
The price of money – Interest rates in medieval sources: Examples from Tirol 1287-1406

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Abstract

This paper discusses information about interest rates in late medieval Tirol. A close reading of the sources shows that in the county of Tirol large parts of the population already from the 13th century onwards owned financial assets or debt instruments and had access to different types of credit (pawn broking, mortgage, *renten*, etc.). The price of money, which is the charging of interest for the borrowing, is of fundamental importance to the economy. However, little is known about how knowledge of interest rates and financial information were distributed in the society.

Sources like charters, court protocols, and debt instruments from notaries in Tirol show that people did have an idea of which interest rates were appropriate, and which were not. Normative sources, like leasehold contracts for comital pawnshops in Tirol (so called *casanas*) or regulations for the *veilträger* (official in charge of pawn sales in Meran), publicly mention maximum rates of interest. However, interest rates cannot be taken one-to-one from the sources and the practice often differed from the norm. The treatment of these interest rates in historiography is marked by a lack of inconsistency in the methods and terminology.

Thus, evaluating interest rates poses many challenges. Very often, the total charged interest and the annualised interest rates are not clearly distinguished from one another, which distort the image. The quotation of a single interest rate is in most cases meaningless unless when compared horizontally to that of other prices for goods and services. On the basis of a new unique dataset, this article addresses the range of interest rates and how information about interest rates and costs was spread.

Keywords

Interest Rates, Credit Market, Money Lending, Pawnbroking, Middle Ages, Tirol

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I. Introduction²

In the late 13th century, much credit activity can be observed in archival material from the county of Tirol, such as notary registers or court protocols. The growing number of credit transactions coincided with the introduction of new credit institutions, like pawnbroking banks (*casanas*) or the office of the *veiltraeger* or *feilträger* (an urban official who was responsible for the correct pledging and selling of pawned items), and the publication of charters regulating financial transactions (like prohibition of usury but also fixing maximum interest rates). However, normative sources rarely tell us about the practical side of interest rates charged in credit transactions. Probably the single most important question of any would-be borrower or lender is simply: what rate of interest is justified? If interest rates differed within a region, which the scattered evidence from Tirol suggests, to what extent circulated information about it in society and how did it influence the borrowing behaviour of people?

According to the general narrative, different forms of loans (loans to princes and personal loans, commercial loans, deposits, annuities and mortgages, loans to states) yielded different interest rates.³ While both economists and historians have studied premodern interest rates intensively, there is still a lack of research focusing on different interest rates charged within one region.⁴ For the medieval period, there are mostly studies about the annuity markets and related interest rates.⁵ Besides, there is hardly any research on the questions of different interest rates within a single region or how information about interest rates – that is the market price of money – circulated.⁶ The scarce source material mentioning interest rates hampers studies on this issue.⁷ I am adding information to the existing literature by providing a new dataset of interest rates from the county of Tirol and by analysing how and where information about interest rates was published.

This paper concentrates on the comparative analysis of interest rates charged in different credit contracts issued between 1287 and 1471 in the county of Tirol. The analysis is based on primary sources like notary registers, private charters, synodal resolutions, court protocols and legal texts. Normative sources like charters are used to reconstruct the target state of charging interest in the county of Tirol. To countercheck these figures, a unique dataset of credit contracts was evaluated. This newly constructed dataset includes detailed information on credit transactions like the date of the contract conclusion, the amount of the principal sum, size of intermediate payments, dates of the repayments, final payment and security obligations (i.e. pawns pledged to the creditor). This information allows us to calculate the interest rate *per annum*. Next to the actual credit contracts, legal texts and court protocols are used to

² The currency used in the county of Tirol was the so-called Berner (*Veroneses*) currency. the text uses the following abbreviations:

¹ *marc* (m.) = 10 *libra* (lb.) = 120 *grossi* (gr.) = 200 *solidi* (sol.) = 2400 *denarii parvulorum* (den.)

³ Homer/Sylla 2011, 87-101; Fryde/Fryde 1963.

⁴ For a recent discussion about interest rates, see Schmelzing 2020; Piketty 2020, 564-570. For criticism about the gathering of older data from Homer and Sylla and Fryde and Fryde, see Schmelzing 2020, 2; Bell/Brooks/Moore 2009, 414-420. For a general debate about the empirical gathering of medieval interest rates, see Bell/Brooks/Moore 2009, especially 414-415.

⁵ The studies on annuity markets and public debt in Northern Italy and North Western Europe are abundant. For a recent overview about the current research, see Huang/Chilosi/Sapoznik 2019; Fuhrmann 2016; van Schaik 2015; Zuijderduijn 2009; Boone/Davids/Janssens 2003; Epstein 2000, 20-23.

⁶ Usually studies about capital markets focus on *renten* and annuities and only deal with differences in interest rates for *leibrenten* und *ewigrenten*. For the case of interest rates on public debt in Basel and Bern, see Gilomen 1982.

⁷ For the difficulties of identifying interest rates in medieval contracts see Bell/Brooks/Moore 2009, 414; Briggs 2009, 74-77.

study how the law concerning moneylending and pawn broking was actually put in practice by different authorities like the counts of Tirol, urban governments and the church.

The collected data shows that interest rates were indeed charged for credit transactions in the Middle Ages. Although usury laws of the medieval church forbade charging interest except for a few exceptions, it becomes clear from the lengthy debates and condemnations of medieval jurists and canonists that there were many ways to hide usury.⁸ Therefore, medieval historians naturally assumed that credit dealings involved some degree of profit to the creditor. Recent studies revised the older, pessimistic view about pre-modern credit markets, where high interest rates and the prohibition to charge interest hampered the economic development and growth of welfare.⁹ In the county of Tirol, a great part of the population had access to credit and different financial instruments, like loans, mortgaging real estate, pawn broking or investments in *renten*, *census* or *redditus* contracts.¹⁰ A better understanding of the rates of interest charged for different credit transactions contributes to our understanding of medieval financial and economic development.

This paper supplements the literature on the evolution of interest rates, but it also questions how information about interest rates circulated in a medieval society. Furthermore, the new dataset sheds light on the collection of medieval interest rates, which so far mainly stem from public credit transactions or merchant loans. The survey begins with an overview about interest rates and usury and describes the approach of calculating interest rates as proposed by Bell, Brooks and Moore in chapter two. Then, in chapter three, interest rates from normative sources are gathered and discussed. In chapter four, credit transactions from notary registers are analysed and interest rates are calculated from them. Also, loans and mortgage contracts are described in detail. In chapter five, the differences between the actual practices of charging interest and the normative sources are discussed by using court protocols and synodal resolutions about usury. The following section asks how information about interest rates was spread among society. In the final section, the results are concluded and summarised.

2. Interest and Usury

Medieval societies were used to the practices of granting and receiving credit. This finding is supported by several surveys about medieval credit markets, or as Smail put it: “*For medieval historians, the matter is settled: credit was everywhere.*”¹¹ However, the sources lack references to charging interest. Contemporaries were careful not to leave any trace of charging interest in their credit activities.

The medieval credit system was closely related to the canonical ban on interest and its (ethical) concept of usury. The *corpus iuris canonici* defines usury as “*whatsoever is exacted beyond the principal*”, be it money, grain, wine or oil.¹² As a consequence, usury legislation can be found throughout the whole of Europe in the Middle Ages. The most important force behind this was the church, although from the late Middle Ages onwards territorial princes and cities actively influenced the policy of usury. In terms of

⁸ Wood 2002; especially 159-205; Tan 2002; Rösch 1994; Langholm 1992; Noonan 1957.

⁹ Skambraks/Köhler/Kehnel/Kümper/Gussone/Schniggendiller 2020; Signori 2014; Clemens 2008. For a general discussion about medieval capital markets, see Zuijderduin 2009, 5-13.

¹⁰ Köhler 2020; Ertl 2017; Stamm 2008; Stamm 2007; Voltolini 1904.

¹¹ Smail 2016, 90. Kuske came to a similar conclusion already a hundred years earlier. Kuske 1927, 52.

¹² “*Usura est, ubi amplius requiritur quam quod datur.*” Gratianus de Clusio 1959, 735.

content, this also had the significant effect that interest payments were partly recognised by the state.¹³ Civil law was more permissive than canon law and allowed interest to be charged under certain circumstances.¹⁴ Following Roman law, loan contracts (*mutuum*) were supposed to be free.¹⁵ Therefore, other contract forms like verbal agreements (*stipulatio*), deposits (*depositum*), exchanges (*permutatio*) or partnerships (*societas*) were to be used to charge interest.¹⁶ Since in these contracts the creditor not necessarily transferred the ownership of the lent goods to the debtor, he was entitled to claim compensation for the attended risk. The most important arguments to ask for a compensation, that is *interesse* or interest, were delay in repayment, loss emerging (*damnum emergens*), profit withheld (*lucrum cessans*) and risk of capital loss (*periculum sortis*). These titles of compensation were put into use. Other forms to charge interest were sale-resale contracts (*emptio cum carta redimenti; carta redempcionis*), mortgage agreements or contracts including a donation of the debtor to the creditor.¹⁷ The sources not always clearly distinguish between usury and legitimate interest. Both the Latin word *usura* and the German expression *schaden* were used synonymously for usury and interest in Tirol.

However, how much interest was charged in Tirol? So far, there are no comprehensive studies about interest in medieval Tirol. One notable exception is the study of Ertl about the land transactions in and around Bozen in the mid 13th century.¹⁸ Here, interest rates are calculated solely from primary sources from the late 13th century onwards. The material gathered in this article stems mostly from private debt. Although comprehensive material is available, public debt incurred by the counts of Tirol is not taken into consideration in this paper.¹⁹ To calculate the interest rate accurately an approach proposed by Bell, Brooks and Moore was chosen.²⁰ Dealing with interest rates requires a consistent terminology and standard method for calculating the interest charged. To begin with, “[a]n interest rate is the extra amount paid expressed as a fraction of the principal sum deposited or borrowed”.²¹ Some authors express interest charges over the whole term of the loan – that is from the beginning to the final repayment – others express the interest rate as annual figure (*per annum*). It is helpful to distinguish between total and annualised interest for a better comparability. Here, the second approach was chosen to take into account the positive value of time, meaning that money received today was considered more useful than money received tomorrow.²² Therefore, the intermediate payments and the payment dates are included in the formula from Bell, Brooks and Moore.

$$L = \left(\sum_{i=1}^N \frac{P_i}{(1+r)^{T_i}} \right) + \frac{F}{(1+r)^T}$$

¹³ Kuske 1927, 56-57.

¹⁴ Botticini 2000, 167.

¹⁵ Wood 2002, 186-187; Pryor 1981, 204-206.

¹⁶ Wood 2002, 183-201; Rösch 1990, 597; Voltolini 1973, XLIII-CCXXXV about the specific contract forms used by Tirolian notaries at the end of the 13th century.

¹⁷ The sale-resale contracts were no longer based on loan contracts, but the buyer (or creditor) of the *census* or *redditus* purchased the right to collect a perpetual stream of future income from the seller (or debtor). Gilomen 1984, 1-31; Munro 2003, 517; Tracy 2003, 14f. (for *renten* used as public credit instrument); Stamm 2009 (for Tirol).

¹⁸ Ertl 2017, for interest rates see especially page 16-17.

¹⁹ The financial activities of the counts of Tirol can be reconstructed from the Tirolian Raitbücher and numerous pawn registers. So far, there are no studies about interest paid by the counts. Hörmann-Thurn und Taxis 2010.

²⁰ Bell/Brooks/Moore 2009.

²¹ Bell/Brooks/Moore 2009, 420.

²² “That money has time value implies, importantly, that the calculation of an interest rate must take into account the timing of any intermediate payments and also the effect of compounding, which is the interest received in subsequent years on the interest paid in previous years.” Bell/Brooks/Moore 2009, 421. Similar Clark 2005, 12-17.

L = initial loan; F = final payment; P = intermediate payments; T = date of initial loan (in years); T_i = date of intermediate repayments (in years), r = interest rate.²³

If we have all this information, we can calculate the actual rate of interest p.a.. This means that we need to extract a lot of specific data from the sources. In most cases, due to the prohibition of usury, both the creditor and the debtor had to disguise the payment of interest. This makes it difficult for the historian to recover the required information, especially since there were several ways to hide the interest charged. In many cases, one of the following methods was used to disguise interest in the county of Tirol:

1. The easiest way of claiming interest was as compensation for damages incurred by the lender, usually through a deferred repayment of the loan. If a debtor defaulted at the agreed date, he had to pay interest. This could be easily arranged by setting an unrealistic early repayment date for the loan and later requesting interest for incurred damages to the creditor. In notarial agreements, the actual legal transaction is often followed by a promise of compensation in the event of failure to fulfil the contract. The usual formula is “*dampnum et expensas*”, damages and costs, which sustained by the debtor in and outside the courts.²⁴ In some cases, it is even explicitly stated that the loan is interest-free as long as it is repaid without delay.²⁵ Naturally, these contracts usually do not mention how much interest has to be paid in case of a deferred payment.²⁶
2. The second method of hiding interest was simply to record a higher amount in the credit contract than was actually paid out by the lender to the borrower. In this case, the creditor could legally claim in court the repayment of the principal together with interest.²⁷ In Tirol, professional money lenders and pawn brokers from the *casanas* disguised their loans as deposits. The promissory notes issued from them differed from the amounts of money actually delivered and deposited. This (obvious) practice was observed suspiciously by the church and condemned in several synods by the bishops of Trient.²⁸
3. The third and for us most visible tactic in the sources is the sale or pledging of rents, usage rights or real estate with a right of redemption to disguise interest payments. In Tirol diverse forms of this credit practice existed. Property, tenant farms, rents or usage rights of fiefdoms (*baurecht, erbleihe*) were used as pawn for credits or were mortgaged. In these cases, legal practice varied a lot.²⁹ In the 13th century, in roughly half the cases we know of, when real estate was used as pawn for a credit, the plots of land were directly transferred to the pledgee for use.³⁰ In this case, the creditor was entitled to receive the revenue from the land as a gift,

²³ Bell/Brooks/Moore 2009, 421-422. This formula calculates compound interest on an annual basis. The annual interest rate of a specific year may be calculated by using another equation. For simplicity only the interest of the accrued interest and the principal are calculated here.

²⁴ Bell/Brooks/Moore 2009, 423; Voltolini 1904, 36; Voltolini 1951, LVII-LVIII. Other formulas include “*cum oni dampno et stipendio*”. Cf. for example Voltolini/Huter 1951, nos. 18, 19, 31, 44, 197, 200, 335, 336, 487, 584, 585, 597, 599, 601, 612, 614, 615, 616.

²⁵ Cf. Mantoan 1999, no. 47. Pasinus the Arko promises to repay a certain debt “*in proximo festo Nativitatis Domini nostri sine omni protrazione et sine omni dampno ad secundum ius hospitum [...], quod si non fecerit omnia et singula dampna et expensas [sic!] etc. reficere promisit cum capitali [...]*”.

²⁶ For interest claimed because of a deferred payment, see below.

²⁷ Briggs 2009, 74; Shatzmiller 1990, 22-26.

²⁸ Voltolini 1904, 26-27 and 36-37. For the reaction of the church see below.

²⁹ For the different form of mortgage contracts, see Briggs/Zuijderduijn 2018, 3-7; Violante 1962; Van Werveke 1968; Briggs 2018.

³⁰ Ertl 2017, 14; Voltolini 1973, CI-CVII.

which was not deducted from the principal (*ex dono non in capitali computando, usque dum [the debtor] solverit*).³¹ Here, the income of the pledged property or rent served as interest payment.³² In addition to these contracts in which the pledged property was transferred immediately, there are often other contracts in which the pledge initially remained in the hands of the debtor, but the use is supposed to be forfeited if payment is not made.

The prohibition of usury was directed against the widespread form of mortgage, in which the use of the deposit was not deducted from the principal.³³ To avoid drawing attention to activities that may have attracted the charge of usury, the interest payments were usually received as gift (*ex dono*). Besides this, the debtor promised to refrain from proving that interest payment was made from the pledged property and from bringing an action for usury (*condictio usurarum*) in court.³⁴ It need not be explicitly mentioned here that ecclesiastical jurisdiction and canon law did not recognise the validity of such waivers.

Similar to the practice of pledging and mortgaging real estate, usage rights or rents, there were also sale contracts with a right of repurchase.³⁵ They were very often not much different from the pledging contracts.³⁶ In these contracts, the debtor sold real estate, usage rights or a rent for a certain price. In the notary registers, either at the end of the entry or in a separate contract (*carta revendicionis, carta redimenti, carta redempcionis*), the seller was granted the right to repurchase his property within a certain period time.³⁷ Sometimes also a perpetual right of redemption was granted. That these transfers of property were indeed credit transactions and that the debtors had the intention to redeem their property is shown by the fact that the land was often sold below value.³⁸

In many cases, only the recognition of debt or the promise to repay a debt was recorded in the sources. This is mostly the case with loans or deposits. Therefore it is possible only in rare cases to calculate the amount of interest that has been paid. However, contracts involving property, rents or usage rights pledged as security were usually recorded with more details. Here, the principal (price of the property or rent), the income of the goods (intermediate payments) with the annual payment date, and the deadline

³¹ Voltolini 1903, 26. Cf. Voltolini 1951, nos. 601, 671, 682, 718, 745; Gamper 1993, no. 55.

³² Both methods were used by the counts of Tirol. Hörmann-Thurn und Taxis 2010, 168. Offices were also pledged in this way. Stolz 1998, 44.

³³ This means that under the so-called *Zinssatzung*, the income from the pledged property was not deducted from the principal, in contrast to the *Totsatzung*. Gilomen 1984, 21f.

³⁴ Voltolini 1973, CIII. “*quod non probabit solutionem huius debiti et quod non erit conquestus pape vel imperatori*”. Cf. Voltolini/Huter 1951, nos. 609, 731, 757, 810, 816, 817, 818.

³⁵ Ertl 2017, 23.

³⁶ Köhler 2020, 21-22.

³⁷ For example: Voltolini/Huter 1951, no. 618: “*Tale pactum. quandocumque ipse fratres aut eorum heredes [=debtors] dabunt ei Jacobo [=creditor] aut suis heredibus et eum amonebunt sua fide cum XXIII lb. Ver., quod tunc eis restitutat et revendat illud erberrecht et sit cassum et vanum.*”; Heinrich Moser, StA Meran, NI 8, fol. 53r: “*Revenditio dicte domine a festo pentecostis per annos integros quatuor vel medio tempore quobus anno hoc foret de festo pentecosten cum marcis VI.*”; Raffener 2008, no. 86: “*Carta redimendi in VI annis super Epyphaniam pro XL libris etc.*”; Mantoan 1999, no. 201: “*Carta revendicionis suprascriptorum fratrum venditorum et eorum heredum a nunc proximo festo Nativitatis Christi ultra III annos vel tempore medio semper in dicto termino, octo diebus ante vel post, pro XII marcis denariorum una cum censu XII modiorum siliginis in festo sancti Martini, ex tunc dicta bona sunt libera et solute, etc.*”.

³⁸ This is indicated in several contracts, for example Raffener 2008, no. 2: “*Ich Mark Mesner ze Las fur mich und miner erben grlten [sic!] sol Gallen Valltrairs sun von Allitz XV lb. perner [...] darumb han ich ain wis gesetzt, min in Grafair III schot kaes gilt, daz ich si losen soll uff den nechsten sannt Agathen tag umb XI lb. oder si ist verstanden und gib im des ainen noderbrif und was si pezzet ist, daz sol er mir herzu geben nach erber liut rat.*”

for the repurchase of the property (final payment) is recorded. Therefore it is possible to assess the level of interest using the equation.

One has to keep in mind that interest rates always involved the default risk of the debtor. Credits secured with real estate or income from a property can be considered risk-free, since in case of non-payment the creditor was secured by the pledge. The average level of risk-free loans is assumed to be around 10 percent, while trade loans carried significantly higher interest rates of 20 to 28 percent.³⁹ In this paper also short-term loans and pawnbroking contracts will be analysed and the results will be compared with findings from other studies.

Table I Interest rates mentioned in statutes

Year	City	Interest rate p.a.	Source
1208	Trient	/	Kink/Wangen 1852, 178-181, no. 79
1297	Riva	43.3% (local residents); 86.6% (strangers)	TLA, HS 282, fol. 108r.
1306	Meran	86.6%	Haidacher 1993, 67-69, no. 3
1314	Sterzing	86.6%	HHStA, HS B 123, fol. 72r.
1319	Bozen	86.6%	Voltelini 1904, 66-69, no. IV
1403	Brixen	86.6% (local residents); no limit (strangers)	Scherer 1901, 580-583
1431	County of Tirol	64.4% (local residents); no limit (strangers)	Scherer 1901, 586f.

Source: TLA, HS 282; Kink/Wangen 1852; Scherer 1901, Haidacher 1993

3. Normative Sources

Almost all normative sources dealing with the permitted rate of interest concern the activities of professional moneylenders, mostly Lombards and Jewish usurers, or the costs for pawnbroking in cities. The sources used in this section are leasehold contracts for pawnbroking banks and municipal statutes dealing with interest rates. This reflects the growing need for credit in the environment of the 13th century Tirol. The fact that the authorities tolerated the taking of interest under certain circumstances can be seen from a document of the bishop of Trient 1208. The bishop granted the community of Trient the right to buy and sell wood and pitch, with income and expenditure to be shared between the community and the bishop. There is explicit mention that it was possible for the municipality of Trient to take out an interest-bearing loan to cover costs incurred for selling the goods.⁴⁰ The idea of the necessity of loans for economic reasons was not foreign to the contemporaries and therefore nothing unusual. However, no interest rate is mentioned in the charter.

We only receive reliable information about interest rates 80 years later when the counts of Tirol founded several pawnbroking banks, the so-called *casanas* or *gazanias*, in their territories.⁴¹ Italian merchant

³⁹ Bell/Brooks/Moore 2009, 415-416; Bell/Brooks/Dryburgh, 2009, 138-143; Clark 2005; Clark 1988, 268-276; McCloskey/Nash 1984.

⁴⁰ “*Et si comune Tridenti, vel ipsi, qui habebunt vel erunt comunis, acceperunt peccuniam mutuo sub usuris pro manutenendo dicta lignamina et picem ad emendum et vedendum, sicuti tenentur facere illas usuras.*” Kink/Wangen 1852, 180, no. 79. Cf. Voltelini 1904, 26.

⁴¹ Voltelini 1904. 46-61.

bankers like the Frescobaldi were the first professional moneylenders (*prestatores, usurarii, mutuarii, wucherer*) to run the *casanas*. However, the exercise of moneylending and pawnbroking was only possible under the count's concession, which regulated the rights and obligations of the moneylenders in the county.⁴² Since the lenders were obliged to make an annual payment to the count of Tirol in order to carry out the activity, the legal relationship can formally be characterised as a lease-out. The leasehold contracts regulated, amongst other things, the permitted interest rates. In four cases, the leasing contracts are preserved and we are informed about the exact conditions of their businesses. This is the case for the *casanas* in Riva 1297, Meran 1306; Sterzing 1314 and Bozen 1319. In the charters of Meran, Sterzing and Bozen the maximum interest allowed to charge was fixed at four den. per pound and per week, equivalent to 86.6% p.a.⁴³ In Riva locals paid only two den. per pound and week, while foreigners had to pay the usual four den. per pound and week. Thus, the interest charged was between 43.3% and 86.6% p.a.⁴⁴ The pawnbroking banks lent money against pawns and other securities and spread over large parts of the county throughout the 14th century. From the middle of the 14th century onwards, however, several of these institutions were already closed down, either due to mismanagement or for other political and economic reasons.⁴⁵

Besides the *casanas*, Jewish moneylenders offered financial services to both the counts of Tirol and the population. Before the 14th century, there is hardly any evidence about Jewish communities in the county of Tirol. Later, Jewish families moved from Carinthia, Bavaria and Austria to Tyrol and settled mainly in the larger towns. Some of them also entered the pawnbroking business and leased some of the comital *casanas*, sometimes in cooperation with Christian moneylenders.⁴⁶ That the settlement of the Jewish communities was preceded by economic considerations of the counts is evident from the privileged status that was offered to them. King Heinrich of Bohemia, count of Tirol, called Jews from Civedale to settle them in his lands in Carniola. In a charter, he put them under his direct protection and also guaranteed them a monopoly on moneylending.⁴⁷ Again, the professional moneylending against interest required the permission of the authorities, be it the count of Tirol or the bishops of Trient or Brixen. The oldest known *Judenordnung* of 1403 from bishop Ulrich of Brixen regulated the moneylending activities of the Jewish community. The charter follows up on existing legal ordinances and fixed the maximum interest rate charged by Jewish moneylenders at four den. per pound and per week for local residents.⁴⁸ From strangers they are free to demand whatever they agree with them.⁴⁹ In 1431 duke Friedrich IV. of Austria, count of Tirol, renewed the privileges for the Jewish communities in the county of Tirol and proclaimed their rights and duties. In article 1 it was decreed that Jewish moneylenders should not charge

⁴² For a detailed description of the rights and obligations of the moneylenders in the county of Tirol see Voltolini 1904,

⁴³ "*Circa casanas vero hec pacta volumus observari, videlicet quod de qualibet libra Veronensium, quam mutaverint pro lucro quatuor solum parvulis stent contenti de qualibet septimana.*" Haidacher 1993, 67-69, no. 3 (for Meran). The wording of the other leasehold contracts is almost identical. Cf. Voltolini 1904, 66-69, no. IV (for Bozen); HHStA, B 123, fol. 72r. (for Sterzing).

⁴⁴ TLA, HS 282, fol. 108r.

⁴⁵ The history of the *casanas* has not yet been fully researched. Voltolini 1904, 39-46.

⁴⁶ Scherer 1901; 575-594; Voltolini 1904, 44-46.

⁴⁷ "*Ez soll auch chain ander Lechner da niht sein.*" HHStA, HS R 52, fol. 60v.

⁴⁸ It is based on well-known older ordinances. For example, the Jewish pawnbroking business in Brixen was to be operated in accordance with the statutes of the cities of Bolzano and Trient. Scherer 1901, 580, 586.

⁴⁹ „[...] vnd doch nur ain phund vmb ain vierer auf die wochen ainem lantman vnd den vnsern; aber ainen gast mügen sie wol leihen, wie er mit jnen vberain komt vnd ain geding machet.“ Scherer 1901, 580.

more than three den. per pound and per week (64.5% p.a.) from local residents or subjects of the duke.⁵⁰ With foreigners, they should come to an agreement as would please them. This was the legal frame for the 15th century.

Besides these charters and statutes, it is difficult to determine the actual height of the interest rates charged by Jewish moneylenders. There are no existing accounting books of Jewish moneylenders and it is impossible to say something about default interest.⁵¹ To demonstrate this problem, two examples will be given. Noble families like the lords of Schlandersberg regularly relied on the financial services of professional moneylenders. In their accounting books the repayment of loans with interest (*ze wucher*) was recorded. In 1402, Kaspar von Schlandersberg repaid the Jewish usurers in Bozen 40 ducats principal and one ducat interest.⁵² However, no specifications about the runtime of the credit or the principal are made. Similar, the counts of Tirol were always in need of money. They not only made massive use of the *casanas* but also of Jewish financial intermediaries to raise capital. Their accounting books are full with records about the repayments of loans, for which also interest (*usura*) was charged.⁵³ In 1308 we are informed that duke Otto, count of Tirol, made a repayment of 120 mr. after one year for a loan with a principal of 100 mr. from the Jew Ysak de Luenza (Lienz).⁵⁴ The interest rate of 20% p.a. indicates that obviously, there was scope to negotiate the interest rate.

Finally, besides the option to resort to the services of professional moneylenders there was also the possibility to obtain credit through the pledging of goods. Although the comital *casanas* had the absolute monopoly of lending against interest in their cities, as confirmed to them in various privileges, pawnbroking was a widespread practice. Non-professional pawnbroking, that is pawnbroking without charging interest, was omnipresent in medieval Tirol. Besides private moneylending secured with pledged items, there was also the possibility to deposit pawns as security in court.⁵⁵ If the debtor would fail to repay the loan, the creditor could claim the pledged goods in court and was held harmless. The practice of pawnbroking in Meran is of special interest. The city of Meran was seat of the provincial and urban court (*Land- und Stadtgericht*) of the provincial district Burggrafenamt.⁵⁶ It was common practice to pledge items as collateral in court for loans or deferred payments.⁵⁷ In Meran in the 14th century there was the office of the *veilträger*, who was responsible for the correct selling of pawned items.⁵⁸ His main purpose was to prevent the unauthorised seizure of goods at the market or at court. He was responsible for the seizure, he took care of the pledged items or animals, organised the auctioning of the goods and ensured payment to all parties involved. In 1337, an addendum to the city book (*Stadtbuch*) of Meran specified the rules governing the exercise of the office. Although the *veilträger* per se did not grant any

⁵⁰ Scherer 1901, 586f.; Voltelini 1904, 50.

⁵¹ Scholl 2019, 327f.

⁵² „den Juden ze Poczen 40 tukaten und ain tukaten ze wucher.“ Ottenthal 1881, 563. Voltelini argued that this was the interest charged per week and comes to an overall interest rate of 130% p.a. However, he does not provide further evidence for this statement. Voltelini 1904, 50.

⁵³ In the year 1304: „Item domine mee mr. 10 lb. 7 in forte et pro usura mr. 8 in debitis suis antiquis.“ BayHStA A Staaten Lit. Tirol 6, fol. 4r. See also fol. 11v; 23v; 24r.

⁵⁴ „Item dominus dux Otto convenit taliter cum Ysako judeo de Luenza, ita quod predictus dux Otto dabit predicto Ysako judeo nomine usure annuatim ver. mr. 120 quancumque sibi mutuabit ver. mr. 100 per circulum unius integri anni.“ HHStA, HS B 123, fol. 44r. Voltelini 1904, 35.

⁵⁵ Private pawnbroking was rarely documented. The notary Jakob of Laas 1391 recorded one rare example of a pawnbroking contract. Raffeiner 2008, no. 5. See Köhler 2020, 23.

⁵⁶ Köhler 2020, 24-30; Stolz 1971, 119-136.

⁵⁷ Köhler 2020, 25f.

⁵⁸ Hagen 2018, 143; Hagen 2015, 157. Women also temporarily held the office. Loose 2018, 269.

loans and therefore did not charge any interest, he was entitled to keep a certain amount of the wares pledged to him. The fees he was allowed to charge were stated in the ordinance of 1337.

Although technically no interest charges, these fees made up part of the transactions costs of moneylending. The *veilträger* was allowed to keep a certain amount of money from the auctioned items for himself. The court protocols and the city book inform us about the procedure: In a first step, several respectable citizens of Meran estimated the value of the pledged items.⁵⁹ Then, the pawns could either be released within a certain time by the debtor or, if not, were publicly auctioned. In both cases, the *veilträger* was rewarded with a certain amount of money. People pledged all kind of items and animals. The statutes mention horses, stallions, cows, oxen, sheep, goats, pigs, salted fish, but also wine, textiles and real estate (*urbor*). The sum charged depended on the type of the pledge (see table 2) and if the item was auctioned or released by the debtor. For a cow worth 60 gr., the debtor had to pay either 20 gr. (if sold) or 10 gr. (if released) to the *veilträger*, which is the equivalent of about 33% or 16% of the price. Salted fish was calculated by quantity, so the *veilträger* claimed every hundredth fish (or 1%). The transactions costs were on average between 8% and 16%, as the lump sums for goods worth more or less than one mark show. Besides, so called eating pledges (*ezzendiu pfand*), which are animals, probably caused higher transactions costs, because they had to be fed and cared for. Depending on the principal and the items pledged, the transaction costs were between 10 gr. and 60 gr. These were the regulations as far as official financial intermediaries or professional moneylenders were involved.

Table 2 costs of pledging, Meran 1337

Kind of pledge	Fee in gr. (sold)	Fee in gr. (released)	Average price in gr.	Source for price	Percentage of price (sold)	Percentage of price (released)
Stallion	60	30	1440	Haidacher 2008, 285.	4.16	2.08
Cow	20	10	60	Kogler, 1901, 467	33.3	16.6
Ox	40	20	204	Ottenthal, 1881, 594	19.6	9.8
Wine (1 <i>fuder</i>)	10	10	384	Karner 1985, 46	2.6	2.6
Small animals (pig)**	10	10	36	Kogler, 1901, 467	27.7	27.7
Small animals (sheep)**	10	10	9	Kogler, 1901, 467	111.1	111.1
Fish*	/	/	/		1	1
Real estate	20					
Goods up to 1 mr.	10	10			> 8.3	> 8.3
Goods more than 1 mr.	20	20			< 16.6	< 16.6

⁵⁹ In a case heard before the court of Meran 1389: “*dar auf ist ertailt, daz mein herr, der richter, dar zw schaffen sol drey oder funf erbergew burger und süllen die hab schätzen.*“ StA Meran, GP, fol. 78v. For the statutes in the city book, see Pfeiffer 1848, 420.

Source: Pfeiffer 1848, 418-421.

Notes: * The *veilträger* could claim every hundredth fish. ** The levy does not refer to each animal, but to the total quantity.

4. Practical Sources: Notary Registers and Court books (*Verfachbücher*)

If we look at the practical side of moneylending, we find a huge number of peer-to-peer moneylending that was recorded by notaries or later in court books (*Verfachbücher*).⁶⁰ Public notaries can be found from the 12th century onwards in the county of Tirol.⁶¹ As public officials they recorded all kind of everyday transactions, ranging from sale and purchase contracts, marriage, dowry contracts, testaments, to credit transactions.⁶² Notaries were not only present in the bigger cities like Bozen, Meran or Trient but also existed in small villages like Laas, with approximately 80 inhabitants in the 14th century. In the late 15th century in the provincial district of Meran (*Landgericht Meran*) a new type of legal protection emerged, namely that of court books (*Verfachbücher*) in which various legal transactions were entered. Both types of sources can be used to reconstruct credit practices.

However, before going into detail it is important to tackle the question of the selection bias of the sources.⁶³ Both notary registers and court books depict the moneylending practices of a certain socio-economic clientele. To reduce high transactions costs, people would not always resort to notaries for registering small-scale credits or pawnbroking contracts. Because of this, not every legal transaction was recorded by a notary or registered in a court book. Contracts involving commercial credits, credits collateralized with real estate and loans with a bigger contract size were more likely to be recorded and therefore are over-represented in notary registers and court books.⁶⁴ Most of the contracts used in this paper to reconstruct interest rates are either commercial loans or credits collateralized with real estate. The different economic background and the securities offered for acquiring a loan (collateral, reputation, and wealth) obviously had a huge impact on the interest charged for a credit. In the following sections, first interest rates mentioned in credit transactions without collateral are discussed and then actual interest payments from loans secured with real estate or income from real estates (*census, redditus*) are analysed.

Table 3 Interest rates on commercial loans*

Year	Principal	Interest Rate (source)	Interest Rate p.a.	Source
1236	126 lb.	2.5 lb. / month	23.8%	Voltelini 1973, no. 560
1237	20 lb.	1 lb. / week	260%	Voltelini 1973, no. 681
1237	5040 d.	126 d. / week	130%	Voltelini 1973, no. 683

Source: Voltelini 1973.

Notes: * Actual repayment dates of the loans are unknown.

As written above, under certain circumstances the charging of interest was legitimate. If and how much interest would be charged was sometimes specified in the credit contracts. This was the case in a contract from 1236. Ilteprandus de Firmian; Utus and Arnoldus de Mecu promised to repay 126 lb. until a certain date. Otherwise, they would cover damages and expenses (*alioquin dampnum et expensas*) incurred to

⁶⁰ For the use of court books in Tirol, see Wopfner 1904; Moeser/Huter 1990, 17-27.

⁶¹ Heuberger 1926; Fliri 2018; Köhler 2020, 17f.

⁶² For an overview about the difference contracts, see Voltelini 1973, XIII-CCXLIII.

⁶³ I addressed this question in another paper. Köhler 2020; Nicolussi-Köhler 2021 (forthcoming).

⁶⁴ Köhler 2020, 24.

the creditor. The interest they were obliged to pay was defined in the contract. They swore to pay 50 sol. per month until the debt would be satisfied, equating to roughly 2% per month or 23.8% p.a.⁶⁵ In another loan contract from 1237, Arnoldus de Wolchenstain and Hermanlinus de Castrorupto promised the payment of 20 lb. for the purchase of two horses with saddles until a specific date. Once again, the debtors swore to pay interest in case of default, namely 20 sol. per week or 5%.⁶⁶ This extraordinary high interest rate per week accounted to 260% p.a. In a third case, the moneychanger (*campsor*) Bovetus de Verona promised the changer Belletus de Verona the repayment of 21 lb. at the will of the creditor. If he would fail to repay in time he would be obliged to pay another 6 den. per pound and per week, estimating to 130% p.a.⁶⁷ These loans with interest were not limited to nobles, citizens or merchants. In another contract it was the abbey of Rot that was indebted. In a contract from 1237, the abbot, with conscience of the brothers and the chapter of the monastery, promised to repay a certain Diatricus de Lengenstain 30 lb. for the principal of a debt and 9 lb. as interest (*de proficuo*). The debt should be repaid until next St. Martin's day. Besides, the abbot pledged a vineyard to the creditor and promised to pay him one *plastrum* of vine out of this property until the debt was satisfied. If the abbot would default at the agreed date, the total income of the vineyard would be transferred to Diatricus. The total income of the vineyard should not be deducted from the principal debt and should only serve as interest payment (*ex dono non in capitali computando*).⁶⁸ Now it is impossible to calculate the interest p.a. since we do not know when the initial debt was incurred. In 1237, already 23% of the overall debt of the monastery originated from servicing the interest payments of the debt. The transfer of the vineyard worsened the financial situation of the abbey. Unfortunately, in none of the cases, we know when the loans were repaid and what interest was actually charged.

As stated above it really depended on how fast the principal would be repaid. In a rare case from 1471, a debt was recorded in the court book of Meran and the repayment modalities were specified.⁶⁹ In this case Dorotheen Hoferin owed 92 lb. 4 gr. principal and 5 lb. interest for the purchase of a manor. The debt should be paid in instalments of 20 lb. each year at Saint Martin's day until everything would be paid off. So, an actual interest rate of 4% p.a. was imposed on the debtor. These figures show that there was a large range of variation and only serve as a rough indicator what was possible to charge and what was possible to publicly write down in a loan contract.

Besides these loans recorded, there were also some dealings of the comital pawnbroking houses written down in the registers of notaries. In the register of Jakob Tugehenn from Bozen from 1295 are 14 contracts of the *casana* recorded.⁷⁰ The contracts involve the pawnbroking business of the *casana*. Regrettably, no interest rates are mentioned here and it is impossible to say if the moneylenders charged the actual 1.6% per week (or 86.6% p.a.) as they were allowed to. Surprisingly, the notary recorded the loans and pawn broking contracts as deposits (*deposium*).⁷¹ Here, the debtors recognised to have received

⁶⁵ Voltelini 1973, no. 560. Besides, the repayment was secured with a promise of hostageship and by providing guarantors.

⁶⁶ Voltelini 1973, no. 681.

⁶⁷ Voltelini 1973, no. 683.

⁶⁸ Voltelini 1973, no. 869.

⁶⁹ Moeser/Huter 1990, no. 201.

⁷⁰ The *casanas* were leased out in 1293 to "*Bartolino, filio quondam Heinrici de Florentia, et Bokino, filio domini Abbatis Rustici de Florentia*" for two years. Haidacher 1998, 210. Contracts of the *casana* in the register of Jakob Tugehenn: Voltelini/Huter 1951, nos. 608, 615, 651, 653, 681, 683, 688, 694, 704, 721, 723, 727, 739, 772.

⁷¹ Voltelini 1904, 36.

the value of the loan as deposit.⁷² In return, they pledged or promised to pledge something as security, like a fur coat, wine, textiles, a knife, other unspecified mobile items (*pignus mobile*) or in one case even a house. The debtors promised to take care of the deposit and return it at will of the creditor and to pay for all damages incurred (*omne damnum etc.*).⁷³ The only existing promissory note from a *casana* clearly states that the debt was to be repaid without interest (*since lucro*).⁷⁴ Obviously, in these cases interest rates were covered by the use of deposit contracts. Interest could be charged in two ways: First, if a higher sum was recorded than was actually advanced and second, if the loan was repaid after the agreed date, interest on arrears could be invoked. Once again, it is impossible to say how much interest was de facto charged solely from these contracts.

Another way to calculate interest payments for loans is to look at mortgage contracts or sale-resale contracts. In many of these contracts registered by notaries, we know the date the debt was incurred, we know about the income or rent of the property sold or pledged that served as interest payment and we know at what date the collateral could be redeemed. Using the formula from Bell, Brooks and Moore, we can calculate the exact interest rate paid p.a. By using these contracts we can get an idea how much interest had to be paid for loans collateralised with real estate. The interest charged here differed a lot from the interest rates mentioned for loans or pawnbroking contracts (cf. table 4). This is because they were more or less risk-free, since the collateral served as security in case of default or the debtor could simply not repurchase his property.⁷⁵ Nevertheless, the collected database allows for the first time to get a glimpse at the capital market in the county of Tirol and the interest rates charged here. It is interesting that although all of these credits were secured with collateral, the actual interest paid varied quite a lot from 3.5% to more than 50% p.a. In this section, 64 sale-resale contracts and mortgage contracts were analysed from five different notary registers and one court book, covering the years from 1295 to 1470 (cf. figure 1).⁷⁶

The contracts used for raising money this way were mostly sale contracts with the right to redeem the sold property or perpetuities within a specific period. Sometimes this clause was part of the original sale contract. However, more often this would be recorded in a separate contract (*carta redimenti, carta revendicionis*). This form of loan favoured the creditor and reduced the risk to a minimum, since he was already in possession of the security and there was no need to bring the case to a court of justice to enforce the admission to possession.⁷⁷ The runtime of the redemption clause was between 63 and 3600 days. In some cases agreement was reached on certain modalities for redeeming the collateral. In 1391, when Hainz Neir of Laas and his wife pledged a meadow for 25 lb., it was agreed that the creditor should send a reminder to the lender one month before claiming repayment. In the meantime the creditor received the income of good.⁷⁸ In 1407 the prioress of the monastery Beate Marie Virginis in Stainach

⁷² Cf. Voltelini/Huter 1951, no. 681: “*Carta Zanini loco Buchini et Bartuli. Die mercuri XIII intrante aprili, in Bozano ante domum Vllini Talari, in presentia dicti Vllini, Dietelini mazellatoris et Pertoldi frater Murari at aliorum. Ibique Jakelinus de Melten confessus fuit in depositum habuisse XXIII libras Ver. Hoc ei redere promisit etc. Unde iure pignoris unam togam brunam cum pelle varo. Et quidquid ei abiret in ipsa toga. Fideiussor d. Chunradus filius di. Gerhardi. Et pignus mobile etc.*”

⁷³ *promisit bene servare et eis redere ad voluntatem*”. Voltelini/Huter 1951, no. 651.

⁷⁴ The note is from a loan of Vannus, leaseholder of the *casana* of Griez, to a certain Vigilius de Treuenstein. Voltelini 1904, 36.

⁷⁵ Briggs/Zuijderduijn 2018, 3-7; Bell/Brooks/Moore 2009, 413-416; Clark 1988, 168.

⁷⁶ For an analysis of other notary registers from 13th century, see Ertl 2017.

⁷⁷ Briggs/Zuijderduijn 2018, 4-6.

⁷⁸ „*War ob er sein gelt muest haben, so sol er in ainen manat [sic!] vor manen [...]*“ Raffener 2008, no. 16.

sold a perpetual rent (*fictus perpetui*) of 18 lb. for 20 mr. The rent could be redeemed within the following six years on Saint Martin's day, but not before the first four years have passed.⁷⁹ This way, the creditor would receive a minimum of four instalments over 18 lb. before the principal would be repaid. In 17 other cases, the seller and his heirs retained a perpetual right of redemption.

Before the interest rates will be discussed, two methodological concerns must be addressed. First, in 24 out of 64 contracts the interest payments stemming from the sold or pledged property were in kind. This means that it was necessary to convert these payments into monetary values. To do that, I used a dataset of 4380 prices for wares from the county of Tirol.⁸⁰ Table 4 indicates the price applied for the calculation and mentions the source for a better comparability. The results compared with the contracts where the interest rate is indicated in currency show that the data interpolated is a good fit. Second, in nearly all the cases there is no way to tell if, and if yes, when the sold or pledged property rights or goods were redeemed. The notaries only recorded the sale contract and issued the charter that proved the right of repurchase. It is not possible to say what happened afterwards. Solely the cancellations of the entries in the notary registers are not sufficient to say anything about the repayment of the debt or the repurchase of the property.⁸¹ In order to calculate the interest rate, the latest possible repayment date was used. Once again, the final results seem to correspond with other findings from medieval Europe of that time.⁸²

As can be seen in figure 2 most of the interest charged for sale-resale contracts or mortgage contracts were between 3.5% and 20% p.a. This was probably the interest rate for risk free credit contracts secured with collateral. These figures correspond well with the findings from Ertl about the credit market in Bozen from 1242, where he found interest rates between 5% and 33% and from Stamm about interest rates of 10% on average in 14th century Bozen.⁸³ There is a general trend of declining interest rates between 1295 and 1471. In the 15th century the interest rates dropped many times below 10% p.a., sometimes even below 5% p.a.⁸⁴ However, there are some remarkable exceptions with higher interest rates of about 25%, 30% or even 56% p.a.

In May 1328, Chunradus de Lebenberch sold a perpetual rent of one cartload (*carrada*) of wine to Bertholdus de Rubein for 10 mr.⁸⁵ The wine had to be delivered during the vintage (*tempore vindemie*). If we convert the price of the wine into monetary values, we can calculate that the rent was worth approximately 384 gr.⁸⁶ Now we know that the rent could be repurchased until next Candlemas (February 2, *in die purificationis beate Marie virginis proxime venture*). The credit transaction can be summed up as follows: The perpetuity was sold in May for 10 mr., the rent was paid in October to the

⁷⁹ The rent could be repurchased, „a nunc proximo festo Sancti Martini ultra VI annos sed in proximis IIII annis non possunt redimere [...]” Mantoan 1999, no. 175.

⁸⁰ This database was created on the initiative of Lienhard Thaler, University of Vienna. We gathered data on prices from account books, notary registers and court protocols covering a period from 1227 to 1519. The database is constantly being expanded.

⁸¹ In some registers, like in StA Meran, NI 30 from the notary Cristanus de Eppiano, some of the *notula* in the register were cancelled and deleted (*cassatum*) by order of the creditor respectively buyer. This might indicate that the property was indeed redeemed. However, without further evidence it is impossible to say. Cf. Mantoan 1999, nos. 97, 117, 169, 173, 185, 193.

⁸² Clark 1988, 273; Ertl 2017, 16.

⁸³ Ertl 2017; Stamm 2015.

⁸⁴ This corresponds with the findings of other authors about risk-free credits. Cf. Clark 1988; Gilomen 1982 (about public debt); Huang/Chlosi/Sapoznik 2019 (about life and perpetual annuities).

⁸⁵ Karner 1985, nos. 12-13.

⁸⁶ The price of wine was naturally subject to great differences in quality. The price of roughly 384 gr. per *carrada* seems reasonable and can be extracted from several other contracts. Karner 1985, 46 and 179.

creditor and the debtor (possibly) recovered his perpetual rent at Candlemas. Due to the short runtime of the contract (277 days) and the early repayment, the actual interest rate p.a. equated to 48.5% p.a. Very often, the size of the interest rates resulted from the circumstances of the credit business. In 1372 Jaeclius and his wife, Elspeta, sold a perpetual rent of four urns of wine, payable from a vineyard called *ze spitz*, for 8 mr. to Laurencius Treipgazzzer.⁸⁷ The rent could be redeemed within four years for the aforesaid price. In another contract, the married couple received the mentioned vineyard *ze spitz* from Laurencius Treipgazzzer as fief for a rent of two urns of wine.⁸⁸ Now, a total rent of six urns of wine was imposed on the vineyard. The high interest rate of 30% p.a. was probably somehow connected to the enfeoffment.⁸⁹ Very often credit operations were connected to other dealings like dowries, buying land or property or other forms of investment. The urgency of borrowing and the relationship between debtor and creditor naturally had a big impact on the interest rates.

In most cases the price (or value) of the sold or pledged good would be ten times the size of the perpetual rent or interest payment.⁹⁰ In such cases, the redemption of the good was usually possible after one or several years. These sale-resale contracts were basically redeemable perpetuities. One of these contracts was the following. Hans der Stadler took a credit of 40 lb. from Chuenrad ab Turnell, for which he pledged a manor as security. Chuenrad was to receive 4 lb. per year from the pledged manor. If the debtor would repay Chuenrad within three years, the manor would be returned to him. Otherwise the mortgage would be transferred perpetually to the creditor.⁹¹ This credit was basically risk-free and 10% p.a. seemed to be a reasonable interest rate for this transaction. The value of the property seems to be connected to the income from the land.

Contrary to the observations of Briggs and Zijderduijn, real estate in Tirol was also used as collateral for small-scale loans.⁹² There were several properties sold or mortgaged that were worth between 120 gr. and 300 gr. Compared to the average wage of a skilled craftsman of 200 gr. per month in 1390/1391, these sums are very small.⁹³ Finally, the interest rate charged does not seem to be connected to the size of the principal (cf. figure 3). The difference of interest rate was connected to other factors. In the next section it will be analysed what interest rates seemed appropriate to the creditor and debtor and how difficulties about it were settled in court.

5. Differences between norms and practices: Credit transactions in court

What can be seen is the practice to charge interest. In some cases, interest rates were hidden by using diverse contract forms. As shown above, interest is rarely ever mentioned in official contracts because the catholic doctrine has forbidden it. However, it was allowed to claim recompensation for damages (*damnum*) if the capital was returned after agreed date or if other costs would incur (e.g. at court). In most *mutuum* or sale contracts, the interest rate would be hid in the amount of the final repayment of the

⁸⁷ StA Meran, NI 8, fol. 58v-59r.

⁸⁸ StA Meran, NI 8, fol. 59v.

⁸⁹ Stamm 2009.

⁹⁰ This finding is for Tirol confirmed by Stamm. Stamm 2015, 66.

⁹¹ Raffener 2008, no.4.

⁹² Briggs/Zijderduijn 2018, 3. In Tirol even modest plots of land, like in one case on seventh of a small field, were sold or mortgaged. Stamm 2009, 35; Ertl 2017, 10-11.

⁹³ Köhler 2020, 36.

loan or in setting an unrealistic date for repayment, so interest could be charged. Another way to hide interest rates was the practice of pledging and/or selling of property or rents with right to repurchase. That these practices were not undisputed is shown by several lawsuits from the 13th and 14th century. In 1236 a debt was settled in Trient between Wercius de Scurellis and his brothers Mucius and Otto on the one hand, and Leonardus on the other. Leonardus owed the three brothers a high sum of money for a loan and interest. However, he successfully sought a lawsuit against Wercius before a papal legate (*delegato domini pape pro usura*) for usury.⁹⁴ In return, Wercius gave up all claims against Leonardus for the interest (*omnibus expensis et dampno*) on that debt and they agreed on the repayment of the principal through selling of a collateral. Once again, we do not know how much interest was actually charged but it looks like Leonard's strategy was successful and he only had to repay the principal of the debt. In another case from Trient from 1236, Albertinus de Castronovo submitted a protest against a judgement in court. Although it is not stated directly in the entry, it appears he was sentenced before to pay a debt with interest. He claimed that the judgement of the official is void because it is the archdeacon of Trient and not the podestà of Trient who is responsible for usury (*usuraria*).⁹⁵ Consequently, he sought a trial before an ecclesiastical court, where he thought he had a better chance of winning.

In July 1328, the bishop of Chur appointed arbiters to decide on a usury-case in Partschins that was brought to the ecclesiastical court.⁹⁶ Here, a woman - oddly enough, not mentioned by name - accused Waltherus de Partschins and his son of hidden usury and that he "squeezed hidden usury out of her" (*ab ea extorsit et recepit usuraria pravitare*). The woman pledged two vineyards to Waltherus and his son and they received an annual rent of three cartloads of wine from it for ten years. That is all we hear about it in the narration of the contract. Then the verdict is recorded. The arbiters decided in favour of the woman and Waltherus and his son were sentenced to pay 10 mr. to the daughter of the mentioned woman. Again, we do not hear anything about the size of the initial debt and the exact value of the rent paid in wine.

It is obvious that such cases must have happened quite often. This leads us to the question what rate of interest was considered to be justified? And why was interest sometimes openly stated in contracts and in other cases disguised? Answers to the question about the practical side of charging interest give us the statutes of the diocesan synod of Trient convened by bishop Heinrich III. (1310-1336).⁹⁷ There it was defined who should be seen as a public usurer and it was described how usury was practiced.⁹⁸ Everyone who runs a *casana* or has a table or bank for lending and receiving money in their home should be regarded as a manifest usurer (*manifestus usurarius*).⁹⁹ Besides, usurers hide the truth by doubling the amount of debt actually received when recorded in debt instruments.¹⁰⁰ Another prohibition applies to

⁹⁴ Voltolini 1951, no. 281.

⁹⁵ Voltolini 1951, no. 431; Voltolini 1889, 125.

⁹⁶ Karner 1985, no. 52.

⁹⁷ The resolutions have confirmed by Heinrich's successor Nikolaus in 1344. Voltolini 1889, 151-153; Voltolini 1904, 40.

⁹⁸ Bonelli 1762, 143-145.

⁹⁹ „quem legitime in iudicio probatum fuerit casanam, ut vulgari regionis utamur, seu discum, vel mensam publice in aliqua domo tenere, in quo disco, seu mensa pecunias publice aliis numeret et recipiat [...]”. Bonelli 1762, 143.

¹⁰⁰ „quod tales in fraudem usuratum instrumenta debitorum suorum dupli quantitatis veri debiti confici faciunt, seu scribi, omne instrumentum cujuscumque debiti, quantitatis, aut speciei cujuslibet aestimatae, quodammodo, et melius, ut credi possit, per talem manifestum usurarium in iudicium produceretur duplum quantitatis veri debiti intellegi volumus continere [...]”. Bonelli 1762, 144.

contracts falsely issued for deposits if they have been drawn up by usurers.¹⁰¹ Thus, all contracts brought before the courts should be valid only for half of the amount of the debt they specify. This was definitely aimed at the practices of the *casanas* that gave out hidden loans in forms of deposits. Consequently, the comital pawnshops in the ecclesiastical territories of Brixen and Trient were the first ones to disappear again, probably because the bishops have acted vigorously against all usury in their territories.¹⁰²

However, usury was not restricted to professional moneylenders and pawnbrokers. In the context of the inquisition investigations of 1332/1331 against Fra Dolcino and his followers in the surrounding area of Riva, several priests were also accused of usury who lent money and grain against interest.¹⁰³ And as the lawsuit about usury from 1328 shows, the income of pledged goods could also be considered as usury if not deducted from the principal. This also made mortgage contracts suspicious. Besides that, legitimate interest was indeed allowed to charge and recompensation for damages was often claimed in the court of Meran.¹⁰⁴ It was a legitimate legal remedy in the event of non-payment of a debt to recover the sum from a moneylender to the detriment of the original debtor. This was the case in 1388 when a certain Prawn sued a woman called Tuesenichtin and one of her guarantors for 92 gr. and damages, which went to a usurer.¹⁰⁵ In a similar case from 1390, the creditor raised the money of the unpaid debt from a usurer at the debtor's expense.¹⁰⁶ As the cases described here show, there was a wide range of interest rates charged in medieval societies, some legally accepted and others not. So the question remains what price for money seemed reasonable for the contemporaries and how did information about it circulated in the urban and rural landscape of medieval Tirol?

6. The price of money? Information about interest rates in a medieval society

When giving a loan, the debtor did not want to pay too much for the credit and the creditor expected a legitimate recompensation. The question of the practice of how loans were taken out in the Middle Ages puzzles historians. How did debtor and lender find each other and how did they agree on a fair price for the money? Older research focused on credit contracts and legal norms. However, with regard to our contemporary perspectives of research, these older publications fail to address some of the key issues that we are dealing with, namely:¹⁰⁷ What information about interest rates circulated in medieval societies? How was information about interest rates exchanged? What financial intermediaries were active in gathering and communicating information?

¹⁰¹ „*Verum quia frequenter in fraudem usurarum foeneratores praedicti tam vere mutuunt instrumenta sub nomine depositi, seu alterius cujuscumque contractus conventionaliter scribi faciunt [...]*.” Bonelli 1762, 144.

¹⁰² The *casana* in Brixen was only active between 1294 and 1303, the *casana* in Trient only between 1293 and 1302. Voltolini 1904, 41.

¹⁰³ Segarizzi 1900; Voltolini 1904, 26.

¹⁰⁴ StA Meran, GP 1, fol. 56v, 58r, 68r, 71v, 73v, 82v, etc.

¹⁰⁵ „*Ez hat volg und frag bracht von der chlag wegen die der Prawn getan hat gen die Tuesenichtin alz gen ainen selb thallen und hintz Hainrich von Laim alz gen ainen burge umb .viii. libra perner minus .iiii. groschen und umb ga[...]igen schaden der dar auf gangen ist an den wuchrer, [...]*.” StA Meran, GP 1, fol. 18r.

¹⁰⁶ StA Meran; GP 1, fol. 116v. The case concerns the question of the amount of the principal debt and interest owed.

¹⁰⁷ Cf. McCusker/Gravensteijn 1991, 21-31.

1. What information about interest rates circulated in a medieval society?

People were well aware about market prices for commodities and the value of different currencies. Many contracts mention the sale of commodities according to the usual and known market prices.¹⁰⁸ In another contract, it is specified that wine should be sold in another town for a price that was to be estimated by several wise men (*secundum consilium sapientium virorum*).¹⁰⁹ Knowledge about currencies is shown when contracts mention the actual exchange value between gold and silver coins for repayments.¹¹⁰ Concerning credits, things were more difficult. The line between fair compensation and the accusation of usury was thin, as has been shown above.

In 1332, a priest from the diocese of Trient, Ser Cyano, was accused of usury by the inquisition.¹¹¹ He gave a loan of 20 lb. to the notary Nicolai, who in return pledged a piece of land with a rent of two *minalia* grain to him. Ser Cyano would receive the rent of the land as compensation for the loan. However, after two years a shortage of grain led to an increase in the price and Nicolai wanted to dismiss the payment of grain to his creditor. He argued that the previous payments would have satisfied his debt, which Cyano denied and insisted on further payments. This case shows that the problem was not the interest payment per se, but the amount. According to the logic of the argument, interest rates had to be within an acceptable range. This problem was all the more important when the interest was paid in kind, which was subject to price fluctuations. In the case of credits secured with real estate or perpetuities, there seemed to be an idea about the just price. In the 15th century, a debate about the just price for perpetuities was discussed at the Council of Konstanz, which confirm interest rates between 4.17% and 5% as just.¹¹² The development of declining interest rates in Tirol in the 15th century, at least for risk-free perpetuities, fits in this picture. In Tirol, people were obviously aware of this concept, but also about the prices for land and commodities.

2. How was information about interest rates exchanged?

Public ordonnances and laws proclaimed by the counts of Tirol, the ecclesiastical lords (the bishops of Brixen, Chur and Trient), and municipal governments would be known to all people. Laws were openly proclaimed at the court meetings (*taidings*) and ecclesiastical doctrine was communicated in the church.¹¹³ Professional moneylenders were bound to a fixed maximum interest rate, which was known to all people. The moneylenders of the *casana* in Bozen kept the privileges of the counts and the leasehold contracts in their shop. They would probably insist on these regulations in the event of litigation.¹¹⁴ Since the privileges of the counts regulated the selling and pledging of the pawned items it can be assumed that these provisions together with the fixed interest rates of 86.6% p.a. were generally known.

However, the actual interest charged was issue of the parties involved and probably connected to the creditworthiness of the debtors. That the interest was hidden in the loan (deposit) contracts was rather due to the ecclesiastical prohibitions, which did not recognise exceptions by the secular rulers. As shown

¹⁰⁸ I.e. in a contract from 1391. Kunz Kalb sold four *fuder* of wine for the usual market price (“*und sol ain fuder anslahen, wie es yetwo anderwo daselben nemen inn gat.*” Raffener 2008, no. 65).

¹⁰⁹ Raffener 2008, no. 69.

¹¹⁰ Cf. Mantoan 1999, nos. 81, 112, 156, 158.

¹¹¹ Segarizzi 1900, 296 and 388. Besides Ser Cyano, another priest, presbyter Stephanus, was accused of usury.

¹¹² Gilomen 1982, 16; Bauer 1964, 178.

¹¹³ Dopsch 2008, 72-77.

¹¹⁴ Santifaller 1927, 56.

before, no creditor was one hundred percent secure against charges against usury. Besides these written normative statutes, there was no collection of fixed interest rates in Tirol.

A lot of discussion about interest rates took place publicly in court. The finding of justice was based on the submission of written evidence, like charters (*prief*), and on questions and opinions (*volg und frag*). In several lawsuits at the court of Meran, the judge appointed several honorable citizens to examine the claim for damages.¹¹⁵ If the debtor would not appear in court, he would be sentenced to the payment of the principal and damages (*schäden*).¹¹⁶ Unfortunately, the verdicts do not state the amount of damages the debtors had to pay. The judgments were found through consultation with the assessors and the hearings were public. So any sentence involving recompensation would be publically known. Besides, the court allowed the lender to reschedule the debt to a professional moneylender in the event of non-payment, who would charge very high interest rates up to the allowed maximum.¹¹⁷

3. What financial intermediaries were active in gathering and communicating information?

Finally, several formal and informal financial intermediaries spread information about interest rates.¹¹⁸ For Tirol, merchant books about prices or exchange rates are non-existent.¹¹⁹ So far, none of these are known for medieval Tirol. Besides merchants, professional moneylenders would provide information about their financial services. It is indicated by several sources that their practices were well known and in Meran, the municipal government taxed the pawnbroking house.¹²⁰ The non-professional pawnbroking business in Meran was monitored by the *veilträger*. This official carried out seizures with his subordinates and organised the sale of the pawns. His wage was based on the value of the seized objects and the transactions costs of his activities might serve as indicator for the costs of pawnbroking. The many references of pledging objects in court and granting of a lien against the debtors (*gewalt und gewer*) underline its importance. The seizure of goods was a public issue and not only would the *veilträger* confiscate goods, but he would also proclaim the uncreditworthiness of certain persons and what ruin their reputation.¹²¹

Notaries were of great importance, since they recorded the debt instruments, issued the charters and probably also acted as brokers in the credit market.¹²² Very often, they would be active in several different places and thus be familiar with different local settings and prices for commodities and real estate. Since they drew up legal contracts, they were accustomed to using different forms of credit instruments like mortgage, sale-resale contracts, loans or purchases with a deferred payment and

¹¹⁵ Cf. StA Meran, GP 1, fol. 88r, 116v, etc.

¹¹⁶ In a lawcase from 1388, the debtor was sentenced to pay interest. „Item Christan Rewpach hat daz recht gesücht alz auf endhaften tag hintz Gesen, dez Mitelpergers swester, umb .viii. markt und umb .iv. ellen tuechs, den mocht nicht gericht werden, sol beleiben bey allen seinen tagen und im sol der selb tag an allen schaden sein gebiet auf daz nächst recht wider für.“ StA Meran, GP 1, fol. 73v.

¹¹⁷ StA Meran, GP 1, fol. 18r.

¹¹⁸ “Informal credit in particular refers to transactions that are not intermediated by operators specialized in matching demand and supply, namely professionals whose specialization was other than this, like for instance notaries, scriveners, merchants and even religious institutions.” Coffman/Lorandini/Lorenzini 2018, 2.

¹¹⁹ In Meran existed official brokers (*underkäufelampt*) for trade. Pfeiffer 1848, 426f.

¹²⁰ Botticini 2000; Kogler 1901, 640.

¹²¹ The procedure of a seizure is described in the court protocols of Meran. StA Meran, GP 1, fol. 135v-136r. For seizures in general, see Smail 2016.

¹²² For example, the notary Jakob Tugehenn acted in several cases as guarantor for a credit transaction he recorded. Voltelini/Huter 1971, nos. 651, 652, 653, 704, 727. For the importance of notaries as financial intermediaries in France in the 18th and 19th century, see Hoffman/Postel-Vinay/Rosenthal 2000; 2019.

probably had an idea what kind of interest would be justified. Together with the other available information, creditors and debtors would have a good idea what interest rates would be appropriate.

7. Conclusion

Overall, it was shown that without officially published price currents there was a wide range of information available to the society about interest rates. This knowledge was transported by both oral and written means. While a large part of the standardisation was determined by statutory texts, in practice there was a wide range of interest rates actually charged. The actual interest rates imposed depended mainly on the repayment date of the loan and the securities (collateral, guarantors, reputation) offered by the debtor. Risk-free loans secured by perpetuities or land were subject to significantly lower interest rates than commercial loans or pawnbroking loans.

The collected dataset is a valuable tool. First, it increases our knowledge about interest rate observations available to historians. Second, it shows that Tirol fits into the overall development of declining interest rates in late medieval Europe. Third, it shows that market forces (supply and demand) were not the only mechanisms determining the interest rates in Tirol.¹²³ The idea of a justified price for perpetuities and risk-free loans of an interest between 5% and 12% p.a. could have played a role.¹²⁴ Fourth, it was shown that knowledge about interest was widespread among large parts of the population of both urban and rural Tirol. The financial “illiteracy” of the population was partly compensated by financial intermediaries like notaries.

¹²³ To my knowledge, the impact of inflation on interest rates has not yet been sufficiently explored for the middle ages.

¹²⁴ Stamm 2015; Gilomen 1982, 15-17.

8. Tables and figures

TABLE 4: INTEREST RATES PER ANNUM (1295 – 1471)

Year	Location	Type of contract	Principal of the loan (in gr.)	Payment in money/kind	Runtime (days)	Interest p.a. (in %)	Source
1295	Bozen	emptio iuris (<i>erbleihe</i>) cum carta redimenti	288	kind	perpetual	19,4	Voltelini/Huter 1951, no. 618
1328	Meran	emptio censi cum carta redimenti	1200	kind	277	48,5	Karner 1985, no. 12
1328	Meran	emptio censi cum carta redimenti	3480	kind	586	38	Karner 1985, no. 27
1328	Meran	emptio censi cum carta redimenti	840	kind and money	1838	10	Gamper 1993, no. 10
1328	Meran	emptio censi cum carta redimenti	720	money	1824	10	Gamper 1993, no. 27
1328	Meran	emptio censi cum carta redimenti	720	money	1824	10	Gamper 1993, no. 28
1328	Meran	emptio censi cum carta redimenti	1560	money	747	10	Gamper 1993, no. 29
1328	Meran	emptio censi cum carta redimenti	1560	money	747	10	Gamper 1993, no. 30
1328	Meran	emptio censi cum carta redimenti	1200	kind	726	20	Gamper 1993, no. 50
1328	Meran	emptio censi cum carta redimenti	600	money	perpetual	12	Gamper 1993, no. 75
1328	Meran	emptio terre et censi cum carta redimenti	1200	money	1064	5	Gamper 1993, no. 79
1372	Meran	emptio censi cum carta redimenti	720	money	1835	10	StA Meran, NI 8, fol. 49r-50v
1372	Meran	emptio censi cum carta redimenti	720	kind	1475	11,16	StA Meran, NI 8, fol. 52r-53r
1372	Meran	emptio censi cum carta redimenti	1920	kind	1463	21,8	StA Meran, NI 8, fol. 55r-56r
1372	Meran	emptio censi cum carta redimenti	960	kind	1130	30,24	StA Meran, NI 8, fol. 58v-59r
1390	Laas	obligatio terre	300	kind	perpetual	4	Raffener 2008,

							no. 16
1390	Laas	obligatio iuris (<i>erbleihe</i>) et censi et cum carta redimenti	480	money	1095	10	Raffeiner 2008, no. 4
1391	Laas	obligatio terre cum carta redimenti	180	money	on demand	8,8	Raffeiner 2008, no. 2
1391	Laas	emptio terre et censi cum carta redimenti	540	kind	2070	9,9	Raffeiner 2008, no. 33
1391	Laas	emptio censi cum carta redimenti	600	kind	1849	10,7	Raffeiner 2008, no. 35
1391	Laas	emptio censi cum carta redimenti	720	kind	1856	12,5	Raffeiner 2008, no. 37
1391	Laas	emptio terre et censi cum carta redimenti	840	kind	1916	8,5	Raffeiner 2008, no. 43
1391	Laas	emptio terre cum carta redimenti	240	kind	1618	13,4	Raffeiner 2008, no. 45
1391	Laas	obligatio censi	2160	money	1099	10	Raffeiner 2008, no. 47
1391	Laas	emptio censi cum carta redimenti	4320	kind	perpetual	8,3	Raffeiner 2008, no. 59
1391	Laas	emptio terre cum carta redimenti	360	money	1821	10	Raffeiner 2008, no. 61
1391	Laas	emptio terre cum carta redimenti	120	money	perpetual	16,6	Raffeiner 2008, no. 79
1391	Laas	emptio terre cum carta redimenti	180	kind	1090	22,3	Raffeiner 2008, no. 80
1391	Laas	emptio terre cum carta redimenti	400	money	perpetual	56	Raffeiner 2008, no. 81
1391	Laas	emptio terre cum carta redimenti	120	money	461	19,9	Raffeiner 2008, no. 82
1391	Laas	emptio censi cum carta redimenti	480	money	1844	12,6	Raffeiner 2008, no. 86
1391	Laas	emptio censi cum carta redimenti	240	money	1057	10,4	Raffeiner 2008, no. 87
1406	Meran	emptio censi cum carta redimenti	720	money	749	10,3	Mantoan 1999, no. 23
1406	Meran	emptio censi cum	480	kind	perpetual	25	Mantoan 1999,

		carta redimenti					no. 33
1407	Meran	emptio censi cum carta redimenti	1200	money	perpetual	10	Mantoan 1999, no. 111
1407	Meran	emptio censi cum carta redimenti	2400	kind	2225	14,3	Mantoan 1999, no. 136
1407	Meran	emptio censi cum carta redimenti	2400	kind	1832	17,4	Mantoan 1999, no. 159
1407	Meran	emptio censi cum carta redimenti	3960	money	1841	7,5	Mantoan 1999, no. 164
1407	Meran	emptio censi cum carta redimenti	360	money	1821	10	Mantoan 1999, no. 169
1407	Algund	emptio censi cum carta redimenti	2400	money	2185	9	Mantoan 1999, no. 173
1407	Meran	emptio censi cum carta redimenti	600	money	1097	10	Mantoan 1999, no. 183
1407	Meran	emptio censi cum carta redimenti	720	money	2178	9	Mantoan 1999, no. 185
1407	Meran	emptio censi cum carta redimenti	3000	money	perpetual	10,6	Mantoan 1999, no. 187
1407	Meran	emptio censi cum carta redimenti	600	kind	perpetual	26,6	Mantoan 1999, no. 193
1407	Meran	emptio censi cum carta redimenti	504	money	374	7,2	Mantoan 1999, no. 198
1407	Meran	emptio censi cum carta redimenti	1440	kind	1464	25,6	Mantoan 1999, no. 200
1407	Mean	emptio terre cum carta redimenti	2400	money	300	13,6	Mantoan 1999, no. 78
1407	Meran	emptio censi cum carta redimenti	1200	money	1705	10,9	Mantoan 1999, no. 97
1468	Meran	emptio censi cum carta redimenti	3000	money	perpetual	4	Moeser/Huter 1990, no. 1
1468	Meran	emptio censi cum carta redimenti	1320	money	239	5,6	Moeser/Huter 1990, no. 2
1468	Meran	emptio censi cum carta redimenti	2400	money	perpetual	10	Moeser/Huter 1990, no. 23
1468	Meran	emptio censi cum carta redimenti	3120	money	perpetual	6,9	Moeser/Huter 1990, no. 24
1469	Meran	emptio censi cum carta redimenti	4800	money	perpetual	5	Moeser/Huter 1990, no. 22
1470	Meran	emptio censi cum carta redimenti	9600	money	1701	5,4	Moeser/Huter 1990, no. 106

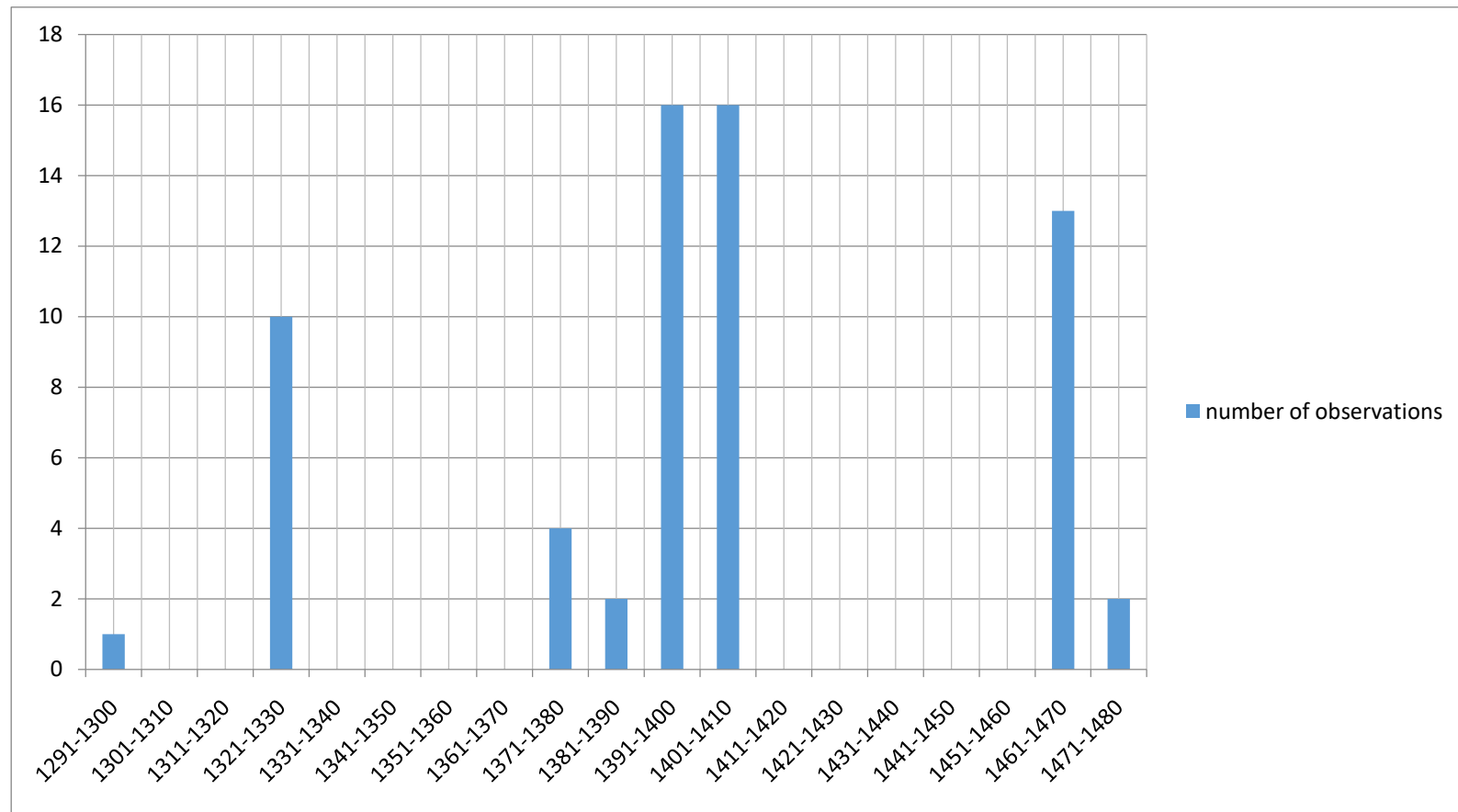
1470	Meran	obligatio terre	4320	money	63	39,9	Moeser/Huter 1990, no. 124
1470	Meran	emptio censi cum carta redimenti	2160	kind	3606	7,1	Moeser/Huter 1990, no. 144
1470	Meran	emptio censi cum carta redimenti	2160	kind	3606	3,5	Moeser/Huter 1990, no. 144
1470	Meran	debitum	1108	money	1188	4	Moeser/Huter 1990, no. 201
1470	Meran	emptio censi cum carta redimenti	840	money	perpetual	4,3	Moeser/Huter 1990, no. 91
1470	Meran	emptio censi cum carta redimenti	2400	kind	perpetual	6,25	Moeser/Huter 1990, no. 92
1470	Meran	emptio censi cum carta redimenti	2160	kind	3437	7,5	Moeser/Huter 1990, no. 95
1471	Meran	emptio censi cum carta redimenti	3000	money	perpetual	4,8	Moeser/Huter 1990, no. 182
1471	Meran	emptio censi cum carta redimenti	3840	kind	483	12,3	Moeser/Huter 1990, no. 196

Source: StA Meran, NI 8; Voltolini 1951; Karner 1985; Moeser/Huter 1990; Gamper 1993; Mantoan 1999; Raffener 2008.

Notes: For a detailed description of the dataset, see page

FIGURE I: NUMBER OF OBSERVATIONS PER DECADE (1291-1480)

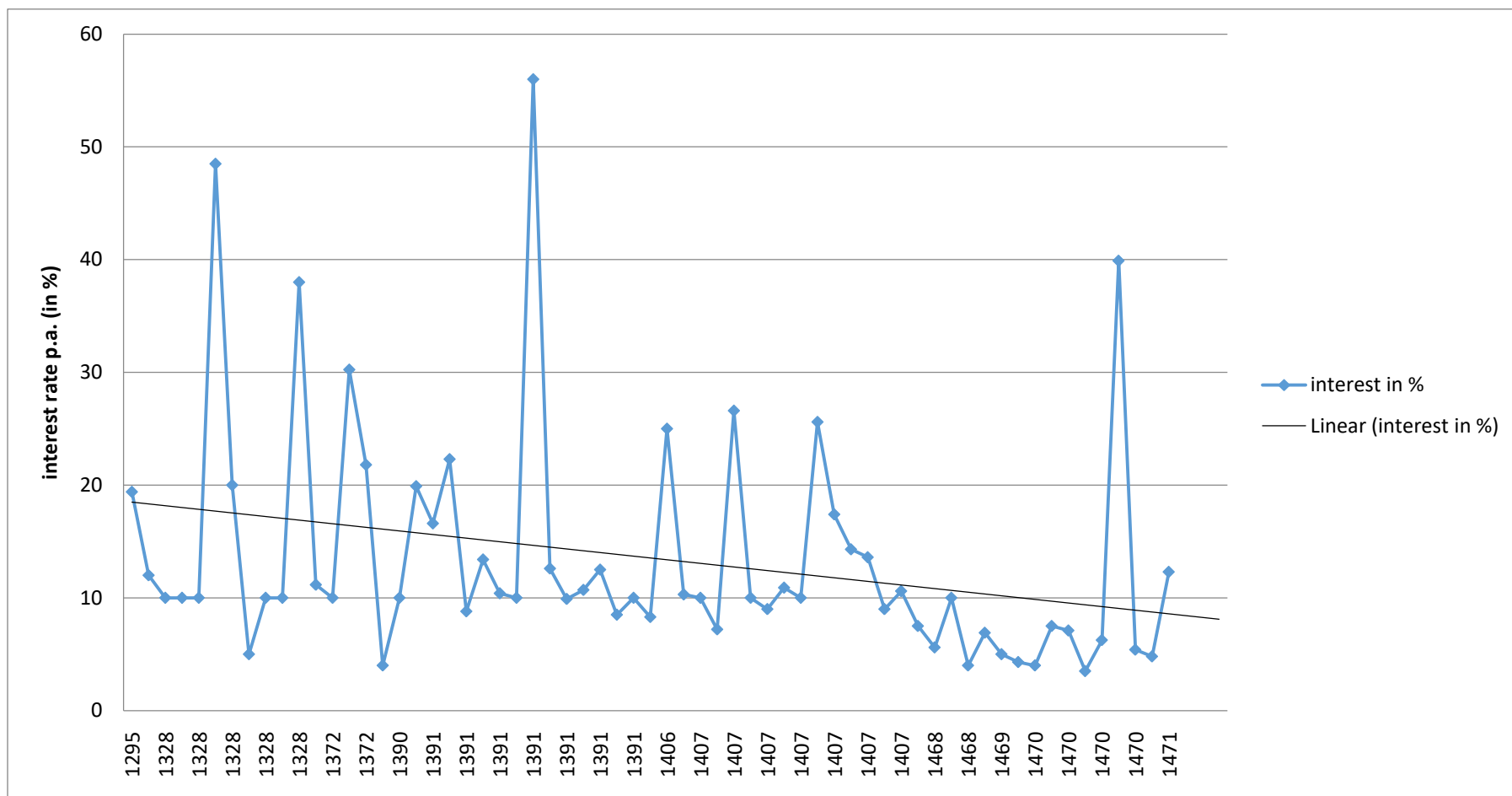
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Source: StA Meran, NI 8; Voltolini 1951; Karner 1985; Moeser/Huter 1990; Gamper 1993; Mantoan 1999; Raffeiner 2008.

FIGURE 2: INTEREST RATES P.A. (1295-1471)

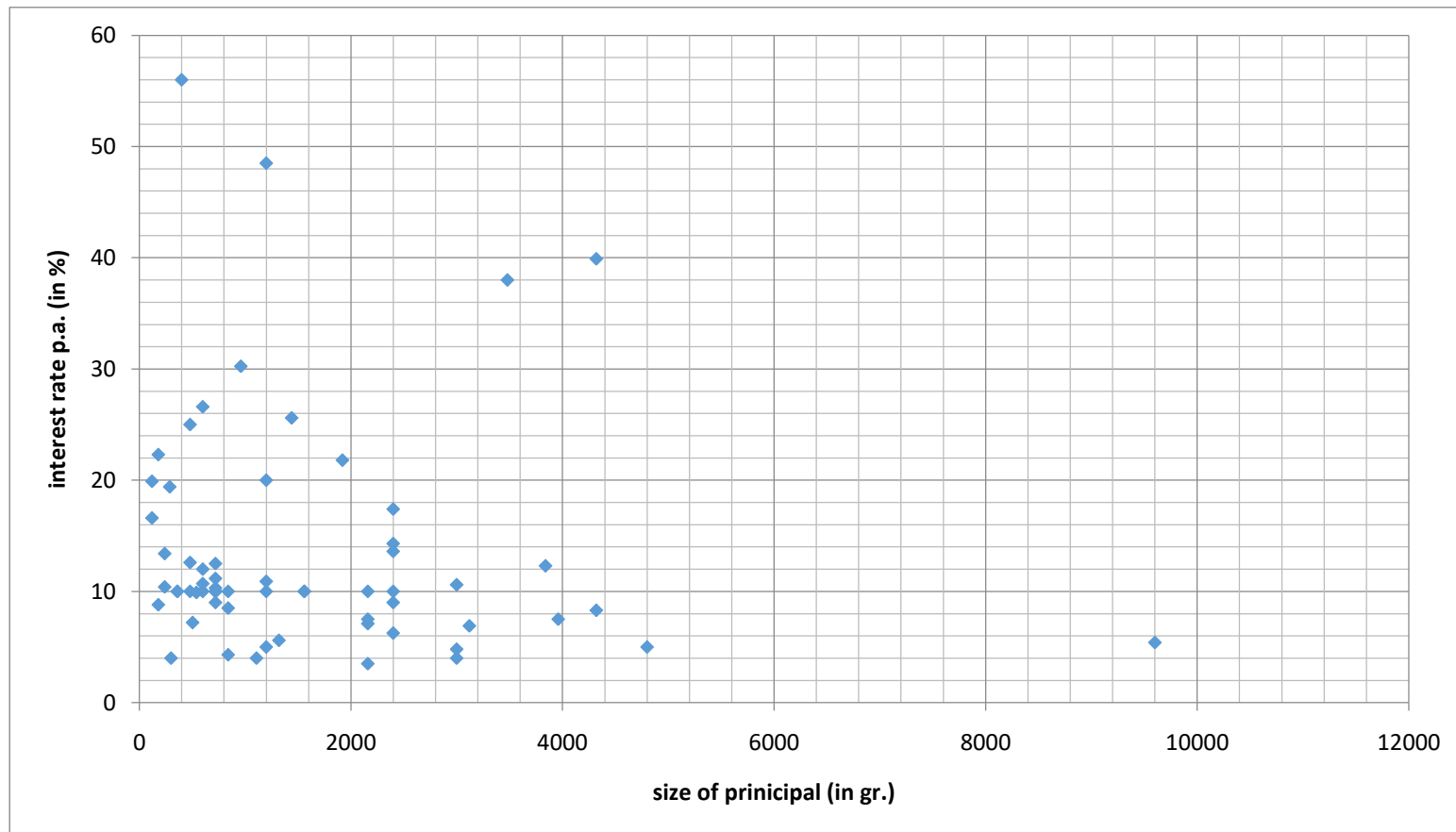
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Source: StA Meran, NI 8; Voltolini 1951; Karner 1985; Moeser/Huter 1990; Gamper 1993; Mantoan 1999; Raffener 2008.

FIGURE 3: RELATION OF INTEREST RATE P.A. TO PRINCIPAL (1295-1471)

N=63



Source: StA Meran, NI 8; Voltolini 1951; Karner 1985; Moeser/Huter 1990; Gamper 1993; Mantoan 1999; Raffener 2008.

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