

## **Interest-bearing loans and unpayable debts in slow-growing economies: insights from eleven historical cases**

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### **Abstract**

Under what circumstances are interest-bearing loans compatible with an economy without much growth? The question is becoming increasingly important given a tendency towards declining GDP in industrialised economies and increasing evidence that continued growth is incompatible with environmental sustainability. Previous theoretical work suggests that when interest-bearing loans compound, this results in exponentially growing debts that are impossible to repay in the absence of economic growth. We here examine eleven historical cases to assess support for this finding. We find that interest-bearing loans have typically resulted in unpayable debts in these non- and slow-growing economies. We further identify five broad category of measures that could prevent or alleviate the problem of unpayable debts, and show how they have been employed in the past.

Keywords: interest, debt, stationary economy, steady-state economy, environmental sustainability.

JEL classifications: N20 Economic History of Financial Markets and Institutions; O44 Environment and Growth; Q57 Ecological Economics.

### **Introduction**

There are doubts about whether economic growth can continue at its current rate (Gordon 2012, Summers 2013, Krugman 2014) and there is increasing evidence that continued growth in industrialised economies may conflict with environmental and resource constraints (Groenewegen et al 1992, Rosser and Rosser 2006, Jackson and Webster 2016, Mardani et al 2019). Since credit creation can be considered a claim on future growth (Von der Becke and Sornette 2017), this creates concerns for mounting debts and rising inequalities in economies with little or no growth (Piketty 2014; Morgan 2015). That could make a steady-state or a stable ‘post-growth’ state incompatible with lending with interest.

Recent economic simulations, however, suggest that under certain conditions positive interest rates are compatible with zero growth and that inequality does not have to increase in the absence of growth (Jackson and Victor 2015, 2016). The conditions postulated are nonetheless quite strict. These first models, based on a Keynesian stock-flow consistent framework, rendered positive interest rates compatible with zero growth only on the condition of zero net savings in the economy (Berg et al., 2015; Jackson and Victor, 2015; Cahen-Fourot and Lavoie, 2016). More recent models show that the necessary condition is somewhat narrower, though still quite challenging: all income from interest must be spent, meaning that lenders cannot make profits or accumulate income from lending (Author 1 et al.

in review). The strictness of these conditions supports the views of those who continue to suggest that there exists a conflict between an economy with positive interest rates, where debt can grow exponentially, and a real economy that is subject to environmental and resource limits (e.g. Soddy 1926, Daly 1980, Martinez-Alier 1987, Farley et al 2013, Lietaer et al. 2013).

What does the empirical record show? How have economies without growth fared – or dealt with – interest rates? And do we find in the historical record examples of societies that tried to impose the strict conditions postulated in the aforementioned models? These are the questions motivating this research. No modern economy has yet experienced prolonged periods of zero or very low growth. In contrast, no pre-modern economy ever exceeded annual per capita GDP growth above 0.2 or 0.3 per cent (Bolt et al. 2018). Historical research thus serves as a useful empirical complement to the current theoretical debates about the feasibility and potential institutional forms a more sustainable economy may take (Matutinović 2007).

Others before us have suggested that historical cases give fodder to the argument that there is no fundamental incompatibility between positive interest rates and zero growth. Cahen-Fourot and Lavoie, for example, write that “interest [was] in existence long before modern capitalist economies relying on economic growth as their ultimate goal took shape in the western world” (2016: 167). Similarly, Strunz et al support their suggestion that interest is compatible with a non-growing economy by citing the existence of interest in Egypt, Mesopotamia, America, India, China, and medieval western Europe (2017: 346). The desire to better understand the historical contexts in which interest-bearing loans have been possible is what motivates this paper.

A first aim of the paper, then, is to examine the extent to which the charging of interest in the absence of substantial economic growth has been problematic historically. We examine literature on eleven different cases (see Table 1). The cases are drawn from across Eurasia, Oceania, and the Americas, their dates ranging from bronze age societies of the 2<sup>nd</sup> millennium BC up to the 19<sup>th</sup> century AD, when the period of modern economic growth was just beginning.<sup>1</sup> Recent research has presented cross-cultural comparisons of debt, including instances of the problems caused by debt in general (Graeber 2011), the early development of interest-bearing debt and debt forgiveness (Hudson 2018), and a comparison of the European and Islamic traditions (Geisst 2013). We here systematically compare the literature on specifically interest-bearing debt, drawing particularly on source materials published in the last few years on the economic history of regions beyond Europe and western Asia.

We find that in these historical cases, interest-bearing debts often did come to exceed the ability of debtors to repay. In general, the presence of interest-bearing debt in a non- or slow-growing economy tended to be accompanied by the accumulation of unpayable debts, debtor dispossession, and social upheaval. Sometimes the problem may be quite limited, since if there are only few debtors then unpayable debts do not become widespread social issue, and even low rates of aggregate growth might be sufficient for small numbers of debtors to be able to repay loans at interest. Sometimes territorial expansion mitigates the problem of growing debts for a while, whether by providing the resources through which debtors can meet repayments or by providing new colonies for the dispossessed to go. But at some point expansion encounters limits. Therefore, our research shows that though societies with little or no growth did indeed have lending with interest, this was often a major source of inequality, social division, and instability.

**Table 1. List of cases**

Case	Approximate dates
Ancient Mesopotamia	24 <sup>th</sup> to 16 <sup>th</sup> centuries BC
The Hebrews	14 <sup>th</sup> BC to 14 <sup>th</sup> AD
Classical Athens	7 <sup>th</sup> to 3 <sup>rd</sup> BC
The Persians	7 <sup>th</sup> BC
Classical Rome	5 <sup>th</sup> BC to 3 <sup>rd</sup> AD
India	5 <sup>th</sup> BC to 19 <sup>th</sup> AD
China	5 <sup>th</sup> BC to 19 <sup>th</sup> AD
Christianity	3 <sup>rd</sup> to 19 <sup>th</sup> AD
Islam	7 <sup>th</sup> to 19 <sup>th</sup> AD
The Nahua ('Aztec')	16 <sup>th</sup> AD
The Tolai (Papua New Guinea)	19 <sup>th</sup> AD

A second purpose of this paper is, then, to identify the kinds of measures attempted by different societies to try to avoid or to mitigate the consequences of unpayable debts. We place these different possible measures into five broad categories: eliminating debt altogether; forgiving accumulated debts; eliminating the charging of interest altogether; preventing the compounding of interest; and limitations such as rate caps and setting maxima on the size and duration of loans. Our specific focus here is on historical cases where the accumulation of interest renders debts unpayable. The possible solutions we here identify here thus either prevent the accrual of interest resulting in unpayable debts, or mitigate such debts when they do occur. The measures we have discussed in our historical cases all fit into one of these five broad categories.

First, abolishing borrowing altogether is one obvious way of preventing unpayable debts: if there is no debt, no-one will ever find themselves with a debt they cannot pay. We find some evidence for a ban on borrowing among the Persians. A ban on all saving would achieve a similar effect, since then nobody would have anything to lend, though we do not find a ban on saving in any of our cases. Though societies can effectively operate without individuals saving or lending (Hartley 2019), such societies tend to be small-scale and not to have experienced the problems associated with interest-bearing loans.

Second, cancelling debts could also resolve the problem of debt accumulation. Such debt forgiveness measures may take place on the individual level as well as more broadly. More narrowly, creditors may be motivated to forgive individual debts through informal norms such as a desire to behave charitably, or may be compelled to forgive loans through the formal mechanisms provided by bankruptcy legislation, for example. More broadly, debt jubilees provide for the cancellation of debts of large numbers of indebted individuals. We find the broad approach of regular jubilees in ancient Mesopotamia and among the Hebrews, and more occasional debt write-offs, as well as narrower individual cases of debt forgiveness, in Athens, Rome, and China.

Third, banning the charging of interest altogether is another obvious way to prevent the accrual of interest into unpayable debts. Interest bans might be partial, such as when interest is permitted on some forms of loan such as for trade or production, but forbidden on loans that might be expected to quickly become unpayable such as consumption loans to the poor. We find interest bans attempted in Rome, China, Christianity, and Islam, and a variety of partial bans among the Hebrews.

Fourth, the compounding of interest might be prevented. The compounding of interest is particularly problematic in non- or slow-growing economies, since the compounding of interest allows debts to grow exponentially. The broadest possible measure to prevent compound interest would be to prevent creditors lending any of their interest income, since then no interest would be paid on interest. In Christianity, we find charitable lenders allowed to charge interest only to cover the costs of lending, effectively preventing interest income being lent, and in China interest income was often earmarked for specific spending purposes. In these cases the intention seems to have been to prevent charging excessive interest and to raise funds, respectively, rather than to explicitly prevent interest compounding, though that would have been the result. A narrower version of preventing compounding is to prevent a creditor charging interest on the interest owed by any individual debtor. This is often effected as a ban on adding interest to the loan principal. Such a measure would at least prevent the exponential accumulation of interest on individual debts, if not in the economy as a whole. Such a ban seems likely to have been much easier to police than attempting a broader ban on compounding by trying to prevent lenders lending their interest income. We find such bans on charging compound interest in Rome, China, India, and Christianity.

Fifth, limitations capping the maximum interest rate, the maximum size of a loan, or the maximum duration of a loan could be applied. Though they would not prevent the accrual of unpayable debts altogether, such measures would limit the number of debts that become unpayable and the rate at which those debts increase. We find such measures in Rome, India, China, Christianity, Islam, perhaps among the Nahua, and among the Tolai. Following work by Passinetti, Lavoie and Seccareccia have recently advanced the idea that a 'fair' rate of interest should equal the rate of labour productivity growth plus the rate of price inflation, and use this to explain why in historical economies with low labour productivity growth and low inflation, the 'fair' rate of interest should be at or close to zero (Seccareccia and Lavoie, 2016). It is worth noting that even in modern economies interest often far exceeds this 'fair' rate, with rates of 1,000 percent per year not unheard of in highly deregulated economies (Martin 2010). One could argue that if lending markets worked efficiently, interest rates should converge towards the rate of real economic activity. Even if that were true, this would suggest that interest rates in a steady-state economy should tend towards zero, and would thus support the proposition that in a zero growth economy, the rate of interest should be zero.

## **Eleven historical cases**

We begin by surveying the eleven historical cases, for each briefly describing the problems attributed to interest-bearing loans as well as the measures attempted to prevent those problems. We proceed roughly chronologically, according to the date of the earliest evidence for the appearance of interest-bearing loans in each of the cases. We list the evidence and our sources in more detail in the Appendix.

### ***Case 1. Ancient Mesopotamia***

Charging interest appears around the 25<sup>th</sup> century BC<sup>2</sup> in records found in the Sumerian city-state of Lagash and relate to tributes owed by neighbouring Umma (Hudson 1993: 73). By the 21st century BC private households as well as the temples and palaces were engaged in money-lending for economic gain (Garfinkle 2004). Any unpaid interest was treated as a new loan upon which interest could be charged, after a period of sixty months had elapsed. Since

the customary rate of interest was 1/60<sup>th</sup> per month (20% percent per year), this was the date at which interest would equal the size of the original loan (Hudson 2000a: 147). By the 24<sup>th</sup> century, the first recorded debt cancellations are made in the Edict of Enmetena, the ruler of Lagash (Hudson 1993: 74). There is evidence of at least 39 debt cancellations by various Mesopotamian rulers between the years 2400 BC and 1600 BC (Hudson 1993: 8-9, 18-19, 23, 25, 39, 46, 72, 74), with some suggestion that the practice persisted in the north of Mesopotamia into the 15<sup>th</sup> century BC (Hudson 1993: 26).<sup>3</sup> Proclamations enforced the forgiveness of debts (Akkadian: *mīšarum*) and allowed those enslaved due to indebtedness to return to their place of origin (*andurārum*), though an exception was made for debts incurred to obtain a profit or in the course of commercial travel, which were not in general forgiven (Lemche 1979: 12, Hudson 2002). However, by the first millennium BC, and possibly already in the period leading up to the Sack of Babylon in 1595 BC, Mesopotamian rulers had gradually lost their power to annul the titles acquired by private creditors. Though rulers continued to proclaim clean slates, these retained a largely symbolic function, and no longer had the restorative effects they had had before (Hudson 2002: 14).

### **Case 2. The Hebrews**

The Hebrews may well have their origins in the Hapiru people who in the second millennium BC were made landless through their inability to pay interest-bearing debts and left Mesopotamia to settled westwards (Hudson 1993: 72). The main source of Hebrew law is the five books of the *Torah*, or 'law'. One of these, Leviticus, uses the words *daror* and *misarim*, loan-words from the Akkadian *andurārum* and *mīšarum*, to refer to the freeing of indentured debtors and the forgiving of debts during the jubilee (Hudson 2002). Partial bans on charging interest are also in evidence. Leviticus 25:36-37 forbids charging interest to the poor, as does another book, Exodus 22:25. A prohibition against interest is also stated in another book of the Torah, Deuteronomy 23:19-20,<sup>4</sup> though with an apparent exception: whilst 'brothers' may not be charged interest, interest may be charged to non-resident 'foreigners' (Hebrew: *nokri*; see Issler 2016; Gordon 1975:75-76; Cornell 2006).

Later books of the Hebrew bible record the subsequent enforcement and reform of the laws, alongside prophetic and didactic text. These books include further injunctions against interest in Psalms 15:5, Proverbs 28:8, and Ezekiel 18:8, 13, 17, and 22:12. Around 600 BC, Habbakuk (2:6-7) explains that charging interest is a major source of social instability as debtors turn against creditors causing internecine strife (Gordon 1975: 76). At least four debt cancellations are likely to have taken place during the 6<sup>th</sup> and 5<sup>th</sup> centuries BC (*Jeremiah* 34:8-19; *2 Chronicles* 32; *2 Kings* 25; *Nehemiah* 5:3-5; see Hudson 1993: 33), and a further cancellation is recorded for the 2<sup>nd</sup> century BC (*I Maccab.* 13-14; Hudson 1993: 48). Though reforms around the end of the first century BC allowed contracted exceptions to the law, injunctions that debts between Jews should be forgiven during the jubilee year persist until the 13<sup>th</sup> century AD (Hudson 1993: 38).

### **Case 3. Classical Athens**

Around 600 BC debtor unrest led the newly democratised Greek city-state of Megara to adopt the *palintokia*, either a requirement for creditors to repay interest to debtors (Millett 2002: 48-49) or a general debt cancellation (Hudson 1992). Similar debtor unrest and

measures in response are also reported for the Greek cities of Olbia, Miletus, Corinth, and Sicyon around this time (Hudson 1993: 32, 81, Wallace 2007: 51-52, Murray 1993: 137-139).

In Athens, in an attempt to prevent similar revolt, the lawmaker Solon's 594 BC reforms cancelled all debts and outlawed debt bondage and dependent labour among Athenians (Wallace 2007: 59, 73; *Constitution of the Athenians* 13.3). However, this debt cancellation was a one-off, and subsequent laws permitted lending at interest and did not set a maximum rate (Lysias *Theomnestus* 1: 10.16, 10.18; Millett 2002: 50). Three decades of unrest culminated in the poorer Athenians supporting a populist, Peisistratus, in his bid to become tyrant of Athens in 561 BC (*Politics* 1305a; Wallace 2007: 75-76). Peisistratus is reported to have assumed the role of providing loans to assist with farming, and appears not to have charged interest, instead issuing loans partly in the expectation that improved yields would increase the tithes that he levied on the produce (*Const. Ath.* 16.2-4, Millett 2002: 50).

Subsequent democratic reforms in Athens proved somewhat more durable, and tensions that might otherwise have arisen may have been reduced by the steadily growing economic base. Between 750 and 500 BC the area of arable land under Greek control roughly doubled (Morris 2004: 733), and increased trade across the Mediterranean allowed perhaps as much as three quarters of Athens' food to be imported (Morris 2006: 42). Nevertheless, the 5<sup>th</sup>-4<sup>th</sup> century BC Athenian philosopher Plato still condemns charging interest, and proposes an outright ban, on the grounds that it creates a group of aggrieved indebted and disenfranchised citizens and thereby weakens the state (*Laws* 5.742, *Republic* 8.555).

#### ***Case 4. Classical Rome***

Reports of tensions due to interest-bearing debt appear soon after the beginning of the Roman Republic, traditionally dated 509 BC.<sup>5</sup> By 494 BC a "blaze of hatred" was rising among those who found themselves "enslaved and oppressed" by their indebtedness to their fellow citizens (Liv. 2.23, trans. Roberts 1912). An early law seems to have forbidden the charging of interest altogether (Geisst 2013: 17). In 450 BC legal reforms, inspired by earlier Greek laws, set a maximum interest rate, first at ten then at five percent, and ultimately banned compound interest (Tac. *Annales* 6.16, Hudson 1993: 50, Momigliano 2005: 180, Liv. 3.33). Unrest over debt is again recorded in 380 and in 378 BC, and colonies such as Satricum are founded specifically as a means to alleviate the debt crisis (Liv. 7.6-7, Cornell 1989: 322). A law of 367 BC stated that the interest already paid on debts should be deducted from the principal, and set maximum limits on land ownership (Cornell 1989: 337). A law of 357 BC reiterates an interest cap, and a law of 347 BC limits the rate to 4 1/6 percent annually (Cornell 1989: 333, Hudson 1993: 50). Probably the same law of 347 BC legislates a moratorium on existing debts, followed by another law setting severe penalties for charging interest in 344 BC (Cornell 1989: 333, Liv. 8.28). In either 313 or 326 BC,<sup>6</sup> legislation called the *lex Poetelia* abolished the indenture of debtors and established a new kind of contract for loans. That law also permitted interest to be charged when the borrower might incur some costs as a result of wear and tear, but prohibited charging for the loan of an item that was consumed by the borrower and later repaid in kind, the latter category including money loans (Noonan 1957: 105-112, Homer and Sylla 1996: 73, Graeber 2011: 290). However, chronic indebtedness continued, and the numbers of dispossessed continued to grow. Many were recruited into the army or became colonists: between 367 and 287 BC twenty-one Latin and six Roman colonies were founded (Abbott 1911: 49). The period from 287-133 BC was characterised by internal political stability and colonial expansion, the two likely related as lasting

improvements for the worst-off became possible only through large-scale territorial acquisitions (Raaflaub 2005, Ungern-Sternberg 2005: 313).

However, after 180 BC only one new colony is reported to have been established (Abbott 1911: 78). Land ownership limits were reinstated in 133 BC, but repealed in 130 BC (Hudson 1993: 51). In 86 BC three quarters of all Roman debts are remitted, and in 70 BC a ban on charging compound interest is introduced to the province of Asia (Plutarch *Lucullus* 23.1, Wylie 1994: 114, Hudson 1993: 52). During the first century BC, when the Roman Republic entered its final crisis, Cicero reports that the problems of indebtedness had never been greater (*De Officiis* 2.84), and the historian Sallust writes that numerous dispossessed farmers were moving to the city and swelling the number of urban poor (*Bellum Catilinae* 37). Having assumed control of government in 49 BC, Julius Caesar enacted bankruptcy laws allowing wealthier debtors to surrender their possessions to limit creditor claims for full satisfaction (Hudson 1993: 52) and legislated that interest should not exceed the loan principal (Mommsen V: 526). In AD 33 the 8 1/3 percent rate is re-imposed by the emperor Tiberius. The empire reached its largest extent under Trajan in AD 117, but his successors no longer pursued a policy of expansion and increasingly debased the coinage to cover expenditures (Abbott 1911: 324, 326). The ‘Crisis of the Third Century’, characterised by rampant inflation and civil wars, is often considered the end of the classical period (Abbott 1911: 329, 334, Graeber 2011: 283).

### ***Case 5. The Persians***

We mention here the Persians, of around 430 BC, since debt was apparently abolished altogether, though the available information consists of this sentence from the Greek historian Herodotus: “They hold lying to be the most disgraceful thing of all and next to that debt; for which they have many other reasons, but this in particular: it is inevitable (so they say) that the debtor also speak some falsehood” (I.138, trans. Alfred Denis Godley).

### ***Case 6. India***

Though debt is mentioned in texts dating from perhaps as early as 1400 BC (Kosambi 1996: 147-148), the earliest surviving discussion of interest (*vrddhi*) in India is in texts by the Sanskrit grammarian Pānini dating to the 5<sup>th</sup> or 4<sup>th</sup> century BC. Pānini mentions rates of 0.5, 2.5, and 10 percent, with 10 percent described as a rate that ‘was not favoured’ (Pānini V.I.47, IV 4.30; Chatterjee 1971: 21). Buddhist texts -- the *Jātakas* relating events from the 5<sup>th</sup> century BC and the *Therīgāthā* poems dating from the 6<sup>th</sup>-3<sup>rd</sup> centuries BC, but both written down much later – also refer to interest (*vrddi*). One of the *Jātakas* expresses tolerance for the profession of money-lending, though elsewhere ascetics accused of lending at interest are described as hypocrites and there are descriptions of slavery resulting from debt (*Jātaka* IV, 422, 184, 521; *Therīgāthā*. 444; Rhys Davids 1922: 205).

Dating to around 3<sup>rd</sup>-1<sup>st</sup> centuries BC the sources of ancient Indian law, the *Dharmasūtras*, begin to regulate interest explicitly. The four surviving *Dharmasūtras* detail circumstances in which no interest should be charged, including if the debtor is imprisoned, if the creditor refuses to accept repayment, or if the debtor has given a pawn in security from which the creditor can earn an income (Chatterjee 1971: 64). Interest is sometimes limited to one year (Gautama G.D.S XII.27), often at a rate of 15 percent (Gautama G.D.S XII.26, Vasistha

II.50, Kautilya 3, II.1, Chatterjee 1971: 21-23, Kosambi 1996: 254), sometimes 12 percent (Baudhāyana 1.5.10.23, Chatterjee 1971 :23, Kane 1973, 420), and sometimes rates are given as 2, 3, 4, or 5 percent per month depending on the debtor's caste (Vasistha II.48; Chatterjee 1971:26). The amount of interest is not to exceed the principal (Gautama G.D.S. XII. 28; Chatterjee 1971: 49), though this rule sometimes applies only to loans of gold or money and higher multiples are permitted on loans of agricultural and weighable goods (Vasistha II 44; Chatterjee 1971: 49, 54, 55, 57, 61).

Later legal treatises and commentaries dating to between the 1<sup>st</sup> and 10th century AD are known as the *Dharmaśāstra*. Monthly rates of 2, 3, 4 and 5 percent by caste are reiterated, but a higher annual maximum of 24 percent is also set, a rate cap that is consistently restated for the next thousand years (Chatterjee 1971: 23-35, Kosambi 1996: 147-148). From the first to the fourth or fifth centuries AD, higher rates for commercial loans are allowed up to 60 percent annually, 120 percent if the debtor passes through a forest, and 240 percent when the debtor crosses an ocean (Chatterjee 1971: 22 29; Kautilya 3, II.1, Yājñavalkya II.38). Already by the second century AD commercial rates are deemed acceptable if agreed by those expert in commerce (Manu VIII, 157).<sup>7</sup> By the ninth century, 5 percent per month is held acceptable if the lender thinks the borrower will use the loan for extensive business, though other rates may be agreed among travelling traders or where cloth is to be received in payment (Medhātithi on Manu VIII 152, Chatterjee 1971: 28, 60-61). The rule that interest should not exceed principal is also repeatedly endorsed (Manu VIII 151, Yājñavalkya, Brhaspati X 17, also 21, 24, Bhārucci VIII 15 Chatterjee 1971: 49-52) and persists into modern Indian law where it is known as *Dāmpudat* (Vesey-FitzGerald 1925, Chatterjee 1971: 50-51).

### ***Case 7. China***

In China, lending at interest is well attested for the Warring States period from 5<sup>th</sup>-3<sup>rd</sup> century BC (Von Glahn 2016 ch.4). There are also mentions of emergency state loans of grain or money, but these were regarded as a form of philanthropy with little expectation they would be repaid (Von Glahn 2016 ch.5 n51). The 3<sup>rd</sup> century BC philosopher Mengzi blames increasing lending for “causing the old and the very young to be cast into the ditches” (quoted in Peng 1971: 107 n11). The *Zhou li*, a detailed description of government administration from around the 3<sup>rd</sup> or 2<sup>nd</sup> century BC, records that the state should limit interest to 20 percent (Peng 1994: 535, Von Glahn 2016). The Qin dynasty of the 2<sup>nd</sup> century BC banned the taking of interest on private debts altogether, outlawed debt bondage for wives and slaves, and capped land ownership (Von Glahn 2016: ch3).

During the Han dynasty of the 2<sup>nd</sup> and 1<sup>st</sup> centuries BC charging interest was subject to a rate cap. Some nobles were stripped of their titles for charging excessive rates (Yang 1971: 5). The rate cap may have been 20 percent, though might have been higher (Peng 1994: 209, 104; Yang 1971: 94). In 40 BC the Emperor Yuan issued an edict forgiving the poor who had borrowed money from having to pay it back (Han Shu 9, Annals of Emperor Yuan). Nevertheless, there are reports of distress sales of land, homes, children, and grandchildren in order to pay debts (Peng 1994: 211, Von Glahn 2016 ch.3 n89, ch.4). The state attempted to resettle families, but even this land tended to end up accumulated by powerful landowners, whether through usurpation or default (Von Glahn 2016: ch.4). At the start of the 1<sup>st</sup> century AD, Wang Mang successfully mounted a coup in an attempt a return to a more interventionist state inspired by accounts of the ancient Zhou. One of Wang Mang's sympathisers, the

scholar Huan Tan, remarks that usury by rich merchants was reducing those from middling families to indentured labour (Von Glahn 2016: ch.4). Among other redistributive reforms, Wang Mang is said to have strictly regulated money-lending and reinstated state lending programs (Peng 1994: 288; Von Glahn 2016: ch.4). The Han restoration of the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD saw increasing social polarisation as land again became accumulated through purchase and debt forfeiture (Von Glahn 2016 ch.4).

Distress sales due to debt are also recorded during the Jin dynasty of AD 266-420 (Peng 1994: 286). In AD 511, the Wei dynasty prohibited the accumulation of interest to more than the original principal (Yang 1971: 95). Further distress sales are reported during the Northern Qi (550-577 AD) (Von Glahn 2016: Ch5). During the Sui dynasty (581-681 AD) interest was charged on state loans to meet the expenses of officials, and the official regulations on interest were broken even by the heir of the dynasty's founder (Peng 1994: 289). During every reign of the Tang Dynasty (618-907 AD) interest-bearing government loans were used to pay for the expenses of government offices and official salaries, with loans charged at a rate of 8 percent per month, reduced to 7 percent around AD 650 and to 5 percent in AD 728 (Peng 1994: 383; Yang 1971: 96). Grain loans were limited to one year (Peng 1994: 382). The Tang revived the Wei period law banning interest exceeding the principal, and banned compound interest, a ban that would be reiterated for the next 1,294 years (Yang 1971: 95; Peng 1994: 385, 625, 741).

As under the Tang, debtors under the Song dynasty (AD 960-1279) were often reduced to indentured labour. One Song reformist, Wang Anshi, identified the chief cause of distress to family farms as a perpetual indebtedness and a lack of capital for investment (Von Glahn 2016: ch.6). Public loans set up in the 11<sup>th</sup> century to relieve these problems charged 20 percent interest per growing season, but this amounted to 40 percent per year and was thus attacked for driving households to starvation or flight by charging twice the level stipulated in the *Zhou li* twelve centuries earlier (Peng 1994: 535; Von Glahn 2016: 535). A large part of the problem seems to have been that the initially secondary goal of increasing government income ultimately took primacy, and so the program ultimately reinforced rather than alleviated the cycle of rural indebtedness (Peng 1994: 535, Von Glahn 2016: ch.6).

In AD 1173 the Jin emperor Shizong ordered the establishment of pawnshops charging 1 percent interest per month (Peng 1994: 625). Under the Yuan dynasty (AD 1271-1368), legislation again set rate caps and prohibited interest exceeding principal, but this seems often to have been flouted, particularly by Uighur moneylenders who lent at annual rates of 100 percent. In 1240 debts owed to Uighur moneylenders were paid off by the government using official goods (Peng 1994: 625). In 1282 powerful families are recorded as causing a crisis by charging 5 percent per month on loans, and making debtors who could not pay enter new contracts, effectively compounding the interest (Peng 1994: 626). A 3 percent monthly rate cap and ban on interest exceeding principal is reiterated by the founding emperor of the Ming dynasty (1368-1644) (Peng 1994: 741-2). From the end of the 17<sup>th</sup> century a sliding scale between 0.8 and 3 percent per month depending on the size of the loan was introduced for pawnshops in some Chinese regions (Yang 1971: 98-99). Under the Qing (1636-1912), the government frequently used pawnbrokers to lend government funds, with the interest generally earmarked for specific purposes such as scholarships to public schools, famine relief, or the maintenance of an orphanage (Yang 1971: 99). The last Imperial Dynasty, Qing law still stated that no more than 3 percent interest could be charged per month, and that interest could not exceed the principal (Von Glahn 2016: ch.8).

## Case 8. Christianity

In AD 325 the Roman emperor Constantine called a meeting of bishops, the First Council of Nicaea, in an effort to reach a consensus on Christian doctrine and law. Amongst the laws agreed was a ban on clergy charging interest (Geisst 2013: 20). In AD 345 the ban was extended to lay people (Canon 12 of the Council of Carthage). In AD 380 Saint Ambrose, the influential Archbishop of Milan, relates stories of debtors forced to sell their children and committing suicide from shame, and equates usury with violent robbery and murder (*De Tobia* 15.51; *De Officiis* 2.25.9; Graeber 2011: 284; Issler 2016). Carefully examining every Biblical reference to moneylending, Ambrose particularly notes the exemption from a complete ban on charging interest indicated by Deuteronomy 23:20, the verse explicitly permitting loans to ‘foreigners’. If charging interest is equivalent to fighting only without a sword, Saint Ambrose reasons, then it would not be a crime to charge interest to those “whom it would not be a crime to kill” (trans. Zucker, quoted in Issler 2016). Only much later<sup>8</sup> is an alternative explanation put forward: that Hebrew law allows interest to be charged to *nokri* because these non-resident foreigners have come to Israel to trade; but such an interpretation appears not to have occurred to the thinkers of the early Church.

In AD 443 Pope Leo reiterates a ban on all lending at interest (Geisst 2012: 22). However, as early as AD 529, the legal code of Eastern Emperor Justinian acknowledges the religious ban but notes that it is hard to enforce. Justinian’s Code instead resurrected the classical Roman ban on both the compounding of interest and the charging of interest in excess of principal, but otherwise permitted an annual rate of 8 percent, later 4 percent (Vesey-Fitzgerald 1925: 176; Geisst 2013: 3, 18). Justinian’s Code would remain the basis for law in the Eastern Empire until the 15<sup>th</sup> century fall of Constantinople to the Ottomans (see below).

In the Western Empire, several jurisdictions reiterated complete bans on interest, including laws of AD 789, 806, and 850 (Gordon 1975: 144-145; Geisst 2013: 26). In other jurisdictions interest was sometimes permitted up to a maximum rate, such as the 12.5 percent per year permitted by the 7<sup>th</sup> century Visigoth Code (Geisst 2013: 30). The Catholic Church, often noting that previous bans had been evaded, reiterated its ban on interest in 1139, 1179, 1215, 1245, 1274, and 1311, the last of these laws specifically voiding any secular law permitting interest (Geisst 2013: 34-46).

In Italy in the 14<sup>th</sup> century, public lenders known as *montes de pietatis* were set up to provide the poor with low interest loans as an alternative to the high interest charged by private creditors. This received Church approval in the Fifth Lateran Council of 1512-1517 on the condition that the interest charged was sufficient only to cover the costs of lending by the *montes* and was not causing the borrowers harm (Geisst 2013: 28, 64). The logic of the 3<sup>rd</sup> century BC Roman law, allowing interest when a loss had been incurred by a lender, began to be applied more widely (Noonan 1957: 35, 100; Issler 2016: 783). But by 1600 the prevalence of money markets effectively meant that making an interest-free loan to one person would mean that a lender always lost the opportunity to make a return elsewhere (Noonan 1965: 221, Noonan 1957: 249-268). Despite repeated attempts in 1569, 1571, and 1586 to close loopholes (Burke 2009: 14, Noonan 1957) the Catholic Church eventually gave up its attempts to discern legitimate interest from illegitimate usury. Though Pope Benedict XIV’s 1745 encyclical *Vix pervenit* would reassert that usury could not be condoned, it would also concede, vaguely, that legitimate reasons to charge interest nevertheless existed (Noonan 1957).

Since the 16<sup>th</sup> century Protestant reformers, often funded by banks, had argued for the relaxation of the interest ban (Geisst 2013: 74-75, Burke 2009: 14). Legislation in the 16th century by northern Swiss Protestants, the Habsburg Netherlands, and the Holy Roman Emperor Charles V permitted interest up to a limit on commercial loans, and a law passed in 1545 by newly protestant England effectively decriminalised interest below 10 percent on all loans (Gordon 1975: 257, Helmolz 1986: 379). Rescinded in 1552 but reinstated in 1571, laws permitting interest up to a certain rate became standard in England, later in the United Kingdom, and in British colonies. In the UK and in almost all states in the post-independence USA, interest rate maxima around 5-8% per annum were in place until well into the nineteenth century (Geisst 2012: 149, *passim*).

### ***Case 9. Islam***

Founded by Mohammed (c. AD 570-632), Islam is in many ways a continuation of the Hebrew and Christian tradition. Hebrew and Christian texts are frequently referred to in the central text of Islam, the Quran (e.g. 4:163, 5:43-44, 5:110, 7:157, 17:55, 21:105, 48:29). The practice of *riba* is banned in the Quran (2:275-6, 3:129), but from the earliest Muslim times there has been debate about what *riba* is. Umar ibn al-Khattab (AD 584-644), a companion of Mohammed and the second caliph, even lamented that Mohammed died before being able to provide a satisfactory explanation of what *riba* actually meant (Algaoud and Lewis 2007: 43, Khalil 2006: 53). The Quran itself describes *riba* as a “doubling and redoubling” (3:130) and enjoins Muslims who charge *riba* to repent and to accept repayment of only the principal of the loan (2:279; Algaoud and Lewis 2007: 43). It also suggests that a debtor who has difficulty repaying should be given more time, and that ideally the debt should be altogether written off as charity (2:280; Hunwick 1999: 80). Various passages prohibiting *riba* sometimes seem aimed at pagans, sometimes at Muslims, and at other times at Jews and Christians, with Jews accused of breaking their own laws by charging interest (Rodinson 2007: 15). The controversy persists into the 21<sup>st</sup> century (Rahman 1964, Hunwick 1999, Khalil 2005, Al Zuhayli 2006, Farooq 2007, Algaoud and Lewis 2007).<sup>9</sup> Nevertheless, the mainstream position in both past and current debates has been that all interest is, at least in theory, strictly prohibited in Islam (Hunwick 1999, Khalil 2005, Stiansen 1999: 107, Algaoud and Lewis 2007: 44).

But there is also some debate about the extent to which the ban on *riba* has been observed in practice. No penalty for *riba* is specified in the Quran, so under Islamic law punishment is left to the complete discretion of the judge or ruler deciding the case (Lewis 2007: 72). Unlike the Catholic Church’s attempts to police interest and punish violators, Islam treats the question of *riba* more as a matter of individual conscience, and emphasising charitable behaviour and encouraging leniency towards borrowers in difficulty (Lewis 2007: 78; Kuran 2012: 165). Where a case is brought, even into the 21<sup>st</sup> century the penalty is often simply to give any illegitimately acquired interest to charity (Lewis 2007: 72). Moreover, from very early on Muslims developed simple techniques (*hiyal*) to evade the ban, techniques often actually devised by religious authorities (Kuran 2012: 143-150, Rubin 2011: 1315). Nevertheless, one cache of documents from Cairo<sup>10</sup> suggests that until the 12<sup>th</sup> century the lending of money at interest was both shunned and of economically limited significance, with investment instead taking the form of partnerships; by the mid-12<sup>th</sup> century, however, interest began to be charged through contracts which concealed it in some way (Rubin 2011: 1315, Kuran 2012). By the 16<sup>th</sup> and 17<sup>th</sup> century, the Ottomans effectively permitted interest up to a set rate, provided the requisite contractual devices were used. In various Turkish cities loans

were charged at annual rates ranging from 10 to 20 per cent, and were permitted by both legal and religious authorities (Kuran 2012: 148, Rubin 2011: 1316n15).

### ***Case 10. The Nahua (Aztecs)***

Among the Nahua, interest-bearing loans are recorded by Spanish chroniclers, the earliest dating from twenty-two years after the start of the Spanish conquest in 1519. Terms relating to lending at interest were already well established in the Nahuatl language at the time of conquest, but the details of what this actually consisted of is much harder to state with certainty. In 1541 the earliest chronicler, Motolinia, initially wrote that interest was charged, but apparently later came to believe that this was not the case (Millhauser 2017). The Codex of Tepeucila, from 1543, relates that in 1535 the local leadership of a town had borrowed Spanish coin from local merchants at a rate of 200 percent in order to pay a tribute demanded by the Spanish overseer, eventually defaulting and being run out of town by their creditors (Hirth 2016: 222, 267). But particularly since the idea of lending money, rather than goods, was novel for the Nahua the story seems more a reflection of European influence than of pre-conquest practices (Millhauser 2017: 267). An ethnographic research study begun in 1545, Sahagun's *Florentine Codex* mentions usury alongside profiteering as a vice of merchants and rich men and describes a bad merchant as one who practices usury and demands excessive interest, which suggests both that norms may have prevented high rates and that lower rates were considered socially acceptable (Sahagun 1961: 59 in Hirth 2016: 267). Molina's Nahuatl-Spanish dictionary compiled between 1555 and 1571 contains five translations of the Spanish word 'logrero', which meant a usurer or someone whose profits are excessive (Millhauser 2017: 267). Intriguingly, Molina's dictionary also contains four different terms to refer to using one debt to pay another, suggesting that some of these debtors may have begun to experience the compounding of interest, perhaps even the accumulation of unpayable debts (Molina 1571, 2.41v, in Millhauser 2017). Writing in 1570, Zorita states that interest was not charged, but according to his translators someone had written in the margins that in fact "interest was used in many places" (Millhauser 2017: 268-269). It may be that what they observed was the contracting for repayment of a greater amount of some good at some future date, the Spanish phrase 'dar a logro' also referring similar contracts in medieval Europe which were used to create the appearance that no interest was being charged (Hirth 2016: 267). There is no evidence that unpayable debts constituted a chronic societal problem (Smith 2015). However, some instances of debt indenture and the selling of family members are reported (Millhauser 2017: 268-270).

### ***Case 11. The Tolai (Papua New Guinea)***

The Tolai and their Melanesian neighbours<sup>11</sup> have been described as 'primitive capitalists' (Epstein 1968), the earliest surviving accounts of their practice of lending shell-money dating to the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. Sometimes borrowing occurred when someone wanted to avoid breaking up their own cache of shell-money but needed a small sum for a purchase, in which case the borrower might prepare a small dinner for their creditor, or otherwise pay a rate of 10 percent, considered as a gift in expression of gratitude for the loan (Epstein 1968: 25-26, Parkinson 1907: 94, Danks 1888: 308). Other loans, such as after the death of a relative for ritual purpose, would be charged at 20 or 50 percent (Epstein 1968: 25-26, Parkinson 1907: 94). Among the neighbouring Buin, a rate of 50 percent was due after about 2 months, a rate of 100 percent after 9 or 10 months, and social pressure to repay after

10 months effectively placed an upper limit on both the length of the loan and the amount of interest that would need to be repaid (Thurnwald 1912: 42-43, Connell 1977: 85). A similar limit is also thought likely for the Tolai, though some suggest loans of 2 or 3 years or more might have occurred without further interest being charged (Connell 1977: 85). Nevertheless, kinship or friendship obligations typically placed the creditor under considerable social pressure to forgive loans altogether (Epstein 1968: 72, 106).

## Discussion

In answer to our first question: the charging of interest in the absence of substantial economic growth resulted in notable levels of unpayable debt in seven out of our eleven cases (see Table 2). In these seven cases, this resulted in debtor dispossession and indenture, and at least some degree of social upheaval or revolt.

The four exceptions are instructive. First, among the Persians borrowing and lending was itself apparently abolished altogether. Second, in Islam a ban on interest was legislated since the religion's inception. Third, among the Nahua debt seems to have been relatively small scale prior to Spanish conquest, and even then some instances of debt indenture and the selling of family members is reported. Fourth, among the Tolai, interest-bearing debt also seems fairly small scale, limits were placed on the length and total size of repayment, and there was a broad social pressure on creditors to forgive overdue debts.

**Table 2. Comparison of cases**

Case	Unpayable debts	Debt ban	Debt jubilees	Interest ban	Compounding ban	Rate or other limits
Mesopotamia	Y		Y			
The Hebrews	Y		Y	Partial		
Classical Athens	Y		Y			
Classical Rome	Y		Y	Y	Y	Y
The Persians		Y				
India	Y			Partial	Y	Y
China	Y		Y	Y	Y	Y
Christianity	Y			Y	Y	Y
Islam				Y		Y
The Nahua	Some, perhaps					Perhaps
The Tolai						Y

Though we do not have a very clear picture of the extent of lending and borrowing in these societies, it seems reasonable to assume that in most cases it was less prevalent than it is today. But social revolts, jubilees, and other alleviatory measures suggest that, in at least seven of these cases, lending with interest became widespread and turned into a social problem. The more extended lending is, the more individual problems of indebtedness are likely to translate into a bigger social problem; where lending more limited, wider social problem did not inevitably result. In the case of the Nahua, for example, evidence suggests that lending at interest was not widespread, and though a few individuals do seem to have found repayment difficult, there is no indication indebtedness caused wider systemic problems. Moreover, even without rapid growth in the economy as a whole, it is plausible that the incomes of the those who do borrow increases sufficiently to repay quite high rates of interest. For example, merchants in Athens, Rome, and India seem to have been able to meet even quite high rates of interest. There is, thus, a logic behind the distinction between commercial loans and other loans made in ancient Mesopotamia for example, where the debts

of commercial agents were not forgiven alongside all other debts, and among the Hebrews where interest was permitted only on loans to foreigners travelling for business purposes.

Our second broad question is: how was the problem of unpayable debt resolved? Among our cases, only the Persians avoided the problem of unpayable debts by abolishing indebtedness altogether. In our two earliest cases, in Mesopotamia and among the Hebrews, regular jubilees forgiving accumulated debts were enacted. One-off or partial debt jubilees were also occasionally instituted in Athens, Rome, and China; in the cases of both Athens and Rome, territorial expansion is also thought to have helped reduce tension by providing an inflow of resources as well as a place for the dispossessed to colonise. Across cases individual creditors are often exhorted to forgive debts.

Rome, China, Christianity, and Islam all attempted to ban the charging of interest, and partial bans are found among the Hebrews and in India. Though the Roman and Chinese bans are relatively short-lived, the Christian and Muslim bans were upheld in theory and often in practice for centuries, and when interest becomes tolerated it is long regulated by the use of interest rate caps. Rate caps are also found in Rome, India, and China. As for bans on compound interest, arrangements that would have prevented compounding altogether by preventing the lending of interest income are in evidence in Christian *montes de pietatis* and in Chinese pawnbrokers, though in those cases the intention does not seem to have been to prevent compounding as much as to prevent excessive interest and to raise funds. Bans on charging compound interest on individual loans, likely easier to enforce than more general bans on lending interest income, are found in Rome, India, China, and Christianity. Measures to prevent interest accumulating to greater than the principal would also generally have had the effect of preventing interest being charged on previously accrued interest, as well as limiting the total size of the resulting loan, are found in Rome, India, China, Christianity and among the Tolai.

## **Conclusion**

When they become widespread, interest-bearing loans have tended to be accompanied by unpayable debts, dispossession and indenture of debtors, and wider social upheaval and revolt. The findings of this paper thus highlight that interest-bearing loans have in general been very problematic in past non- and slow-growing economies. We have found that this problem has in the past been avoided or alleviated by banning all debts, forgiving debts, banning interest, banning compound interest, and setting limits on loan sizes and on interest rates.

A question remains as to the extent to which modern economies have different characteristics than these historical economies we have studied. Though financial institutions are now recognised to have played a much larger role in the past than previously thought, it is clear that the scale of lending with interest is today far more widespread, more complex, and more fundamental for the functioning of the economic system than it has ever been in the past. This may make it much more difficult to control indebtedness in the way that past societies were able to do. Nevertheless, our aim has been to show that current theories that suggest interest-bearing loans may become problematic in the absence of substantial growth have significant empirical support when tested against historical cases. We hope our findings will stimulate further research into how the problems caused by interest-bearing loans may best be avoided in future slow- and non-growing economies.

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## Appendix

**Table A1: Absence/presence of interest-bearing loans**

Case/place	Date	Absent or present?	Primary source	Secondary source
<b>Mesopotamia (Sumer: Lagash)</b>	c.2500 BC	Present		Hudson 1993:73, citing Steinkeller 1981.
<b>The Hebrews</b>	c.1400 BC	Possibly present		Hudson 1993: 72 citing Diakonoff 1982.
<b>The Hebrews</b>	11 <sup>th</sup> -7 <sup>th</sup> century BC	Present	Leviticus.	Grabbe 1993, Hudson 2002.
<b>Greece</b>	7 <sup>th</sup> century BC	Absent/optional	Hesiod <i>Works and Days</i> ll.349-51.	Millett 2002: 32-33, 46, citing Korver 1934: 63.
<b>Greece</b>	c.475 BC	Present	Pindar's poetry.	Millett 2002: 36.
<b>Greece</b>	423 BC (date from wiki)	Present (including compound interest)	Aristophanes <i>Clouds</i> ll.115-6; ll.1286-97	Millett 2002: 46, 185 citing Dover 1968.
<b>Rome</b>	509 BC	Present	Livy 2.23	
<b>India</b>	14 <sup>th</sup> -12 <sup>th</sup> century BC	Probably absent	Rigveda 10.34.10; AV. 6.117-9.	Kosambi 1996: 147-148.
<b>India</b>	5 <sup>th</sup> -4 <sup>th</sup> century BC	Present	Pānini V.I.47, IV 4.30.	Chatterjee 1971: 21.
<b>India</b>	5 <sup>th</sup> -4 <sup>th</sup> century BC	Present	Jātaka IV, 422, 184.	Rhys Davids 1922: 205.
<b>China</b>	5 <sup>th</sup> -3 <sup>rd</sup> century BC	Present		Von Glahn 20166: ch.4 cites Yamada 2000: 45.
<b>China</b>	206 BC - AD 25	Present	Han Shu 91.11a, 15A.23a, 15B.30b.	Yang 1971: 5.
<b>Pre-Roman, pre-Christian Europe*<sup>12</sup></b>	C1st AD	Absent	Tacitus <i>Germania</i> 26.	Hudson 2000a: 146.
<b>Pre-colonial West Africa*</b>	AD 1745	Absent	Governor Billsen, in Justesen ed. 2005, trans. Manley.	Quoted in Spicksley 2013: 151n23.
<b>Pre-colonial West Africa*</b>	AD 1760	Absent	Rømer 1760 (trans. Winsnes 2000).	Quoted in Spicksley 2013: 156.
<b>Ashanti/e (Ghana, West Africa)*</b>	c.AD 1869	Present		Austin 2005: 144-145.

<b>Ashanti/e (Ghana, West Africa)*</b>	AD 18-19 <sup>th</sup> century	Present		Law 1999: 37, citing Austin 1993: 103-4.
<b>The Nahua</b>	AD 1541	Perhaps present	Motolina.	Millhauser 2017: 267, Hirth 2016: 234.
<b>The Nahua</b>	AD 1570	Present	Marginal notes in Zorita 1570.	Millhauser 2017: 267; Hirth 2016: 268.
<b>The Nahua</b>	AD 1571	Present	Molina 1571: 1:78v, 2:153v, 2:41v.	Millhauser 2017: 267; Hirth 2016: 244-247.
<b>The Nahua</b>	AD 1576	Present	Sahagún [1576] 1950-82, 10:41, 43, 59 .	Millhauser 2017: 267.
<b>The Tolai</b>	19 <sup>th</sup> century AD	Present	Danks 1888, Parkinson 1907.	Connell 1977, Epstein 1968.

**Table A2. Debt forgiveness (both general jubilees and individual debt remissions)**

Case/place	Date	Event/law	Primary source	Secondary source
Mesop. (Sumer: Lagash and Umma)	c.2400 BC	Debt cancellation	Edict of Enmetena, ruler of Lagash.	Hudson 1993: 68. <sup>13</sup>
Mesop. (Sumer: Lagash and Umma)	c.2350 BC	Uruinimgina's debt cancellation	SARI La 9.1 clay cone, and La 9.3 clay plaque.	Quoted in Hudson 1993: 16, 74.
Mesop. (Sumer: Lagash and Umma)	c.2130 BC	Gudea's New Year debt cancellation	Statue B, Cylinder B.	Quoted in Hudson 1993: 16-17, 72.
Mesop. (Ur III. including Elam (Susa), Ashur, and Mari)	c.2100 BC	<i>Nig-šiša</i> debt cancellation by Ur-Nammu, during his reign		Hudson 1993: 46.
Mesop. (Ur III including Elam (Susa), Ashur, and Mari)	c.2090 BC	Shulgi's debt cancellation		Hudson 1993: 46.
Mesop. (Ashur)	c.1900 BC	<i>Andurarum</i> debt cancellation		Hudson 1993.
Anatolia, Karum Kanesh, Cappadocia (a trade colony of Ashur)*	1900-1800 BC	<i>Hubullum masa'um</i> (debt cancellations)	Cuneiform tablets.	Hudson 1993: 19 cites Kemal Balkan 1974: 30 for interpretation of cuneiform tablets.
Mesop. (Assyria)	1993 BC	<i>Andurar</i> by Ilushuma (debt cancellation)	Building inscription.	Quoted in Hudson 1993: 19 citing Kraus 1984: 103.
Mesop. (Assyria)	1974 BC	<i>Andurar</i> by Erishum (debt cancellation)	Building inscription (BM 115689, Ass. 16850, in J. E. Reade, 2001).	Quoted in Hudson 1993: 19 citing Kraus 1984: 103.
Mesop. (Sumer: Lagash)	1974 BC	<i>Nig-šiša</i> by Iddin-Dagan (debt cancellation)		Hudson 1993: 18 citing Edzard 1957 and Kraus 1984.
Mesop. (Sumer: Lagash)	1953 BC	<i>Nig-šiša</i> by Ishme-Dagan, probably upon taking the throne.		Hudson 1993: 18 citing Edzard 1957 and Kraus 1984.
Mesop. (Sumer: Lagash)	1934 BC	<i>Nig-šiša</i> by Lipit-Ishtar, fifth ruler		Hudson 1993: 18.
Mesop. (Sumer: Lagash)	1923 BC	<i>Nig-šiša</i> by UR-Ninurta		Hudson 1993: 18.
Mesop. (Sumer: Larsa)	1822-1763	Rim-Sim		Hudson 1993: 19 cites legal contracts in Kraus (1958: 201f. and 1984: 31ff.)
Mesop. (Sumer: Larsa)	1822-1763	Rim-Sin's second debt cancellation		Hudson 1993: 18.
Mesop. (Sumer: Larsa)	1822-1763	Rim-Sin's third debt cancellation		Hudson 1993: 18.
Mesop. (Der)	<1802 BC	Misharum (debt cancellation) by Nidusha, ruler of Der		Hudson 1993: 19.
Mesop. (Hana)	Not clear	Debt cancellation		Hudson 1993: 19.
Mesop. (Eshnunna)	Not clear	Debt cancellation		Hudson 1993: 19
Mesop. (Mari)	c. 1800 BC	Contract attempting to circumvent a future <i>andurarum</i>	ARM 8 33.	Hudson 1993: 39.

<b>Mesop. (Mari)</b>	1775-1761 BC	Shunuharahalu (a local chieftain) proclaims <i>andurarum</i>		Hudson 1993: 25 citing Charpin 1987: 41.
<b>Mesop. (Babylonia)</b>	1880 BC	<i>misharum</i> by second ruler, Sumulael		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1812 BC	Sin-Muballit on accession		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1803 BC	Sin-Muballit		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1797 BC	Sin-Muballit		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1792 BC	Hammurapi on accession		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1780 BC	Hammurapi after local victories		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1771 BC	Hammurapi after another military victory		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1762 BC	Hammurapi on the 30th anniversary of his rule, and on the defeat of Rim-Sin		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1749 BC	Samsuiluna on his accession	A letter by Samsuiluna.	Hudson 1993: 23.
<b>Mesop. (Babylonia)</b>	1741 BC	Samsuiluna		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1711 BC	Abi-Eshuh, on his accession		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1683 BC	Ammititana, on his accession		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1662 BC	Ammititana		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1647 BC	Ammititana		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1646 BC	Ammisaduqa on his accession		Hudson 1993.
<b>Mesop. (Babylonia)</b>	1636 BC	Ammisaduqa	S.5-6, in ANET (esp. lines 36-41).	Quoted in Hudson 1993 : 24.
<b>Nuzi (upriver from Babylon)*</b>	1500-1400 BC	Various debt cancellations ('shudutu')	<i>Ennamati</i> contracts, and subsequent similar contracts.	Hudson 1993: 26.
<b>Babylonia*</b>	680-669 BC	Andurarum debt cancellation proclamation by Esharhaddon		Hudson 1993: 32, citing Lambert 1965 translations.
<b>Egypt*</b>	663-609 BC	Psammeticus I debt cancellation		Hudson 1993: 50.
<b>Egypt*</b>	192 BC	Debt cancellation by Ptolemy V on coming of age		Hudson 1993: 31.
<b>Hebrew law, Levant</b>	587 BC	Zedekiah frees Jewish debt-slaves cancelling their debts	Jeremiah 34:8-19; 2 Chronicles 32; 2 Kings 25.	Hudson 1993: 12, 48.
<b>Hebrew law, Levant</b>	586-539 BC	Jubilee year cancels debts and redistributes land	Leviticus, Deuteronomy 31:10.	Hudson 1993: 33.
<b>Hebrew law, Levant</b>	444 BC	Nehemiah's debt remittance and release of lands	Nehemiah 5:3-5	Hudson 1993: 34.
<b>Hebrew law, Levant</b>	433/432 BC	Nehemiah's debt remittance and release of lands	Nehemiah 5:3-5	Hudson 1993:34, 48.

<b>Hebrew law, Levant</b>	131 BC	Hasmonians liberate Israel from yoke of debts and taxations	I Maccab. 13-14	Hudson 1993: 48.
<b>Hebrew law, Spain</b>	13 <sup>th</sup> century AD	Sabbatical jubilees	Maimonides, Ibn Adret	Hudson 1993: 38, citing Neuman 1942: 219f and 29.
<b>Sparta (Greece)*</b>	820 BC	Lycurgan reforms: land made inalienable, money banned		Hudson 2000b: 2.
<b>Olbia (Greece)*</b>	7 <sup>th</sup> century BC	Debt cancellations after overthrow of elites		Hudson 1993: 81.
<b>Miletus (Greece)*</b>	7 <sup>th</sup> century BC	Debt cancellations after overthrow of elites		Hudson 1993: 81.
<b>Corinth (Greece)*</b>	657 BC	Cypselus cancelled rural debts, having exiled ruling Bacchiads		Hudson 1993: 32.
<b>Megara (Greece)*</b>	7 <sup>th</sup> century BC	Debts cancelled: 'palintokia'	Plutarch <i>Greek Questions</i> Q18.	Millett 2002: 49-50, Hudson 2000a, Hudson 1993:32.
<b>Sicyon (Greece)*</b>	7 <sup>th</sup> century BC	Cleisthenes cancelled debts		Hudson 1993: 32.
<b>Athens (Greece)</b>	594 BC	Solon's debt cancellation ('seisachtheia')		
<b>Sparta (Greece)*</b>	220-200 BC	Cleomenes and Nabis, kings, cancel debts		Hudson 1993: 50.
<b>Rome</b>	367 BC	Interest cancelled (Lex de aere alieno, of the Lex Licinia Sextia)	Livy.	Cornell 1989: 337.
<b>Rome</b>	86 BC	3/4 of Roman debts remitted	The Valerian law.	Hudson 1993: 52.
<b>Rome</b>	49 BC	Interest to be deducted from principal (for existing loans)		Hudson 1993: 52.
<b>Rome</b>	49 BC	Rome's first bankruptcy law for wealthy debtors	Cesar's <i>cessio bonorum</i> .	Hudson 1993: 52.
<b>Rome</b>	47 BC	Proposed debt cancellation by Cneius Cornelius Dolabella		Hudson 1993: 52.
<b>China</b>	Warring States (5 <sup>th</sup> -3 <sup>rd</sup> century)	Little expectation of repayment of emergency loans		Von Glahn 2016: ch.5n51 citing Okada 1990.
<b>China</b>	3 <sup>rd</sup> century BC	Individual creditors forgive debts	Zhan guo ce 'Strategems of Qi' 4, and Shi Ji 'Basic Annals of Emperor Gao Zu.	Peng 1994: 105-106; Von Glahn ch.5n51 citing Okada 1990.
<b>China</b>	1 <sup>st</sup> century BC	An individual creditor, Fan Zhong, forgives millions of coins in debts	Hou Han shu 32.1119. Fan Ye.	Von Glahn 2016: ch.4, citing HHS and Wilbur 1943: 212-13, Gao Min 1986: 55-6, and Inaba 1984: 95-8, 105-07.
<b>China</b>	40 BC	Emperor Yuan edict forgiving poor people's debts	Han Shu 9, Annals of Emperor Yuan.	
<b>China</b>	AD 420-479	Head of commandery (prefecture) extra-judicially destroys debts	Liu-Song History, 81, 'Biography of Gu Kaizhi'.	Peng 1994: 286.
<b>China</b>	c.AD 550-577	An individual creditor forgives debts	Northern Qi History, 22, 'Biography of Li Yuanzhong'.	Peng 1994: 286.

<b>China</b>	AD 1240	Government pays off debts owed to Uighurs by officials and by commoners.	Yuan History: 2 'Annals of the Emperor Taizong' 12th year.	Peng 1994: 625.
<b>China</b>	AD 1738	Government writes off interest-bearing pawn shop loans debts after an earthquake	Qing Emperor Gaozong Veritable Record, 88.	Peng 1994: 943.
<b>Islam</b>	7 <sup>th</sup> century AD	Individual creditors recommended to forgive debts	Quran 2:280.	Hunwick 1999: 80;
<b>The Tolai</b>	19 <sup>th</sup> century AD	Social pressure to forgive loans		Epstein 1968: 72.
<b>United Kingdom*</b>	AD 1869	Law allowing voluntary bankruptcy	Bankruptcy Act.	Geisst 2013: 148.
<b>United States of America*</b>	AD 1898	Law allowing voluntary bankruptcy	National Bankruptcy Act.	Geisst 2013: 179.

**Table A3. Bans on interest (including proposed and partial bans)**

Case/place	Date	Event	Primary source	Secondary source
The Hebrews, Levant	11-7 <sup>th</sup> century BC	Ban on interest on loans to the poor	Leviticus 25:36-37.	Issler 2016; Gordon 1975:75-76; Cornell 2006.
The Hebrews, Levant	8 <sup>th</sup> -5 <sup>th</sup> century BC	Ban on interest on loans to the poor	Exodus 22:25.	Issler 2016; Gordon 1975:75-76; Cornell 2006.
The Hebrews, Levant	7 <sup>th</sup> -5 <sup>th</sup> century BC	Bans on interest on loans to 'brothers'	Deuteronomy 23:19-20.	Gordon 1975:75-76; Cornell 2006.
The Hebrews, Levant	6 <sup>th</sup> century BC	Ban on interest	Ezekiel 18:8, 13, 17, and 22:12.	
Athens (Greece)	Plato	Proposal to ban interest (not enacted)	Plato <i>Laws</i> : 742c.	Giesst 2013: 19.
Rome	Before 450 BC	Usury banned	Appian.	Geist 2013 :17, citing Zimmerman 1996: 167–168.
Rome	344 BC	Severe penalties for taking interest	Livy 7.28.	Cornell 1989: 344.
Rome	342 BC	Proposed interest ban (perhaps enacted)	Livy 7.42.	Hudson 1993: 50.
India <sup>14</sup>	Mid 3 <sup>rd</sup> century BC	No interest due if debtor imprisoned, creditor refuses repayment, or creditor holds a usufructary pledge	Gautama.	Chatterjee 1971: 64.
India	Mid 2 <sup>nd</sup> century BC	No interest due during calamities such as famine	Prajapati.	Chatterjee 1971: 64.
India	Mid 2 <sup>nd</sup> century BC to 1 <sup>st</sup> century AD	No interest from death of one King until coronation of the next	Vasistha.	Chatterjee 1971: 64.
India	c. midC1	No interest during long sacrifices, disease, when under pupillage	Kautilya's <i>Arthashastra</i> .	Chatterjee 1971 :64.
India	AD C4-5	No interest when credit refuses to accept repayment	Yājñavalkya.	Chatterjee 1971: 64.
India	AD C5-6	No interest to friends for 6 months	Narada	Chatterjee 1971: 64.
India	AD C5-6	No interest on price of commodities, wages, deposits, fines, lost and found, idle promises, and gambling winnings	Narada	Chatterjee 1971: 65.
India	AD 7-8 century	No interest on hides, crops, wine, bride-price of women, debt by suretyship	Kātyayāna	Chatterjee 1971: 65.
India	Uncertain <sup>15</sup>	No interest on suretyship, where there is enjoyment of pledge, when creditor refuses repayment, on fines, and on bride-price	Vyāsa	Chatterjee 1971: 67.
China	2 <sup>nd</sup> century BC	Interest ban on private debts		Von Glahn 2016: ch.3, cites Zhu Honglin 2008: 151–54.
Christianity	AD 325	Churchmen banned from charging interest	First Council of Nicaea, Canon 17, in Tanner 1990: 14.	Geist 2013: 20.

<b>Christianity</b>	AD 345	Interest ban extended to laymen	Canon 12 of the Council of Carthage.	
<b>Christianity (Western Empire)</b>	AD 789	Interest banned	Canon 36 of the Council of Aix.	
<b>Christianity (Frankish kingdom)</b>	AD 789	Interest banned for both laity and clergy	<i>Admonitio Generalis</i> of Charlemagne.	Gordon 1975: 144.
<b>Christianity (Holy Roman Empire)</b>	AD 806	Interest banned for both laity and clergy	Capitulary of Nijmegen, clause 11, clause 16.	Gordon 1975: 145, quoting from Latouche 1961: 156.
<b>Christianity (Holy Roman Empire)</b>	AD 850	Interest banned	Pavia Synod	Geisst 2013: 26.
<b>Christianity (England)</b>	Before AD 1066	Interest banned (for Christian lenders) by Edward the Confessor.		Geisst 2013: 37n37 citing Plowden 1797: ch.4: 125.
<b>Christianity (England)</b>	AD 1215	Interest banned on inherited debts while the heir is under age	Magna Carta, article 10.	Geisst 2013: 29.
<b>Christianity (England)</b>	AD 1235	Interest banned on inherited debts while the heir is under age	Statute of Merton	Geisst 2013: 37 citing Plowden 1797: ch.4: 125.
<b>Christianity (England)</b>	AD 1275	Interest banned	Edward I of England	Geisst 2013: 30.
<b>Christianity (Catholic Church)</b>	AD 1139	Interest banned	Second Lateran Council in Tanner 1990: 200.	Geisst 2013: 34.
<b>Christianity (Catholic Church)</b>	AD 1179	Interest banned	Third Lateran Council in Tanner 1990: 223.	Geisst 2013: 34.
<b>Christianity (Catholic Church)</b>	AD 1215	Interest banned	Fourth Lateran Council in Tanner 1990: 265.	Geisst 2013: 36.
<b>Christianity (Catholic Church)</b>	AD 1245	Interest banned	First Council of Lyons	Geisst 2013: 38.
<b>Christianity (Catholic Church)</b>	AD 1274	Interest banned	Second Council of Lyon	Geisst 2013: 38.
<b>Christianity (Catholic Church)</b>	AD 1311	Interest banned, and defenders of usury punished as heretics	Council of Vienne in Tanner 1990: 385–386.	Geisst 2013: 46.

**Table A4. Arrangements where interest income is spent not lent, thus preventing compounding<sup>16</sup>**

Case/place	Date	Event	Primary source	Secondary source
China	3 <sup>rd</sup> -2nd century BC	Local Official Coin Offices (quanfu) charged interest on loans and used it to cover expenses	Zhou li	Peng 1994: 104; Von Glahn 2016.
China	1 <sup>st</sup> century AD	State (under Wang Mang) charged interest but without aim of making profit		Peng 1994: 288; Yang 1971: 94.
China	Before AD 594 (Sui period, before ban)	Interest used for public expenses	Sui History, 46, Biography of Su Xiaoci; Northern History, 75, 'Biography of Su Xiaoci' ; Sui History, 24, 'Treatise on Food and Money': Kaihuang 8.	Peng 1994: 289.
China	AD 618-907 (Tang, every reign throughout dynasty)	Interest on government loans used to pay official salaries and government expenses		Peng 1994: 383; Yang 1971: 96 citing Chü Ch'ing-yüan, 1940: 126-132.
China	AD 960-1279 (Song)	Interest from 'Green Sprouts' government loans used for flood control, famine relief, frontier armies.		Von Glahn 2016: ch.6; Peng 1994: 535.
China	Qing (1636-1912)	Interest to be used for a purpose, as a rule, e.g. scholarships, famine relief, orphanages.		Yang 1971: 99, citing Abe Takeo: 15-31.
Christianity (Catholicism)	Early 14 <sup>th</sup> century AD	<i>Montes de pietatis</i> charge interest that covers only lending costs		Geisst 2013: 28.
Christianity (Catholicism)	AD 1512-17	Fifth Lateran Council endorses <i>montes</i> charging interest on condition it is used to cover costs.	In Tanner 1990 (6): 626-627.	Geisst 2013: 64.

**Table A5. Bans on charging compound interest**

Case/place	Date	Event	Primary source	Secondary source
<b>Egypt*</b>	717-711 BC	Bakenraef (Bocchoris) bans compound interest	Herodotus	Vesey-FitzGerald 1925.
<b>Rome (province of Asia Minor)</b>	70 BC	Ban on compound interest		Hudson 1993: 52; Wylie 1994.
<b>China</b>	AD 618-907 (Tang)	Ban on compound interest (ban on <i>i-li wei-pên</i> )	Tang Collected Statutes, 88: "Chang'an 1, 11th month, 13th day, edict.	Yang 1971: 95, Peng: 385.
<b>China</b>	AD 618-907 (Tang)	Ban on compound interest explicitly includes pawnshops	Tang Order Supplemented	Peng 1994: 385.
<b>India</b>	AD midC2nd	Ban on compound interest	Manu VIII 153.	Chatterjee 1971 :43.
<b>India</b>	AD C5-6	Ban on compound interest	Brhaspati X 21.	Chatterjee 1971: 46.
<b>Christianity (Eastern Empire)</b>	AD 529	Ban on compound interest (ban on <i>anatacoismus</i> )	Justinian's Code.	Geisst 2013: 3, 18.

**Table A6. Limitations on loan or interest size or length**

Case/place	Date	Event	Primary source	Secondary source
Rome	70 BC	Debt service limited to 1/4 of debtors income		Hudson 1993: 52.
Rome	1 <sup>st</sup> century BC	Interest not to exceed principal		Peng 1993: 211n18, citing Mommsen 1894: 526.
India	Mid 3rd century BC	Interest (possibly only money loans) not to exceed principal	Gautama G.D.S. XII 28.	Chatterjee 1971: 49.
India	Mid 3rd century BC (perhaps later insertion; Chatterjee: 57).	Interest not to exceed five times principal on animals, on wool, on the produce of a field and on beasts of burden	Gautama G.D.S. XII 33.	Chatterjee 1971: 54.
India	Mid 3rd century BC	No interest beyond 1 year	Gautama G.D.S. XII 27.	Chatterjee 1971: 61.
India	Mid 2 <sup>nd</sup> century BC-1 century AD	Interest on gold not to exceed principal	Vasistha II 44.	Chatterjee 1971: 49.
India	Mid 2 <sup>nd</sup> century BC-1 century AD	Interest not to exceed three times principal on grains, fluids, flowers, roots and fruits	Vasistha II 44-46	Chatterjee 1971: 55.
India	Mid 2 <sup>nd</sup> century BC-1 century AD	Interest not to exceed eight times principal on weighable goods	Vasistha II 47.	Chatterjee 1971: 55.
India	Mid 2 <sup>nd</sup> century AD	Interest not to exceed five times principal on animals, on wool, on the produce of a field and on beasts of burden	Manu VIII 151.	Chatterjee 1971.
India	Mid 2 <sup>nd</sup> century AD	No interest beyond 1 year	Manu VIII 153.	Chatterjee 1971: 53, 61 (also noting evasion by novation possible).
India	4 <sup>th</sup> to 5 <sup>th</sup> century AD	Interest on gold not to exceed principal	Yājñavalkya.	Chatterjee 1971:50, 53 (also noting evasion by novation possible).
India	4 <sup>th</sup> -5 <sup>th</sup> century AD	Interest not to exceed eight times principal for fluids, four times on cloth, three times on grain	Yājñavalkya II.39	Chatterjee 1971: 55-56.
India	5 <sup>th</sup> - 6 <sup>th</sup> century AD	Interest not to exceed principal	Brhaspati X 17, also 21, 24	Chatterjee 1971: 49.
India	7 <sup>th</sup> -8 <sup>th</sup> century AD	Interest not to exceed principal	Kātyāyana 509-510.	Chatterjee 1971.
India	Late 9 <sup>th</sup> century AD	Not beyond 1 year	Commentary on Manu VIII 153.	Chatterjee 1971: 62.
India	Before 10 <sup>th</sup> century AD	Interest on money not to exceed principal	Bhārucci commentary on Manu VIII 151	Chatterjee 1971: 49.
India	Before 10 <sup>th</sup> century AD	No interest beyond 1 year if it more than doubles the debt	Bhārucci commentary on Manu VIII 153, also refers to Gautama XII 31 (28)-II.3.28	Chatterjee 1971: 61.
India	Into 20 <sup>th</sup> century	Interest not to exceed principal	Dāmpudat	Chatterjee: xiii, 49; Kane III:423-425.
China	AD 618-907 (Tang)	Interest not to exceed principal	Tang Order Supplemented	Peng 1994: 384.
China	AD 618-907 (Tang)	Grain loans limited to 1 year	Tang Order Supplemented	Peng 1994: 384.

<b>China</b>	AD 511 (and reiterated from 7 <sup>th</sup> to 20 <sup>th</sup> century)	Interest not to exceed principal ( <i>i-pên i-lî</i> )	Wei shu, 114.18a-b.	Yang 1971: 95.
<b>China</b>	AD 1115-1234 (Jin)	Interest not to exceed principal	Ruzhen-Jin History, or 'Jin Shi', 50 'Treatise on Food and Money, 5, Harmonious Purchase.	Peng 1994: 625.
<b>China</b>	AD 1240	Interest not to exceed principal on loans longer than 1 year	Yuan History: 2 'Annals of the Emperor Taizong' 12th year. Yuan History 146 'Biography of Yelü Chucai; 191 'Good clerks 1, Biography of Tan Deng; 155 Biography of Shi Tiance; Yuan History, 105 "Treatise on Punishments, 4. Prohibitions; Yuan History 125.	Peng 1994: 625.
<b>China</b>	AD 1266	Interest not to exceed principal (even upon novation)	Itemization of the Universal System, 28 'Taking Interest in Violation of Rules'.	Peng 1994: 625.
<b>China</b>	c.AD 1368-1379	Interest not to exceed principal	Dong Hanyang, <i>Green Jade Village Miscellaneous Holdings</i> , 'Shen Wansan, Xiu.'	Peng 1994: 741.
<b>China</b>	AD 1368-1644 (Ming)	Interest not to exceed principal (on private loans and pawned goods)		Peng 1994: 741.
<b>Christianity (Eastern Empire)</b>	AD c.440-461	Interest not to exceed principal	Constitutions of Leo.	Geisst 2013: 24.
<b>Christianity (Eastern Empire)</b>	AD 529	Interest not to exceed principal ( <i>alterum tantum</i> restriction)	Justinian's Code, 'Institutes' title IV.	Geisst 2013: 3, 18, 68. <sup>17</sup>
<b>The Tolai</b>	19 <sup>th</sup> century AD	Interest not to exceed principal (interest limited to 100%, loans generally to 10 months)	Parkinson 1907: 94.	Connell 1977: 85, citing Fisk 1972: 368.

**Table A7. Interest rate caps**

Case/place	Date	Event	Primary source	Secondary source
Mesopotamia	2130-2088 BC	33% annually	Code of Hammurabi	Homer and Scylla 1996.
The Hebrews, Levant	444-432 BC	12% used to settle disputes	Nehemiah	Geisst 2013:15 citing Neufeld 1954: 196.
Rome	450 BC	8 1/3 % annually	The Twelve Tables, Table 8, 18A.	Geisst 2013: 16.
Rome	357 BC	Reiterations of interest cap		Hudson 1993: 50.
Rome	347 BC	4 1/6 % cap		Hudson 1993: 50.
Rome	193 BC	8 1/3% cap includes non-Romans	The Sempronian law.	Hudson 1993: 51.
Rome (province of Asia)	70 BC	12% cap imposed by Lucullus		Hudson 1993: 52.
Rome	AD 33	8 1/3% cap reimposed by Tiberius		Hudson 1993: 52.
India	Mid 3 <sup>rd</sup> century	15% annually	Gautama, G.D.S XII.26.	Chatterjee 1971: 21.
India	Mid 2 <sup>nd</sup> century BC	12% or 15%	Baudhāyana 1.5.10.23.	Chatterjee 1971: 23.
India	Mid 2 <sup>nd</sup> BC- 1 <sup>st</sup> century AD	15% annually	Vasistha II.50.	Chatterjee 1971: 23, Kosambi 1996: 254.
India	Mid 2 <sup>nd</sup> BC- 1 <sup>st</sup> century AD	2,3,4,5% monthly depending on caste of debtor	Vasistha II.48.	Chatterjee 1971: 26.
India	Mid 1 <sup>st</sup> century AD	15% or 60% for business lending	Kautilya, <i>Arthashastra</i> 3,II.1.	Chatterjee 1971: 22; Kosambi 1996: 147-148.
India	Mid 2 <sup>nd</sup> century AD	15% annually, 2% monthly acceptable	Manu VIII, 140-141.	Chatterjee 1971: 23
India	Mid 2 <sup>nd</sup> century AD	2, 3, 4, 5% monthly by caste	Manu VIII, 142	Chatterjee 1971: 26.
India	Mid 2 <sup>nd</sup> century AD	5% monthly	Manu VIII, 152	Chatterjee 1971: 28.
India	Mid 2 <sup>nd</sup> century AD	Any rate agreed by experts <sup>18</sup>	Manu VIII, 153, 157.	Chatterjee 1971: 36.
India	4th-5 <sup>th</sup> century AD	15% annually	Yājñavalkya [II.37]	Chatterjee 1971: 23.
India	4th-5 <sup>th</sup> century AD	2,3,4,5% monthly by caste	Yājñavalkya [II.37]	Chatterjee 1971: 26.
India	4th-5 <sup>th</sup> century AD	10% for trade loans if crossing forests, 20% if crossing oceans.	Yājñavalkya [II.38]	Chatterjee 1971: 29.
India	4th-5 <sup>th</sup> century AD	(Any agreed rate)	Yājñavalkya [II.38]	Chatterjee 1971: 30.
India	5 <sup>th</sup> -6 <sup>th</sup> century AD	15% annually, 2% monthly	Nārada [IV.99, 101.	Chatterjee 1971: 23.
India	5 <sup>th</sup> -6 <sup>th</sup> century AD	2,3,4,5% monthly by caste	Nārada IV, 100	Chatterjee 1971: 26.
India	5 <sup>th</sup> -6 <sup>th</sup> century AD	According to circumstance	Nārada IV, 103, 105	Chatterjee 1971: 35, 31.
India	5 <sup>th</sup> -6 <sup>th</sup> century AD	15% annually	Brhaspati X.28	Chatterjee 1971: 23.
India	5 <sup>th</sup> -6 <sup>th</sup> century AD	2,3,4,5% by caste	Brhaspati X.4	Chatterjee 1971: 26.

<b>India</b>	Uncertain	1/80 monthly for pledged loans, 1/60 monthly for sureties loans.	Vyāsa (quoted in the Smrticandrika 11.361).	Chatterjee 1971: 24.
<b>India</b>	Uncertain	2% monthly without pledge	Vyāsa (quoted in the Vivādaratnākara, 7).	Chatterjee 1971: 26.
<b>India</b>	Uncertain	24% annually or 2% monthly	Hārīta (quoted in Vācaspatimisra 3, Vivādaratnākara 8).	Chatterjee 1971: 24.
<b>India</b>	Late 9 <sup>th</sup> century	1/80 monthly, or 2% monthly if the credit cannot maintain livelihood on 1/80.	Medhātithi commentary on Manu VIII 142.	Chatterjee 1971: 26.
<b>India</b>	Late 9 <sup>th</sup> century	5% monthly acceptable if the lender thinks borrower will use it for business	Medhātithi commentary on Manu VIII 152.	Chatterjee 1971: 28.
<b>India</b>	Late 9 <sup>th</sup> century	Any agreed rate between distant traders	Medhātithi commentary on Manu VIII 153.	Chatterjee 1971: 35.
<b>India</b>	Before 10 <sup>th</sup> century AD	Any agreed rate, even above 10% and in times of debtor distress	Asahāya commentary on Nārada IV 103.	Chatterjee 1971: 35.
<b>India (under British Rule)*</b>	Under George III (r.1760-1820)	12% annually		Geisst 2013: 115.
<b>China</b>	3rd century BC	20% annually	Zhou li (Rituals of Zhou), 14 'Local Official Coin Offices', plus notes by Xuan of Han and Jia Gongyan.	Peng 1994: 535.
<b>China</b>	116 BC	A rate cap	Han Shu 15, Table of Princely Ranks.	Yang 1971: 94; Peng 1994: 209.
<b>China</b>	31 BC	A rate cap	Han Shu 15, Table of Princely Ranks.	Yang 1971: 94, Peng 1994: 209.
<b>China</b>	AD 618-907 (Tang)	A rate cap (though often unenforced)		Yang 1971: 98.
<b>China (Middle Capital and the Southern Capital (i.e. Bianjing), and in Dongping and Zhending)</b>	AD 1173	1% monthly on pawnshop loans	Ruzhen-Jin History, 57, Treatise on Officials, 3.	Peng 1994: 625.
<b>China</b>	AD 1282	3% and 4.3% monthly	Yuan History 12 Annals of Emperor Shizu, 9; Itemization of the Universal System, 28; Xu Zaisi, Qing River Prefaces ("Xiangsi").	Peng 1994: 626.
<b>China</b>	c.AD 1368-1379	3% monthly	Dong Hanyang, <i>Green Jade Village Miscellaneous Holdings</i> , 'Shen Wansan, Xiu'.	Peng 1994: 741.

<b>China</b>	AD 1368-1644 (Ming)	3% monthly		Peng 1994: 742.
<b>China (Chekian province, Hou-chou)</b>	End 17 <sup>th</sup> century AD	1.5-3% monthly pawnshop sliding scale		Yang 1971: 98-99.
<b>China (Chekian province)</b>	AD 1780	0.8-2% pawnshop sliding scale	“Hu-chou fu-chih, [Gazetteer of the Hou-chou prefecture] 1874 ed., 77.37b. 95.24a-b.”	Yang 1971: 98-99.
<b>China</b>	AD 1644-1911 (Qing)	3% monthly		Von Glahn 2016: ch8.
<b>Christianity (Visigoth France)</b>	AD 642-643, AD 654	12.5% annually (except if contracted and already paid)	<i>Forum Judicum</i> (Visigothic Code), book 5, in Scott, 1910, ch.8.	Geisst 2013: 30, citing Scott 1910: ch.8.
<b>Christianity (Holy Roman Empire)</b>	AD 1540	12% annually	Constitution of Charles V: 767.	Gordon 1975: 257, citing Lessius 1605: 11:20:14:124.
<b>Christianity (England)</b>	AD 1545	10% pa		Geisst 2013: 76.
<b>Christianity (England)</b>	AD 1571	Cap restored (after complete interest ban in 1552)		
<b>Christianity (United Kingdom)</b>	AD 1624	8% pa, by James I’s parliament		Geisst 2013: 92, 102.
<b>Christianity (United Kingdom)</b>	AD 1713-1854	5% pa	From Queen Anne (lasting to Queen Victoria)	Geisst 2013: 102.
<b>Christianity (United Kingdom)*</b>	AD 1900	5% annually (though any rate permitted if expressly agreed in the absence of distress)	Money-Lenders Act 1900	Geisst 2013: 177-178: citing Bridges and Spear 1908.
<b>Islam (Ottoman Empire)</b>	AD 16 <sup>th</sup> and 17 <sup>th</sup> century	10-20% annually.	Judicial records in Kayseri, Anatolia, Turkey	Kuran 2012: 148, Rubin 2011: 1316n15.
<b>Islam (Ottoman Empire)</b>	AD 17 <sup>th</sup> century	15% annually		Imber 1997: 146, cited in Rubin 2011: 1315.

## Notes

1. Future research might fruitfully extend this analysis to ancient Egypt (Hudson 1993, Vesey-FitzGerald 1925), Japan (Morris 1999), and Russia (Law of Vladimir II, articles 48 and 49; Smith 1966: 509). More research on Africa would also be very welcome, and particularly information on eastern and southern Africa which remains hard to find (Stiansen and Guyer 1999: 8n4).
2. Dates according to the Middle Chronology.
3. Debt jubilees may also have later been revived to some extent in the neo-Babylonian period during the 7<sup>th</sup> and 6<sup>th</sup> centuries BC (Hudson 1993: 29, 32).
4. Numbered following the Christian convention.
5. We use the conventional dates, derived from Varro, throughout.
6. Livy dates the law to Gaius Poetilius Libo Visulus's third consulship, Varro to the year he was elected dictator (Varro 1958: 359n).
7. The Law of Manu also became influential outside of India, including in the Buddhist countries of Southeast Asia as far as Sumatra and Java, and especially Burma and Thailand where the Buddhist law codes are ascribed to Manu (Olivelle 2005: 3; see Vesey-FitzGerald 1925: 172 for examples from Sumatran, Javan, Burma, and Thai codes relating to interest).
8. Matthew Henry's 1706 *Complete Commentary on the Bible* is the earliest we have found. This interpretation now has broad scholarly consensus; see Issler (2016).
9. The controversy is somewhat downplayed by Kuran (2012: 144-145), who takes the view that *riba* refers only to the pre-Islamic practice of 'doubling'. This view is far from the consensus, however, is described as 'dissenting' and 'revisionist', and is accepted neither by religious authorities nor by Islamic banks (Stiansen 1999, Khalil 2005, Algaoud and Lewis 2007).
10. Though most of the merchants referred to in the 'Geniza documents' are Jewish, many did business according to Islamic rather than Jewish law (Kuran 2012: 59).
11. Neighbours with similar practices include the Buin (Thurnwald 1912:42-43, Cornell 1977: 85), the Kinawanua (Danks 1887: 308, Parkinson, 1907: 94), the Kiliai (Connell 1977: 85 citing Counts 1970), and the Siuai/Siwai (Connell 1977: 85). Beyond New Britain and Bougainville, it is doubtful that shells were used as true currency elsewhere in Melanesia (Connell:1977:85). Current scholarship also suggests that earlier reports of interest in Melanesia, as well as among the New Zealand Maori and among the North American Kwakiutl, were actually a means to secure contributions, and not loans at all (Liep 2009: 302-303 and references therein).
12. An asterisk (\*) denotes events not included in our paper since they occur in times or places beyond our case studies. We include them here to provide some context, and to aid future research.

13. Hudson relies heavily on F. R Kraus, *Königliche Verfügungen in alt-babylonischer Zeit* (1984) and Otto Edzard, *Die Zweite Zwischenzeit Babyloniens* (1957).

14. As in the main text of our paper, we restrict our entries on Indian law to indicating some key texts. A more comprehensive list of Indian legislation can be found in Kane III (1973) and Chatterjee (1971).

15. Dates for Vyāsa and Hārīta are uncertain as the texts are not extant, they are known only through citation by later authors (Davis and Brick 2018: 38).

16. There is no suggestion that the intention behind any of these measures was to prevent the compounding of interest. In the Chinese cases, the intention was to use interest income to fund public projects. In the case of the Christian *montes de pietatis*, the intention was to provide cheap loans to the poor, and interest was permitted on the condition it was used to cover costs and did not harm the debtor.

17. Geisst (2013: 18), citing Vespey-Fitzgerald (1925), states that there is a “general assumption” that the ban on interest exceeding principal (*alterum tantum*) along with other interest legislation lapsed between Ulpian in the 3<sup>rd</sup> century AD and Justinian's 6<sup>th</sup> century revival. However, Geisst also cites Leo's Constitution, as well as a court case that shows that the law against interest exceeding principal was in fact applied during the fifth century, apparently proving this ‘general assumption’ to be mistaken.

18. Beginning with Manu, texts seem to re-iterate the rate caps given by previous authorities depending on caste and circumstance, but ultimately tend to apply no cap to freely negotiated contracts between knowledgeable people.