

LOANS AND EDICTS
A QUANTITATIVE ANALYSIS OF THE TEMPORAL DISTRIBUTION OF
LOAN DOCUMENTS AND ROYAL EDICTS UNDER THE REIGN OF SAMSU-ILUNA.

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This article intends to exemplify how a quantitative analysis of documents can provide historical insights that are not found through interpretation of isolated documents. The author's analysis builds on the conclusions reached by Charpin in 2000 in his analysis of a number of Old Babylonian archives.

§1 Introduction

In his 2000 article “Les prêteurs et le palais: les édits de *mīšarum* des rois de Babylone et leurs traces dans les archives privées”¹, D. Charpin discusses how concentrations of loan-transactions relate temporally to debt remissions by royal edict in the Old-Babylonian period. The prevailing view on the subject, first expounded by J.J. Finkelstein in 1965, is that “the years immediately preceding a *mīšarum* should show a low rate of frequency in transactions in general, higher interest rates, lower sales prices for real estate, etc. (the risk for the potential buyer and creditor being then much greater)”². Charpin argues that the evidence having since come to light shows, that: a) creditors did, as a rule, *not* know in advance that a *mīšarum* was coming, and b) the number of transactions *increases* as the edict draws nearer. Charpin illustrates his point with nearly 130 loan documents from seven Babylonian archives³, that show temporal concentrations (some more marked than others) shortly before the edicts of Hammurabi year 31 (the conquest of Larsa) and of his son Samsu-iluna's accession, as well as before that of Samsu-iluna's 8th year. The latter is corroborated by an archive not included in the article, but later mentioned by Charpin in *N.A.B.U.*⁴. A similar concentration occurs in Samsu-iluna's 28th year, and Charpin suggests that this is caused by another, hitherto undocumented, *mīšarum* at this moment⁵.

¹ Charpin 2000, 185-211.

² Charpin 2000, 186, after Finkelstein 1965.

³ Charpin also used documents from the manuscript of M. Sigrist's *Old Babylonian Account Texts in the Horn Archaeological Museum. Andrews University Cuneiform Texts (AUCT) V*, published in 2003. Charpin, in his 2005 review of *AUCT V* (Charpin 2005), corrected some dating errors in that edition, as well as some omissions in his Charpin 2000. These are taken account of below. Documents with incomplete dates (missing month, year, or both) are excluded from the present analysis, as are documents that do not pertain to loans but to the renting of property or personnel.

⁴ Charpin 2001, 51. The tablets from this archive are published in Al Rawi, F.N.H. & S. Dalley 2000: *Old Babylonian Texts from Private Houses at Abu Habbah Ancient Sippir: Baghdad University Excavations, Edubba 7*, London, and have been included in the present analysis.

⁵ Charpin 2000, 185-6; also, Kraus pointed out that document *PBS 8/2 226* refers to an edict, and Charpin recognizes the witness mentioned in this document from documents of Samsu-iluna years 26 and 29; Charpin 2000, 198

Charpin's explanation of this phenomenon is elegantly easy: the only loan documents that have come down to us are those of unpaid debts⁶, debts that in this case remained unpaid on account of their remission by royal edict *after* the loan had been issued. Why these now worthless documents were kept by some creditors (in whose archives they were found) remains unclear, but Charpin reminds us of the modern case of Russian bonds, that certain families would keep for generations in spite of the ever diminishing chance of reimbursement. The author proposes the chronological classification of all loan documents that we have and expects the appearance of marked "peaks" in the months preceding edicts: the opposite of the situation Finkelstein proposed. Furthermore, he suggests that the height of a peak just before the edict would reflect the normal transaction volume⁷.

A step in the direction proposed by Charpin now seems to largely confirm his general findings as well as his expectations. Some 560 loan documents dating from the reigns of Hammurabi and Samsu-iluna have been tabulated and their temporal distribution plotted in graphs (see §6), together with the aforementioned four (one of them assumed) edicts. The graphs show the peaks that Charpin expected and they indeed occur just before edicts⁸. In order to generate meaningful graphs, the period under consideration (81 years, from Hammurabi's accession in 1792 to the end of Samsu-iluna's reign in 1712⁹) has been divided into almost 1000 time units of one month each (see below)¹⁰. In this scheme, month one is Hammurabi's year one, month one. The distribution was then calculated in the form of a list of total amounts of documents per time unit and subsequently plotted in a number of graphs. The graph we will primarily concern ourselves with here is the combined graph of all loans. Other graphs used in the analysis were those of barley loans and silver loans, those will only be used here to detect seasonal influences on the transaction volume. The main sources for our data are *CBCY* volume 4¹¹, *YOS* 12¹², *BIN* 7¹³ and Charpin's article¹⁴. Additional data have been taken from Charpin's sources¹⁵.

⁶ Loan documents remained in possession of the creditor until the debt was paid off, at which moment the document was returned to the debtor, who would then destroy it.

⁷ Charpin 2000, 203-5.

⁸ Van Lerberghe 2003, 72-3, 75, notices a similar chronological distribution around year 1 of Ammi-šaduqa, in about 200 loan contracts from the years Ammi-ditana 1 to Ammi-šaduqa 18 (1683-1625 BC). The author suggests that this concentration may be linked to political events, to wit Ammi-šaduqa's *mīšarum*-act in his first regnal year. This might have improved the economic situation in the country, leading to a decline in the number of loans. Van Lerberghe, like Charpin, thinks that the only loan contracts kept in an archive would be for debts that had never been settled.

⁹ All dates BC; after Brinkman 1977; Hammurabi and beyond: 337.

¹⁰ The intercalary months in this period, as identified by Huber 1982, 56-9, have not been included because this would have unnecessarily complicated the processing of the data. In the analysis and interpretation of the graphs the intercalary months of the relevant periods have been included.

¹¹ Beckman, G. 1999: *Catalogue of the Babylonian Collections at Yale, 4: Old Babylonian archival texts in the Yale Babylonian Collection*, Bethesda, MD (*CBCY* 4).

¹² Feigin, S.I. 1979: *Legal and administrative texts of the reign of Samsu-iluna, Yale Oriental Series Babylonian Texts; Vol.12 (YOS 12)*, New Haven.

¹³ Alexander, J.B. 1943: *Babylonian inscriptions in the collection of James B. Nies (BIN VII: Early Babylonian letters and economic texts)*, New Haven.

¹⁴ Charpin 2000.

¹⁵ *ibid.*, 210-1, and Al Rawi & Dalley: *Private Houses* (cf. note 4, above).

The purpose of the present article is twofold: 1) aside from confirming Charpin's proposition it aims to take his work a step further, primarily by extending the data set; 2) it aims to show how sheer quantitative analysis can add to our understanding of historical data and thus can be a useful companion technique to the customary elaborate interpretation of isolated documents.

§2 *Reservations*

Before looking at the details of the dates of the edicts, the description and interpretation of the graphs, and the conclusions drawn from them, some reservations should be pointed out:

- 1) The choice of one month as time unit is in part arbitrary. In part it is also determined by the following factors: a) in most texts that mention an expiration date, that date falls less than a year after the loan was issued; b) when relating temporal distribution to social/economic or political events, we sometimes have the dates of those events accurate to the month or even less. a. and b. entail that any convenient time unit longer than one month would give us too coarse a resolution to be useful; c) shorter time units will cause the total amounts of documents per unit to become smaller and are therefore less meaningful (see also 2b, below).
- 2) the following factors have a negative influence on the representativity of the results for the temporal distribution as it would have been in reality: a) the fluctuation of the total amount of available documents per time unit. Months that render few documents of any kind now seem to have a disproportionately small number of loan documents. Expressing the number of loan documents as a percentage of the total amount of dated documents from the same month would solve that problem, but would introduce a new one because of the relatively small overall number of texts used in our analysis (see also b, below): a number of two loan documents on a total of four from the same month would render a percentage of 50, which can hardly be considered representative; b) this is a quantitative analysis, and as such, a number of 560 loan documents — rendering an average of less than one (!) document for each of the nearly 1000 time units — is simply too small. An average of, say, five to ten documents per unit would increase confidence in the representativity of the data. The alternative solution — to increase the time unit — is undesirable (see 1., above); c) less than half the documents used have been published in any form, and of those only a small amount were read fully, due to the limited amount of time available. The primary basis for our data is the catalogue *CBCY* 4 (see above), the entries of which provide all required information. The use of standard formulations in the loan documents made it possible to quickly check a large number of entries by comparing them to the published texts, and on the whole the entries proved to be correct¹⁶.
- 3) No account has been taken of the spatial distribution of the documents and edicts. The underlying assumption is, that an edict was effective in the king's entire realm (which must

¹⁶ In the case of *CBCY* 4, the index was more reliable than the publication: *CBCY* 4 correctly dates *YOS* 12 417, -418 and -419 in Hammurabi year 39, month 2, whereas *YOS* 12 assumes them to be from Samsu-iluna year 23, month 2. The confusion might have been caused by the similarity of the respective year names (Ungnad 1938, 181b #141 and 184a #168, respectively). *CBCY* 4 also correctly dates *YOS* 12 50 in Samsu-iluna year 1, instead of 2 (Ungnad 1938, 182a #146 and #147).

not necessarily have been the case), so that a document dated by a certain king's regnal year was subject to any following edict of the same king.

In short: the quality of this analysis would improve by further enlarging the dataset, by expressing the results as percentages, possibly also by taking the data from the texts themselves instead of from indices, and by extending the analysis to include spatial alongside temporal distribution.

§3 Exclusion of topics

Some topics of the original analysis on which this article is based are excluded here because they did not reveal any significant insights. For the sake of completeness however, they should be mentioned. The first is the distinction between types of loan documents as distinguished by Skaist: *ur₅.ra*-loans, *šu.lá*-loans, *eš.dé.a*-loans, *ana zē/ārānī*-loans, *ana šám*-loans and *šám*-loans, and further *nam.tab*/"partnership"-loans and *našpakūtum*-loans¹⁷. All documents in our set have been checked for the presence of these keywords. On the total of 560 documents there were 1 *eš.dé.a*-loan, 2 *šu.lá*-loans, 9 *ana šám*-loans and 28 *šám*-loans. On the basis of these negligibly small amounts, no conclusions should be drawn from the temporal distribution of these documents.

A different distinction is that between *šu.ba.an.ti*- and *šu.ti.a*-documents and promissory notes (using the phrase *ugu PN <PN₂> tuk*¹⁸). The majority of documents belong to the first two groups, with 297 *šu.ba.an.ti*- and 265 *šu.ti.a*-documents. According to Oppenheim *šu.ba.an.ti* refers to a loan¹⁹. He interprets *šu.ti.a* in some cases as "loan", in others as "receipt"²⁰. The catalogues *CBCY* 2 and -4 do not explain the terms, but when compared to the cuneiform they show to refer to *šu.ba.an.ti*-texts as "loan" and to *šu.ti.a*-texts as either "loan" or "receipt"²¹. Hübner and Reizammer translate as "Einnahme, Empfang"²². Charpin does not distinguish the two and refers to both as "loan", based on document *DCS* 103, which mentions the one term on the envelope, the other on the document itself²³. In our original analysis the temporal distribution of both types did not differ, although the *šu.ba.an.ti*-documents showed somewhat sharper peaks. Therefore, both have been regarded as equal in nature in the present analysis and have been counted together as "loan documents", leaving out the *šu.ti.a*-documents that clearly referred to rent etc²⁴. The *ugu PN <PN₂> tuk*-documents make

¹⁷ For definitions see Skaist 1994, 43-81.

¹⁸ Oppenheim, in *YOS* 12, Introduction, translates as "promissory notes". M. Stol, in: Charpin, D., D.O. Edzard, & M. Stol 2004: *Mesopotamien: die altbabylonische Zeit/OBO* 160/4, Fribourg, 863, explains these documents as "Verpflichtungsscheine": contracts for the remainder of a debt that has been paid in part, thus indeed being a kind of promissory note.

¹⁹ *YOS* 12, Introduction.

²⁰ *YOS* 12 187 is listed as a loan in the index, *YOS* 12 179 as a receipt. Both are *šu.ti.a* documents. Apparently Oppenheim's interpretation of *šu.ti.a* depends on the context: see *YOS* 12 208 which is a *šu.ti.a* document for barley, being the *rent* for a rented-out son.

²¹ Either following or confirming Oppenheim in at least the two cases mentioned in the previous footnote: *YOS* 12 187 (YBC 8330) is listed as "loan", *YOS* 12 179 (YBC 8326) is listed as "receipt".

²² Hübner, B., & A. Reizammer 1985: *INIM KENGI* II, *Sumerisch-Deutsches Glossar, Band 2 (M-Z)*, Marktreidwitz, 996.

²³ Charpin 2000, 193, note 31.

²⁴ Such as *YOS* 12 208, mentioned in footnote 20.

up only 37 documents of the total, again too few to allow any conclusions to be drawn from their distribution.

Yet another division is that according to different categories of commodities lent (including silver). These included barley, silver, oil, dates, sesame and a range of products accumulated in a category "other". The largest groups were those of barley and silver, and the temporal distribution of those loans will be discussed below. The other, smaller groups followed the temporal distribution of barley and silver loans. They did not significantly influence the shape of the peaks in the figures below, and merely added their number to the overall pattern that was determined by barley and silver loans. The other groups will therefore not be discussed separately.

§4 Dates of the edicts

For our purpose it is important to independently establish the dates of the edicts under consideration as accurately as possible. Since our extended dataset does not show a marked concentration before the edict of Hammurabi year 31 (the conquest of Larsa), as opposed to the more limited dataset Charpin used²⁵, we will disregard this edict. In fact, our entire dataset only begins to show any (barely) noticeable concentrations just before that same edict. I have not found a satisfying explanation for this. The edict suggested by Charpin to have been issued in Samsu-iluna's 28th year follows mainly from his own analysis and can therefore not be dated independently, so we will have to follow Charpin here. It should be noted however, that the only documents dating from Samsu-iluna's 28th year in our larger data set are exactly those from Charpin's set²⁶. Our set must therefore necessarily confirm this edict, and we cannot rely on it to confirm or disprove Charpin here. We will look at this concentration of documents only to see whether it has anything in common with other peaks. That leaves the edicts of Samsu-iluna's accession year and that of his 8th year to be dated.

Samsu-iluna year 1: Hammurabi year 43, month 6 (which is month 510 in our scheme):

- Based on his conclusion that temporal concentrations occur shortly before edicts, Charpin supposes that Samsu-iluna must have issued his edict before Hammurabi year 43, month 7: most loan documents around this edict are dated within about one year before this month²⁷. For our purposes this would be a circular argument, and should therefore not be put forward, but:
- It is well possible that Samsu-iluna had already during his father's life begun to take over certain governmental responsibilities. Hammurabi must in his 43rd regnal year have been over 50 and was possibly ill²⁸. We will return to this when interpreting the graphs.
- These arguments leave some margin for this edict's date and we will see below that a slightly later date is to be preferred.

²⁵ Charpin 2000, 187-9.

²⁶ As stated in the introduction, the data in our data set includes that of Charpin.

²⁷ Charpin 2000, 190; see also his note 21 there: E. Woestenburg dates Hammurabi's death at year 43, month 6, day 3.

²⁸ Charpin 2004, referring to Samsu-iluna's letter *TCL* XVII 76, translated by Kraus 1984, 66 nr. 1, and recently by Veenhof 2005, nr. 130, quoted below; Van De Mierop 2004, 120-1, contends that 50 was a considerable age for the time.

Samsu-iluna year 8: year 8, month 3²⁹ (which is month 603 in our scheme):

– This edict, following Kraus' reconstruction of it, begins with the following lines:

- 1 [itu s]ig₄ u₄ [x.kam]
- 2 [m]u sa-am-s[u-i-lu-na lugal(.e)]
- 3 urud k[i l]u[gal gub.ba(a)]
- 4 i[d hur.sag didli.bi(.ta)]³⁰

The year name in line 2 corresponds to that of Samsu-iluna's 8th year³¹; line 1 gives us month 3. Kraus notes: "wie das Datum [...] für die Datierung des Edikts zu verwenden ist, bleibt unklar"³². Elsewhere, however, he notes that the date on which an edict was to take effect was an essential part of it (based by Kraus on the edicts of Samsu-iluna and Ammišaduqa)³³. The latter is very likely, we will return to this when interpreting the graphs and here date this edict as stated.

Samsu-iluna year 28: year 28, month 6 (which is month 846 in our scheme):

– A number of archives in Charpin's analysis break off abruptly in month 5 of year 28³⁴. Therefore, it seems reasonable to date the supposed edict in month 6.

§5 What to expect

A critical analysis of the graphs will benefit from having an idea of what is to be expected if Charpin's suggestions as mentioned in the introduction are correct (the concentration of documents occurs before the edict; the number of transactions increases as the edict draws nearer; there would appear a marked "peak" in the months preceding the edict; the height of a peak just before the edict would reflect the normal transaction volume; and creditors did not know in advance that a *mīšarum* was coming). For simplicity's sake, I would like to add the basic assumption that loans were issued at a more or less constant rate in any given time period, but we will see below that our graphs suggest otherwise. We can now sum up our assumptions:

- 1) Before the edict we expect to see a linear rise with time, of the number of documents.
- 2) The oldest of those would not have been older than the time that would normally elapse between the issuing of a loan and the moment of payback (which is not necessarily the due date!) in the time period under consideration. Any older loans would have been paid back before the edict was issued.
- 3) The rising line would reach its highest point at the moment of the edict, and then drop to zero. This highest point would reflect the normal transaction volume.
- 4) In case, *contra* Charpin, that creditors *did* know beforehand that an edict was coming, we would expect the drop to occur at the moment this fact became known. Creditors lending money or goods after that date would have been sure to lose their money.
- 5) Assuming, further, that there would always be a certain amount of loans that were never paid back, we expect a more or less constant "static"-line just above the zero level. These

²⁹ Charpin 2000, 190, after Kraus.

³⁰ Kraus 1984, 154.

³¹ Ungnad 1938, 182b, #153.

³² Kraus 1984, 69.

³³ Kraus 1984, 71.

³⁴ Charpin 2000, 198-202.

documents would not have been destroyed, for the same reasons as why those rendered worthless by an edict were kept.

- 6) After the edict, the number of loan documents would have very quickly risen from zero to the static level because chances of a new edict so soon after the previous one would have been considered minute. The risk involved in lending money or goods would have been perceived to be correspondingly low, so there is no reason to expect a prolonged period of not issuing loans.

We can now draw a graph showing what to expect, according to the above six points:

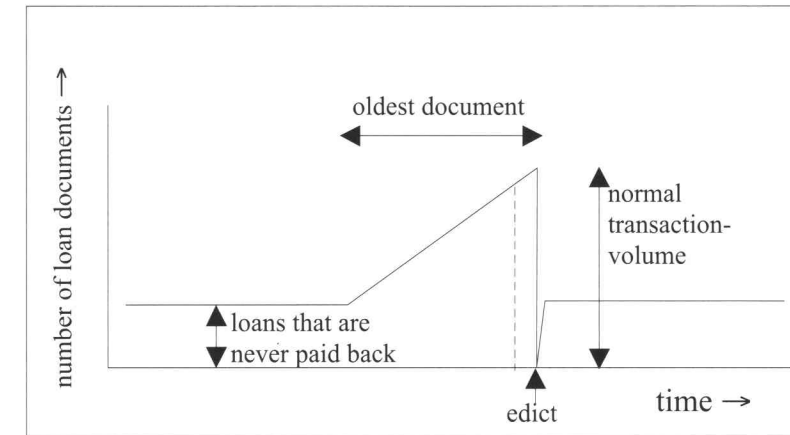


Figure 1 The dotted line represents the situation where creditors know in advance that the edict is near.

§6 Analysis of the graphs

The graph in figure 2 shows the section of the data that is relevant to our analysis³⁵. The horizontal axis numbers the time units, approximately months 400 — 890. That is, Hammurabi year 34, month 4 to Samsu-iluna year 32, month 2. The vertical axis displays the total amount of loan documents, that is, including barley, silver, dates, sesame, etc. The vertical bars in the graph show this total amount for each month. Also, the three edicts that fall within this time period are displayed, marked with an arrow below the time axis: Samsu-iluna's accession edict in Hammurabi year 43, month 6 (month 510 in our scheme), the edict of his 8th year in month 3 (month 603 in our scheme), and the edict suggested by Charpin to have been issued in Samsu-iluna year 28, month 6 (month 846 in our scheme).

There is a marked peak around month 598 (Samsu-iluna year 7, month 10). More to the left is a smaller peak around month 502 (Hammurabi year 42, month 10), followed by a break and then another small peak. On the far right is a third peak around month 844 (Samsu-iluna year 28, month 4). Charpin's data contributes to these peaks, but not overbearingly (except in the

³⁵ The graph is cut off in order to fit onto the page. To the left of this section there are hardly any data until month 409. To the right there are no data after 876.

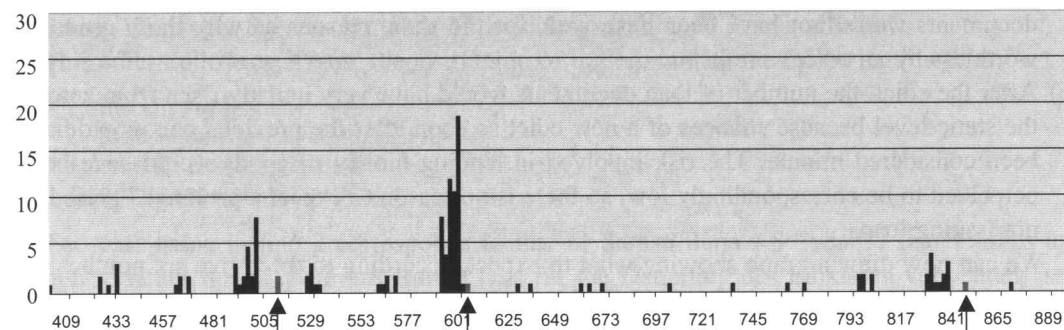


Figure 2

third peak, see above). In between the peaks we see either the static level or no documents at all. The periods in which concentrations culminating in peaks occur, are approximately as follows (dates as <king>.<year>.<month>):

Month 489 — 507	(Ha.41.09 — Ha.43.03)	peak 1a
Month 513 — 529	(Ha.43.09 — Si.02.01)	peak 1b
Month 568 — 607	(Si.05.04 — Si.08.07)	peak 2
Month 836 — 845	(Si.27.08 — Si.28.05)	peak 3

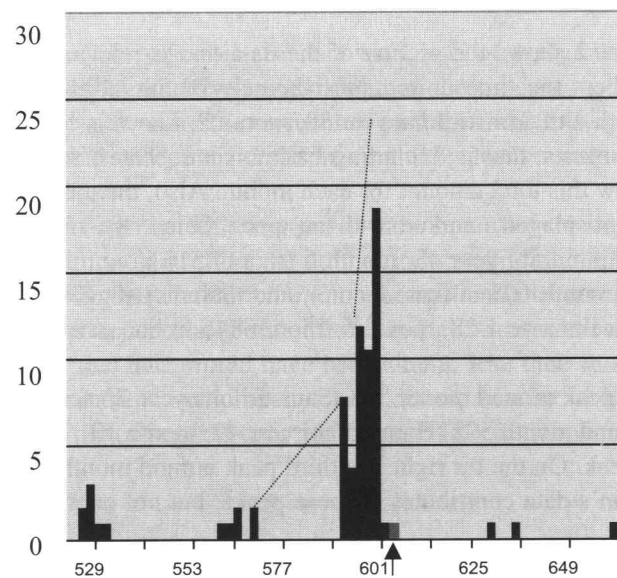


Figure 3

The clearest peak is number 2, so we will look at this one first (figure 3). This peak includes the intercalary months SI.05.06b, SI.07.12b and SI.08.06b³⁶; in our scheme these are months 570b, 600b and 606b.

- its onset is slow, rising from the static level of 2 documents in month 568 to a number of 8 in month 591; that is, an increase of 6 documents per month in 24 months (including one intercalary month).
- in month 594 the number of documents is notably higher (13) and rises to the maximum of 24 documents in month 598, an increase of 11 documents per month in 4 months; this sharper rise must have set in between months 591 and 594, a period with comparatively few documents, perhaps having to do with the chance of appearance of documents on the market and in the archeological record³⁷, and with my choice of sources.
- between months 598 and 602 the number of documents drops sharply to nearly zero (5 months, including intercalary 600b)
- in month 602 the static level is reached again, with a few highs in months 604-7.

Peaks 1a and -b develop as shown in figure 4. There are no intercalary months in this period³⁸.

- months 480 — 502 show a rise from 3 to 10 documents; that is, an increase of 7 documents per month in 22 months, a similarly slow rise as in peak 2.
- from month 502 to month 508 the number of documents drops to zero. This decrease takes one month longer than that in peak 2.
- in months 508 to 513 the number of documents remains zero.
- in month 513 (three months after the supposed date of the edict in month 510) we see the first document again, the number quickly rising to 3 (static level) with some highs in months 515-23.

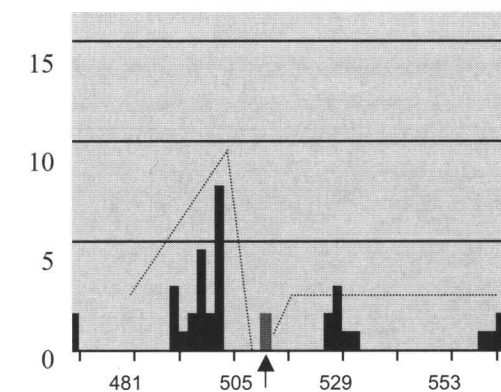


Figure 4

³⁶ Hubner 1982, 58, gives SI.05.06b and SI.08.06b. SI.07.12b is not listed by Hubner, but attested by Al Rawi 2000, no. 32:12.

³⁷ The documents in this analysis come from both regular and illicit excavations. Charpin 2001, 51, refers to regular excavations; Charpin 2005, 411, refers to illicit excavations.

³⁸ Hubner 1982, 57-8; this period covers months 480-523, corresponding to HA.40.12-SI.01.07.

Peak 3 has a more squared shape (fast rise and fall) and shows a concentration of documents in months 836-840, and a maximum in months 843-4-5. There are intercalary months in SI.27.12b and SI.28.12b, the latter intercalation being very unreliable³⁹. The former corresponds to month 840b, separating the first concentration and the maximum by an additional month. It is this peak's deviant shape that raises some doubts as to whether it is caused by an edict, as Charpin suggests.

Plotting the contribution of barley and silver separately, we get the following graphs (Fig. 5: silver; Fig. 6: barley):

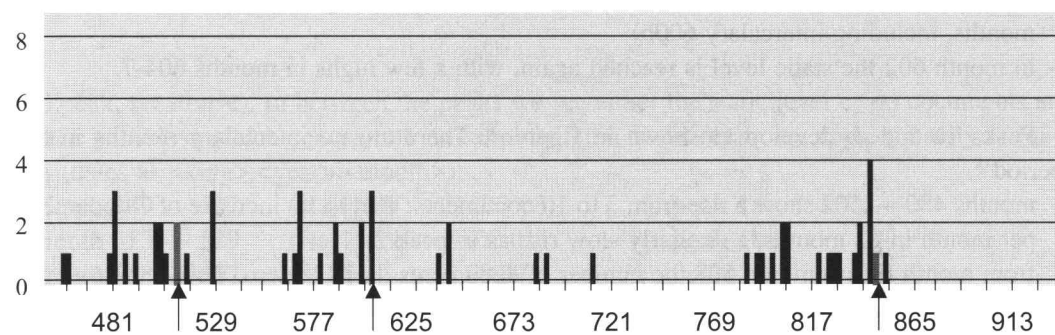


Figure 5

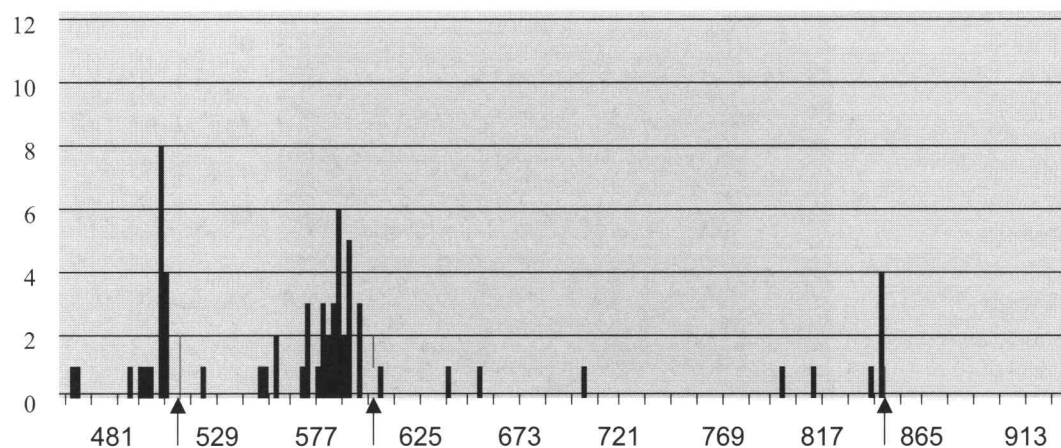


Figure 6

³⁹ Hubner 1982, 58.

Both graphs follow the same pattern as the first one (Fig. 2). Silver mostly in a temporal sense, barley temporally as well as in amplitude. Note that the spikey character of Fig. 2 seems to be caused by barley loans, and that peak 3 is dominated by silver loans.

§7 Interpretation of the graphs

Peaks 1a/b and 2 correspond to the edicts of, respectively, Samsu-iluna year 1/Hammurabi year 43, month 6 (month 510) and Samsu-iluna year 8, month 3 (month 603; see arrows in Figs. 3 and 4). There are similarities and differences with the expected pattern or trend model as drawn in §5:

Similarities

- 1) A gradual rise of the number of documents per month, before the edict.
- 2) A sharp drop in numbers just before the edict of peak 2.
- 3) A quick recovery after the edict of peak 2.

Differences

- 4) A sudden increase of the rise in peak 2 between months 591 and 594.
- 5) A drop in numbers in peak 1a rather long before the edict. The drop is also slightly more gradual than that in peak 2.
- 6) A later return to the static level after the edict of peak 1a/b.
- 7) After the edicts of both peaks 1a/b and 2 at first we see some highs.
- 8) Peak three differs in shape from both other peaks and the trend model. It is also composed of different loans than peaks 1a/b and 2 (it is primarily composed of silver, rather than barley loans).

It now remains to derive consequences from the similarities and to try to explain the differences.

1) In peak 2 the onset starts in month 568, 37 months before the edict in month 603⁴⁰. Following the reasoning in §5, that would mean that 37 months was the usual maximum duration of a loan, considerably longer than the expiration dates suggest. These dates only mention the month in which a debt expires, never a year, so customarily the loan would have been expected to be paid back within a year. Our analysis suggests that it could take as long as three years to pay back what was due. We will return to this below.

4) The sudden increase between months 591 and 594 suggests that we are looking at two superimposed trends. Both might have had their separate causes in economic life. Let us try to reconstruct both these component trends and to relate them to economic factors. Based on the expected graph in §5 we work on the assumption that both trends are linear. The first part of peak 2 is composed of only one of the two components, which shows a rise of 6 documents in 24 months (see above). If we extrapolate this trend to the date of the edict (month 603) we arrive at a number of 11 documents per month in month 603⁴¹.

⁴⁰ Including intercalary months 570b and 600b mentioned above.

⁴¹ A rise of 6 documents in 24 months results in a rise of $9.25 = 9$ documents in 37 months (568 when the rise begins, to 603, including intercalary 570b and 600b). Add the static level of 2 per month and we arrive at 11.

The second part of peak 2 shows a rise of 11 documents in 4 months. Extrapolating to month 603 we arrive at 41 documents per month⁴². This, of course, is the combined result of both component trends. To find the true value of the second component in month 603 we have to subtract the contribution of the first (11), giving us 30 documents per month as the second component's contribution. Extrapolating in the other direction, we would see this trend line cross the static level of 2 documents in month 590⁴³. Had we had more data we would have seen a bend in peak 2 here.

We now have two separate component trends. The first begins in month 568 and rises in 37 months (see above) to a level of 11 documents in month 603. Considering the long duration of this rise it seems safe to assume that 11 documents per month reflects the longer-term customary transaction volume (a.) for the period under consideration (see §5)⁴⁴. The second component begins in month 590 and rises to 30 documents in month 603, a period of 14 months (including one intercalary). This would have been a short-term transaction volume (b.).

a.) The timespan of 37 months for the long-term usual volume suggests that economic conditions in this period were rather painful: as already said, if a loan document states an expiration date at all, it always falls within one year after the loan was issued. Here we find that it might well have taken a debtor three years on average to pay off his debt. Endebted farmers etc. must have lived in economically dire circumstances and debt-slavery might have been quite common⁴⁵. This would have resulted in all the more credit for the king who would remit those debts by edict.

b.) The short-term character of the second component, together with the fact that barley loans dominate peak 2 (as well as peak 1, but as opposed to peak 3 which is dominated by silver loans), suggests that there is some seasonal influence at work, having to do with barley. We find the highest levels of barley loans in peak 1 in months 502-504, that is, Hammurabi year 42, months 10-12. The highest level of barley loans in peak 2 we find in months 597-600: Samsu-iluna year 7, month 9-12. The silver loans that dominate peak 3 are concentrated in months 843-845: Samsu-iluna 28, months 3-5. In these periods there were no intercalary months.

Landsberger showed that in months 6 and 7 the early sowing took place, in months 11 and 12 the summer sowing, and in between (months 8 and 9) the late sowing. In months 3-5 no sowing took place but the harvest was processed and the land was tilled⁴⁶. These periods correspond fairly well to the concentrations we saw: barley loans dominate in periods of sowing, silver loans in periods when no sowing was done. One question remains, however. Why did people start borrowing barley 14 months in advance (the period we reconstructed for the

⁴² We had already found an increase of 11 documents in the 4 months in which the graph shows a sharper rise. Another 6 months (598 — 603, including 600b) would add another $16.5 = 17$ documents. Add the 24 documents of month 598.

⁴³ Taking 4 months (= 11 documents) off month 594 (with 13 documents). An exact calculation — leaving out the influence of the first component — yields a date 3.8 ~ 4 months before 594.

⁴⁴ Note that, if we multiply the number of documents in our set by 'x', this transaction volume must be multiplied by 'x' as well.

⁴⁵ Veenhof 2000, 8, mentions the sale of family members as a form of debt-slavery, referring to the Codex Hammurabi §117. This law code may not have been put into actual practice (Veenhof 2000, 12), but the mere mentioning of the phenomenon shows that it existed.

⁴⁶ Landsberger 1949, 284-5.

short-term loans)? Perhaps this rather long period is only due to the reconstruction itself: had we based this on the next bar (month 595, 12 documents, instead of month 594 with 13), a shorter period, in which we would see a steeper rise to a higher maximum number of documents, would have resulted. More data would, again, have provided better insight.

2) The drop in numbers in peaks 1 and 2 before the edicts suggests that creditors knew or expected that an edict was coming. We have no direct evidence of this, the only letters that refer to the actual promulgation of an edict do so *after* the fact. Two of these explicitly link the promulgation of the edict with the "raising of the golden torch" by the king⁴⁷. Kraus thinks this practice could have actually existed: broadcasting messages by land transportation was a slow process, and it was imperative that an edict should come into effect everywhere at the same time. The light signal was a sufficiently fast medium to notify all who were involved of the moment the edict was to take effect. The actual terms of the edict would have been sent afterwards by courier⁴⁸.

Kraus rightfully stresses the importance of synchronizing the moment that the edict would come into effect: in case a creditor would claim his due around this date, there could — especially when creditor and debtor lived in different towns or even areas — easily have arisen dispute about whether or not the edict had already taken effect. The light signal makes sure that everybody is aware that *everybody else* knows whether the edict is effective or not. This precludes any discussion about that moment.

Some questions remain, however, because a similar problem pertains to the edict's contents: even if the moment that the edict was to take effect had been agreed on, there could still be disagreement about its exact stipulations. Furthermore, a light signal is an undifferentiated signal, and being such a fast means of signalling it would be useful in other circumstances as well (think of early warning in case of war). If the meaning of any such binary signal were not known beforehand, the signal would have been meaningless. The Mari letters seem to confirm that a signalling system with previously agreed signals existed in the Mari region. A simple, single, light signal would have been used to signal enemy attack. A double signal might have signalled a country-wide state of alert and call to arms⁴⁹. Light signals were also used in Mari in times of peace, for instance for communicating the arrival of a dignitary⁵⁰. More complex signals or sequences of signals might have been used to send more complex messages⁵¹. The details of the use of light signals in Babylonia would require a separate study, but can we say anything here about their occurrence and probable purpose? And how was the content-issue solved?

⁴⁷ Kraus 1977: *AbB* 7, 153:1-3; van Soldt, W.H. 1990: *AbB* 12, 172:8-10.

⁴⁸ Kraus 1984, 70-71.

⁴⁹ Dossin 1983, 233-245 (previously published in *RA* 35 (1938), 174-186). Dossin publishes a Mari letter, notifying the king that the Benjaminites of the Terqa district have "raised the torches" in all their villages, and advising the king to reinforce the guard at Mari and not leave the city. Dossin therefore thinks these fires signalled a Benjaminite mobilization and hostilities (237-240). Another letter indicates that a single light signal with a previously agreed meaning was sent as a call for help during an enemy attack (240-1). The use of the double signal for country-wide mobilization is indicated by two more letters (241-2). See also Crown 1974.

⁵⁰ Dossin 1983, 244-5.

⁵¹ Dossin 1983, as well as Crown 1974, 251-2.

The use of a light signal for war-time purposes in Babylonia is attested by an Old Babylonian letter, saying: "... The following message of Sabium has reached me: — *He will raise his torch*, and has ordered the provisioning for three days of his soldiers —..."⁵² The military context of the passage in the letter indicates that the signal must here have had the purpose of mobilizing the king's troops for a campaign⁵³.

Considering the multiple purpose of simple, single, light signals in Babylonia⁵⁴, as well as the predominantly military purpose they had in Mari, it is reasonable to assume that if such a signal was used to notify the country of an edict, its impending promulgation must have been communicated before sending the signal. Sending the edict *before* the light signal, that is, before the edict would take effect, would then have solved both the content-issue and the problem of how to interpret the light signal. It can therefore be assumed that in case of peak 2 people *were* aware of the impending edict, which gives a satisfying explanation for the drop to almost zero in about 5 months, starting 6 months before the edict.

5) In peak 1a/b this drop takes one month longer. Also, it begins considerably longer (in month 502) before the edict (in month 510). It seems as though people were aware of the impending edict in this case much earlier than in the case of peak 2. If so, then why?

Kings would usually issue an edict at the moment they came to the throne⁵⁵, so it is reasonable to assume in this case that people expected a change of ruler. The most obvious explanations for such an expectation would be a prolonged war with diminishing success, and serious illness of the reigning king — in this case Hammurabi. We know very little of this king's last years, but there is a letter of his son Samsu-iluna, suggesting that his father was ill and had transferred his governing powers to his son while still alive:

*My father, the king, is ill and I have now sea[ted myself] on the dynastic throne in order to provide justice to the land.*⁵⁶

Moreover, Hammurabi died in the first half of his 43rd year⁵⁷, which — if related to his illness — indicates the seriousness of that illness. We will therefore assume that around the beginning of the drop in month 502 (HA.42.10) the old king got ill, or word of his illness got out, and that in the following months Samsu-iluna began to take over governmental responsibilities, including providing justice to the land by remitting debts, which culminated in his royal edict in month 510 (HA.43.06), shortly after his father's death⁵⁸. This scenario would explain why creditors stopped lending so long before the edict.

⁵² Cagni 1980, nr. 23:23-7; Cagni thinks this could refer to Sabium, the third king of the First Dynasty of Babylon (1844-1831), p.19.

⁵³ See also Kraus 1984, 71.

⁵⁴ The military purpose just mentioned, and the above mentioned signalling of an edict (cf. note 47).

⁵⁵ Veenhof 2000, 6.

⁵⁶ Veenhof 2005, nr. 130:4-7, a letter by Samsu-iluna to Etel-pi-Marduk; the passage about the change of power is slightly damaged, but since Samsu-iluna states that he has remitted arrears and broken the tablets of debts of soldiers, 'fishermen' and ordinary citizens (ll. 11-13), which only the king could do, we must assume that he was effectively in power at this point.

⁵⁷ According to E. Woestenburg, Hammurabi died in month 6 of his 43rd regnal year (Charpin 2000, 190, note 21), and Charpin convincingly argues that the king must have died at the latest in month 5 of that same year (Charpin 2003, 104; a reference to the relevant source is found in Charpin 2004, 333).

⁵⁸ Veenhof 2005, note 130.a, refers to the opening statements of the *mīšarum*-decrees of Samsu-iluna and Ammi-šaduqa, that sound similar to the letter quoted above. If, however, Samsu-iluna was referring to his edict, the

The slightly slower rate of descent in months 502-508 could well be just a coincidence, but in the present light it could also be the consequence of people only gradually becoming aware and convinced that the old king was not going to return to office.

3), 7) and 6) The relatively high number of documents shortly after the edict of peak 2 (Samsu-iluna year 8) could have been caused by the edict itself. So far, a regular character of *mīšarum*-acts has not been confirmed, but they were not a rarity either⁵⁹. Charpin reconstructs a pattern of approximately one edict every 9 ± 2 years during the reign of Samsu-iluna⁶⁰, so the interval is clearly to be measured in terms of several years. Shortly after an edict, potential creditors would therefore not have expected another one to arrive soon, so they would have been more willing to lend out money or barley, the risk of losing the commodity through another edict being minimal. In peak 1 we also see a relatively high number of documents after the edict. Following the same reasoning as for peak 2, we would expect this to happen shortly after the edict. Another three months pass, however, before the numbers pick up again. We could look for an explanation for this delay, but since we have seen that there was some margin in this edict's date (§4 above), it is just as acceptable to move this date from month 510 (HA.43.06) to month 513 (HA.43.09).

8) Peak 3 remains an anomaly in this dataset, both in shape and in composition (mainly silver loans). We cannot exclude the possibility that this peak is mainly the result of Charpin's choice of data: the majority of the 65 documents that make up this peak⁶¹ come from only two archives: that of Ibni-Amurru (26) and that of Dada, son of Kubbulum (31). Both archives could have terminated for other reasons than a royal edict, such as a catastrophe⁶². Charpin explains the occurrence of a concentration of silver loans here from a possible bad cereal harvest, causing farmers to anticipate an equally bad harvest of sesame and dates, for the purchase of which almost all Ibni-Amurru's loans were issued⁶³. Assuming that this bad cereal harvest had come somewhat unexpectedly, it does explain the rather sudden appearance of peak 3. Also, its date fits the period in which normally the cereal harvest would have been processed (months 3-5, see above), following immediately after the harvest in months 1 and 2⁶⁴. Finally, an edict shortly after a bad harvest in order to mitigate the economic damages suffered by many farmers makes sense as well. In the absence of a sufficient amount of data, that would allow a fuller picture for this specific period, none of this can be confirmed.

letter — referring to debt-remission, breaking of tablets and establishing justice, in the *past* tense — must have been written *after* he had issued his edict (so, after month 6). The letter would thus have to be dated after his father's death (at the latest in month 5/6), whereas it clearly states that the old king was ill, hence alive. Thus, the letter was written before Hammurabi's death and before Samsu-iluna's edict, and proves that Samsu-iluna had begun remitting debts before his father died and before the edict, but after he had seated himself on the throne on account of his father's illness. Below, we will see that the edict was probably issued in the ninth month of year HA.43 (month 513), even longer after Hammurabi's death.

⁵⁹ Charpin 2000, 186; Veenhof 2000, 9, indicates that they occurred at irregular moments but were certainly not rare.

⁶⁰ Charpin 2000, 202-3.

⁶¹ Including the documents listed in Charpin 2005, 411-2.

⁶² Charpin 2000, 201 mentions this possibility for Dada's archive.

⁶³ Charpin 2000, 199; Sigrist 2003 shows that also Ibni-Amurru's loan tablets from Charpin 2005, 411-2, that are dated around this peak, mostly concern silver loans (6 out of a total of 8 loans).

⁶⁴ Landsberger 1949, 284-5; intercalary month SI.27.12b falls outside this period.

§8 Conclusions

The primary conclusion must be that Charpin's thesis — that concentrations of loan documents are found before instead of after edicts — holds also for a four-fold increase in the number of documents. Peaks 1a/b and 2 provide the evidence for this. This opinion of Charpin, together with his thesis that the number of loan documents at the date of an edict would reflect the current transaction volume around that date, formed the basis for modelling the expected trend in the number of documents toward an edict. This predicted pattern was tested against the data — primarily peak 2 — and proved to be accurate. This warrants the conclusion that Charpin's ideas are basically correct.

We encountered some deviations from the trend model, which we have been able to attribute to specific circumstances. Below follow the conclusions arrived at.

In peak 2 there was a superposition of two separate trends in the amount of documents. A long-term trend lasting 37 months and rising to a number of 11 documents per month, and a short-term trend lasting 14 months with a maximum of 30 documents per month. The latter seems to be the result of seasonal barley loans. The long period it took to pay off one's debts — as shown by the long-term trend — suggests that economic circumstances at this time were difficult.

The long gap in the pattern of peak 1a/b could have been caused by illness of Hammurabi in his last year. Public knowledge of his illness, combined with Samsu-iluna's taking over of public royal duties, would have made creditors reluctant to lend out silver or barley because they would have been expecting an edict any time (i.e. when the new king would officially take the throne). That same edict of Samsu-iluna must be of a later date than has been assumed so far: the preferred date is Hammurabi year 43, month 9 (instead of month 6). The sudden drop in the number of documents shortly before the edict of Samsu-iluna year 8 (peak 2) can be explained if we accept that people were aware of an impending edict. We have seen that edicts were likely to have been received *before* they took effect.

Shortly after an edict there is an increased transaction volume as compared with the static level. This is caused by the perceived minimal risk of lending out goods or money immediately after an edict. The static level can be explained from the ever-present volume of debts that remained unpaid.

The deviant shape of peak 3, before the edict Charpin postulates in Samsu-iluna's 28th year, and the fact that it is based on a limited set of data from only two archives, call for a closer analysis of this period. First, this requires analysis of more documents from more archives; secondly, a closer look at political and economic circumstances in this period is required.

Bibliography

- Alexander, J.B. 1943: *Babylonian Inscriptions in the Collection of James B. Nies (BIN VII: Early Babylonian letters and economic texts)*, New Haven.
- Al Rawi, F.N.H. & S. Dalley 2000: *Old Babylonian Texts from Private Houses at Abu Habbah, Ancient Sippir: Baghdad University Excavations, Edubba 7*, London.
- Arnaud, D. 1990: *Altbabylonische Rechts- und Verwaltungsurkunden aus dem Musée du Louvre (BBVOT 1)*, Berlin.
- Beckman, G. 1995: *Catalogue of the Babylonian Collections at Yale, 2: Old Babylonian archival texts in the Nies Babylonian Collection*, Bethesda, MD.
- . 1999: *Catalogue of the Babylonian Collections at Yale, 4: Old Babylonian archival texts in the Yale Babylonian Collection*, Bethesda, MD.

- Brinkman, J.A. 1977: "Mesopotamian Chronology of the Historical Period", in: Oppenheim, A.L. 1977: *Ancient Mesopotamia, Portrait of a Dead Civilization*, London, 335-346.
- Cagni, L. 1980: *Altbabylonische Briefe VIII — Briefe aus dem Iraq-Museum (AbB 8)*, Leiden.
- Charpin, D. 2000: "Les prêteurs et le palais: les édits de *Mišarum* des rois de Babylone et leurs traces dans les archives privées", in: Bongenaar, A.C.V.M. (ed.): *Interdependency of Institutions and Private Entrepreneurs (MOS Studies 2)*, Istanbul, 185-211.
- . 2001: "Les prêteurs et le palais (suite)", *N.A.B.U.* 2001 nr. 3 (september), 51.
- . 2003: *Hammu-rabi de Babylone*, Paris.
- . 2005: "Res bibliographicae — Données nouvelles sur la vie économique et sociale de l'époque paléobabylonienne", *OrNS* 74, 409-21.
- Charpin, D. & J.M. Durand 1981: *Documents cunéiformes de Strasbourg conservés à la Bibliothèque Nationale et Universitaire (DCS), tome 1*, Paris.
- Charpin, D., D.O. Edzard & M. Stol 2004: *Mesopotamien: die altbabylonische Zeit / OBO 160/4*, Fribourg.
- Crown, A.D. 1974: "Tidings and instructions: how news travelled in the Ancient Near East", *JESHO* 17, 244-71.
- Dossin, G. 1983: "Signaux lumineux au pays de Mari", in: Dossin, G.: *Recueil Georges Dossin: mélanges d'Assyriologie*, Leuven, 233-245 (previously published in *RA* 35 (1938), 174-186).
- Feigin, S.I. 1979: *Legal and administrative texts of the reign of Samsu-iluna, Yale Oriental Series Babylonian Texts; Vol.12 (YOS 12)*, New Haven.
- Huber, P.J. 1982: *Astronomical Dating of Babylon I and Ur III*, Malibu.
- Hübner, B. & A. Reizammer 1985: *INIM KENGI II, Sumerisch-Deutsches Glossar, Band 2 (M-Z)*, Marktredwitz.
- Kraus, F.R. 1977: *Altbabylonische Briefe VII — Briefe aus dem British Museum (CT 52), (AbB 7)*, Leiden.
- . 1984: *Königliche Verfügungen in altbabylonischer Zeit. Studia et Documenta ad iura Orientis antiqui pertinentia XI, (Kön. Verfüg.)*, Leiden.
- Landsberger, B. 1949: "Jahreszeiten in Sumerisch-Akkadischen", *JNES* 8, 284-5.
- Sigrist, M. 1990: *Old Babylonian Account Texts in the Horn Archaeological Museum. Andrews University Cuneiform Texts (AUCT) IV*, Berrien Springs.
- . 2003: *Old Babylonian Account Texts in the Horn Archaeological Museum. Andrews University Cuneiform Texts (AUCT) V*, Berrien Springs.
- Skaist, A. 1994: *The Old Babylonian loan contract: its history and geography*, Bar-Ilan.
- van Soldt, W.H. 1990: *Altbabylonische Briefe XII — Letters in the British Museum, Part 1 (AbB 12)*, Leiden.
- Tammuz, O. 1993: *Archives from Lagaba*, Ann Arbor.
- Ungnad, A. 1938: "Datenlisten", *RIA* 2, 131-195.
- Van De Mierop, M. 2004: *King Hammurabi of Babylon: a biography*, Malden, MA.
- Van Lerberghe, K. 2003: "Private and Public: the Ur-Utu Archive at Sippar-Amnanum (Tell ed-Der)", in: Brosius, M. (ed.): *Ancient Archives and Archival Traditions — Concepts of Record-Keeping in the Ancient World*, Oxford, 59-77.
- Veenhof, K.R. 2000: *Recht en gerechtigheid in Babylonië*, Leiden.
- . 2005: *Altbabylonische Briefe XIV — Letters in the Louvre (AbB 14)*, Leiden.