunkt sozialer Beziehungsnetze: Reden und Objekte im Alltag (Oberrhein, 14.–16. Jahrhundert)*. Göttingen: Vandenhoeck & Ruprecht.
- Smail, Daniel Lord. 2003. *The Consumption of Justice. Emotions, Publicity, and Legal Culture in Marseille, 1264–1423 (Conjunctions of Religion & Power in the Medieval Past)*. Ithaca: Cornell University Press.
- . 2016. *Legal Plunder: Households and Debt Collection in Late Medieval Europe*. Cambridge, MA: Harvard University Press.
- Steinbrink, Matthias. 2007. *Ulrich Meltinger. Ein Basler Kaufmann am Ende des 15. Jahrhunderts*. Stuttgart: Steiner.
- Taylor, Scott L. 2015. Law. In *Handbook of Medieval Culture. Fundamental Aspects and Conditions of European Middle Ages*, ed. Albrecht Classen, 836–863. Berlin: De Gruyter.
- Todeschini, Giacomo. 2004. *Ricchezza francescana: dalla povertà volontaria alla società di mercato*. Bologna: Il Mulino collana Intersezioni.
- von Heusinger, Sabine. 2009. *Die Zunft im Mittelalter. Zur Verflechtung von Politik, Wirtschaft und Gesellschaft in Straßburg*. Stuttgart: Steiner.

- Wedell, Moritz. 2011. *Zählen: Semantische und praxeologische Studien zum numerischen Wissen im Mittelalter*. Göttingen: Vandenhoeck & Ruprecht.
- Westermann, Ekkehard, and Markus A. Denzel. 2011. *Das Kaufmannsnotizbuch des Matthäus Schwarz aus Augsburg von 1548*. Stuttgart: Steiner.
- Wilson, Laurel Ann. 2017. Common Threads: A Reappraisal of Medieval European Sumptuary Law. In *Legal Encounters on the Medieval Globe*, ed. Elizabeth Lambourn, 141–166. Kalamazoo: Arc Humanities Press.
- Woolgar, Christopher, ed. 1992 and 1993. *Household Accounts from Medieval England*, 2 vols. Oxford: Oxford University Press.

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