

WEBS OF CREDIT AND USES OF CIVIL JUSTICE

The Case of 15th-Century Basel

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Abstract: This article discusses the contribution that quantitative methods such as network analysis and spatial analysis can make to the study of late medieval credit relations. Using the example of a civil court in Basel, the so-called *Schultheissengericht*, questions of access to justice as well as its use, network structures and the influence of various attributes are presented. The study is based on two samples of court records in the middle and at the end of the fifteenth century. On a further level, reflections will be made on the possibilities of presenting the results of quantitative and spatial analyses. The article describes asymmetries in the access to court and in the ways defaulted credit is negotiated in court, and discusses the topographies of debt within the city of Basel and in its hinterland.

Keywords: credit, network analysis, civil justice, use of justice, Basel

Introduction

The ubiquity of credit in premodern societies has become a commonplace observation, in long-distance trade as well as in local urban economy.¹ Credit in local settings was generally less formalised and consequently harder to observe;

1 As Daniel Lord Smail has put it, “For medieval historians, the matter is settled: credit was everywhere.” (Smail 2016, 90). With regard to urban economy, see for example Schuster 2008; Schuster 2014; Signori 2015; Gilomen 2007; Gilomen 2011; Gilomen 2014; Gilomen 2018.

quite often only disputed debts that have been the subject of legal proceedings left traces one can analyse today. This paper presents the main results of my research project on credit networks and the use of urban civil justice in late medieval Basel.² It covers three areas of interest. First, the people involved: Who used courts and what kind of procedure? What constellations of people could be observed? How did individual cases connect with others, thus creating network structures? The second perspective is one of court usage: What was the role of the court as an offer to litigate over credit? How did the court staff perform their function as arbitrators of conflicts? The last area of interest is the characteristics of credit as a relationship. Was credit merely an economic relation or was there more behind it, in concrete terms a social relation? What indications of long-lasting economic relationships do we have? What can be said about the moment when a transaction or a chain of transactions turn into credit?

My project tried to answer these questions with a combination of qualitative and quantitative approaches, the focus here being more on the quantitative analysis, in particular network analysis.³ Credit relations have been described and analysed as networks,⁴ stating that credit was based on networks and created networks at the same time.⁵ Formal network analyses, however, were only carried out on 19th century credit relations.⁶ Studies on premodern credit quite generally use the term *network*, but mostly in a metaphoric way.⁷ Thus, formal network analysis of medieval credit economy remains a desideratum.⁸

2 The research was conducted as a habilitation project; the manuscript titled “Ein Netz von Schulden. Schuldbeziehungen und Gerichtsnutzung im spätmittelalterlichen Basel” contains more details on the methodology and literature used.

3 For an overview of historical network analysis, see Bixler 2015; Düring, Eumann and Stark 2016; Düring and Stark 2011; Graham, Milligan and Weingart 2016; Lemerrier 2012; Nitschke 2016.

4 A selection of literature: Bolton 2011; Chilosi, Schulze and Volckart 2016; Clemens 2008; Von Doosselaere 2009; Gestrich and Stark 2015; Lipp 2007; Reupke and Stark 2015; Stark 2015; Vogel 2015; Wirtz 2010.

5 Crowston 2013, 12.

6 For examples, see Stark 2015; Reupke and Stark 2015; Vogel 2015. The statement is also based on a review of the collaborative bibliography on Zotero called “Historical Network Analysis”, https://www.zotero.org/groups/209983/historical_network_research (accessed on 10 February 2021).

7 Most prominently Muldrew 1998a, for ex. 95. To the metaphoric use of the term *network*, Ruggiu 2009, 73; Burkhardt 2014, 13; Düring and Kerschbaumer 2016, 31; Bixler 2015, 54.

8 Lipp 2007, 27.

Credit or Debt?

From a modern point of view, the terms *credit* and *debt* do not necessarily mean the same thing. The corresponding German terms⁹ suggest a distinction between a more contractual (*credit*) and a less restricted form (*debt*). But this distinction is rather hazy—especially since the use of legal procedures could serve as a means to actually formalise debts.¹⁰ While the German *Schuld* opens the semantic field of guilt,¹¹ the English and French term *credit* has a second meaning besides the material aspect, namely the dimension of a person's reputation that went beyond the knowledge about the person's financial situation.¹² Craig Muldrew claims that the two dimensions of the term could not be separated in premodern societies; thus, credit and reputation were in constant circulation.¹³ The sources of the civil justice in the city of Basel use mainly the term *debt* (*schuld sein*) to describe all sorts of situations of indebtedness.¹⁴ Aspects of reputation and trust are nonetheless present in these sources, as some examples show.¹⁵ While the sources do not distinguish forms of credit or debt by the use of specified expressions, it is still necessary to contextualise the choice of wording in this paper. In light of these considerations, I decided to use the term *credit*.¹⁶ It stands here for all sorts of situations where one person owes something—money, things, or work force—to another person. Credit is generally measured in terms of monetary value and always involves time as a crucial factor.¹⁷

The credit relations examined in this paper are quite manifold—but in general, the credit only appears in the records after a longer preliminary period, only when the debtor failed to pay his due. Mostly, the court records do not mention how the credit first came into existence. One type of source can help out here. Testimonies recorded in court for the use as evidence in lawsuits tell stories from the perspective of people present in various transactions. In my study, I examined such stories in detail. Here, it seems necessary at least to note that actual money-lending was relatively rare compared to the numerous sales of consumer and pro-

9 *Kredit* and *Schuld*.

10 Reifner 2015, 380–382.

11 As does the French *dette*, see Fontaine 2008a, 19.

12 Crowston 2011, 11; Fontaine 2008a, 20.

13 Muldrew 2008b, 75.

14 This is similar to the situation in France as described by Claustre 2014, 39.

15 StABS, Gerichtsarchiv D 6, fol. 93v; StABS, Gerichtsarchiv D 6, fol. 62v.

16 In German, I prefer *Schuld/Schulden*.

17 See the definition of *dette* by Claustre 2014, 37–38.

duction goods. In such situations, sale transactions turned into credit where the creditor was not always willing to extend credit.¹⁸

Sources and Approaches

The records of the court in question comprise about 160 volumes, a mass of sources that can never be handled by any research project, let alone by one person alone.¹⁹ Thus, I decided to work with two samples of one year each, namely 1455 and 1497 AD. The samples were chosen for their proximity to tax rolls which allowed to identify many individuals and obtain additional data on their wealth, address within Basel, and profession.²⁰ For each sample, I coded approximately 900 credit relations, further split up into various court procedures.

The data of these two samples can cover two areas of research. The first mentioned here is the use of the courts, where data on wealth, place of origin, and sex can help to describe a differentiated use of the court and the procedures it offered as one means of collecting debts. The second area is of course credit itself. One has to consider, though, that only a minor part of all credits were negotiated in court. Only if the debtor failed to pay back and if the creditor subsequently chose to go to court (among other options) was a trace of the debt handed down. It is impossible to know what proportion of the total volume of credit these court records represent, but probably it was only a small part.²¹ For a credit-based economy to function, a sufficiently large proportion of credits should be paid back more or less on time, and given the social embeddedness of credit,²² other, less escalating ways of debt recollection were probably quite common. The object of my research is therefore not credit in general but conflictual credit brought to court—an observation that ties the two aspects together.

18 Smail 2003, 144–145.

19 Hagemann 1987, 6; Signori 2015, 20; see more generally about the problem of the mass of serial sources Piant 2007.

20 See Schönberg 1879, 594–689; Degler-Spengler 1974. Localisation was only possible for the 1497 sample and the (larger) part of Basel south of the Rhine river. I am very thankful to my colleague Andreas Gehringer for digitising and georeferencing the 1497 tax roll.

21 Gilomen 2011, 122, compared a list of about 200 debtors to a deceased merchant in Basel with the debt recognitions in the court records of the era and found only one coincidence. See Muldrew 1998a, 117 and 178, for some speculations as to the proportion of “desparate debts” and the total number of credit transactions in an early modern English town. Muldrew estimates the proportion of credit transactions reaches up to 90 per cent, with 5 to 7 per cent credit failures.

22 Crowston 2011, 15.

This paper not only presents results from a quantitative analysis but it tries at the same time to evaluate the possibilities of representation. The data I collected is relational (ties of credit between individuals), georeferenced (villages and cities outside Basel for both samples, address-level in Basel for the 1497 sample), and contains attributes like sex and wealth (for those individuals identified on a tax roll) as well as information about the type of court procedure. For each hypothesis in the two domains of research mentioned above, I propose the analysis and representation that in my opinion suits the data best—in the sense that they allow a solid reflection on the hypotheses I made.²³ This paper thus contains a selection of the most speaking graphs, tables, and maps that resulted from my research project on the networks of credit in late medieval Basel. It is important to note here that a beautiful image does not represent a result of research in itself. In the process of research, I created many more visual representations which will never appear in a publication—but even the discarded visualisations were of great help for formulating questions and enhancing the design of my research.²⁴

Using Civil Justice

The so-called *Schultheissengericht*²⁵ where cases of credit were negotiated was a lay court. A number of well-to-do citizens formed a jury, the role of the judge was limited to conducting the trial. Jurors only received a minor attendance fee, but profited from the high prestige of the function—many of them ended up in high political positions. The court offered various procedures of debt recollection. The most accessible option consisted of the recording of debt recognitions. If the debtor agreed, the entry in the court book was free of charge. Seizures were a bit more conflictual. The court records distinguish two forms. Seizures of movables were nearly as frequent as debt recognitions and quite widely used, seizures of real estate were used more restrictedly, mainly for failure to pay interest on annuities or feudal duties. Seizures were to be confirmed by the creditor on three occasions, only after the last time could the goods actually be sold. The most conflict-prone form were the actual lawsuits, where the debtor tried to worm out of

23 Cf. Düring and Kerschbaumer 2016, 36–37.

24 To the role of visualisations in the domain of historical network research see Eumann 2016, 127; Reupke and Volk 2013, 310; Düring and Kerschbaumer 2016, 43; Bixler 2015, 61.

25 Hagemann 1987, 18–68; Signori 2015.

any obligation to pay immediately. The different forms of procedures were recorded in particular series of codices.²⁶

Differentiated Access to Justice

At a first glance, the *Schultheissengericht* was easily accessible. It convened locally on a nearly daily basis, and costs of procedures were comparatively low.²⁷ And indeed, one can find people from all social strata, men and women, from poor domestic servants to rich patricians! But the quantitative analysis of the samples allows for a more differentiated perspective. The comparison of the number of households for each category of wealth to the number of people actually represented in court records shows that not all people could make use of the court in the same ways (see Figure 1). The richer the people, the larger the proportion of people found in court. The data for the 1497 sample are a bit less distinctive, due to the fact that only three categories of wealth could be formed. But the overall tendency is the same. Considering that the jury was formed by the (future) political elite of the city, it can be argued that the court was above all an institution for the economic and social elite, populated by the elite.

A second characteristic to analyse is sex. Approximately 15 per cent of all people found in the court records were women. They appear a bit more frequently in the role of a creditor. But this percentage misrepresents the role of women in the credit economy. When real estate served as a collateral and was threatened with seizure, women were often involved without being mentioned. Property deeds regularly mention the buyer's or seller's wife, though often without a name.²⁸ Joint liability probably existed in many cases where only men appeared in court. When a husband was absent, on the other hand, their wives could step in and negotiate the couple's or the husband's debts in court.²⁹ Among the women

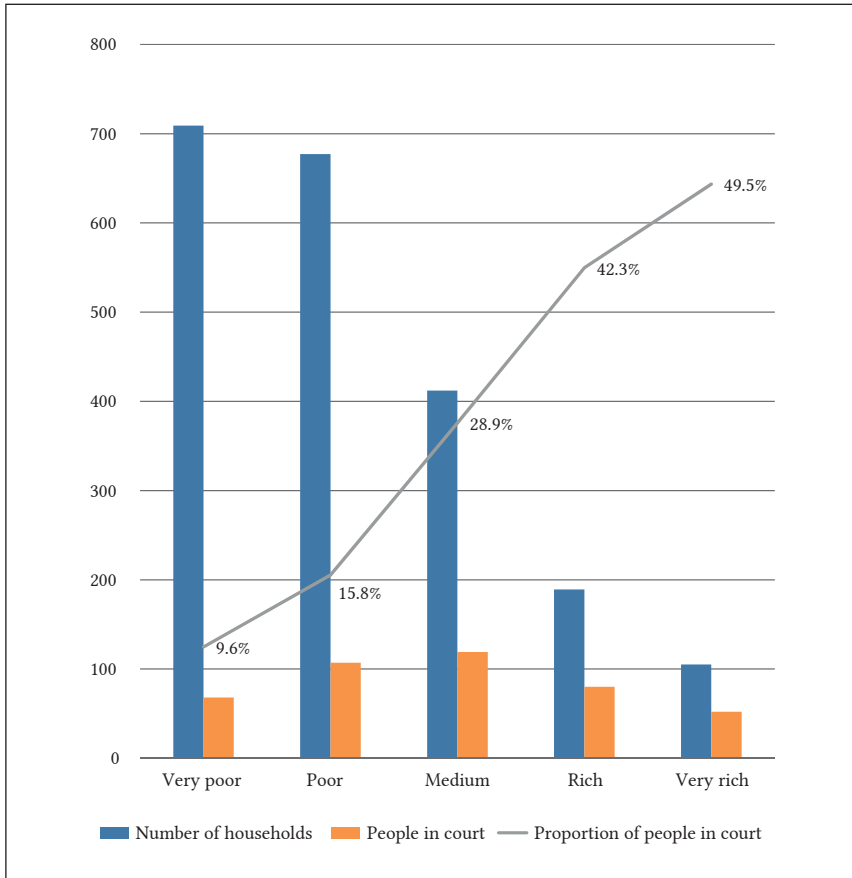
26 For example StABS, Gerichtsarchiv A (*Urteilsbücher*, i.e. verdicts); StABS, Gerichtsarchiv C (*Vergichtbücher*, i.e. debt recognitions); StABS, Gerichtsarchiv E (*Frönungen und Verbote*, i.e. seizures).

27 Hagemann 1987, 104–105. Unfortunately, the exact cost of a procedure cannot be evaluated. The court seemed relatively inexpensive in comparison with the ecclesiastical courts (see Albert 1998, 77 and 85).

28 StABS, Gerichtsarchiv B (the so-called *Fertigungsbücher* recorded property deeds). The number of mentions is quite high in the 1455 sample and somewhat lower in the later sample. But at this time, a new legislation had been imposed, according to which real estate was generally common property of husband and wife (Signori 2015, 71).

29 StABS, Gerichtsarchiv C 6, fol. 37v; StABS, Gerichtsarchiv C 16, fol. 47v; see also Fontaine 2008a, 150–151.

Figure 1 Participation in court procedures according to wealth category, 1455 sample.



who appeared in court, widows were well represented. They could pursue their affairs without legal representation.³⁰ But not all cases of the use of justice by women could be explained by such particular circumstances. In many situations, women could go to court just like men. Thus, I would describe the difference between sexes as a quantitative rather than a qualitative matter. To obtain a better understanding of the underrepresentation of women in the court records, the pro-

³⁰ I will not go into detail here as the impact of the obligation to be represented legally is highly unclear (see for Basel Hagemann 1987, 144; Gilomen 2014, 117; Signori 1999). It seems to me that there was a considerable gap between quite rigid norms and manifold ways of handling representation in practice (see Schneider 2000).

portions mentioned above can be compared to the proportion of households in the tax rolls that have female heads of household. For both samples, the proportion of female heads of household is higher in the tax roll than the proportion of female users of justice. As has been observed with regard to criminal justice,³¹ women had less access to civil justice. Court records, therefore, seem to be a bad means to measure female participation in the urban economy.

The 1497 data allows for the analysis of the geographical distribution in the city of Basel. When looking at categories like wealth and sex, I did consider the actual role in court in detail. Certainly, it did make a decisive difference whether one was in the role of a debtor or creditor. For the geographical analysis presented here, I take that difference into account. In order to represent the participation in justice as a debtor or creditor, I divided the city map into squares and calculated the proportion of people in court in one role or the other in comparison to the total number of households in the square. Figure 2 and Figure 3 show that while creditors were much more concentrated in the city centre around the market place, debtors are scattered more regularly over the whole city, with some peripheral places with quite high proportions (coloured red), but also many debtors in the city centre. This result corroborates the observations made above, since it is known for Basel that the wealthy were mainly concentrated in the centre.³² And it confirms that it is their role as a creditor that is mostly responsible for their over-representation. But how can we interpret this concentration of creditors in the centre? Knowing that economic transactions took place in public places like markets, but also in private houses, we can now imagine people from all over the city going to central places in order to buy consumer goods or obtain a loan.

How can we know if the interpretations we make based on geographical representations are valid? I claimed in the introduction that representations often serve as a base for further analysis. This was the case here: I used the concept of spatial autocorrelation (LISA),³³ which detects patterns of geographical structures that have similar values for a variable (here the proportion of creditors). Each grid square with a significant result is assigned to one of four possible categories and coloured accordingly (see Figure 4). Bright red stands for squares with a high proportion with similar neighbours, faint red for squares with a high proportion but with different neighbours. Bright blue stands for low proportion and similar neighbours, and faint blue finally for low proportion and different neighbours. The result confirms mainly the strong concentration in the city centre, while the low proportion in the periphery is less distinct. The same analysis for debtors is

31 Burghartz 1991.

32 Simon-Muscheid 1988, 199.

33 The concept goes back to Anselin 1995.

Figure 2 Densities of participation in credit relations as a creditor (the redder the square, the more frequent the participation as a creditor), 1497 sample.

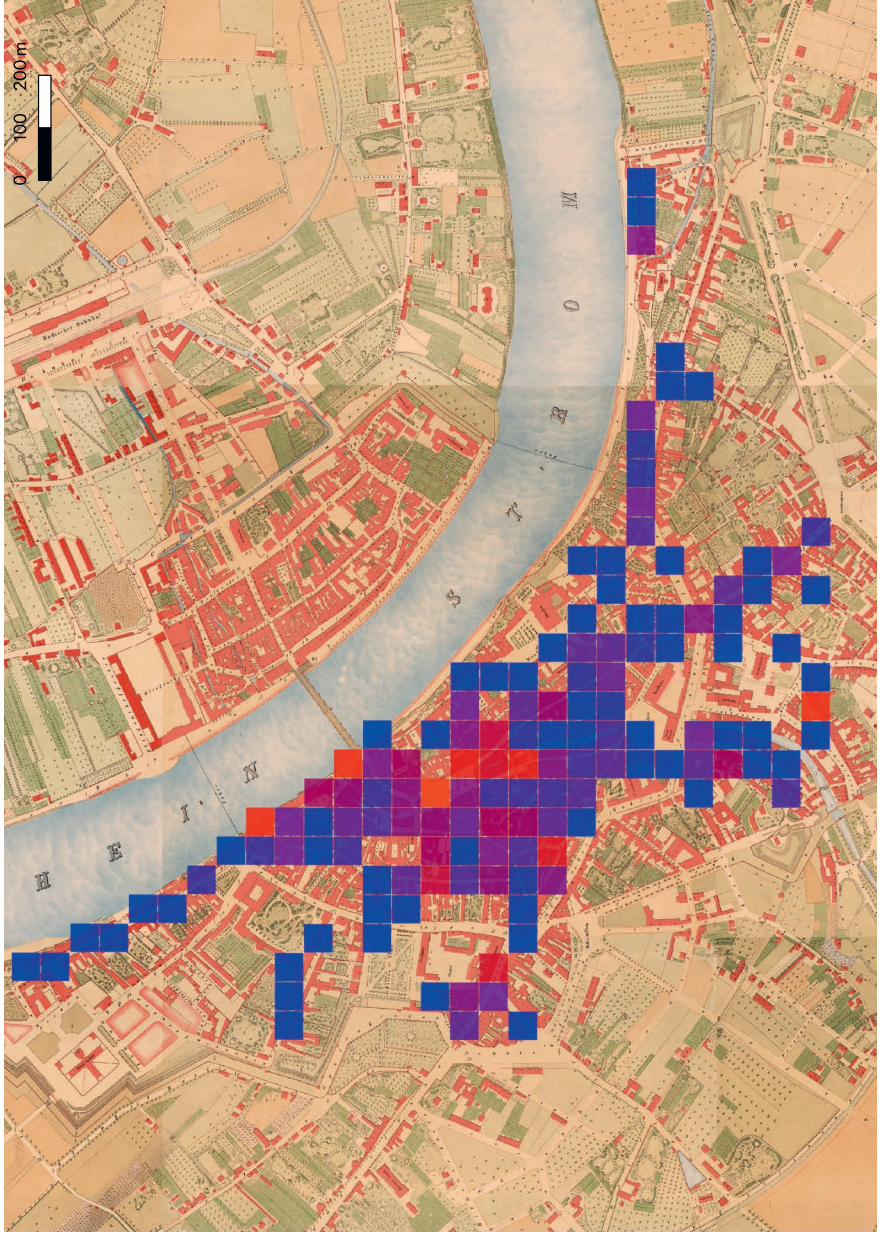


Figure 3 Densities of participation in credit relations as debtor (the redder the square, the more frequent the participation as a debtor), 1497 sample.

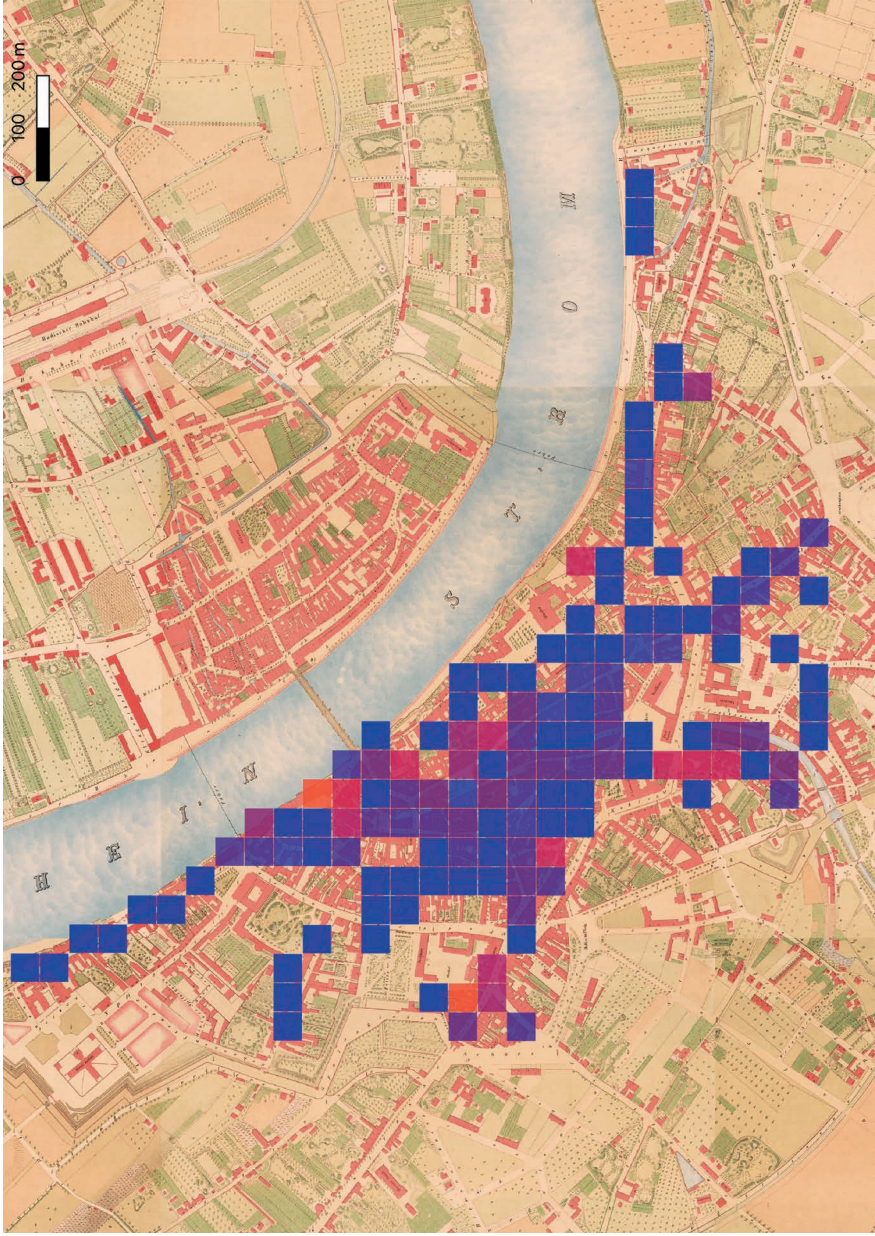
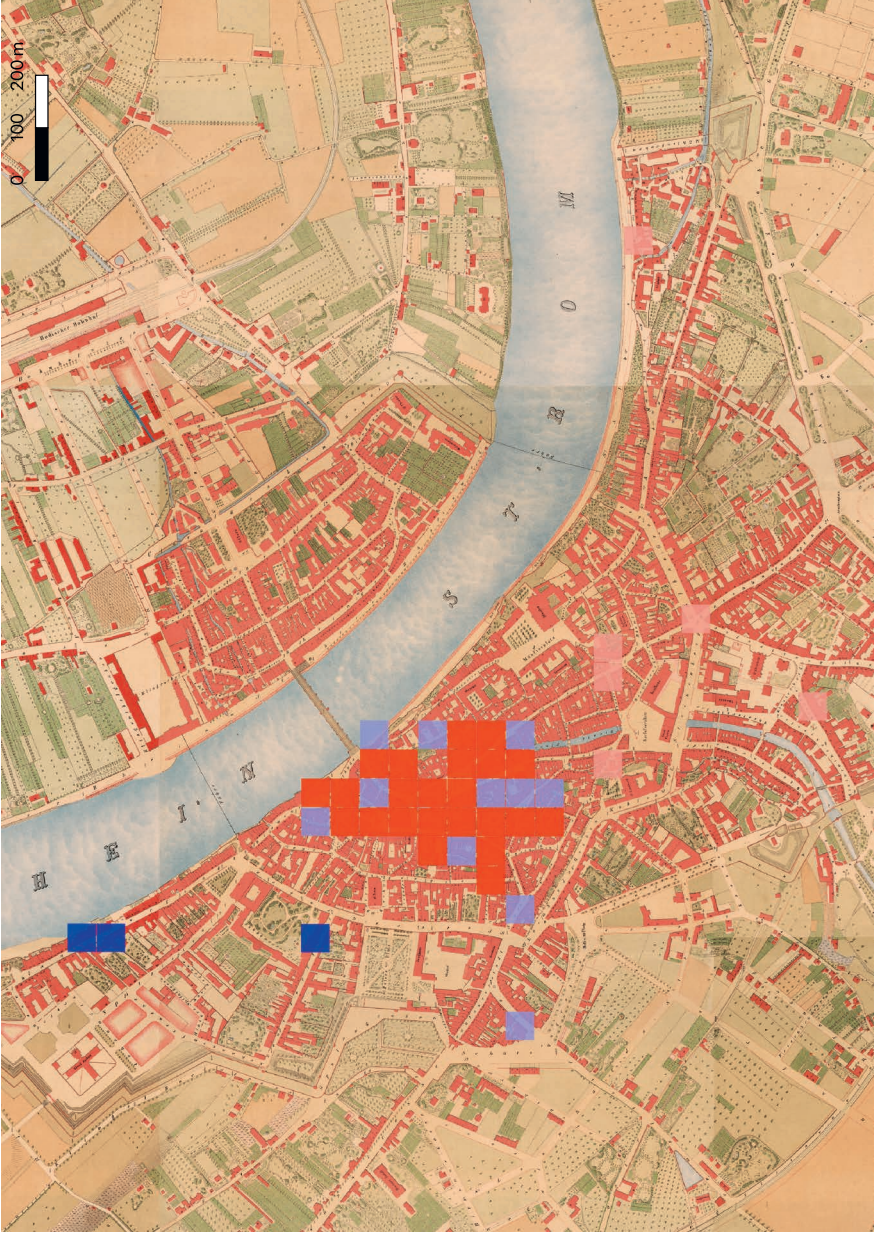


Figure 4 Spatial autocorrelation (LISA), squares with significant patterns of autocorrelation. The chart shows a massive concentration of frequent creditors in the city centre.



less clear and therefore not shown here—but in accordance with the observation of a more regular distribution over the city. In light of this additional analysis, the interpretations made above based on visual observation are confirmed by statistical means.

Apart from the important distinction between the use of justice as a creditor and the much less voluntary apparition in court as a debtor, the use of different court procedures present an interesting object of research. The choice of procedure varied with different aspects, of which I pick two, firstly the sum at stake, and secondly the category of wealth of the people involved. Table 1 shows the mean and median sum at stake for the four most frequent types of procedure in the 1497 sample.³⁴ The difference between the two indicators of central tendency

Table 1 Mean and median of the amount owed in the 1497 sample.

Procedure	Mean amount	Median Amount	Number of Values	Percentage of cases
Debt recognition	7.6	2.8	190	66.2%
Seizure of moveable goods	15.1	2.7	124	55.6%
Seizure of real estate	24.6	3.5	21	58.3%
Lawsuit	85.2	10.0	55	34.0%

indicates an unequal distribution. Whatever the procedure, a large number of rather small amounts that lead to a low median value is combined with a few high amounts that are responsible for a higher mean value. The more conflictual the procedure, the higher the difference between mean and median. Only the actual lawsuits involved distinctly higher amounts—although this observation is somewhat put into perspective by the many cases without a known amount of debt. All in all, this is what one would expect—the more money at stake, the higher the willingness to pursue the case against all resistance. By the way, statistical methods indicate that the differences observed were not accidental.³⁵

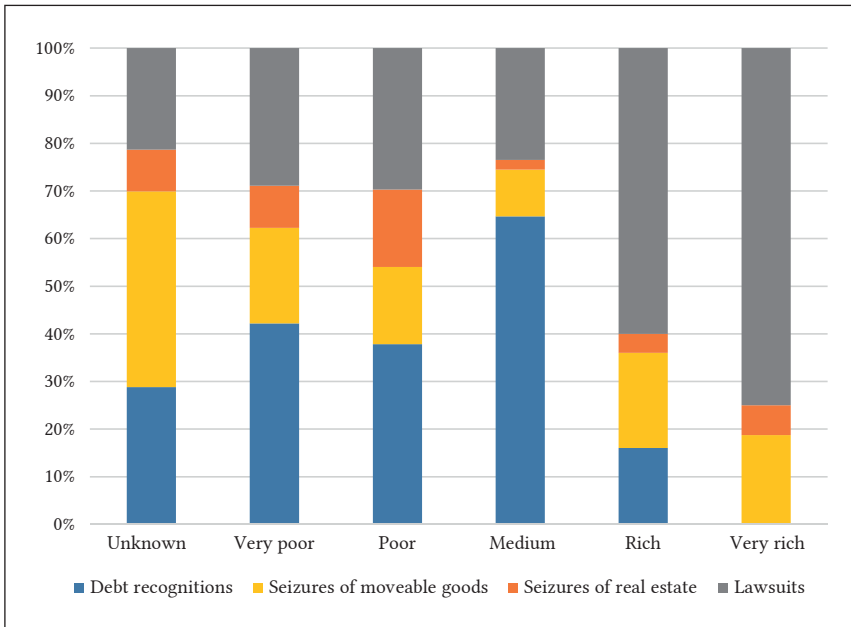
The second observation is that the choice of procedure is not only linked to the sum at stake but also to the wealth of the people involved. Interestingly, the

³⁴ The 1455 sample allows less detailed analyses, since the records mentioned debt amounts less frequently.

³⁵ Both analysis of variance (ANOVA) and mood's median test proved significant at a 5 per cent level.

wealth of the creditor made less difference than the wealth of the debtor. The former had a slightly higher inclination to sue and to use debt recognitions at the expense of seizure when they were richer—the tendency of this is unclear as it combines the most conflictual with the least conflictual procedure. As debtors, on the other hand, rich people were virtually not subject to (voluntary) debt recognitions but to lawsuits (see Figure 5). Surprisingly, seizures of real estate

Figure 5 Frequency of court procedures for wealth categories, 1455 sample.



affected the poorer people much more frequently. This indicates that the poorest were probably completely absent (as seen above, richer people were proportionally more involved in justice). While poorer debtors were either subject to the threat of seizure or trying to uphold their obligations by promising to pay back their credits, richer people were involved in more conflictual cases—the omnipresent question for poorer people, if and how they could pay their due, receded behind conflicts over whether there was any debt at all. This observation leads to questions about the role of the court in the urban credit economy of Basel. Therefore, the next chapter tries to describe the court as an institution.

The Court as an Institution

Taking a case of unpaid credit to court certainly meant escalation.³⁶ As we have seen, the choice of procedure depended on factors like the sum at stake or the wealth of the people involved. Other factors rather prevented people from going to court. In both samples, cases of dispute within families or among neighbours³⁷ were quite rare. People who were socially close tended to use other means for resolving their conflicts. It was only when all other means had failed that people resorted to the courts. Accordingly, the cases where family or neighbours were involved look like stories of formerly good relations going “bad”. The data on usage of justice as well as the relational data discussed below suggest that the court played an important role for all those credit relations that were not based on other, social relations. As a relatively low-threshold service, the court facilitated the extension of credit—in case of default, it gave creditors efficient means to recover debt. But how did this happen?

The analysis of debt recognitions that often took the form of promises of payment speaks in favour of their efficiency. People generally seemed to keep their promise and pay more or less within the given timeframe.³⁸ The promises of payment often mentioned additional securities. Only a minor and decreasing part of those securities were pawns that could be turned into money immediately. Mostly, people promised to come to town and stay there until the matter was settled (when they were not residents of Basel), or they promised to pay all at once if they missed one instalment (when such a payment was arranged), or simply to pay additional costs arising from the pursuit of their debts. In a majority of cases, thus, creditors were simply given the means to take the case to court again.

Cases of seizure were similar in the sense that the opening of proceedings did not allow direct access to the debtor’s property. The creditor had to wait at least six weeks and repeat his claims thrice to obtain permission to actually access the assets. Even so, several judgements show that the debtors could raise objection, forcing the creditor to further proceedings. In the 1455 sample, the clerks noted the three dates regularly in the court book.³⁹ Implying that the creditor did not reappear when no further dates are noted, I could estimate a (maximum) number of abandoned cases. Only half of the cases contained the three dates—and consid-

36 Smail 2003, 87.

37 Neighbourhood was measured by distance between people in the 1497 sample. As I could not locate people this precisely for the 1455 sample, I looked at cases within one street (the tax roll being grouped by street).

38 Generally, one month, but other arrangements could be made, often giving the debtor more time. See Signori 2015, 138, concerning the efficiency of debt recognitions.

39 StABS, Gerichtsarchiv E 4, fol 5r–22v.

erably more frequently when a dead person's debt was at stake. So while seizures could lead to actual confiscation of goods and public auctions, engaging a procedure mostly forced debtors to negotiate their debts (hence the higher proportion of actual seizures when the debtor was dead—he could no longer negotiate). Taking a case to court did not necessarily mean to bring it to a judgement—rather on the contrary. Actual verdicts were seldom, it seems that the court served as a means of leverage in an attempt to negotiate a solution outside the court.⁴⁰

The entries of the so-called verdicts book (*Urteilsbuch*) show best how the court saw its own role as an arbitrator rather than a judge. One of the most frequent decisions of the court consisted of adjourning cases in order to give the parties time for further negotiations or to produce evidence. The jurors could also simply refuse to decide a case, admonishing the parties to solve their problem otherwise.⁴¹ Sometimes the court would propose possible arbitrations. Such verdicts generally offered to look into the matter again if the arbitration outside the court failed. The court records often mention arbitration, either in verdicts that were necessary because it had failed, or in the series of debt recognitions, where the repayment arrangement was presented as a result of arbitration. Quite often, court clerks were at the origin of such arbitration. The court even went so far as to present their own verdicts as arbitration!⁴²

All in all, the court tried to prevent conflicts from escalation. The abrupt disappearance of cases from the court records serves as an indicator of a finally successful to and fro between court procedures and out-of-court negotiations.⁴³ Only a minority of cases dragged on for a long time, forcing the court to utter a final verdict. If one only looked at these exceptional cases, one would have a completely wrong idea of the functioning of the court and the use people made of it. Mostly, people could find arrangements—combining the patience of the creditors with the obligation of the debtor to finally pay, if not with cash, then with their possessions or their work force.

40 This is no particularity of Basel, see for example Smail 2003.

41 There are numerous examples in StABS, Gerichtsarchiv A 26; StABS, Gerichtsarchiv A 41.

42 StABS, Gerichtsarchiv A 26, fol. 74r; StABS, Gerichtsarchiv A 26, fol. 83r; StABS, Gerichtsarchiv C 16, fol. 48r.

43 This observation is in line with research on the so-called *infrajudiciaire* (Garnot 1996; Loetz 2000; Piant 2006, 208).

Topography of Credit

Since the proclamation of the so-called *spatial turn*,⁴⁴ historians have turned their attention to spatial aspects. The geo-referencing of households in Basel thanks to tax rolls and the identification of villages and towns in the surroundings of Basel allowed spatial analysis of credit relations. In this section, I look at representations of those aspects.

Credit in the Surroundings of Basel

Many of the places from which people came to Basel to negotiate their debts could be identified and thus represented using GIS technology.⁴⁵ But what data should be used for such a representation? I very much wanted to avoid showing modern boundaries and transportation like motorways and railways, as would have been the case when using modern, freely accessible maps.⁴⁶ There are no contemporary maps of sufficient precision to use with GIS, so I had to combine the data that seemed to make sense myself. I decided to focus on topographic aspects, combing elevation data with waters and forest data.⁴⁷ The first are obviously very stable over time, the latter considerably less so, but still useful to identify places with a high level of forest vegetation. To complete the picture, I added larger places—based on current data, as contemporary data is not available in an edited form.⁴⁸ Figure 6 and Figure 7 show the area around Basel (represented as a bright blue circle), representing creditors as green and debtors as red dots. The size of the dots indicates the number of credit relations in connection with a place (the green dots are a bit bigger in general, but in the background, allowing better visibility in case there were creditors and debtors at one place).

The representations are quite similar for both samples: the immediate vicinity of Basel shows a dense pattern; more remote regions show less density. The role of debtor predominates, but with increasing distance from Basel, the propor-

44 Rau 2013; Schwerhoff 2011, 11.

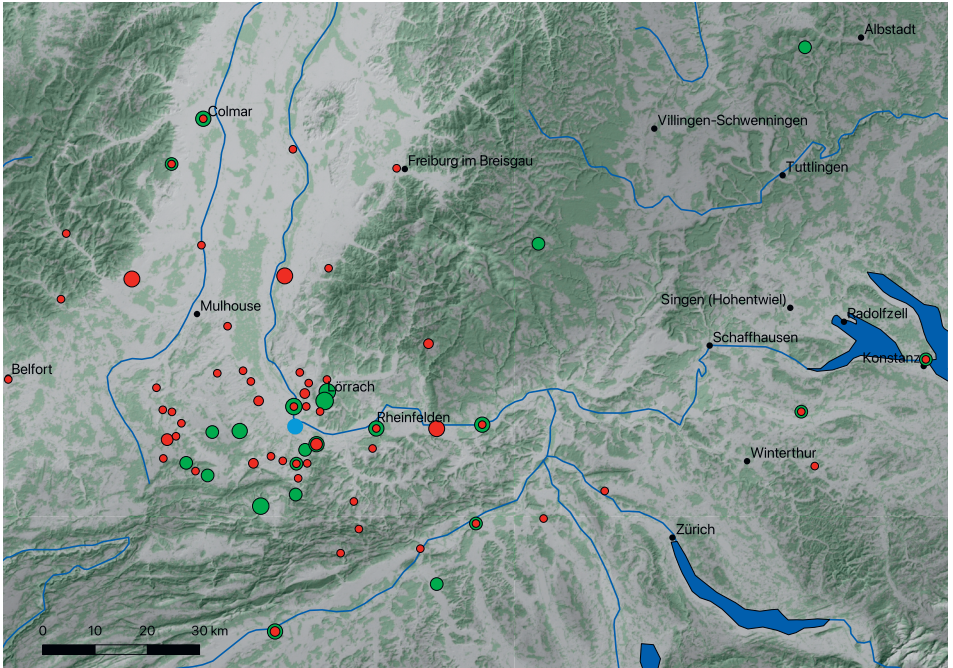
45 I worked with QGIS, an open source GIS program (<https://qgis.org>, accessed on 10 February 2021). For the field of historical GIS, see for example Geddes, Gregory 2014; Lilley, Porter 2016.

46 Like for example open street map (<https://www.openstreetmap.org>, accessed on 10 February 2021).

47 https://data.europa.eu/euodp/data/dataset/data_eu-dem; <http://www.naturalearthdata.com/downloads/110m-physical-vectors>; <https://forest.jrc.ec.europa.eu/en/past-activities/forest-mapping/#Downloadforestmaps> (all links accessed on 10 February 2021).

48 www.mapcruzin.com (accessed on 10 February 202).

Figure 6 Geographical distribution of creditors (green) and debtors (red) in the surroundings of Basel, 1455 sample. Larger points mean a larger number of debt relationships and/or persons.

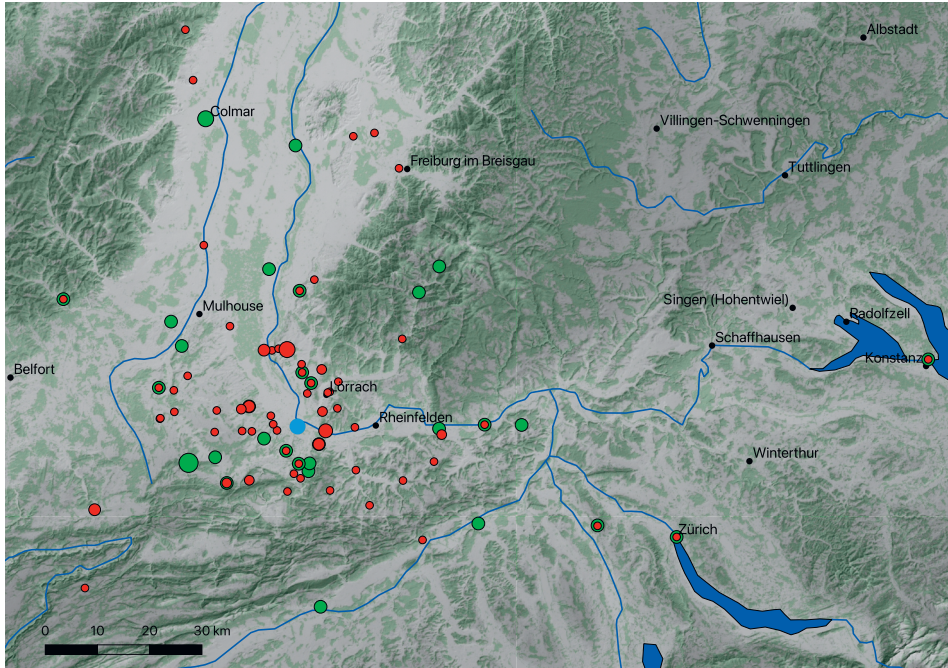


tion of creditors increases—in the more distant regions not represented here, the ratio is even inverted. It seems that not only the roles change with increasing distance but also the distribution over space. To test this hypothesis, I calculated the centres of gravity for the patterns of debtors and creditors. The centre of gravity serves as a kind of average location.⁴⁹ One calculation was made only with people within a 40 km radius from Basel; the other calculation included all persons. The result is presented in Figure 8; the centres of gravity for the immediate environment are shown as rhombuses, the others as circles.

The short distance of the diamond symbols from the city of Basel indicates that in the urban hinterland, creditors as well as debtors were found regularly. The less populated, hilly and forested areas north and south of Basel occur less frequently as places of origin, but the effects cancel each other out. In the overall perspective, on the other hand, one can see more marked differences. While the debtors' cen-

⁴⁹ It is actually calculated as an average of longitude and latitude.

Figure 7 Geographical distribution of creditors (green) and debtors (red) in the surroundings of Basel, 1497 sample. Larger points mean a larger number of debt relationships and/or persons.



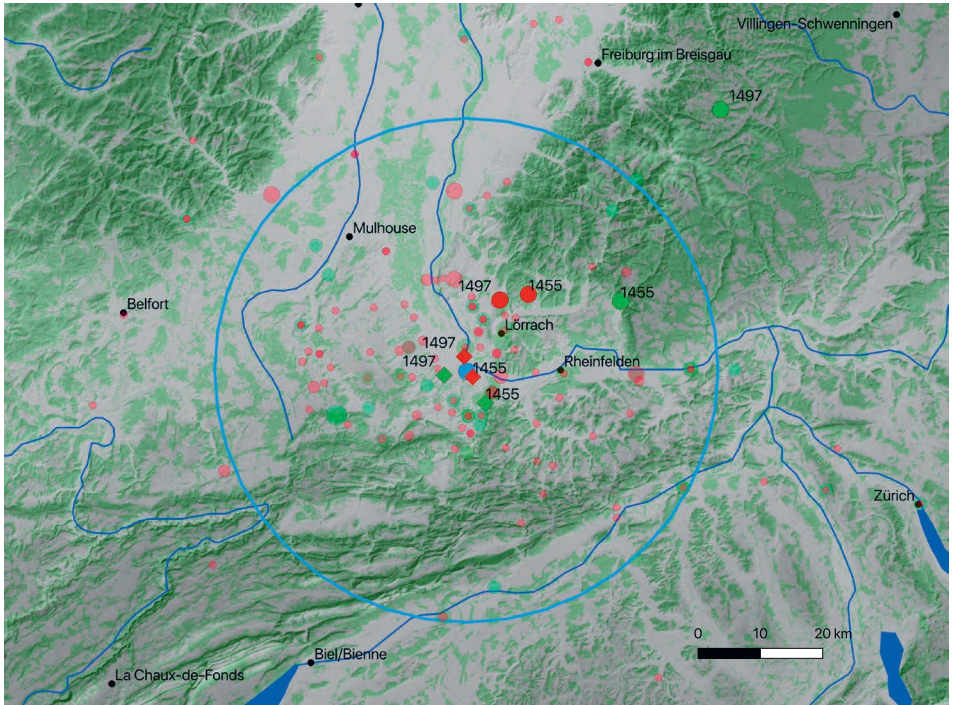
tres of gravity deviate only slightly to the north, the creditors' deviation to the North-East is striking. These observations point to different types of economic interdependence. Basel can be perceived as an urban economic centre with a rural hinterland whose credit needs are met in the city. This confirms quite traditional views,⁵⁰ but the presence of creditors in this area should not be neglected. The economic integration with the hinterland was not one-sided. In a wider regional context, the distribution of (mainly) creditors shows the integration into the empire's economy.⁵¹

As in the case of the network representations, it is evident that topographic representations are often only the starting point for further considerations and

50 Rippmann 1990, 132; Steinbrink 2007, 74; Gilomen 1998.

51 Basel was not yet part of the Swiss Confederation—it would be interesting to compare the patterns fifty years later to see to what extent the membership in the Confederation changed the economic integration.

Figure 8 Centres of gravity of the distribution of creditors (green) and debtors (red) from outside Basel, both samples.



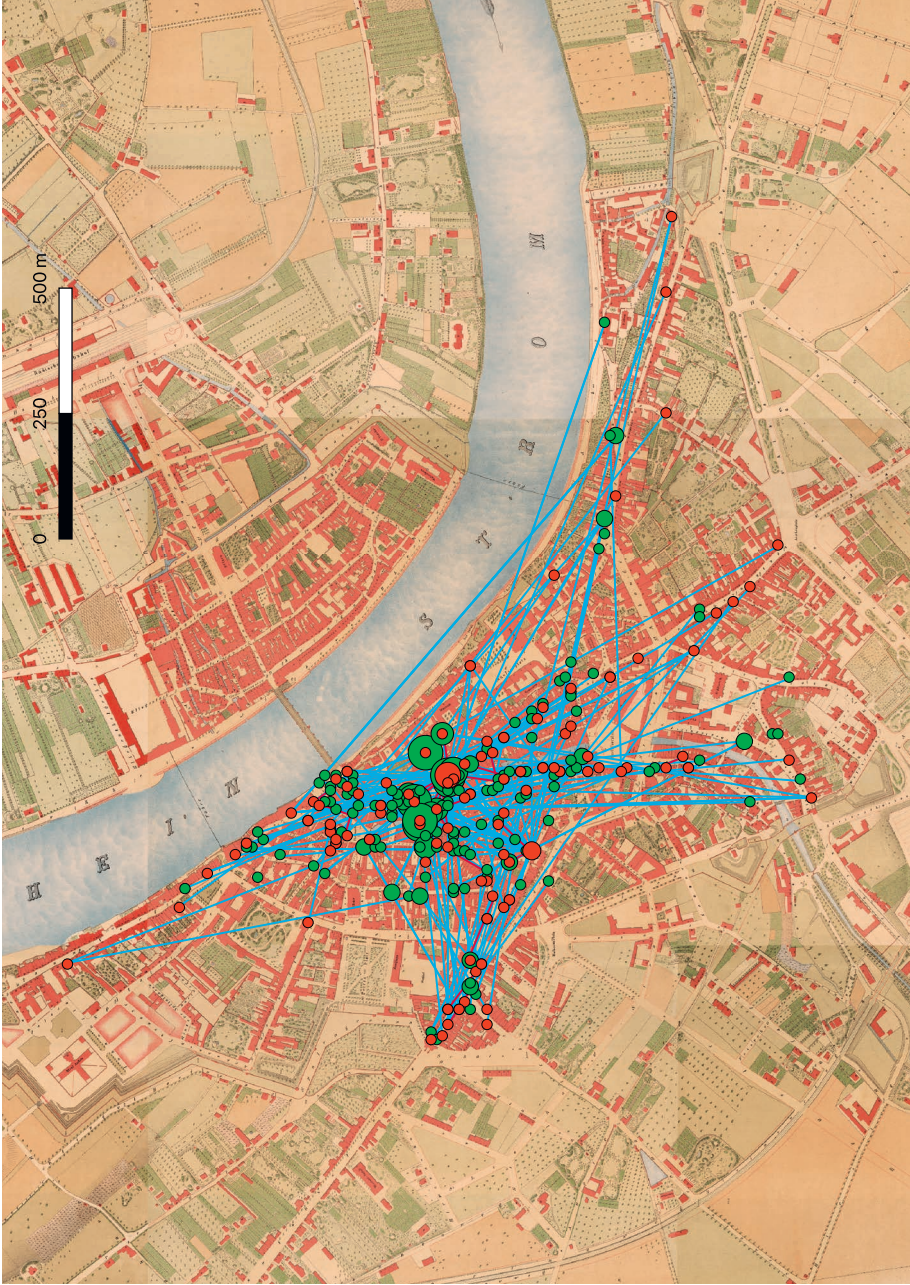
analyses. In this case, the hypotheses concerning the differentiated dispersion of individuals could be tested by means of calculations of the centre of gravity.

Credit in the City of Basel

For the representation of credit relationships within the city of Basel, I chose a city map established in the nineteenth century, one of the first to be geometrically precise enough to allow easy integration into GIS software.⁵² The relative stability of the city's topography since the late Middle Ages justifies this choice, although one must consider city growth. Not all the suburbs visible on the map were actually populated around 1500. Figure 9 shows a possible representation of credit relations in the city. As usual for the representations in this paper, debtors

⁵² Source: Geodata of the Canton of Basel, <https://shop.geo.bs.ch> (accessed on 10 February 2021).

Figure 9 Topography of credit relations in the city of Basel, 1497 sample.



are marked as red, creditors as green circles. The size of the circle stands for the number of incoming credit relations of a person (in network terms: the indegree). As the tax rolls do not allow a precise localisation of people from the part of the city north of the Rhine, they are not represented here.⁵³

The observations made above, concerning the distribution of creditors and debtors over the city perimeter, are confirmed. The resulting pattern of credit relations—every relation is drawn as a blue or red line, the red lines standing for credit relations with a distance of less than 100 metres—shows a clear hub-and-spoke structure. With the exception of one suburb (the *Spalenvorstadt*, inhabited by relatively rich people occupied in the transportation business⁵⁴), the short-distance credit relations were concentrated in the city centre around the market place and in a second centre at the bridge head of the only Rhine bridge. Although creditors were also present in the suburbs (albeit much less frequently), they were generally in connection with debtors from relatively distant places.

For further analysis, I calculated the distance of credit relationships, which averaged 310 metres. This distance can be put in perspective by calculating the average distance between all people found in the sample, which amounted to approximately 400 metres. Given the concentration of creditors in the centre—which suggests short distances—the difference is small, indicating widely spread credit relations and confirming the hub-and-spoke structure.

Networks of Credit

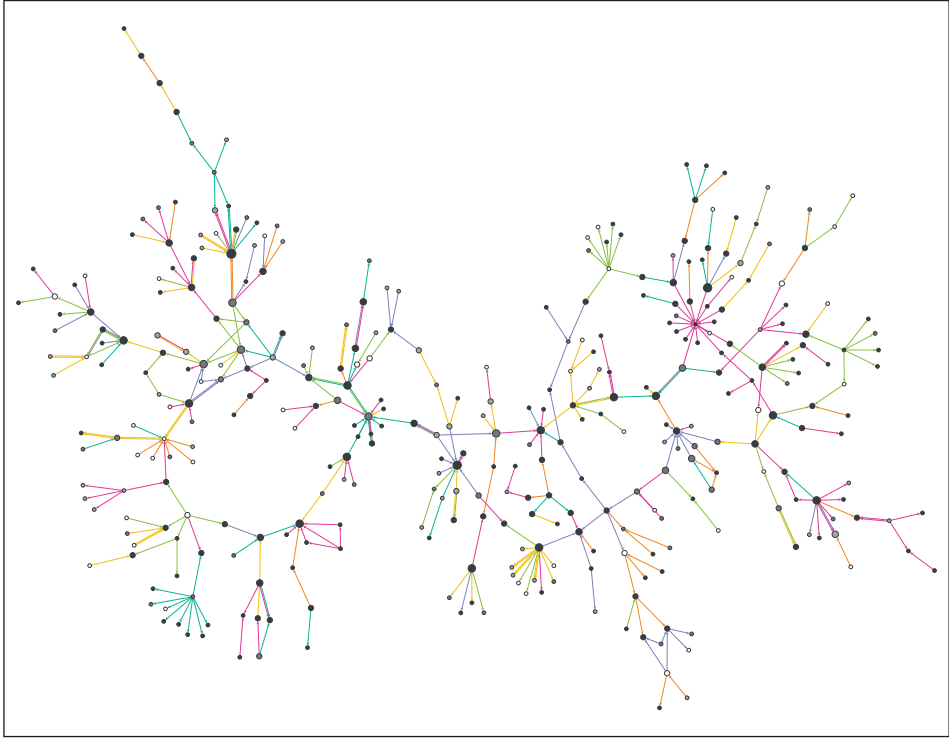
Let us now look at the results of the network analysis of the two samples of my study. Both networks are composed of a relatively large main component of interconnected people and other parts of lesser density. Formal analysis was made difficult by the fact that approximately 70 per cent of all people appeared in only one record. So the overall density of both networks was low, which prevented meaningful results of analyses like clustering (forming groups of strongly interconnected people) or blockmodelling (identifying people in similar structural positions).⁵⁵ I could use some network measures, though, to compare the two sample

53 The court was actually jurisdictional for the southern part of the city, but people from the northern part appeared quite often.

54 Simon-Muscheid 1988, 137 and 213.

55 See for these concepts general introductions like Jansen 2012; Prell 2012. Van Doosse-laere 2009, 148, describes the same problem. For a classic historical blockmodel analysis, see Ansell and Padgett 1993.

Figure 10 Network representation, main component, 1455 sample. The credit relationships are coloured according to time criteria (always two months combined).

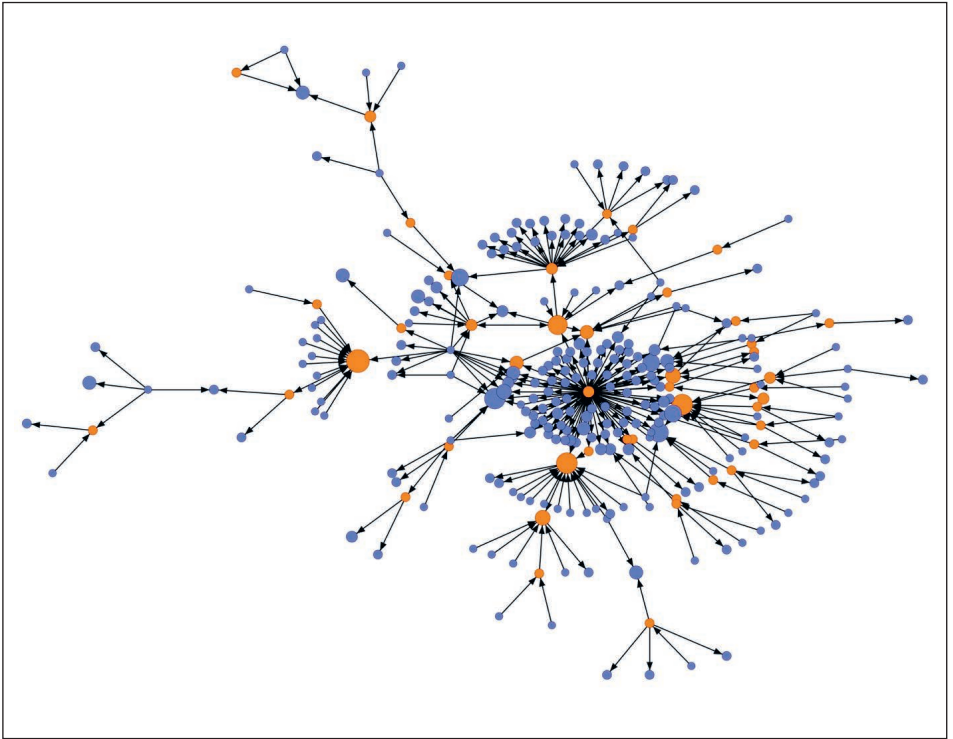


networks and note that they had a similar structure (see Figure 10 and Figure 11). The most striking difference was due to several cases of bankruptcy in the 1497 sample. Those cases caused a rush of creditors trying to obtain their share of the bankruptcy assets, resulting in dense star-shaped sections of the network.

For both networks, measures of centrality were meaningful.⁵⁶ Obviously, bankrupts had high centrality values, but creditors seemed more interesting to me. Using the Indegree (the number of incoming credit relations) centrality measure, I identified important creditors and noted that they were important nodes of the network for holding it together. Those creditors turned out to be well-to-do citizens of Basel, mostly merchants, but also craftsmen, who seemed to have been engaged in money lending as an ancillary activity.

⁵⁶ Stark 2016, section IV.

Figure 11 Network representation, main component, 1497 sample. People who are creditors as well as debtors (pivots of credit chains) are marked in orange.



The two examples of network representations show ways of further exploration of the data beyond the simple network structure. For the 1455 sample (see Figure 10), I coloured the links according to temporal criteria, trying to evaluate the distribution of cases over the year. A colour represents a time frame of two months. What this shows is not seasonal variation⁵⁷ but how individuals were present. Debtors tended to be confronted with debt claims in a temporally concentrated manner, whereas creditors' use of justice was much more regularly distributed. The representation of the 1497 sample (see Figure 11) anticipates the question of credit chains (see below) by colouring individuals who were creditors as well as debtors. This shows that many of those people were in quite central positions in the network and that it is worth looking closely at credit chains.

⁵⁷ This could be observed too, showing peaks of amounts in spring and autumn, and a peak in the number of cases only in autumn.

From the many network representations I made in the course of my research, I only retained a few. Mostly, they served as inspiration for new questions and deeper analysis. Network representations do not speak for themselves, nor can they be easily interpreted. Often, other forms of representation serve the purpose of analysis and visualisation of results much better. It turned out that the aggregation of actors according to attributes like wealth, sex, and origin was an important track of investigation, but aggregated network representations were of little use to present results. Thus the following section on density matrices.

Density Matrices

In light of the lack of clear results on a single-actor level of the network, it seemed promising to group individuals by attribute, and observe structures between and within those groups. The aggregation of data has been proposed before⁵⁸ and proved interesting here. For each constellation of attributes, the number of observed credit relations was set in relation to the theoretically possible number. The resulting densities are used to colour a matrix; the darker the field, the higher the density. The role as a debtor is represented in rows, the role as a creditor in columns. The most interesting attribute is again wealth (see above). Figure 12 shows the density matrix for the 1455 sample with five wealth categories. As many individuals could not be identified on the tax rolls (this obviously applies to people from outside Basel, but many inhabitants of the city could not be assigned either),

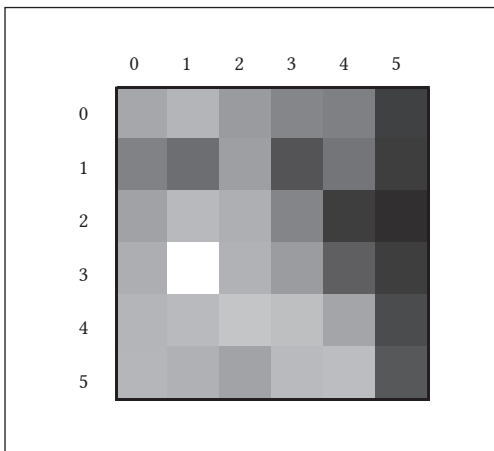


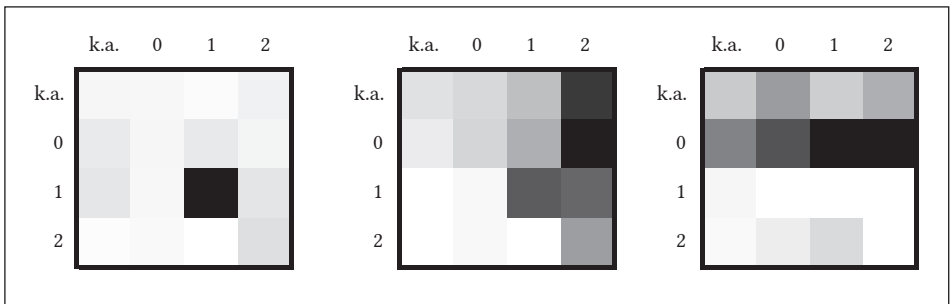
Figure 12 Density matrix of credit relations between categories of wealth, 1455 sample (0: unknown, 1: very poor, 2: poor, 3: medium, 4: rich, 5: very rich).

58 Jullien 2013.

I included the category *unknown* to detect additional patterns.⁵⁹ The first observation is in line with what was said above about the uses of justice. Richer strata, and especially the richest, were clearly more frequently found in the role of a creditor (see the column to the right). The second, not less striking observation is that the lower left corner shows significantly⁶⁰ lower densities. Credit negotiated in court tended to be asymmetric in nature. Although almost every constellation actually occurred, situations with a wealthier creditor of a poorer debtor outnumbered other situations. Credit within people of similar standing was not very frequent, but slightly more frequent than poor creditors trying to obtain payment from richer creditors.

As seen above, it is promising to look at the different procedures the court offered. Figure 13 shows the density matrices for wealth categories of the 1497 samples for two types of procedure, namely lawsuits and debt recognitions. The

Figure 13 Density matrices of credit relations for lawsuits, debt recognitions, and seizures of movables (from left to right), 1497 sample (k.a.: unknown, 0: poor, 1: medium, 2: rich).



debt recognitions show a pattern similar to the matrix for the 1455 sample shown above, with a dense top right corner. In comparison, lawsuits were much less evenly distributed. The richer strata were even more involved, especially the medium category (which corresponds more or less to the second richest category of

59 Since the proportion of unclear classifications was regularly quite high, I kept comparing the *unknown* category to check for systematic bias. As a general observation, bias seemed rather low.

60 I used a homophily analysis to check the overall tendency of the sample to form relations within or between groups. A significant result served as indication that the observed patterns were not just accidental.

the 1544 sample). The poorer people were less involved, not even as debtors, and lawsuits quite often took place within categories, thus on a horizontal level. This confirms the conflictual character of the procedure, much more oriented towards the question of whether any credit was due than other procedures more occupied with the negotiation of payment in cash or in nature. Payment in nature was enforced with the procedure of seizure, which was mainly a tool used by richer people against debtors of the poorer strata.

These differences make it clear that using the court or being confronted with a court procedure did not mean the same thing for all people. Poorer people were more frequently in a passive role, being forced to sell their goods, whereas richer people hardly ever felt pressure on their possessions. If all debtors seem unwilling to pay to a certain degree, they did so for different reasons: the poor because they did not want to pay with their goods,⁶¹ the rich because they could afford to stall the case hoping to outlast the suing creditor.

The representation of network data in an aggregated matrix⁶² was extremely helpful for interpretation as patterns are easily recognisable. Although it might not be obvious at first glance, the data represented in density matrices is still relational data, but actual network graphs—aggregating data or not—could not show the structures with the same clarity. On the methodological level, I therefore advocate the use of such forms of representation for network analysis wherever categorical attributes are present.

Credit Chains

The notion of credit chains is a second metaphor mentioned with some regularity when looking at structures of credit relations.⁶³ As with the network metaphor, it has never been subject to an actual formal analysis. The formation of chains is based on the fact that some people appeared as creditors as well as debtors in the samples. Formally, credit chains are paths⁶⁴ through the network, following the directed edges. In my samples, I could identify hundreds of such paths with a maximal length of seven credit relations. The redundancy is high, as many paths pass through the same links. When looking at credit chains, I focussed on patterns suggesting the presence of a hierarchy in the chain, based on increasing amounts of credit or increasing socio-economic status of the people involved. If such pat-

61 On goods as stores of value, see Smail 2016, 61; Smail 2013, 367; Fontaine 2008b.

62 I thank Claire Lemerrier for the very precious advice on this matter.

63 Muldrew 1998a, 3; Ago 1999, 195. Maybe today these authors would speak of networks.

64 See Jansen 2012, 96; Stark 2016, 163–164.

ning of the chain. The Meltinger example is not the only one showing such structures. The same observation of hierarchical structures could not be made for the longer chains—the Meltinger example shows that, too. I conclude that only patterns involving two credit relations—and in consequence three people—can be interpreted meaningfully. All other structures were more or less accidental and where the people involved were not necessarily aware of the other relationships. When looking closely at some cases of the Meltinger sample, one can see that the suing creditors were aware of their debtor's debtor. The seizures they sought concerned the credits of their debtor's debtors. This quite common proceeding actually forced the person in the middle to pass on any payment received. Here again, the awareness of credit chains did not go beyond the length of three linked people.

These observations show that the interpretation of computationally found data and structures is important. If one interpreted all credit chains found as a meaningful pattern, one would most certainly be wrong. However, the randomly appearing debt chains were contrasted by hierarchical structures. Although it is not possible to calculate an exact proportion of the various forms, the considerations on how the participating actors perceived structures appears to be an important key. I will come back to this point in the concluding remarks.

The analysis of credit chains is an example where it made sense to represent parts of the network graphically. The relatively small number of individuals involved and the focus on certain structural effects made it possible to form conclusions based on the analysis of the networks, including attribute data on the people involved and additional data on the credit relations like the amounts. This permitted comparisons (which I cannot carry out here) and targeted research in the source material about conspicuous points in the credit chains.

Conclusion

The analysis of the access to the court, the relations of creditors and debtors, and the networks created thereby points out that most credit relations negotiated in court were characterised by asymmetry. Socially, economically, and also geographically, aspects of distance prevail over aspects of closeness. This can be seen as an expression of strong economic integration, as people from all over the city and the hinterlands had access to credit. But at the same time, this vision should not obscure the fact that poorer people faced many more problems in case of default, being forced to sell their possessions, sometimes even being evicted from their homes. But was credit consequentially purely economic? I would argue that

a credit relationship was always more than just an economic relation, in a society that did not know economy as a separate sphere. Sources I could not mention here indicate that credit often developed from longstanding business relations and was based if not on trust, then at least on knowing one's partner quite well. Furthermore, most credit in everyday transactions was neither initially nor at a later stage based on collateral like real estate or pawn, but on the options offered by the court to enforce payment. In the case of asymmetry, creditors probably tended more easily to use these options. But whatever the degree of escalation, going to court was a step that only exceptionally led to longer proceedings and a final verdict. The court actively encouraged arbitration outside the court and gladly recorded its results, thus trying to mitigate conflicts and integrate their resolution into the city's society as a whole.

To come to such conclusions, network analysis was used as a tool. I now want to consider to what extent contemporaries perceived their credit relations as part of a network—knowing that the term is of course anachronistic. I argued above that in general, people did not see more than two or three links of a network structure. Citizens of Basel thus did not dispose of actual knowledge of who owed whom (a partial reconstruction of which was made for this study), but they certainly had an idea of whom to ask for credit and thus a general perception of availability of credit—especially with regard to the moneylenders frequently occurring in the court records.⁶⁵ Although it would be wrong to claim the perception of a network, the contemporaries' awareness of interdependences makes network analysis appear a useful tool of analysis for today's historians.

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StABS, Gerichtsarchiv D 6.

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65 See for questions of information circulation, Hitz 2020.

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Picture Credits

All graphics are made by the author. GIS Representations are based on freely available and usable GIS data (all links last accessed on 10 February 2021).

Data	Source
Digital Elevation Model over Europe (EU-DEM)	https://data.europa.eu/euodp/data/dataset/data_eu-dem
Vector data of waters	http://www.naturalearthdata.com/downloads/110m-physical-vectors
Places	www.maperuzin.com
Pan-European Forest/Non-Forest Map 2000	https://forest.jrc.ec.europa.eu/en/past-activities/forest-mapping/#Downloadforestmaps
City map by L. H. Löffel, 1862	https://shop.geo.bs.ch
