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Barley:Silver Price Ratios

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The Structure of Prices in the neo-Sumerian¹ Economy (I): Barley:Silver Price Ratios

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Introduction

The debate in Sumerology about how prices of commodities and factors of production were determined in the economies of third millennium Sumer has to an extent been shelved, and given the constraints imposed by the limited and opaque data available from all periods in ancient Mesopotamia is largely unresolved. Conceptualisations of the mechanisms which allocated resources in the Sumerian economies of southern Mesopotamia vary, though not wildly, with the often anachronistic theories and models adopted to describe the structures and production processes in which they are embedded. A near consensus is that the most credible model of the third millennium economic system controlled by Sumer's institutions, from the "oikos economy" of palace and temple households of the Early Dynastic to the provincial governments of the Ur III state, may be categorized as "redistributive".²

There is not much doubt that, normally, ancient Mesopotamian agriculture produced a surplus. Agricultural production by Sumer's institutions was organised to exceed its redistribution to dependent labour and administration, not only to buffer poor harvests but also to support cult offerings to temples, to finance and otherwise provision internal and external trade via merchants, and to fulfil the taxation requirements of the state.

Given that the overwhelming majority of cuneiform texts from third millennium Mesopotamia are administrative texts from the accounting systems of temple, palace and state, we are confronted with largely insurmountable difficulties in attempts to construct a much different model of the Sumerian economy. Most of the texts tell us that we are dealing with a highly centralised and centrally controlled economy, especially during the Ur III period; indeed, Englund (2012a:427) has labelled it a "command economy".

However, although the redistributive model is the prevailing theory of the structure of the Sumerian economy, there remains substantial variation in interpretations of the embedded processes which allocate resources between various activities within production processes. Disputation is due mainly to differing conceptions of how prices, whether of commodities or factors of production, are determined, and largely reduces to whether prices result from the interaction of "supply and demand" in a market economy, are fixed by some central authority, or are a mixture of both. The notion that "markets, defined... as a system of exchanging and allocating resources by means of a price mechanism - with prices determined primarily by supply and demand"- were much in evidence in commodity and factor markets of Sumer, even accepting the

¹ The neo-Sumerian period refers to the emergence and territorial hegemony in southern Mesopotamia of the Ur III state and is conventionally dated 2112-2004 BC. The period encompasses the reigns of the kings of the Ur III dynasty thus: Ur-Nammu 2112-c. 2095, Šulgi 2094-2047, Amar-Suen 2046-2038, Šu-Suen 2037-2027, Ibbi-Suen 2026-c. 2004.

² For a recent, detailed text based analysis of the redistribution process, in this instance of the pre-Sargonic e₂-MI₂/^dba-ba₆ in Girsu, see Prentice (2010:13-95).

co-existence of administrative means of resource allocation, enjoys enduring traction (van Bavel 2014:145, 157-158).

Scholars who largely reject Polanyi's paradigm of the redistributive and so-called "marketless" economy, though they may acknowledge the economic dominance and distributional system of the governing institutions of the third millennium argue a central role for price making markets in the allocation of resources.³ Powell (1999:11), for example, suggested "there is good reason to believe that both market places and markets in the sense of economic mechanisms existed in Babylonia and that they were shaped by supply and demand like contemporary markets in Anatolia". Powell's rejection of Polanyi is partly motivated, as is that of other Assyriologists, by evidence from the Old Assyrian trade of the early second millennium, and partly by a philological analysis of Old Babylonian terms for "market" and its surrogates. Neither indication is from the third millennium, but as regards the latter, he argues that semantic developments like that of the word *kāru* from a Sumerian loan into Akkadian would not have occurred if a similar community of merchants engaged in commerce had not been present in Sumerian cities in the third millennium. Powell also points to other Akkadian terms suggesting market places which may have Sumerian prototypes. The philological and archaeological evidence together with pottery typology argue against any radical hiatus between the Ur III and Old Babylonian periods assumed from the texts (Powell 1999: 10). We are to assume therefore, that markets existed in third millennium Sumer, at least during the neo-Sumerian period.

Polanyi, of course, specifically distinguished market *place* from market as in "*price-making market system*". The first is the location where people meet to transfer or exchange goods, the second includes "the aggregation of such sites into a system, involving repeated exchanges of commodities; and a mechanism that determines the production and distribution of resources through supply-demand feedback". To confuse the two is to make a categorical error. The first can be unearthed by the archaeologist the second cannot. Polanyi accepted that market places may have existed as early as the Neolithic whereas the *price-making market system* only arrived in the first millennium BC, in Greece (Dale 2013:162ff.). Although there is no written evidence of barter or local markets in the Ur III economy they must have existed. How else would ordinary people obtain their household goods and foodstuffs? This was structurally essential for the distribution of perishables and commodities not produced within non-institutional households. These local markets were for exchange not redistribution (Steinkeller 2004: 95-96)

Snell (1982:188), on the other hand, concluded from his study of prices, predominantly from the Ur III "silver accounts", that variations in commodity prices arising from different transactions over very short time periods and sometimes even in the same merchant text, made it highly improbable that "Polanyi's theories have any application to Ur III trading systems,...".

Equivalencies and prices

In particular, Snell argued that the ratios of silver to quantities of other commodities in the silver accounts are prices not equivalencies as suggested by Polanyi. "By equivalencies Polanyi meant money amounts exchanged for goods not on the basis of supply and demand but on the basis of set equivalents established by authoritative decree or by custom" (Snell 1991:131). However, the evidence of transactions in the Ur III Umma merchant accounts showed that while it is possible a few products do seem to have fixed equivalencies, the prices of an overwhelming majority have *prices determined by supply and demand*. Those that may have equivalencies are of minimal economic significance. "Equivalencies do not dominate and Polanyi is irrelevant for most of the products with which the Umma silver balanced account system deals" (Snell 1991:135). It should be emphasised apropos Snell's preference for "prices" rather than "equivalencies", however, that he

³ For a reassessment of Polanyi's theories see now Dale (2013).

restricts this, but not every, aspect of his analysis to the “silver accounts” kept by the central institutions recording the trading activities of the Umma merchants on their behalf (Snell 1991:132).⁴

A polar opposite conclusion is arrived at by Englund from roughly the same data. He perceives the state imposition and monitoring of silver value equivalencies as accomplished by institutional household accountants who employed, “with almost dizzying accuracy, a broad palette of equivalencies as part of their means of control of production” (Englund 2012a: 427). The shekel of silver was the basis of valuing all commodities in the Ur III accounts with the prescribed norm of 1 shekel = 300 sila₃ (“litres”) of barley as the basis from which all other equivalencies were derived.

The silver to “quantity of a commodity” equivalencies, are sometimes thought of as analogous to “transfer prices” in modern business corporations, fixed by administrative systems and only *reflecting* real market prices, applied to “in-house” flows of resources as essential for accounting and forward planning (Hudson 2004: 99,102). The use of the silver shekel to quantity equivalency in order to standardise comparisons of value in respect of a variety of different commodities in accounts thus became pervasive in the Ur III accounts and was not restricted to the silver/merchant accounts from Umma.

In this view, the Ur III pseudo-prices were not determined by the interaction of supply and demand in a market, but were normative prices, set and administered by the institutions, and the value of a given weight or quantity of a commodity was commonly ku₃-bi (“its silver”). However, silver and barley with one shekel of silver set at a value of one gur (300 sila₃) of barley “became equal standards of value against which other commodities were measured, creating a bi-monetary price ratio that was the first step in administering prices.” (Hudson 2004: 112).

Money and price

An essential precursor of any definition of prices whether determined by the interaction of supply and demand or fixed administratively is to identify the category of money which exists in the economy. Despite the often espoused notions that the majority of Assyriologists accept the existence of money in the Ur III state as self-evident (Ouyang 2013:17) or that because cuneiformists ubiquitously describe silver as “money”, “currency” or “cash” it clearly exists (Powell 1996:225), it is more appropriate to define the form of money in the neo-Sumerian economy as commodity money. “When a commodity is accepted in trade not to be consumed or used in production, but to be used to facilitate further trade, it becomes a *medium of exchange* and is called *commodity* money. If an object with no intrinsic value becomes a medium of exchange, it is called *fiat* money”, (Kiyotaki and Wright 1989: 929). In the Ur III economy both silver and barley were most commonly used as commodity money but on occasions other staples were too, particularly wool. Each was a medium of exchange and equally each had an *intrinsic value*, in that, at least *some* people derived utility from also consuming whichever of them was also used as a medium of exchange (Champ and Freeman 2001: 38).

It is essential to recognize the Ur III economy as a commodity money economy because it circumscribes *direct* barter as the principal mechanism determining prices in the economy.⁵ Such

⁴ While the large majority of Snell’s prices are culled from the so-called silver or merchant accounts, his prices for “grain” in his table 6 on pages 138ff. contain as many examples from other sources as from “silver account” texts. This fact has a significant bearing on the analysis in this paper which is concerned with the barley:silver price ratio.

⁵ “A barter economy is one in which the goods one owns are traded directly for the goods one wants to consume. In a barter economy, no particular good is used as a medium of exchange”. (Champ and Freeman 2001:33-34). Trade in a barter economy requires what Jevons in 1875 called a double coincidence of wants, “the person with whom you wish to trade must not only want what you have, but must have what you want”. In more complex economies such

delimitation does not exclude the role of barter in local markets, but does point to its almost certain absence as a mechanism determining many of the so-called prices witnessed in the administrative texts from institutional households⁶.

To what extent commodities other than silver, and specifically barley, were capable of fulfilling all of the economic functions of money may be uncertain. Since Jevons (1875: chapter III), economists have defined four functions of money. Firstly, money provides a unit of account and a standard of value. In the neo-Sumerian both barley and silver were used for this purpose. Secondly, money most obviously functions as a medium of exchange. Again, both barley and silver, predominantly, performed this role. Thirdly, money functions as a store of value. For this purpose, money needs to be capable of being kept for long periods of time. Silver and other metals were the most obvious candidates for this purpose. The precious metals of gold and silver have mostly performed this role, not only in history, but even today are regarded as investments and a store of value. However, gold was not so widely available as silver in the Ur III period, so that silver prevailed as the standard and store of value. Though, to state the obvious, barley could be stored for a while in granaries, it is much less obvious that it could serve as a store of value in money terms for very long. On the other hand, perhaps as much as, if not even more than silver, barley fulfilled the fourth function of money as a standard of deferred payment. Debts were repaid with both barley and silver for reasons which are examined later.

All prices are ratios, whether or not they are measured with commodity money or, as today, with fiat money. In the modern economy we calculate prices as a ratio between the quantities of commodities and money values measured in whichever currency is appropriate (nominal price). In the Ur III economy, the value of a commodity is expressed as a ratio between its quantity and the quantity of another commodity (relative price). Theoretically, the “dizzying array” of relative prices envisaged by Englund and which confronted the Ur III scribe, was extremely large in that as many price ratios could exist as the number of pairs that could be formed from the number of commodities in the system. In reality, the scribe would not have had to consider such a great number of price ratios. The quantity of each of all other commodities as a ratio of one commodity only, the shekel of silver or alternatively the gur of barley, was known. Therefore, the price of each commodity in relation to any other could be computed in a much smaller number of calculations.⁷ It is conceivable that with the increased complexity of the Ur III institutional economy and its accounting systems, the bi-monetary standard of 1 gur of barley to 1 shekel of silver became an essential device to reduce the dimensions of relative price structures to manageable proportions.

Be that as it may, whether we are considering relative or nominal prices, intrinsic to the definition of price is the process of commodity exchange. First and foremost, administered or market, price

as the Ur III economy, where a wider variety of goods is to be traded and there is a much greater specialisation in production, barter becomes inefficient because of the much increased search time in matching wants. As an economy develops, the search costs associated with barter increase exponentially.

Therefore, the commodity money economy emerges. “In a commodity money economy, the goods one owns may be traded for a good that is not consumed but traded, in turn, for the good one desires”. (Champ and Freeman 2001:38).

⁶ The extent to which silver could be regarded as commodity money available as a medium of exchange in both institutional and non-institutional sectors of the Ur III economy is disputed by some. Widell (2005:398-399), for example, argued that there were two economic “spheres” in the Ur III state, the institutional large scale economy in which silver was the medium of exchange and the local barter economy in which the medium of exchange was barley and which meant that prices in each sector were separate. However, see Cripps (2014:227-228) for a discussion and contra argument.

⁷ The number of pairs that can be selected from n commodities is no less than $n(n-1)/2$, or about $\frac{1}{2} n^2$. However, because a shekel of silver or its equivalent gur of barley is common to price ratios for each and every commodity, the scribe need only consider $n-1$ price ratios.

is “the quantity of one thing that is exchanged or demanded in barter or sale for another”.⁸ Whether or not the apparent price ratios in the Ur III corpus, especially of barley:silver, arise out of a process of exchange or potential sale is questionable. Their merit as a price and even as a measure of “equivalent value” requires a much more focussed analysis than we have seen hitherto.

Snell’s 1982 study of the Ur III prices of a wide variety of commodities remains the basis of information from which much Sumerological opinion and analysis regarding the measurement of value and commodity exchanges in the neo-Sumerian economy proceeds. Much of Englund’s data on silver equivalencies in his study of value in the Ur III state relies on Snell’s study (Englund 2012a:443). In his analysis of wool bought and sold by the institutional economy in Ur III Umma, for example, Sallaberger (2014:97, Table 6.1) estimates prices from Snell’s median wool price of 10 mina of wool per shekel of silver and regards this as the standard price relationship of wool. Although their own study of the prices of aromatics examines data added to the corpus since the texts available to Snell, the most recent data which Brunke and Sallaberger can consult to augment their own on aromatic product quantities and prices is also from Snell’s study (Brunke and Sallaberger 2010:71, fn. 39)).

Fluctuating prices

Primarily based on the data from Snell’s analysis of the Umma “silver” merchant accounts, both Englund (2012a: 441-3) and Snell (1982: 189-196) call attention to fluctuations and instability in commodity prices. How much price fluctuation was tolerated or even encouraged by the administration in the Ur III period is unclear (Englund 2012a: 443). While 1 shekel of silver per gur of barley was held to be the “official notional value of barley during the Ur III period” there was a wide dispersal around this value (Widell 2005: 391-392).⁹

The Umma merchant accounts, though relating to a relatively short period in the middle of the Ur III period, display noteworthy variations in the measures per shekel of silver for several of the same commodities. The value in silver of the staple barley, for example, varies by 180 per cent in these particular accounts. A number of credible reasons can be proposed for these fluctuations, “including exchange pressures generated by bumper harvests or a major influx of silver, conflict, drought, degradation of the fields through salinization, or other processes endemic to alluvial agriculture in antiquity” (Englund 2012a:443). Fluctuations in prices established by such influences may suggest their determination in exchanges in an early form of market system rather than one in which prices or equivalencies were “administered” or set by the administration.

Producers may have made pricing decisions in response to these influences and this was reflected in both “debits” and “credits” in the merchant accounts; in both the prices/values of the “capital” provided to the merchants by the administration and in the prices of the goods supplied to the administration by the merchants (Snell 1982:191). If these prices had displayed stability it would suggest price control by the administration.

However, price fluctuations may well have been tolerated and even inherent in the administrative system of acquiring commodities not produced by the central institutions themselves. Merchants or “trade agents” may even have been required to obtain set amounts of the products needed by the provincial administration regardless of price. The “capital” with which merchants were resourced was sufficient to allow whatever expenditure was necessary. “The prices in the silver accounts may therefore be as regular or as irregular as the price setters wanted.” Expenditure by

⁸ Merriam-Webster Dictionary.

⁹ Widell also used a fairly limited set of data from Umma texts from the period AS 1 to ŠS 8.

the merchants would always be covered (Snell 1982: 189-190). Clearly, if such was the practice, recorded prices or equivalencies were unlikely to be centrally administered.

On the other hand, few of these determining factors may apply if the barley:silver ratios turn out *not* to be market prices.

The barley:silver price ratio

As a first step in the study of Ur III price structures, we need to ask if there is substantial evidence in the texts for a standard of 1 gur of barley = 1 shekel of silver to which other prices could be related and to evince any information there might be about how the price of barley or that of silver may have been determined. It may also be relevant to understand how and why these price ratios varied over time. Surprisingly, given the almost polarised interpretations of the mechanisms in the Ur III economy which determine prices, there is a long established consensus that in the neo-Sumerian period that 1 gin₂ (“shekel”) of silver = 1 gur (300 sila₃) of barley. This relationship is held to be more or less so, on the one hand by those who primarily regard prices or equivalencies as administered/set by decree (Englund, Hudson) and on the other by those who would rather support the notion of a price-making market system (Powell, Snell).¹⁰

The remainder of this article is therefore devoted to the textual evidence in the Ur III corpus relating to the barley: silver price ratio. For the most part my analysis will understand relative prices or price ratios as prices rather than equivalencies but with a view, at least prior to any conclusion, to remaining overtly agnostic with respect to Polanyi’s definition of equivalencies and their determination.

The Appendix comprises a list of 157 attestations of the barley:silver price ratios extracted from the approximately 60-70000 transliterated Ur III administrative texts in the CDLI database. Each text ID is compiled from its Year Date, provenance, and text siglum. Access to the CDLI transliteration of each text identified can be had by following the hyperlink of each siglum. In some texts there is more than one occurrence of a price. Each occurrence is recorded in the list even if each has the same value. Multiple occurrences of a price in a text usually arise from several transactions and are therefore separate examples of the barley:silver ratios. Sometimes, the same text records different values from separate transactions.

About half of the 157 price ratios were also included in Snell’s table 6. “Grains” s.v. “še “grain” (Snell 1982: 138-143). Most of Snell’s entries in his table were recoverable from the CDLI database. A few could not be found and the additions to Snell’s list in the Appendix for the most part have been published since his book.

For want of a better terminology and *pro tem*, the column headed “unit” is the “unit of account”. “še-bi” in an entry denotes those transactions in which a transfer of silver has an associated (perhaps equivalent) value in barley, generically “*n* gin₂ ku₃(-babbar), še-bi *n* gur” as in [Nisaba 07, 21](#) obv. 3-4. Conversely, “ku₃-bi” denotes those transactions in which a transfer of barley has an associated (perhaps equivalent) value in silver, thus “*n* še gur, ku₃-bi *n* gin₂”, see [MVN 01, 240](#) obv (i) 8-9. In many interpretations in Sumerology, “še-bi” is thought of as the barley equivalent value

¹⁰ “... the golden rule throughout early Mesopotamian history was surely 1 gur of barley = 1 shekel of silver, which though not formalized in third-millennium decrees is implied by the majority of *barley exchange* (my emphasis) notations and by the evident interest of the crown in standardizing both metrological systems and barley wages...” (Englund: 2012a: 443). Powell (1990:92) also noted that the *mean* price of barley was close to 1 shekel per gur (300 sila₃) in Ur III texts, was a standard of value in the Laws of Ešnunna, and remained the standard calculation value in the OB mathematical texts. Snell (1982:142), on the other hand, showed that the *median* value in his data was 1 shekel of silver = 300 sila₃ of barley. The notion that it was a norm decreed by administrations may be more substantial than a mere assertion, although despite the Ešnunna Code, Snell (1982:185) demurred from the notion of a fixed ratio between barley and silver promulgated by the state “or sanctioned by tradition”.

or barley price of silver and “ku₃-bi” as the silver equivalent value or silver price of barley. However, the notion of equivalent value is not readily apparent in very many examples particularly in silver loan documents. Snell (1982) used these terms to define “price” and in a more recent study of the monetary role of silver in Ur III Umma, Ouyang (2013:64) prefers to regard these price ratios simply as a conversion rate rather than a price on the probably dubious grounds that Snell (1982:189) found it difficult to set up a typology of Ur III texts that use various pricing formulae.

Nevertheless, “ku₃-bi” is customarily considered the pre-eminent unit of account or measure of equivalent value in exchanges of many different commodities recorded by the Ur III accounting system. In those employing a barley:silver ratio, however, this is clearly not so. Of the 157 occurrences listed in the Appendix, some 100 (64%) have “še-bi” as their unit of account and only 45(29%) “ku₃-bi”. The remaining 12 entries express the relationship of barley to silver as nig₂-sa₁₀-(am₃)-(bi) (3) or via a terminative (-še₃) (2) or ablative/distributive (-ta) suffix (7). The column in the Appendix headed “ratio” converts all of these to values of *n* sila₃ of barley per shekel of silver.

Which way round the barley:silver ratio is expressed, whether as “*n* gin₂ ku₃(-babbar), še-bi *n* gur” or as “*n* še gur, ku₃-bi *n* gin₂” may be a significant indicator of how barley and silver prices were determined. The first formulation occurs in transactions which indicate a payment in silver, while the second is in those which are indicative of a payment of barley. In his table 6 on grain (še) prices, Snell, however, appears to consider both forms to be identical as an indicator of price in that all prices except for twelve different formulae given above are identified in his table only by the suffix –bi, which he defines as “silver, its value in (a product)...”, Snell (1982:120). The commodities in this present study are also še “barley or grain” and ku₃-(babbar) “silver”.

A contextual typology of barley:silver price ratios

It may be difficult to define a typology of texts based on various pricing formulae, but it is feasible to propose a classification of texts which helps to elucidate the structure of the barley:silver price ratios and perhaps leads to a better understanding of how they might have been determined. Texts from which these ratios can be calculated may be categorised as follows:

1. *Accounts of barley deliveries to institutional households.*
 - (i). Collected summaries (*Sammelurkunden*) of deliveries of barley containing some silver payments in lieu of barley.
 - (ii). the primary records of transactions which become summarised in the *Sammelurkunden*.
Both groups of these texts have provenances almost entirely in Girsu.
2. *Accounts of barley expenditures by institutional households.*
 - (i). Expenditures on the bala and other items, predominantly in records from Girsu.
 - (ii). Expenditures via merchants/trade agents. These are primarily records from Umma with only one from Girsu.
3. *Loans and receipts of silver with repayments in barley*
 - (i) Loan documents, mostly from Nippur and Umma but also from Girsu.
 - (ii) Receipts. These may be related to loans but are not explicitly documented as such.
4. *Miscellaneous silver or barley disbursements with barley or silver equivalent*

Texts analysed in each of these categories are excerpted in seven tables below and the account type defined by each of the tables into which an occurrence of the barley:silver price ratio is assigned is incorporated in its list entry in the Appendix. A glossary of the Sumerian words and phrases used below to indicate these account types is included here to promote a fuller understanding of the tables.

Glossary of Sumerian terms used in tables

<i>Sumerian</i>	<i>English translation</i>
ab-ši-gar	“is being replaced”
ag ₂ -e-dam	“it is to be measured out”
ba-an-ku _x	“it was entered/delivered”
bala dub-sag	“first (season) bala”
bala-bi 1-am ₃	“its bala is 1” (first bala)
buru ₁₄	“harvest”
buru ₁₄ ama-bi gi ₄ -gi ₄	“the harvest will remit this debt”
dub-sar zi ₃ -da-ke ₄ -ne	“scribes of the flour”
e ₂ -šabra	“house(hold) of the major domo”
egir buru ₁₄	“after the harvest”
erin ₂	“workers”
gi ₄ -gi ₄ -dam	“it is to be returned”
giri ₃ PN	“via/under the authority of Person Name”
ka-guru ₇	“granary supervisor”
ka ₄	“messenger”
ki PN gal ₂ -la-am ₃	“it is located in the place of Person Name”
kikken ₂	“(flour)mill/mill workers”
kišib ₃	“seal”
kišib ₃ dib-ba	“audited sealed document”
kislah	“threshing floor”
ki-su ₇	“threshing floor”
ku ₃ a ₂ zi ₃ -KA nu-ar ₃ -ra	“silver of the labour of un-milled KA-flour”
ku ₃ (-babbar)	“silver”
ku ₃ -bi <i>n</i> gin ₂	“its silver <i>n</i> shekels”
la ₂ -ia ₃	“deficit/arrears”
lu ₂ lunga	“brewer”
lu ₂ niq ₂ -dab ₅	“storekeeper”
lu ₂ -inim-ma-bi-me	“the witnesses”
mu lugal-bi in-pa ₃	“he swore (an oath) on the name of the king”
mu PN-še ₃	“on behalf of/for Person Name”
mu-ku _x (DU)	“delivery”
<i>n</i> gin ₂ ku ₃ (-babbar)	“ <i>n</i> shekels of silver”
<i>n</i> še gur	“ <i>n</i> gur of barley”
nig ₂ -ka ₉ -ak	“balanced account”
nig ₂ -ka ₉ -ak ka-la ₂ -a	“balanced account of the remainder”
nig ₂ -ka ₉ -ak ninda	“balanced account concerning groats”
nig ₂ -ka ₉ -ak PN dam-gar ₃	“balanced account concerning Person Name, merchant”
nig ₂ -ka ₉ -ak še si-i ₃ -tum	“balanced account of remaining barley deficits”
nig ₂ -ka ₉ -ak še ur ₅ -ra kišib ₃ dib-ba	“balanced account of loan barley and audited sealed documents”
nig ₂ -ka ₉ -ak si-i ₃ -tum	“account of remaining deficits”
nig ₂ -ka ₉ -ak zi ₃ KA	“balanced account concerning KA-flour”
nig ₂ -ka ₉ -ak, gana ₂ uru ₄ -a, PN	“balanced account of fields in cultivation (by) Person Name”
nig ₂ -sa ₁₀ -am ₃ -bi	“its exchange”
nig ₂ -sa ₁₀ -ma	“purchases”
PN šu ba-ti	“Person Name received”
ša ₁₃ -dub-ba	“chief accountant”
ša ₃ uri ₅ ^{ki} -ma	“in the province of Ur”
ša ₃ -bi-ta	“therefrom/out of it”
sag-nig ₂ -gur ₁₁ -ra-kam	“debits/available assets/capital” in a balanced account
še	“barley”

še buru ₁₄ a-na-ag ₂ -bi	“barley measured to him at the harvest”
še kar-ra	“barley removed”
še kin-ga ₂	“harvested barley”
še sumun	“old barley”
še ur ₅ -ra kišib ₃ gid ₂ -da	“sealed document of extended debt repayment periods”
še-bi <i>n</i> gur	“its barley <i>n</i> gur (gur = 300 litres approx.)”
su-ga mu-ku _x (DU)	“replaced (with) delivery”
šum ₂ -mu-dam	“it is to be exchanged/purchased”
su-su-dam	“it will be replaced”
tukum-bi	“iP”
ugu ₂ PN ba-a-gar	“it was debited to the account of Person Name”
ugu ₂ -a ga ₂ -ga ₂	“to be debited to the account”
zi-ga	“expended/deducted”

1. *Accounts of barley deliveries to institutional households*

These accounts record deliveries of barley and occasional payments of silver in lieu of barley to different functions of the provincial administration. The quantities of barley delivered possibly represent quotas to be met by barley producers in the employ of the institutional households or perhaps renting fields from demesne land. These summary accounts of the institutions typically bring forward balances and arrears of barley accumulated in a previous year together with quotas due from named individuals. Some of these balances are settled with deliveries of barley made in the current accounting period. The accounts are also debited with quantities of barley due from individuals in the current year and the quantities so specified as due may also be settled in whole or in part by deliveries in the current year.

There are broadly two kinds of these accounts. The first comprises accounts subscribed nig₂-ka₉-ak si-i₃-tum “account of remaining deficit” while the second encompasses those subscribed nig₂-ka₉-ak PN. Both types of text describe similar processes and are characterised by several typical transactions and phrases. The deduction of deliveries from either quotas or arrears is indicated by sa₃-bi-ta “therefrom” immediately after the entry of the quantity of barley required by the institution. The delivery of barley into the institution to offset arrears is given by su-ga mu-ku_x(DU) “replaced (with) delivery” and the delivery to offset other debits by mu-ku_x(DU) “delivery”. Quantities of barley may also appear in these accounts as contra entries, identified as a deduction (zi-ga).

nig₂-ka₉-ak si-i₃-tum with silver paid in lieu of barley delivery

The characteristics and sigla of the first group of these texts are excerpted in Table 1.

Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
Nisaba 7, 7	nig ₂ -ka ₉ -ak si-i ₃ -tum, lu ₂ nig ₂ -dab ₅ -ba kikken ₂	la ₂ -ia ₃ , ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ , še-bi <i>n</i> gur, mu-ku _x (DU), su-ga mu-ku _x (DU), zi-ga, la ₂ -ia ₃ -am ₃	Girsu	300
HLC 091 (pl. 031)	nig ₂ -ka ₉ -ak si-i ₃ -tum, lu ₂ nig ₂ -dab ₅ -ke ₄ -ne	si-i ₃ -tum, la ₂ -ia ₃ , ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ -ta, še-bi <i>n</i> gur, PN šu ba-ti, mu-ku _x (DU), zi-ga, la ₂ -ia ₃ -am ₃	Girsu	300
MVN 8, 179	nig ₂ -ka ₉ -ak si-i ₃ -tum, lu ₂ nig ₂ -dab ₅ -ke ₄ -ne ša ₃ gir ₂ -su ^{ki}	la ₂ -ia ₃ , ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ (-babbar), še-bi <i>n</i> gur, su-ga mu-	Girsu	317

Table 1. <i>nig₂-ka₉-ak si-i₃-tum with silver paid in lieu of barley delivery</i>				
Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
		ku _x (DU), zi-ga, la ₂ -ia ₃ -am ₃		
TUT 119	nig ₂ -ka ₉ -ak si-i ₃ -tum, lu ₂ nig ₂ -dab ₅ -ke ₄ -ne	la ₂ -ia ₃ , si-i ₃ -tum, ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ (-babbar), še-bi <i>n</i> gur, su-ga mu-ku _x (DU), mu-ku _x (DU), la ₂ -ia ₃ -am ₃	Girsu	300
CT 07, pl. 05-06, BM 012934	nig ₂ -ka ₉ -ak si-i ₃ -tum še kin-ga ₂	la ₂ -ia ₃ , ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ , še-bi <i>n</i> gur, su-ga, su-ga mu-ku _x (DU), la ₂ -ia ₃ -am ₃	Girsu	300
TIM 06, 02	[nig ₂]-ka ₉ -ak si-i ₃ -tum	la ₂ -ia ₃ , ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur, su-ga mu-ku _x (DU), la ₂ -ia ₃ -am ₃	Girsu	307
CT 09, pl. 44, BM 019038	nig ₂ -ka ₉ -ak si-i ₃ -tum kilib ₃ -ba	ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ , še-bi <i>n</i> gur, su-ga ugu ₂ -a ga ₂ -ga ₂ , zi-ga, la ₂ -ia ₃ -am ₃	Girsu	299
MVN 12, 175	nig ₂ -ka ₉ -ak si-i ₃ -tum kilib ₃ -ba	ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ (-babbar), še-bi <i>n</i> gur, zi[ga], su-ga ugu ₂ -a ga ₂ -ga ₂ , ugu ₂ PN ba-a-gar, la ₂ -ia ₃	Girsu	300
Nisaba 07, 21	nig ₂ -ka ₉ -ak si-i ₃ -tum	ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur, ensi ₂ -gal šu ba-ti, mu-ku _x (DU), la ₂ -ia ₃	Girsu	299
Ontario 2, 442	si-i ₃ -tum, <i>n</i> gur, ki PN gal ₂ -la-am ₃	ša ₃ -bi-ta, <i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur, mu-ku _x (DU)	Umma	300

Most of the transactions collected in these texts register the delivery of barley to meet the amounts required by the institutions, either in whole or in part. Total arrears arising as a result of only part deliveries are carried forward to the next accounting period. However, and key to this study of the barley:silver price ratio is that several of the quotas and arrears are settled in whole or in part with payments of silver in lieu of barley. Often, to satisfy arrears, these payments of silver are combined with several deliveries of barley. An exemplary formulation is given in [MVN 8, 179](#) rev. (v) 8-14.

- | | |
|---|---|
| 8. 6 2(ban ₂) 6 ¹ / ₃ sila ₃ gur | “1826 ¹ / ₃ sila ₃ of barley (probably in arrears) |
| 9. ša ₃ -bi-ta | therefrom (deduct from) |
| 10. 5 gin ₂ la ₂ igi 6-gal ₂ ku ₃ | 5 minus 1 ¹ / ₆ shekels of silver |
| 11. še-bi 4 4(barig) 1(ban ₂) gur | its barley 1450 sila ₃ of barley |
| 12. 1 1(barig) 1(ban ₂) 6 ¹ / ₃ sila ₃ gur | (and) 376 ¹ / ₃ sila ₃ of barley |
| 13. su-ga mu-ku _x (DU) | replaced (with) delivery |
| 14. sa ₁₂ -ti-um | Satium.” |

The barley:silver price in this excerpt from [MVN 8, 179](#) is 1 gur (300 sila₃) barley = 1 shekel silver. Altogether, five transactions are recorded in this text, the mean price ratio from which is 317 sila₃

“litres” (1 gur 1 ban₂ 7 sila₃) to each shekel of silver. The barley:silver ratios from each of the individual transactions are set out in the Appendix. Three of the five price ratios are the supposed standard 1 gur = 1 shekel of silver. Eleven transactions which describe the payment of silver in lieu of the delivery of barley occur in [Nisaba 7, 7](#), the mean ratio from which is 1 gur = 1 shekel since all the barley:silver prices are close to this standard value. The price ratios given for the summary accounts in Table 1 are all averages, with the exception of [CT 07, pl. 05-06, BM 012934](#), in which text there is only a single transaction in silver. As before, the individual ratios for all occurrences of the ratios are given in the Appendix.

[CT 09, pl. 44, BM 019038](#), a Girsu account dated Šulgi 47, differs from the other nig₂-ka₉-ak si-i₃-tum in this group not only in its lack of explicit credits of deliveries (mu-ku_x(DU)) to settle individual deficits, but also in its overall structure. It is more evidently structured as a “balanced account” similar in form to the more widely discussed “merchant” or “silver” accounts examined later. As in these and other balanced accounts all of the credits against the arrears brought forward are bracketed by ša₃-bi-ta.....zi-ga, the difference between the credits and debits being the arrears carried forward to the next period. An analysis of this text may be constructed as follows.

Although the account is dated to Š 47, the principal quantity of barley arrears is carried forward from Š 43. The quantity of barley required to be delivered is subsequently added to by deficits in barley due from two named persons. These three quantities comprise the total “debits” in this account. From these are to be deducted the six payments enumerated a) to f). These in fact are defined as repayments (su-ga), three of which are made in silver in lieu of barley. These repayments are in the process of being debited to the account (su-ga ugu₂-a ga₂-ga₂), so too was the later debit to the account of a PN. This contrasts with the occasional charges or debits made to the accounts of PNs in other accounts of this genre listed in Table 1, where the debits have already been made. A comparable account also dated Šulgi 47 is [MVN 12, 175](#).

[CT 09, pl. 44, BM 019038](#) an analysis.

	<i>Litres barley</i>	<i>Litres barley</i>	<i>Litres barley</i>	<i>Litres barley</i>
barley b/f (si-i ₃ -tum)				
še mu en ⁴ nanna (Š 43)	328953.60			
barley deficit from PN1	4745.83			
barley deficit from PN2	7469.33			
<i>total debits (deficit)</i>	341168.76			341168.76
<i>payments to be deducted therefrom (ša₃-bi-ta)</i>				
a). 2.84 shekels of silver in lieu of barley	850.00			
b). barley	10530.00			
c). 2.84 shekels of silver in lieu of barley	850.00			
d). barley	16705.00			
e). 37.57 shekels of silver in lieu of barley	11270.00			
f). barley	3226.16			
<i>repayments to be charged to the account (su-ga ugu₂- a ga₂-ga₂)</i>		43431.16		
deduction (zi-ga) for field ritual		336.00		
to be charged (ugu ₂ - a ga ₂ -ga ₂) to PN		780.00		
<i>total deduction (zi- ga)</i>		44547.16	44547.16	
remainder (la ₂ -ia ₃) c/f			296621.6	

nig₂-ka₉-ak si-i₃-tum kilib₃-ba “account of all deficits”, še mu en ^dnanna (Š 43).
mu us₂-sa ki-maš^{ki} ba-hul (Š 47).

The subscripts to several of the texts in Table 1 indicate accounts kept of the activities of officials engaged in different functions of the provincial government. Two thirds of the nig₂-ka₉-ak si-i₃-tum are accounts concerning the activities of lu₂ nig₂-dab₅-ke₄-ne who in these texts are incontrovertibly “storekeepers” at institutional facilities such as threshing floors and milling houses.¹¹

The administration’s proprietorship of these barley delivery accounts is also witnessed by [CT 07, pl. 05-06, BM 012934](#) in which the arrears of barley carried forward are via an official, giri₃ nig₂-u₂-rum gu-za-la₂ and in which the subscript nig₂-ka₉-ak si-i₃-tum še kin-ga₂ means “the account of the remainder of harvested barley”.¹²

¹¹ The meaning of the term lu₂ nig₂-dab₅-ke₄-ne has varied with context between “conscripts”, “requisitioners” and “storekeepers”. lu₂ nig₂-dab₅ ugnim^(ki) was considered to be a member of a specific category of recruited men in a military establishment (an army?) by Lafont (2009:4) in interpretation of a Girsu text [CT 10, pl. 45, BM 021394](#) obv. 13. Since the reverse of the tablet records the storage of barley under the seal of lu₂ nig₂-dab₅-ke₄-ne, these men were probably storekeepers of the army. Although Sallaberger (2003:49 fn. 205) substantiated the interpretation “Magazinverwalter”, he also differentiated a special meaning of “persons who appropriated cattle for offerings”, applicable to the Puzriš-Dagan texts in his study.

It is evident, though, that in Girsu, lu₂ nig₂-dab₅-ke₄-ne were officials of the provincial government who operated as storekeepers in a variety of environments. More than a dozen texts attest to kišib₃ lu₂ nig₂-dab₅-ke₄-ne and objects “under the seal of the storekeepers”. [PPAC 5, 0199](#) is a tag from a sealed basket of tablets, kišib₃ lu₂ nig₂-dab₅-ensi₂-ka-ne “under the seal of the storekeepers of the governor”, which emphasizes the role of the storekeepers as officials of the provincial administration. Other texts are both explicit about the storekeeper occupation of the lu₂ nig₂-dab₅-ke₄-ne and of their position as officials of the governing institutions. The subscript of [PPAC 5, 0310](#) at rev. (ii) 20-22 totals the sealed allocations of quantities of barley by a list of individuals as šu nin₂ 1 guru₇ [...], kišib₃ lu₂ nig₂-dab₅-ke₄-ne, e₂-kišib₃-ba-ta, “1080000+ litres [barley], under the seals of the storekeepers, from the store of sealed commodities”. [TEL 204](#) is subscribed gaba-ri kišib₃ lu₂ nig₂-dab₅, sukkal-mah-ke₄-ne, e₂-kišib₃-ba-ta, lu₂-ma₂-gu-la šu ba-ti “Lumagula received a copy of the seal of the storekeeper of the chief minister from the store of sealed commodities”.

In addition to Lafont’s identification of their role as storekeepers in the military of Girsu, the lu₂ nig₂-dab₅-ke₄-ne were also occupied in other areas of the provincial administration. They were officials of the threshing floor, lu₂ nig₂-dab₅-ki-[su₇]-ra-ke₄ in [CM 26, 071](#), and in [Nisaba 7, 7](#) a nig₂-ka₉-ak si-i₃-tum of table 1 above, they are storekeepers in the e₂-kikken₂ “mill (house)”.

¹² KIN here is understood as synonymous with gur₁₀ ešedu “to harvest” (Civil 1994:169-70). še kin-ga₂ was stored in an e₂ kin-ga₂ which is probably another word for “grain store”, as established by a fragmentary Girsu text dated Šu-Suen 7, [TEL 173](#). Part of the obverse of this fragment reads:

1. 5 1(barig) še gur	“1560 litres of barley
2. še e ₂ -kišib ₃ -ba	barley of the sealed store
3. 2(barig) 4(ban ₂) še e ₂ -kin-ga ₂	160 litres barley of the grain store
4. ša ₃ pu ₂ šu-i-ne	in the irrigated orchard of the barbers
5. 1 1(ban ₂) 5 sila ₃ še e ₂ -kišib ₃ -ba	315 litres barley of the sealed store
6. 3(barig) 1(ban ₂) 5 sila ₃ še nig ₂ -ar ₃ -ra	195 litres of barley groats
7. še e ₂ -kin-ga ₂	barley of the grain store
8. ša ₃ gešimmar du ₃ -a	in the planted date palms”

The co-occurrence of e₂-kišib₃-ba and e₂-kin-ga₂ in this text suggests a semantic relationship between the two terms for “store house”; one kind of store is sealed and one isn’t. It is also evident from the reverse of the fragment that these stores are probably in the ownership of some part of the governing administration, since the barley is received from the stores under the seal of ur-mes, a šabra in the royal or a temple household. The location of this particular e₂-kin-ga₂ at the “orchard of the barbers” is probably also attested in the sealed document, also dated Šu-Suen 7, [MVN 02, 074](#) rev. 1. i₃-dub pu₂ šu-i-ne-ta “from the grain store of the irrigated orchard of the barbers” from which barley rations are distributed to workers; and in the subscript of [BM Messenger 337](#) where guruš and erin₂-tur are

Accounts listed in Table 1, with the exception of [CT 09, pl. 44, BM 019038](#), are each a collection of summarised accounts of individual “primary” transactions, an example of which may be provided by [Nisaba 07, 21](#). This text could equally well have been included in Table 2, but has been retained in Table 1 in deference to its subscript *nig₂-ka₉-ak si-i₃-tum*.

[Nisaba 07, 21](#) dated Šulgi 39 reads:

obverse	
1. 3 4(barig) 3(ban ₂) 8(disz) sila ₃ gur lugal	“1178 sila ₃ of barley in the royal measure
2. ša ₃ -bi-ta	therefrom (deduct from)
3. 2 gin ₂ ! la ₂ 5 ½ še ku ₃ -babbar	2 shekels minus 5 ½ grains of silver
4. še-bi 1 4(barig) 5(ban ₂) gur	its barley 590 sila ₃
5. ba-zi ensi ₂ -gal šu ba-ti	(silver which) Bazi, ensi ₂ -gal, received ¹³
6. mu-ku _x (DU)	delivery.
7. la ₂ -ia ₃ 1 4(barig) 4(ban ₂) 8 sila ₃ gur	arrears 588 sila ₃ of barley
reverse	
1. giri ₃ ba-zi	via Bazi
2. nig ₂ -ka ₉ -ak si-i ₃ -tum	the account of the remaining deficit
3. da-ti-mu	(of) Datimu
4. mu PU ₃ .ŠA-iš- ^d da-gan ba-du ₃	Year the temple of Puzriš-Dagan was built (Š 39)

In this text the silver payment replaces barley at a ratio of 299 sila₃ per shekel. The ensi₂-gal, Bazi, received the payment of silver, presumably from Datimu, and also authorised the carrying forward of his arrears of barley. Datimu may be the scribe in [MVN 02, 192](#) obv. 10 a text from Šulgi 40, a year later than this account, although we cannot guess that he acts in the capacity of scribe here.

These accounts of individuals could also be in surplus as well as arrears. Thus [MVN 9, 96](#) is perhaps one of these and reads:

obverse	
1. 4(barig) 2(ban ₂) 5 sila ₃ še lugal	“265 sila ₃ barley by the royal measure
2. ša ₃ -bi-ta	therefrom (deduct from)
3. 1 gin ₂ ku ₃ -babbar	1 shekel of silver
4. še-bi 1 gur	its barley 300 sila ₃
5. na-silim dumu ur-nig ₂ -palil šu ba-ti	Nasilim son of Urnig-palil received
6. mu-ku _x (DU)	delivery
7. diri 3(ban ₂) 5 sila ₃ še	surplus: 35 sila ₃ of barley
reverse	
1. giri ₃ ga-sa ₆ -ga	via Gasaga
blank space	blank
2. nig ₂ .ka ₉ -ak	the account of
3. iri ^{ki} -bi dumu ur- ^d utu ma ₂ -lah ₅ ?	Iribi son of Ur-utu sailor.
4. mu us ₂ -sa bad ₃ ma-da ba-du ₃	The year after the wall of the land was built (Š 40).

remunerated with barley i₃-dub pu₂ šu-i-ka-ta “from the grain store of the irrigated orchard [pu₂ (-^{geš}kiri₆)] of the barbers” by a royal overseer (nu-banda₃ lugal). It is reasonable to assume therefore that e₂-kišib₃-ba, e₂-kin-ga₂ and i₃-dub are semantically cognate.

¹³ ur-^damma was ensi₂ of Girsu at this time. The meaning of ensi₂-gal is unclear therefore, although it surely denotes the profession of a state official, but see [CDLI Seals 005843 \(composite\)](#) where a Bazi, is the scribe and son of Nasilim on a seal with Ur-Lamma the governor of the Lagash province. Translations of “great/chief governor” or “former governor” don’t seem to fit the context.

In this instance more silver was paid in lieu of the barley than the amount due required. It may be that Nasilim deemed the amount due to be 1 gur and therefore the standard value of 1 shekel of silver was sought in lieu of barley, though clearly the makers of the account did not consider it so. In [CT 07, pl.46, BM 017774](#) ga-sa₆-ga is a cook (muḫaldim), while na-silim has a seal, both of whom, since they appear together, may be identified with the same two persons named here.

nig₂-ka₉-ak PN with silver paid in lieu of barley delivery

The second group of texts which account for the delivery of quantities of barley to various functions within provincial administrations (again primarily that of Girsu) are labelled as accounts concerning individual persons who were probably officials responsible for the administration of some function or other in the governing institutions of the province. Table 2 provides an overview of these texts. Although they suggest that an individual as opposed to some general office were accounted, some of the accounts summarised several transactions, while the remaining texts describe a single transaction only. The institutional context of these texts may prima facie be indicated in Table 2 by the subscripts to [HSS 4, 24](#) and [MVN 6, 507](#). The first is subscribed as the account of an overseer of a mill/mill workers and the second as that of the member of the household of an official administrator (šabra “major domo”).

<i>Table 2. nig₂-ka₉-ak PN with silver paid in lieu of barley delivery</i>				
<i>Text Sigla</i>	<i>Subscript</i>	<i>Indicative phrases</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
CT 07, pl.46, BM 017774	nig ₂ -ka ₉ -ak PN	n gin ₂ ku ₃ -babbar, še-bi n gur, si-i ₃ -tum nig ₂ -ka ₉ -ak, ša ₃ -bi-ta, mu-ku _x (DU), la ₂ -ia ₃	Girsu	300
CT 10, pl.44, BM 018962	nig ₂ -ka ₉ -ak PN	si-i ₃ -tum, ša ₃ -bi-ta, n gin ₂ ku ₃ , še-bi n gur, mu-ku _x (DU), la ₂ -ia ₃	Girsu	240
HSS 4, 24	nig ₂ -ka ₉ -ak PN ugula kikken ₂	si-i ₃ -tum, ša ₃ -bi-ta, n gin ₂ ku ₃ (-babbar), še-bi n gur, ugu ₂ PN ka-guru ₇ ba-a-gar mu-ku _x (DU), la ₂ -ia ₃	Girsu	271
MVN 6, 507	nig ₂ -ka ₉ -ak PN e ₂ -šabra	ša ₃ -bi-ta, n gin ₂ ku ₃ , še-bi n gur, mu-ku _x (DU), la ₂ -ia ₃	Girsu	300
Nisaba 13, 54	nig ₂ -ka ₉ -ak PN	ša-bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, mu-ku _x (DU), la ₂ -ia ₃	Girsu	300
TLB 03, 150	nig ₂ -ka ₉ -ak PN	si-i ₃ -tum, ša ₃ -bi-ta, n gin ₂ ku ₃ , še-bi n gur, mu-ku _x (DU), la ₂ -ia ₃ su-su-dam,	Girsu	300
Nisaba 13, 53	nig ₂ -ka ₉ -ak PN lu ₂ lunga	ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, mu-ku _x (DU)	Girsu	300
MVN 9, 96	nig ₂ -ka ₉ -ak PN	ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, mu-ku _x (DU), diri	Girsu	300
Nisaba 18, 95	nig ₂ -ka ₉ -ak PN	ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, mu-ku _x (DU)	Girsu	300
HLC 39 (pl. 70)	nig ₂ -ka ₉ -ak giri ₃ PN	si-i ₃ -tum, ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, ugu ₂ PN ba-a-gar, mu-ku _x (DU), la ₂ -ia ₃	Girsu	240
HLC 270 pl.125)	nig ₂ -[...] PN	ša-bi-ta, n gin ₂ ku ₃ -babbar, še-bi	Girsu	240

Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
		<i>n gur, mu-ku_x(DU), la₂-ia₃</i>		
MVN 11, 76	nig ₂ -ka ₉ -ak kas ₄ u ₃ PN	ša-bi-ta, <i>n gin₂ ku₃-babbar, še-bi n gur, mu-ku_x(DU), la₂-ia₃</i>	Girsu	300
PPAC 5, 707	giri ₃ PN, date	si-i ₃ -tum <i>n gin₂ ku₃-babbar, še-bi n gur, mu-ku_x(DU), [ugu₂]PN ba-[a]-gar</i>	Girsu	333

In [HSS 4, 24](#), balances of barley owing (si-i₃-tum) from two separate years totalling 18817 litres are the responsibility of (giri₃) two officials, Gudea and Nigurum¹⁴. Set against these deficits are firstly a quantity of barley and a payment of silver in lieu of barley received by Nigurum and secondly several deliveries of barley including a second payment of silver in lieu together with a quantity of barley debited to the account of a granary supervisor. These total some 15522 litres of barley including the barley equivalents of the silver payments. This total amount of barley is to be replaced (su-su-dam) via Gudea and Nigurum and is recorded as a delivery. The account is made in respect of ur-nig₂ ugula kikken₂ “Urnig the overseer of mill-workers”. The barley deficit was probably owed to the mill therefore. The account was apparently established in Šulgi 37, but dates settlements of the account and particularly the silver payments to the later years of Šulgi 42 and 43. It may be that these silver payments were required once barley due was deemed to be not forthcoming. Both of the other accounts with several transactions, [CT 07, pl.46, BM 017774](#) and [MVN 6, 507](#), suggest a similar process.

[TLB 03, 150](#) is paradigmatic of the more numerous texts where only one transaction delivered barley and silver in lieu of barley in part defrayal of a barley deficit. Its explanatory qualities merit a more detailed examination, hence the transliteration and translation of the short text included here.

obverse	
1. 38 2(barig) 4(ban ₂) še gur lugal	“11560 sila ₃ of barley measured with the royal gur
2. si-i ₃ -tum mu us ₂ -sa bad ₃ ma-da ba-du ₃	remaining deficit the year after the wall of the land
	was built (Š 38)
3. ša ₃ -bi-ta	therefrom (deduct from):
4. 11 1(barig) 1(ban ₂) gur	3370 sila ₃ of barley
5. 19 gin ₂ 20 la ₂ 2 še ku ₃	(and) 19 shekels and 20 minus 2 grains of silver
6. še-bi 19 3(ban ₂) gur	its barley 5730 sila ₃
7. ur- ^d ba-ba ₆ šu ba-ti	Urbaba received
8. mu-ku _x (DU)	delivery
9. mu en ^d nanna maš-e i ₃ -pa ₃	the year the en-priestess of Nanna was chosen by extispicy (Š 43)
blank space	blank space
10. šu-nigin ₂ 20 1(barig) 3(ban ₂) gur	total: 9100 sila ₃ of barley.

¹⁴ gu₃-de₂-a is possibly gu₃-de₂-a ša₁₃-dub-ba “Gudea, chief accountant” in six texts dated between Š 31 and IS 1, although 34 years as an official seems overlong. The seal of [TLB 03, 157-158](#) dated to AS 7 reads gu₃-de₂-a ša₁₃-dub-ba gir₂-su^[ki] clarifying the position of Gudea as an official of the provincial administration in a role most likely to be involved in these transactions. Alternatively, but perhaps less likely Gudea may be identifiable with gu₃-de₂-a ab-ba iri “Gudea, the city elder” an official in nine texts with dates approximately contemporary with [HSS 4, 24](#) i.e. all dated between Šulgi 34 and 43. However nig₂-u₂-rum does not appear in any other texts with him, although he must be acting here in an official capacity.

reverse	
1. mu-ku _x (DU)	the delivery
2. la ₂ -ia ₃ 8 1 (barig) gur	(together with) the deficit of 2460 sila ₃ of barley
3. lu ₂ -uš-gi-na su-su-dam	(to) Lu-Ušgina, to be replaced
4. giri ₃ ur- ^d ba-ba ₆ dumu ur-sa ₆ -ga ¹⁵	via Urbaba, son of Ursaga.
blank space	blank space
5. nig ₂ -ka ₉ -ak	account (of)
6. lu ₂ -uš-gi-na dumu ka ₅ -a-mu ¹⁶	Lu-Ušgina, son of Ka'amu
7. mu us ₂ -sa bad ₃ ma-da ba-du ₃	the year after the wall of the land was built (Š38). ¹⁷

The account held by the official Lu-Ušgina records a barley deficit of some 11560 litres in the year Šulgi 38. A second official, Urbaba, is to replace this with barley plus a payment of silver in lieu of barley he has received as a delivery in the year Š 43. The silver is equivalent to 5730 litres of barley. The total delivery of 9100 litres of barley (actual barley plus silver equivalent) still leaves a deficit of 2460 litres remaining from the original deficit of 11560 litres. The delivery plus the remaining deficit are to be replaced in Lu-Ušgina's account via Urbaba. Interestingly, the date of the receipt of barley together with the silver payment by Urbaba is apparently some five years after the beginning date of the account, perhaps indicating that silver was paid in lieu after several years of failure to deliver a required quantity of barley. Significantly, the barley:silver price ratio used to convert the silver payment to barley in this instance is 300 sila₃ barley to 1 gin₂ silver.

2. *Accounts of barley expenditures by institutional households*

Expenditure on the bala and other items

A distinguishing characteristic of the texts listed in tables 1 and 2 is the formulary common to each group. There are two exceptions identified in table 1 ([CT 09, pl. 44, BM 019038](#) and [MVN 12, 175](#)). Nonetheless the essential structure of their syntax, “si-i₃-tum, ša₃-bi-ta.....mu-ku_x(DU), la₂-ia₃/diri”, indicates that deliveries of barley were set off against deficits from a previous period to leave either a remaining deficit or a surplus.

Although two of them are balanced accounts of remaining deficits (nig₂-ka₉-ak si-i₃-tum) of barley, all of the accounts in table 3 on the other hand primarily deal with the expenditure by provincial institutions of probable barley surpluses. They do not describe deliveries (mu-ku_x(DU)) of barley or silver in lieu into these institutions to offset the deficits of barley. Elaborations of their structure aside, the overriding syntax of these particular balanced accounts ((sag-nig₂-gur₁₁-ra-kam), ša₃-bi-ta.....zi-ga-am₃) indicates expenditure from “capital” or “available assets” of barley - often translated less definitively as the debits. The phrase sag-nig₂-gur₁₁-ra-kam is amissible in the Ur III balanced accounts. Traditionally, “capital” seems to be most frequently used in the context of the merchant accounts. Whether or not the Sumerians would have regarded the goods totalled at the head of these accounts and often termed sag-nig₂-gur₁₁-ra-kam as “capital”, or simply as an accumulation of stored barley to be expended or otherwise distributed is moot. The etymology of the term could perhaps stem from the agricultural processes of an agrarian economy where the gur₁₁ sign in the phrase is synonymous with guru₇ “grain heap” or “silo”. sag-nig₂-gur₁₁-ra-kam is probably related to e₂-nig₂-gur₁₁-ra “storehouse or treasury” which is attested from ED IIIb through the Old Babylonian periods, though not in administrative texts after the Old Akkadian.¹⁷

¹⁵ ur-^dba-ba₆ dumu ur-sa₆-ga was almost certainly a state official and also son of an official at around the time indicated by the dates in this text. In the year Š 39 ur-sa₆-ga was a nu-banda₃ (see [TUT 130](#) obv. 5.). In Š 42 ur-^dba-ba₆ was a scribe. The seal on the envelope [Nisaba 18, 002](#) reads ur-^dba-ba₆, dub-sar, dumu ur-sa₆-^rga¹, [nu-banda₃] ^rgu¹-^rza¹-[la₂].

¹⁶ In [TCTI 2, 03956](#) lu₂-uš-gi-na dumu ka₅-a-mu is a scribe and therefore an official of the state or provincial administration. However, that text is dated Amar-Suen 8, some 13 years after the latest date in [TLB 03, 150](#). Nevertheless, lu₂-uš-gi-na dub-sar, dumu ka₅-a-mu appears in some 18 seals and texts between AS 8 and IS 3. ka₅-a-mu is also a scribe in Girsu texts which range in date from late in the reign of Šulgi to the middle of Šu-Suen.

¹⁷ Dahl (2010:277-8), on the other hand, suggests that the terminology used in the balanced accounts is best understood as simply relating to the physical structure of the document, rather than the nature of the goods. Thus, sag-nig₂-gur₁₁-ra-kam is “loosely” translated as “the first section of the account”, while the second is initiated by ša₃-bi-ta meaning “from its middle” and terminated by zi-ga-am₃ “torn/booked out”. If the value (as expressed by

Table 3. Expenditures from barley assets on the bala and other				
Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
CT 07, pl.21. BM 13165	nig ₂ -ka ₉ -ak PN	sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, ugu ₂ -a ga ₂ -ga ₂ , n gin ₂ ku ₃ -babbar, še-bi n gur, zi-ga, diri.	Girsu	240
ASJ 13. 230 74	nig ₂ -ka ₉ -ak, gana ₂ uru ₄ -a, PN	sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, n ku ₃ , še-bi n gur, kišib ₃ ensi ₂ , zi-ga, la ₂ -ia ₃	Girsu	240
CTNMC 53	nig ₂ -ka ₉ -ak še si-i ₃ -tum, ka-guru ₇ u ₃ dub-sar zi ₃ -da-ke ₄ -ne	si-i ₃ -tum, sag-nig ₂ -gur ₁₁ -ra -kam , ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, e ₂ -gal-la ba-an-ku _x , še ur ₅ -ra kišib ₃ gid ₂ -da, ugu ₂ -a ga ₂ -ga ₂ , zi-ga, la ₂ -ia ₃ -am ₃ .	Girsu	300
CT 1, pl.04-05, BM 17744	nig ₂ -ka ₉ -ak si-i ₃ -tum še sumun, nig ₂ -ka ₉ -ak ka-la ₂ -a PN ensi ₂	sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, ugu ₂ -a Prof N ba-a-gar, n gin ₂ ku ₃ -babbar, še-bi n gur, ugu ₂ -a ga ₂ -ga ₂ , zi-ga, šum ₂ -mu-dam, la ₂ -ia ₃ -am ₃ .	Girsu	300
HLC 81 (pl.32)	nig ₂ -ka ₉ -ak PN dub-sar zi ₃ -da, bala dub-sag.	si-i ₃ -tum nig ₂ -ka ₉ -ak, sag-nig ₂ -gur ₁₁ -ra-kam , ša ₃ -bi-ta, zi-ga lugal, ugu ₂ -a PN ba-a-gar, ugu ₂ -a ga ₂ -ga ₂ , n gin ₂ ku ₃ , še-bi n gur, zi-ga, la ₂ -ia ₃ .	Girsu	300
CM 26, 143	[nig ₂]-ka ₉ -ak PN, bala-bi 1-am ₃	si-i ₃ -tum bala dub-sag, ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, la ₂ -ia ₃ su-ga, zi-ga-am ₃ ugu ₂ -a ga ₂ -ga ₂ .	Girsu	300
KM 89534	nig ₂ -ka ₉ -ak ninda PN bala-bi 1-am ₃ ,	nig ₂ -ka ₉ -a zi-ga, sag-nig ₂ -gur ₁₁ -ra-kam ša ₃ -bi-ta,	Girsu	300

equivalences) of the second section was larger than the first, a “surplus” (diri) resulted. If smaller, the result was a “deficit” (la₂-ia₃). Despite the simplification, Dahl follows Englund (1990) in considering that the merchant accounts “calculated the rate at which the trade agent converted *the “goods”, put at his disposition by certain agencies of the state*, into commodities sought by the same or other agencies of the state”. The italics are my emphasis to highlight that these are the sag-nig₂-gur₁₁-ra-kam, and which therefore relate to the nature of the goods supplied by the state. Indeed, Steinkeller (2003:53-4) is unequivocal that the “merchant balanced accounts” were standing accounts into which the “fiscal office” of the Umma government funnelled *bulk capital* (i.e. sag-nig₂-gur₁₁-ra-kam) *in the form of grain, silver and wool* which financed independently made withdrawals (zi-ga-am₃) of goods required by various government institutions from merchants’ stores. The structure of the balanced accounts may be readily generalised even though applied to diverse activities in the Ur III economy as it “was similar in most cases: the balance carried over from a former balanced account, plus new items ...made available during the period ..., constituted the debits section; the next section included the expenditures credited to the person to whom the balanced account belonged; then followed the comparison between the preceding totals and the report of a positive or negative balance; and the document usually finished by recording the dates to which the balanced account applied and the name of the person or organization involved.” (Moliña 2016: §38). Even so, the nature and valuation (price determination) of the so-called “capital” items in the merchant accounts remains a particular issue.

Table 3. Expenditures from barley assets on the bala and other				
Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
		ugu ₂ -a ga ₂ -ga ₂ , zi-ga lugal, n gin ₂ ku ₃ , še-bi n gur, zi-ga, la ₂ -ia ₃		
MCS 8, 74 Liv 51 63 34	nig ₂ -ka ₉ -[ak] zi ₃ KA, x x e ₂ - ^d nin-geš-zi-da, u ₃ e ₂ - ^d ig-alim.	ša ₃ -bi-ta, ugu ₂ -a PN ba-a-gar, n gin ₂ ku ₃ -babbar, še-bi n gur, PN šu ba-ti, ugu ₂ -a ga ₂ -ga ₂ , zi-ga, la ₂ -ia ₃	Girsu	200
SNAT 434	nig ₂ -ka ₉ -ak še ur ₅ -ra kišib ₃ dib-ba PN	la ₂ -ia ₃ kišib ₃ dab-ba, sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, še ur ₅ -ra maš ₂ (nu-)ga ₂ -ga ₂ , n gin ₂ ku ₃ -babbar, še-bi n gur, zi-ga-am ₃ , la ₂ -ia ₃ -am ₃ .	Umma	300
SAT 3. 1652	nig ₂ -ka ₉ -ak PN	ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar, še-bi n gur, [zi-ga]-am ₃ , [la ₂]-ia ₃	Umma	150

[CT 07, pl.21. BM 13165](#) provides the most penetrable example. A total of 857 gur + 2 barig + 1 ban₂ of barley is the sag-nig₂-gur₁₁-ra-kam, supplied by the managers (sanga) of the temples of Nindara, Dumuzi and Ningirsu and a fourth official.¹⁸ From this 794 gur + 2 barig + 1 ban₂ is received by a PN₁ (kišib₃ PN₁) to ship to Nippur (Nibrū^{ki} nigin₂) and a further 61 gur is received by (kišib₃ PN₂) a chief boatman, as wages of a boat of hirelings to go to Nippur (a₂ ma₂ hun-ga₂ nibrū^{ki}-še₃). These two amounts are to be debited to the accounts (ugu₂-a ga₂-ga₂) of the aforementioned PNs, who had issued two sealed documents (kišib₃-bi 2-am₃), one each, to receipt the expenditure. Separately from the Nippur transactions a further 4 barig + 4 ban₂ of barley were debited to the account of PN₃ and of significance for this study ur-sa₆-ga nu-banda₃ received 2 minus ¹/₆ shekels of silver worth 1 gur + 2 barig + 2 ban₂ of barley (240 sila₃ per shekel).¹⁹ The

¹⁸ In the Ur III state and possibly differently from Umma, where the provincial government may have been exercised from a series of bureaus, the government of Lagaš probably operated via temple households, especially to administer agricultural land on behalf of the provincial administration (Sharlach 2004:63). The administration of Lagaš was headed by the e₂-gal “palace” under the authority of the ensi₂ “governor” responsible to whom were households consisting of the main temples and lesser temples and shrines led by a chief priest and administered by the secular sanga and his subordinate the šabra. The palace and the temples had sections devoted to agricultural production, animal husbandry, craft industries and administration (de Maaijer 1998:53-4). The organisation of Umma on the other hand is seen by Steinkeller (2003: 41-2) and followed by Sharlach, as somewhat different. As in Lagaš the governor was the administrative head of the province, “under whom were the temple households and various offices responsible for running different branches of the Umma economy”. The most influential of the latter was the fiscal office, but there was also an agricultural office, a grain office, a labour office, an animal office in charge of cattle, sheep and goats, a wool office, a leather office, a metals office, a boat office and a forest sector. Steinkeller’s reconstruction is conceptually similar to the scheme of temples and bureaus for the administration of Umma put forward by Snell (1982:77). However, as Steinkeller himself noted, the existence of these secular institutions is implied rather than explicit. Indeed, it may even be contradicted by [YOS 4, 237](#) which shows that in Umma, the flocks of sheep owned by the ensi₂ were held by the temples of the province. The Umma temples thus managed the subsistence economy of farming and animal husbandry. “In this way, the economy of Sumer remained stable despite political changes and turmoils (*sic*). Thus the Ur III state mainly represented a new overlying structure, which despite its general influence left the base intact” (Sallaberger 2014:105).

¹⁹ ur-sa₆-ga nu-banda₃ gu-za-la₂ appears in some eight Girsu texts between Š31 and Š40. It is most probable therefore that ur-sa₆-ga nu-banda₃ in this text dated to Š40 is the same person and thus an official of the ensi₂. It is not apparent from this text, however, as to why he received a payment of silver in lieu of barley, if that was the case.

total of barley expended (zi-ga) amounts to 857 gur + 4 barig + 1 ban₂ including the barley equivalent of the silver received by ur-sa₆-ga. This level of expenditure exceeds the sag-nig₂-gur₁₁-ra-kam by 1 ban₂, which is the diri.

[ASJ 13, 230 74](#) is a Girsu “seed and fodder” text for the demesne fields managed by ur-^dlamma dumu nam-mah (Maekawa 1991:211). It is formulated as a balanced account and is subscribed nig₂-ka₉-ak, gana₂ uru₄-a, ur-^dlamma, dumu nam-mah “balanced account of fields in cultivation by Ur-Lamma, son of Nammah”. Barley “assets” (sag-nig₂-gur₁₁-ra-kam) from various sources are disbursed to seed both the fields in cultivation (gana₂ uru₄-a) and other fields in rotation (gana₂ bala-a), the latter being brought into cultivation from the fallow. The barley to remunerate hired labour (a₂ hun-ga₂) to seed these fields is also counted among the expenditure as is barley redistributed as rations to the cultivator’s agricultural workers (še šuku-ra engar dumu-da-ba). In addition to these barley expenditures, 60 shekels of silver is received by the governor (kišib₃ ensi₂) for which barley at the rate of 240 sila₃ per shekel of silver, in total 48 gur, is expended and debited to the account. What this payment of silver to the ensi₂ is in respect of, is not immediately obvious. A possible explanation is that it represents the silver portion of a rental payment for land leased from the state demesne managed by ur-^dlamma. Such payments were required to be partly in silver and partly in barley (de Maaijer 1998:57).

[CTNMC 53](#) is defined by its subscript as an account of barley remaining (nig₂-ka₉-ak še si-i₃-tum) in the management of the granary supervisors and scribes of the flour. The account records the institutional expenditure of barley “assets” (sag-nig₂-gur₁₁-ra-kam) for a variety of purposes (zi-ga didli inim gu₃-de₂-a ša₁₃-dub-ba-ta “various expenditures under the instructions of Gudea, the chief accountant”) and via a variety of personnel. Three only of the many expenditures/withdrawals involve a transfer of silver and record its barley equivalent (še-bi). The first of these is a transfer of one and a half mina plus one shekel of silver in lieu of barley together with 60 gur and three barig of barley to Uršugalamma, a šabra (major domo) of a temple. The barley:silver ratio in this transfer is 300 sila₃ per shekel. The institutional household in Girsu of which Uršugalamma was šabra at the time of Šulgi may have been the palace, e₂ šul-gi “the household of Šulgi”, though since the household is also attested throughout the reign of Amar-Suen, it was more likely to be a temple.²⁰ The combined payment of silver and barley to a šabra is also suggestive of a field rental payment. The two other transfers of silver recorded and which involve an expenditure (zi-ga) of barley are on the face of it quite different. Perhaps uniquely in these Girsu texts, barley may have been *directly exchanged* to acquire large amounts of silver currency. In this particular instance, and if so, it is possible to think of the barley:silver price ratio as a barley price of silver.

[CTNMC 53](#) obverse (ii) 17-22 reads/ 1gu₂ 3²/₃ ma-na 7gin₂ ²/₃(NINDA₂xŠE.2) 12 še ku₃-babbar/ še-bi 1guru₇ 227 3(barig) 4(ban₂) gur/ e₂-gal-la ba-an-ku₃(KWU147)/ giri₃ šeš-kal-la/ dumu ur-^dba-ba₆. “3827.73 shekels of silver, its barley 1148320 sila₃, were delivered into the palace via Šeškala, son of Urbaba”. The barley:silver price ratio here is also 300 sila₃ per shekel. This transaction is dated to Š 33.

[CTNMC 53](#) obverse (iii) 17-20 record a second smaller delivery of silver into the palace also subject to a similar exchange with barley via Šeškala. This is dated to Š 34 and in this transaction 81055

²⁰ [HSS 04, 004](#) depicts the annual allocation of threshed barley primarily to officials of temple households grouped under the šabra of each household in an account of threshed barley of temple households and their managers (še geš ra sanga šabra-ne). Heading each list of barley allocations is a distribution to the šabra. The group at rev. (i) 9-11 is headed ur-šu-ga-lam-ma, e₂ ^dšul-gi, 40 (gur) šabra. The date of the text is AS 2 which is somewhat later than [CTNMC 53](#). Nevertheless, ur-šu-ga-lam-ma is associated with the household of Šulgi in texts throughout the period from Š 33 to AS 9. Most if not all of the households listed in [HSS 04, 004](#) are temples, which suggests that e₂ šul-gi was a temple also.

$\frac{5}{6}$ sila₃ of barley are exchanged for 270 shekels of silver, so that the barley:silver “price” ratio is again 300 sila₃ per shekel.

šeš-ka-la dumu ur-^dba-ba₆ was probably a scribe, and thus an official of the provincial administration, identifiable from the seals in [MVN 11, 044](#) and [PPAC 5, 1559](#) both of which are also from the late Šulgi period (Š 46 and Š 48 respectively). In both of these texts, distributions of barley, in the first instance via a barley loan, are authorised under his seal. Further confirmation of his association with some of the activities described in [CTNMC 53](#) may be given by [MVN 07, 534](#) and [ASJ 03, 158 122](#). The subscript in [CTNMC 53](#) rev. 11-12, nig₂-ka₉-ak še si-i₃-tum // ka-guru₇ u₃ dub-sar zi₃-da-ke₄-ne, could even be one of the tablets in the tablet store of which [MVN 07, 534](#) is the undated pisan-dub-ba. This basket of tablets contained accounts charged to the granary supervisors and kišib₃ šeš-kal-la dumu ur-^dba-ba₆ i₃-gal₂ “is under the seal of Šeškala son of Ur-Baba”. [ASJ 03, 158 122](#) suggests that in Š 44 šeš-kal-la dumu ur-^dba-ba₆ may be the subordinate of the ugula of a grain store/silo (i₃-dub).

In all, [CTNMC 53](#) records that a large quantity of silver was delivered to the e₂-gal in exchange for an equally large volume of barley. That the silver of (ii) obv. 17 has been acquired with a disbursement of barley is evidenced by the fact that še-bi 1guru₇ 227 3(barig) 4(ban₂) gur of (ii) obv. 18, is paralleled by obv. (iii) 14, šu-nigin₂ 1guru₇ 227 3(barig) 4(ban₂) gur še ku₃ “Total: 1148320 sila₃ barley for silver”. Similarly, it is certain that the še-bi 270 5(ban₂) 5 $\frac{5}{6}$ sila₃ gur of obv. (iii) 18 enables obv. (iii) 23 to be restored as šu-nigin₂ 270 5(ban₂) 5 $\frac{5}{6}$ sila₃ gur [še ku₃]. A reasonable reconstruction would suggest that the barley disbursed from a granary, perhaps administered on behalf of the province by a Girsu temple, was actually exchanged for silver to be delivered by Šeškalla to the provincial governor, the ensi₂ of Lagaš, whose administration resided in the e₂-gal. In all, in this one text, some 4108 shekels of silver were delivered to the e₂-gal via Šeškalla in the two years of Š 33 and 34.

[CTNMC 53](#) is structured so that after expenditure is totalled and deducted from the sag-nig₂-gur₁₁-ra-kam a substantial amount of barley remains unspent. This remainder is then appropriated in three ways. A proportion of the debit (“capital”) is set aside to be investigated/checked (ugu₂-e tak₄-a en₃-bi tar-re-dam); a large quantity of barley²¹ is assigned as loan barley in a “sealed document of extended debt repayment periods” (še ur₅-ra kišib₃ gid₂-da).²² A proportion of the remainder of the unspent barley is allotted to scribes of the flour and Uršugalamma, the šabra. The final remainder (la₂-ia₃) is then carried forward in the account of the granary supervisors and the flour scribes.

In [CT 1, pl.04-05, BM 17744](#), nam-mah dumu ur-^{ges}gigir, probably an official of temple or state, has received nearly six mina of silver, seemingly in lieu of barley, from the expenditure of sag-nig₂-gur₁₁-ra-kam which is composed mainly of the remaining balance of loan barley and barley from a granary (i₃-dub). The barley:silver ratio is again 300 sila₃ per shekel. The silver so received is to be debited to his account. The great majority of the expenditure in the account is of barley, a major part of which was debited to the account of a šabra “major domo” of a sanga “temple administrator”. The balanced account is a remainder account (nig₂-ka₉-ak ka-la₂-a) of ur-^dlamma, the ensi₂ of Lagaš dated Š 35.

Loan barley (še ur₅-ra) with and without interest added, deficits of barley not yet issued as loans (la₂-ia₃ še ur₅-ra nu-ta-e₃-a) and arrears of barley registered in audited sealed documents (la₂-ia₃

²¹ 3 guru₇ 4(geš^u) 7(geš₂) 14 3(barig) 2(ban₂) 7 $\frac{2}{3}$ sila₃ gur.

²² For this possible interpretation of this phrase see the discussion by Wilcke (2006:18) of kišib gid₂ as “eine (Schuld)urkunde prolongieren”.

kišib₃ dib-ba) are accumulated as the sag-nig₂-gur₁₁-ra-kam of [SNAT 434](#), a balanced account. Small amounts of wheat (gig and ziz₂), are also included with the barley as “capital”. The expenditure out of these available assets includes the payment of two probable field rents, one of four gur of barley, a-ša₃ ^{ges}ma -nu-ta “(rent) from the willow field”, and a second much larger payment, half of which was 20 gur of barley and half was 20 shekels of silver, a-ša₃ la₂-mah -ta “from the Lamah field”. The barley equivalent (še-bi) of the silver is also 20 shekels and thus the barley:silver price ratio is 300 sila₃ = 1 shekel. The difference between the assets and expenditures, la₂-ia₃-am₃, is the remainder in nig₂-ka₉-ak še ur₅-ra kišib₃ dib-ba ku₃-ga-ni “balanced account of loan barley and audited sealed documents of Kugani, who was probably also responsible for paying the field rents recorded in the account.”²³

Three documents in Table 3 account wholly or partly for barley expenditures for the Girsu bala. One tablet is from Lagaš’s early season (bala dub-sag) and two are subscribed bala-bi 1-am₃.²⁴ Each of these texts contains relatively small transfers of silver, one of which replaced a small deficit (la₂-ia₃ su-ga). They were all receipts of silver in lieu of barley and the barley:silver ratio in each case was 300 sila₃ per gin₂.

Expenditure via Merchants/Trade Agents

Like the accounts listed in Table 3, the so called merchant accounts are characterised by the syntax (sag-nig₂-gur₁₁-ra-kam,) ša₃-bi-ta.....zi-ga, la₂-ia₃/diri but on this occasion record the expenditure of provincial resources defined as capital or available assets supplied to the merchants and debited in the account.²⁵ There are important features which distinguish them from the accounts just discussed. First and most obviously they are subscribed nig₂-ka₉-ak PN (dam-gar₃) “accounts (concerning the activities) of PN, (merchant/trade agent)” and second they itemise in the sag-nig₂-gur₁₁-ra-kam section “goods” made available by the provincial administration, possibly from surpluses, to be expended on the acquisition via merchants of commodities not available from its own institutional producers. This understanding of the function of the “debits” section is central to an interpretation of the barley:silver ratios calculable in the merchant accounts, since for the most part the only significant transactions involving barley appear in this part of them. The “credits” in these accounts catalogue and value the withdrawals and thus “purchases” of these commodities from the merchant’s store by a variety of officials of the provincial administration (Steinkeller 2004: 99), but these almost never include barley. Note that the subscript to [YOS 18, 123](#), nig₂-ka₉-ak nig₂-sa₁₀-ma/ur-^ddumu-zi-da dam-gar₃/mu en ^dnanna kar-zi-da ba-hun,

²³ It is not entirely clear to me as to whether we should read kišib₃ dib-ba, perhaps “audited sealed document”, or kišib₃ dab-ba, perhaps “binding sealed document”, in this context. My preference is for the former. The most plausible explanation of the text [SNAT 434](#) is that incorporated in it were the contents of associated sealed documents (kišib₃) from different years, which for the most part had been audited (kišib₃ dib-ba), although, in one of the years, the audited loan barley and barley products provided as “capital” had not been sealed (obv. (ii) 13. dib-ba kišib₃ nu-tuku). The kišib₃ dib-ba could be subsidiary documents linked to balanced accounts as they appear to be in [SNAT 434](#) and were stored together with the account tablets in the same pisan dub-ba. Both [BPOA 1, 1139](#) and [UTI 3, 2103](#) are tags from baskets of tablets which contained nig₂-ka₉-ak u₃ kišib₃ dib-ba-bi “balanced accounts and their audited sealed documents”. Equally, the kišib₃ dib-ba existed independently of the balanced account as a document registering commodities. [CTNMC 52](#) registers a variety of grain products as the contents of audited sealed documents (ša₃ kišib₃ dib-ba) and others which are registered in sealed documents but which are apparently not audited (ša₃ kišib₃-ba), those for which a sealed document was not available (kišib₃ nu-gal₂) and the contents of a tablet on which a seal had not been rolled (kišib₃ nu-ra-a). Its subscript, rev (ii) 6-8, indicates that the kišib₃ dib-ba is to become part of the contents of a first basket of tablets belonging to ARAD, (kišib₃ dib-ba/ša₃ pisan 1-kam/pisan ARAD-ta).

²⁴ See Sharlach (2004:77-82) for identification of the bala seasons in the Lagaš province and the terms bala dub-sag, bala egir and bala-bi 1-am₃ and bala-bi 2-am₃.

²⁵ sag-nig₂-gur₁₁-ra-kam in these merchant accounts again appears to be amissible. Albeit some of the texts listed in Table 4 omit the term, they nevertheless exhibit variants of the syntax described here.

“the account of the things purchased (concerning) Ur-dumuzida, merchant, the year the en-priestess of Nanna of Karzida was installed” specifies “purchases”.²⁶ A third significant difference between the merchant accounts and those in Table 3 is the unit of account used in these records. In the merchant accounts this is always silver rather than barley so that the equivalent value of any commodity is “ku-bi” rather than “še-bi” and the value of capital or debits in the account is calculated as a weight of silver and not a quantity of barley. Expenditures or credits in the accounts are also converted into silver as are all deficits and surpluses carried forward to the next accounting period.

Table 4 outlines the main features of *only* those few merchant accounts which contain barley to silver equivalents and therefore *allow* the calculation of the barley:silver price ratio.²⁷ Unlike all of the texts discussed to this point and the silver loan documents examined later, these texts deal with the provision of barley as “capital” converted to equivalent values in silver for accounting purposes, perhaps rather than the physical transfer of silver in lieu of barley. Fifteen of the sixteen merchant texts studied here and summarised in Table 4 are from Umma. [MVN 11, 101](#) is the only one that originates from elsewhere - Girsu. Between them, the sixteen texts contain 22 separate attestations from which the barley:silver ratio can be computed and these are all listed in the Appendix.

The Umma administration supplied a substantial range of so-called capital goods (sag-nig₂-gur₁₁-ra-kam) to the Umma merchants to disburse in acquiring commodities on its behalf. Ranked in order of their silver value, they were grain (often barley), silver, wool, dates, fish, sheepskin and leather goods, flour, resins, smoked fish, and fish oil (Ouyang 2013: 117-8). The most substantial in quantity and value was grain (36%) followed in value by silver (22%), which was nevertheless not much greater in value than wool (20%). Grain, silver, wool and dates comprised almost 90% of the “capital goods” received by the merchants from the Umma administration.²⁸ Other than

²⁶ See also [Sauren 001](#) from ŠS 3 with a similar subscript: nig₂-ka₉-ak nig₂-sa₁₀-ma/ša₃ uri₅^{ki}-ma/giri₃ ab-ba-gi-na/mu si-ma-num₂{ki} ba-Γ^{hul}?. Although it doesn't specify an account of a merchant, it is a balanced account and Aba-gina is possibly identified in an Umma text from ŠS 6 as an overseer of merchants (Ouyang 2013:116-7).

²⁷ Excluded from table 4 are those texts in which še i₃-šah₂ (-ka) is supplied to merchants as capital to trade. Ouyang (2013:145) proposes that the term means that such barley was issued to Umma merchants for the procurement of lard. She argues that pig farming was relatively insignificant in the Umma institutional economy and thus the provincial administration relied on the merchants to provide the large additional quantities of lard they required. However, an obvious question is, why earmark barley as the specific capital item to acquire lard from local producers? Why couldn't merchants trade for lard with any of the commodities supplied to them as capital - unless “barley(grain) of the lard” is different from “barley” and is perhaps required to be fed to pigs to produce lard? This notion may be supported by the Umma text from Šulgi 45, [MVN 03, 210](#), which reads obv. /10 2(barig) 3(ban₂) še gur lugal/še i₃-šah₂-ka-še₃/mu engar-e-ne-še₃/KLAN^{ki}-ta/ki ARAD₂-ta/rev./a-tu šu ba-Γ^{ti}/seal impression/iti ^ddumu-zi/mu ur-bi₂-i₃-lum ba-hul/seal/a-tu/dub-sar/dumu lugal-sa₆-ga. “3150 litres of barley by the royal measure, for grain of the lard for the farmers from KLAN, Atu received from Arad, in the month of Dumuzi of the year Urbilum was destroyed. Sealed by Atu the scribe, son of Lugalsaga.” Ouyang (*ibid.*) also suggested that lard was acquired from local families each rearing pigs on a small scale. This text would suggest that the rearing of pigs was undertaken specifically by “farmers” as well as, or even rather than, the generality of local village families. The grain was supplied by Arad, who is identifiable as the ka-guru₇ of the Umma government. All of the attestations to še i₃-šah₂ in the CDLI database are in some 26 Ur III Umma texts (one from Garšana) and six of these refer to *n* še gur, še i₃-šah₂-ka distinguishing “grain of the lard” as a qualifier of barley.

²⁸ These percentages are based on Ouyang's statistical results regarding which it is necessary to enter the usual caveat. It is of course equally true of the data and statistics presented in this paper which can only be derived from analyses of the texts available to study. As with all other texts from Sumer available to us, these are only those which have found their way into collections, the majority via the antiquities market. All of these have not yet been published and transliterated. The vast majority (87%) of the 75000+ texts of all genres which are accessible, emanate from no more than three places, Umma (37%). Girsu (32%) and Drehem (Puzriš-Dagan) (18%). Those with a provenance of Ur are the next most numerous but constitute less than 6% and of Nippur less than 5%. Garšana is the origin of less than 2% and the many provenances of the remainder provide less than 0.27% each (Molina 2008: 52-3).

silver, therefore, the assets or capital which the governing institutions made available to the merchants for exchange were primarily the accrued surpluses of staples produced by their own organisation.

Silver as capital was supplied to the merchants exclusively by four major recipients of silver revenues, all members of the family of the *ensi*₂ (Ouyang 2013:96-7). Other forms of capital such as barley were supplied by a variety of administrators including the *ensi*₂, but perhaps the most important supplier of barley was the *ka-guru*₇ “chief granary officer” of the Umma administration also a member of the governor’s family. Yet other kinds of capital were chiefly issued by the four officials, various scribes and people with occupations such as gardeners and fishery inspectors.

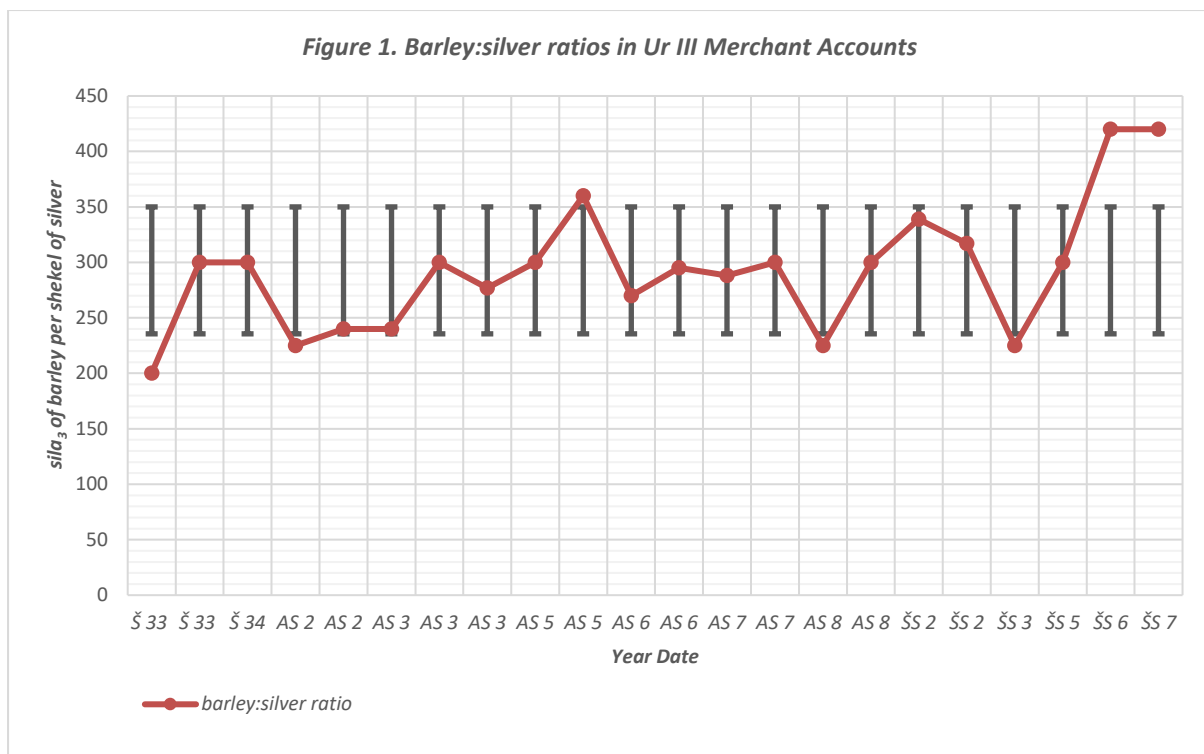
<i>Table 4. Barley expenditures in merchant accounts.</i>				
<i>Text Sigla</i>	<i>Subscript</i>	<i>Indicative phrases</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
MVN 11. 101	nig ₂ -ka ₉ -ak PN dam-gar ₃ , bala-bi 1-am ₃	<i>n še gur, ku₃ 1 gin₂-a 1 še gur, ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, zi-ga, la₂-ia₃</i>	Girsu	300
SNAT 276	nig ₂ -ka ₉ -ak PN <dam-gar ₃ >	<i>ša₃-bi-ta, n še gur ku₃-bi n gin₂, zi-ga-am₃, la₂-ia₃</i>	Umma	250
YNER 8.1	nig ₂ -ka ₉ -ak PN dam-gar ₃ , egir ₆ ba-uš ₂ -ta nig ₂ -ka ₉ -bi ba-ak	<i>n še gur ku₃-bi n gin₂, ša₃-bi-ta, ku₃-bi, zi-ga-am₃, la₂-ia₃</i>	Umma	233
Fs Jones 216	nig ₂ -ka ₉ -ak PN dam-gar ₃	<i>si-i₃-tum, n še gur, ku₃-bi n gin₂, ša₃-bi-ta, zi-ga-am₃, la₂-ia₃</i>	Umma	240
HUCA 30. 113-114	nig ₂ -ka ₉ -ak PN dam-gar ₃	<i>n še gur ku₃-bi n gin₂, ša₃-bi-ta, šu ba-ti, la₂-ia₃</i>	Umma	300
SANTAG 6.119	[nig ₂ -ka ₉]-ak PN [dam-gar ₃]	<i>[si-i₃]-tum, n še gur ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, [zi]-ga, [la₂-ia₃]</i>	Umma	277
TCL 5. 6056	nig ₂ -ka ₉ -ak PN dam-gar ₃	<i>si-i₃-tum, n še gur ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, zi-ga-am₃, la₂-ia₃</i>	Umma	300
YNER 08. 07	nig ₂ -ka ₉ -ak PN dam-gar ₃	<i>si-i₃-tum, n še gur ku₃-bi n gin₂, ša₃-bi-ta, zi-ga-am₃, la₂-ia₃</i>	Umma	360
JRAS 1939. 32	nig ₂ -ka ₉ -ak PN dam-gar ₃	<i>si-i₃-tum, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, n (ban₂) še ku₃-bi n še, zi-ga bala-a, zi-ga-am₃, la₂-ia₃</i>	Umma	270
YNER 08. 11	nig ₂ -ka ₉ -ak PN (dam-gar ₃)	<i>si-i₃-tum, n še gur, ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, zi-ga-am₃, la₂-ia₃</i>	Umma	294
MVN 01. 240	nig ₂ -ka ₉ -ak PN (dam-gar ₃)	<i>n še gur ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-bi-ta, zi-ga-am₃, la₂-ia₃</i>	Umma	225
YOS 18. 123	nig ₂ -ka ₉ -ak nig ₂ -sa ₁₀ -ma PN dam-gar ₃	<i>n še gur ku₃-bi n gin₂, sag-nig₂-gur₁₁-ra-kam, ša₃-</i>	Umma	300

Text Sigla	Subscript	Indicative phrases	Provenance	mean sila ₃ barley per shekel silver
		bi-ta, ku ₃ -bi, zi-ga-am ₃		
TCL 5, 5680	nig ₂ -ka ₉ -ak PN dam-gar ₃	n še gur ku ₃ -bi n gin ₂ , sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, ku ₃ -bi, zi-ga-am ₃ , diri	Umma	328
SNAT 490	nig ₂ -ka ₉ -ak dam-gar ₃ ša ₃ uri ₅ ^{ki} -ma giri ₃ PN	n še gur ku ₃ -bi n gin ₂ , ša ₃ -bi-ta, ku ₃ -bi, zi-ga-am ₃ , la ₂ -ia ₃	Umma	225
YNER 8, 14	nig ₂ -ka ₉ -ak dam-gar ₃ -ne PN	n še gur ku ₃ -bi n gin ₂ , ša ₃ -bi-ta, ku ₃ -bi, zi-ga-am ₃	Umma	420
YNER 08, 15	nig ₂ -ka ₉ -ak PN (dam-gar ₃)	n še gur ku ₃ -bi n gin ₂ , ša ₃ -bi-ta, ku ₃ -bi, zi-ga-am ₃	Umma	360

Compared with the limited variety of their capital goods, the products acquired for and supplied to the different departments of the provincial administration by the merchants were far more diverse. Barley, however, hardly features in these accounts other than as “capital” supplied *to* the merchants by the provincial administration. Of the sixteen texts listed in Table 4 only [JRAS 1939, 32](#), an account of Šeškala the merchant, can categorically be said to attest to the supply of barley *from* a merchant to some function of the governing institutions. Obverse (ii) 17-20 identifies the withdrawal from the merchant of 30 litres of barley equivalent to 20 grains of silver by Hulibar, as fodder for a mule (^{ans^c}kunga₂) and received by (under the seal of) Lugina. The barley:silver ratio in this instance is 1 gur (300 sila₃) barley per shekel of silver.

A second Umma text, [SNAT 276](#), may be argued to be a merchant account in which, though still relatively small, more substantial quantities of barley are supplied *to* the administration of the province. This a small balanced account of nig₂-u₂-rum which records the expenditure of silver “capital” on lard and two quantities of barley, 2 gur and 6 gur. The silver equivalents were 3 shekels and 6 shekels, respectively giving barley:silver ratios of 200 sila₃ per shekel and 300 sila₃ per shekel. Since the supply of silver to the merchants as “capital” with which to acquire various commodities was monopolised by the Umma administration, which was also the predominant destination of lard supplied by the merchants, and although the text does not say so, it is as likely as not that the account records transactions made with the administration by nig₂-u₂-rum dam-gar₃. He is possibly identified as a merchant in one text only, namely [MVN 13, 864](#).

The sixteen texts of Table 4 represent a total of 22 entries in the Appendix. Deviation from the “standard” 300 sila₃ of barley per shekel of silver is markedly more common in the Umma merchant texts than Girsu institutional texts. The sole Girsu merchant text suggests that the Girsu administration may have supplied barley “capital” at the price of 1 gur of barley per shekel more consistently; cf. the valuation evident in the texts discussed earlier. Figure 1 illustrates the range of values of barley:silver ratios from all 22 entries. The mean value of the ratios in Figure 1 is 293 sila₃ per shekel, while the median value is 300 sila₃ per shekel as is the mode value. One standard deviation in the distribution is 57 sila₃ per shekel. The vertical bars in Figure 1 represent one std.dev. on both sides of the mean of 293 sila₃, so that for all intents and purposes and allowing for a relatively small sample, all but two three outliers exhibit barley:silver ratios in the range of 1 gur ± 1 barig per shekel.



3. Loans and receipts of silver with repayments in barley

Loans of silver with repayment in barley

By far the largest category of texts which has somewhat problematically been mined as a source from which to calculate a barley:silver price in earlier Ur III price studies, records loans of silver with promises of repayment in barley.²⁹ These promises are often witnessed and made with oaths in the name of the king and the documents frequently bear the seal of the person in receipt of the loan.

Table 5 summarises the content of 25 such texts, twelve of which are from Nippur, eleven from Umma and one each from Girsu and Puzriš-Dagan. The delineating syntax of these texts is *n gin₂ ku₃-babbar//še-bi n gur//ki PN1-ta//PN2 šu ba-ti//either su-su-dam “to be replaced” or ag₂-e-dam “to be measured out”*. The month dates of when the loan is received and of when it is to be repaid are usually but not always included. There are variations in the terminology used in the loan documents, though these do not alter much their fundamental meaning. A frequent variant is *n gin₂ ku₃-babbar//še n gur-ta “n gur of barley for each (shekel of silver)”*. *su-su-dam* or *ag₂-e-dam* also have variants, *gi₄-gi₄-dam “to be returned”*, *šum₂-mu-dam “to be given”* and *ga-ag₂ bi₂-du₁₁ ““I (will) measure out”, he promised”*. Other variants appear to be largely orthographical such as *ag₂-da < ag₂-(e)-da*. In two texts in Table 5, both from Nippur, *nig₂-sa₁₀(-am₃)-bi* is written where *še-bi* might be expected and have a meaning which excludes that of price.³⁰

²⁹ Such use of these loan texts is principally by Snell, cf. his table 6. Grains (Snell 1982:138-143). Gomi (1984:233) has already noted, “We must be very careful when we try to calculate the price of barley in a loan contract”. He refers to Owen Nippur 17, [NATN 017](#) here, CBS 7790 in Snell’s table, to show that Snell calculated the price of 0.45 še of silver per sila₃ of barley from the quantity of barley the borrower promised to repay at the rate of 400 sila₃ per shekel of silver, as set in the contract. Gomi argues that the price of barley in this contract is most likely to be 0.6 še per sila₃ or 1 shekel per 300 sila₃, since a rate of 400 sila₃ per gin₂ includes the typical 1/3 interest rate common to barley loans in the Ur III period. He is almost certainly correct in his assumptions and criticism, though I return to the issue in a further discussion of this text below.

³⁰ See my discussion elsewhere of the Sumerian concept of price and the semantic range of translations of *nig₂-sa₁₀-am₃* (Cripps 2014:220-3).

Six of the Nippur texts in Table 5 explicitly affirm that barley is expected in repayment of the silver loan. *n gin₂ ku₃-babbar//še-bi n gur//ab-ši-gar* in these texts translates as “*n* shekels of silver, (with) *n* litres of barley is being replaced.”³¹ None of the remainder of the 25 loan texts contains this phrase and it is clear that it was not essential to the loan contract in which for whatever reason repayment in barley was required to redeem the debt. It does occur in three of the texts in Table 6, distinguished as receipts. Though these documents do not contain any specific promise to repay the loan with barley, the barley:silver ratios in most of them suggest that the silver received could be a loan, the repayment of which may be documented elsewhere.

Table 5. Loans of silver with repayment in barley				
Text sigla	Indicative phrases	Loan period	Provenance	mean sila ₃ barley per shekel silver
NYPL 387	<i>n gin₂ ku₃-babbar , še buru₁₄ a-na-ag₂-bi n še gur-ta, ki-PN1, PN2 šu ba-ti, su-su-dam</i>	iti ezem- ⁹ ba-ba to iti GAN ₂ -maš (month 8 to month 1: sowing to beginning of harvest)	Girsu	360
NRVN 1, 200	<i>n gin₂ ku₃-babbar, [nig₂]-sa₁₀-bi n gur, [ki]-PN1-ta, PN2 šu ba-ti, gi₄-gi₄-dam.</i>	<iti> še-sag ₁₁ -ku ₅ to iti sig ₄ (month 12 to month 3: irrigation to mid-harvest)	Nippur	430
TMH NF 1-2, 072	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, su-su-dam (witnessed)</i>	iti še-sag ₁₁ -ku ₅ -ta, iti sig ₄ -še ₃ (month 12 to month 3: irrigation to mid-harvest)	Nippur	420
CST 036	<i>n gin₂ ku₃-babbar, nig₂-sa₁₀-am₃-bi, n še gur-ta, ab-ši-gar, ki-PN1-ta, PN2 šu ba-ti, ag₂-da ab-du₁₁ (seal)</i>	iti ab-e ₃ u ₄ 6 ba-zal to iti gu ₄ -si-su-ka (month 10 to month 2: late sowing to mid-harvest)	Nippur	440
NATN 379	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1, PN2 šu ba-ti, ag₂-e-dam</i>	iti apin-du ₈ -a to iti šu-numun, (month 8 to month 4: sowing to late harvest)	Nippur	360
NRVN 1, 199	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, su-su-dam (seal)</i>	iti apin du ₈ -a u ₄ 25 ba-zal to iti sig ₄ -še ₃ (month 8 to month 3: sowing to mid-harvest)	Nippur	480
NYPL 390	<i>n ku₃-babbar, še-bi n še gur, ab-ši-gar. ki-PN1-ta, PN2 šu ba-ti, ag₂-[e]-dam , mu-lugal [i₃]-rpa₃¹, lu₂-inim-ma-bi-me (witnessed)</i>	iti kin- ⁹ nanna to iti sig ₄ -ga-še ₃ (month 6 to month 3: ploughing to mid-harvest)	Nippur	400
NATN 266	<i>n gin₂ ku₃-babbar, ki PN1-ta, PN2 šu ba-ti, ku₃-babbar sag-bi gi₄-gi₄-dam, tukum-bi ku₃-babbar nu-gi₄, egir buru₁₄-še n še gur-ta, i₃-ag₂-e (witnessed) (seal).</i>	iti e-lu-nu-um to iti apin-du ₈ -a (Month 6, kin- ⁹ nanna, to month 8) or on default after harvest. ³²	Nippur	600
NATN 437	<i>n gin₂ (ku₃-babbar), še n gur-ta n, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, ag₂-e-dam, mu lugal-bi</i>	iti ezem-mah-ta, iti gu ₄ -si ₄ -su ₄ -še ₃ (month 9 to month 2: late	Nippur	600

³¹ In [NATN 017](#) the alternative syllabic spelling of gar in ab-ši-ga₂-ar is preferred. Both spellings are the passive of the verb gar “to put/place”. The terminative infix -ši- changes the meaning to “put for” (thus “to restore/replace”); the pronominal b- is “it”. This interpretation contrasts with the translation of the term as “were assessed” by Steinkeller (2001:56). I revisit Steinkeller’s treatment of the text in a later discussion. [NATN 312](#) has the same phrase in a subordinate *hamtu* construction viz. *n gin₂ ku₃-babbar/ še-bi n gur/ab-ši-gar-ra* “*n* shekels of silver which is being replaced (with) *n* litres of barley”.

³² iti e-lu-nu-um in Nippur is month (6) and equals kin-⁹nanna. It is the Ur III month eponym of the *elunum* festival cf. Sallaberger (1993:202) and CAD *e* page 136 s.v. *elulu*.

<i>Table 5. Loans of silver with repayment in barley</i>				
<i>Text sigla</i>	<i>Indicative phrases</i>	<i>Loan period</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
	in-pa ₃ , (witnessed) (seal).	sowing to mid-harvest) ³³		
TMH NF 1-2, 33	<i>n gin₂ ku₃-babbar, še n gur-bi [ab]-ši-gar, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, ag₂-(e)-da mu lugal-bi in-pa₃</i>	to be repaid in iti sig ₄ (month 3:mid-harvest)	Nippur	540
NATN 312	<i>n gin₂ ku₃-babbar, še-bi n gur, ab-ši-gar-ra, ki-PN1-ta, PN2 šu ba-ti, ag₂-e-dam (witnessed)(seal)</i>	iti du ₆ -ku ₃ to iti sig ₄ (month 7 to month 3: early sowing to mid-harvest)	Nippur	600
TMH NF 1-2, 060	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1-ta, mu-PN2-še₃, kišib PN3, šum₂-mu-dam, mu lugal-bi in-pa₃, (witnessed)(seal)</i>	iti še-sag ₁₁ -ku ₅ to iti gu ₄ -si-su (month 12 to month 2: irrigation to mid-harvest)	Nippur	481
NATN 121	<i>n gin₂ ku₃-babbar, še-bi n (gur), ab-ši-gar, ki-PN1, PN2 šu ba-ti, su-su-dam (seal)</i>	iti bara ₂ -za ₃ -gar-ra to iti sig ₄ (month 1 to month 3: late irrigation to mid-harvest)	Nippur	450
NATN 017	<i>n gin₂ ku₃-babbar, n še gur-ta, ab-ši-ga₂-ar, kishlah ag₂-e-de₃, ki-PN1, PN2 šu ba-ti, a-ša₃ nam-10 PN3 uru₄-e-de₃, PN2, PN1 in-na-sum, mu lugal-bi in-pa₃, (witnessed) (envelope seal)</i>	iti-sig ₄ -ga (month 3 to threshing: mid-harvest to end harvest)	Nippur	400
MVN 13, 881 & 882	<i>n gin₂ ku₃-babbar, še-bi n gur, buru₁₄ ama-bi gi₄-gi₄, su₃-su₃-da, mu lugal-bi in-pa₃, ki PN1-ta, PN2 šu ba-ti (envelope, seal)</i>	Loan received in iti me-gi ₈ -gal ₂ (month 11: irrigation to harvest)	Puzriš-Dagan?	360
MVN 13, 246	<i>n gin₂ ku₃-babbar, še-bi n gur-ta, ki PN1-ta, PN2 su-su-de₃ (seal)</i>	iti ^d li ₉ -si ₄ -ta, iti pa ₄ -u ₂ -e-še ₃ (month 9 to month 11: late sowing to irrigation)	Umma	240
AUCT 1, 98	<i>n gin₂ ku₃-babbar, še-bi n gur, ki PN1, PN2 & PN3 šu ba-ti, mu lugal-bi iti... ag₂da i₃-in-pa₃, (witnessed)</i>	To be repaid in iti nesag (month 4: late harvest)	Umma	452
AUCT 1, 965	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, mu lugal ezem nesag-e ga-ag₂bi₂-du₁₁ (witnessed)</i>	iti pa ₄ -u ₂ -e to ezem nesag-e (month 11 to month 4: irrigation to late harvest)	Umma	444
PPAC 5, 956	<i>n (gin₂) ku₃-babbar, še-bi n (gur), ki-PN1-ta, PN2 šu ba-ti, su-su-dam, mu lugal-bi in-pa₃, (witnessed) (seal)</i>	To be repaid in iti nesag (month 4: late harvest)	Umma	600
NUL 06	<i>n (gin₂) ku₃-babbar, še-bi n (gur), ki-PN1-ta, PN2 šu ba-ti, su-su-dam (seal)</i>	iti nesag to iti ri (month 4 to month 5: late to end harvest)	Umma	420
SANTAG 7, 172	<i>n gin₂ ku₃-babbar, še-bi n gur, ki-PN1-ta, PN2</i>	After the harvest.	Umma	600

³³ iti ezem-mah is month 9 in Puzriš-Dagan and probably Nippur (Wu 2002:117) while iti gu₄-si₄-su₄ is month 2 in Nippur.

Table 5. Loans of silver with repayment in barley				
Text sigla	Indicative phrases	Loan period	Provenance	mean sila ₃ barley per shekel silver
	šu ba-ti, egir buru ₁₄ , su-su-dam, (seal)			
YOS 04. 049	<i>n</i> gin ₂ ku ₃ -babbar, še <i>n</i> gur-ta, ki-PN1-ta, PN2 šu ba-an-ti, su-su-de ₃ , mu lugal-bi in-pa ₃ , (seal), (witnessed)	iti ^d pa ₄ -u ₂ -e to iti še-kar-gal ₂ -la (month 11 to month 3: irrigation to mid-harvest)	Umma	450
SAT 3. 1987	<i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur-ta, ki-PN1-ta, PN2 šu ba-ti, su-su-dam (seal)	iti- ^d dumu-zi-ta, iti nesag-še ₃ (month 12 to month 4: irrigation to late harvest)	Umma	360
YOS 4. 48	<i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur, ki-PN1-ta, PN2 šu ba-ti, ki-su ₇ ag ₂ -e-da, mu lugal-bi in-pa ₃ (witnessed) [seal]	iti- ^d dumu-zi to ki-su ₇ (from month 12 to threshing: irrigation to end harvest)	Umma	420
YOS 4. 27	<i>n</i> gin ₂ ku ₃ -babbar, še-bi <i>n</i> gur, ki-PN1-ta, PN2 šu ba-ti, mu PN-še ₃ , še-bi ki-su ₇ -ka ag ₂ -e-da, mu lugal-bi in-pa ₃ (seal)	iti še-sag ₁₁ -ku ₅ to ki-su ₇ (month 1 to threshing: last irrigation to end harvest)	Umma	450
YOS 4. 20	<i>n</i> ku ₃ -babbar ₂ , še-bi <i>n</i> gur, ki-PN1-ta, PN 1, PN2, PN3, [šu-ba]-ti-eš, mu lugal-bi in-pa ₃ -eš (seals)	iti- ^d dumu-zi to [iti-še-kar]-ra-gal ₂ -[la], (month 12 to month 3: irrigation to mid-harvest)	Umma	450

Redemption of these silver loans is invariably to be made during or after the harvest. Two texts are explicit about repayment at the barley harvest. [NYPL 387](#) assesses the barley required to repay the silver loan as še buru₁₄ a-na-ag₂-bi *n* še gur-ta “its measured to him at the harvest barley, *n* litres for each (shekel of the loan)”. The loan of four and a half shekels is to be repaid at the rate of 1 gur and 1 barig of barley per shekel of silver or 360 sila₃ per shekel. The loan is made in month 8 (October-November), which is a late sowing/end of ploughing period, and is scheduled to be replaced (su-su-dam) in month 1 (March-April) which is apparently at the beginning of the harvest in Girsu.³⁴ In the Umma text [SANTAG 7, 172](#), on the other hand, the loan period is not dated. It is merely specified that the loan of 15 shekels of silver su-su-dam “is to be replaced” with 30 gur of barley (i.e. 600 sila₃ per shekel) egir buru₁₄ “after the harvest”. In several instances redemption of the loan is to occur when the harvested barley is measured out on the threshing floor (kishlah/ki-su₇) [NATN 017](#), [YOS 4, 27](#) and [YOS 4, 48](#). In none of these is the redemption date otherwise specified. However, threshing probably occurred during months 4 to 5, June-July to July-August (Potts 1997:73).

Further explicit attestations that the repayment of debts mainly took place at harvest time is indicated in several texts by the phrase buru₁₄ ama-bi gi₄-gi₄ “the harvest will remit this debt”.³⁵ The phrase primarily appears in those few Ur III texts which suggest that the cancellation of debts may also have occurred around harvest. Borrowers could on occasion be released from their debts

³⁴ I have followed Potts (1997:74) and his Table III.1 “Stages in the Mesopotamian agricultural calendar” to correlate Mesopotamian months with our modern calendar and to assign the agricultural operations (ploughing, sowing, irrigation, harvest etc.) appropriate to specific months of the year. Potts’s correlations are with the Girsu calendar. I have assumed that differences in the times of these operations in neighbouring Umma or even Nippur are marginal or perhaps non-existent.

³⁵ Literally “harvest returning (to) its mother”. ePSD translates ama-ar-gi₄ as “reversion to a former state”. Cf. also CAD A2 p.115 s.v. *anduraru* for ama-(ar)-gi in the lexical notes and with an OB meaning of remission of (commercial) debts. The literal translation suggests that its etymology is from the alternative interpretation of ama-ar-gi₄, “manumission”.

on the grounds that their harvest had failed due to a natural disaster such as an inundation from the river in spate or a storm, either of which had laid waste their crop of barley. At least, this appears to have been the case in Nippur and Puzriš-Dagan. I am not aware of evidence for the remission of this kind of debt from other provinces in the Ur III state. [MVN 13, 881 & 882](#) in Table 5, perhaps from Puzriš-Dagan, is the only text directly relevant to this price analysis, that is, in which a loan of *silver* is to be repaid by barley and which may be subject to this provision. It reads obv. /2 gin₂ ku₃-babbar/še-bi 2 2(barig) gur/buru₁₄ ama-bi gi₄ -gi₄ su₃-su₃-da /ba-a-mu/rev./mu lugal-bi in-pa₃/ki ^dnanna-i₃-gi-ta/ba-a-mu/šu ba-ti/iti me-gi₈-gal₂/[mu en] ^dnanna maš₂-e i₃-pa₃. “2 shekels of silver, its barley 720 litres. The debt will be cancelled at harvest time, should (the harvest) be inundated. Ba’amu has made an oath in the name of king. Ba’amu received (the loan) from Nanna-igi in the month Mekigal of the year when the en priestess of Nanna was chosen by omens.” The crucial indicator that the text describes a loan which is to be repaid is given by the phrase buru₁₄ ama-bi gi₄-gi₄. In each of the texts containing this phrase and discussed here, it is evident that the borrower’s obligation for the debt incurred will be discharged by repayment from the borrower’s barley harvest. The loan in this instance was again to be repaid at the rate of 360 sila₃ per shekel although the text is obscure with regard to whether it will be repaid or not. There is no repayment term to which Ba’amu’s oath refers. Nor does the oath verify his receipt of the silver. The fact that Ba’amu has made an oath actually precedes the recording of the receipt of the silver. It immediately follows, however, the statement of the remittable aspect of the debt.³⁶

³⁶ It is probable that release from a debt was conditional on there being actual destruction of the borrower’s barley harvest. It seems also to have depended on the whether or not the distressed debtor petitioned the king and/or the administration of a temple, that he had suffered losses through natural disaster (Steinkeller 2002:134 note 18). The oath made by Ba’amu may be an indication that he was not going to petition the king or the temple for debt relief. There are three examples from Nippur of renunciations of such a petition by borrowers; none of which is a loan of silver. [NRVN 1, 180](#) records a loan made with barley from the temple household of Enlil and reads thus: obv./1(barig) 4(ban₂) še šeš-kal -la/1(barig) 4(ban₂) a₂-zi-da/1(barig) 4(ban₂) ur-^dnin-urta /še ur₅-ra ^den-lil₂-la₂/ki lugal-nam-tar-re-ta/šu ba-ti-eš₂/kišib₃ ur-^dnin-urta/rev./buru₁₄ ama-bi gi₄-gi₄/a-ša₃-mu a-e ba-ab-re_x/u₄-de₃ ba-ab-re_x/nu-ub-be₂-ne-a/lugal-ra u₃ sanga nu-na-be₂-a/mu lugal-bi i₃-pa₃-de₃-eš₂/iti diri še-sag₁₁-ku₅/mu en-am-gal-an-na en ^dinanna maš₂-e i₃-pa₃ ./seal/ur-^dnin-urta/dumu lu₂-^dlamma . “100 litres of barley to Šeškala, 100 litres to Azida, 100 litres to Ur-Ninurta, barley loan (of the temple household) of Enlil, they received from Lugal-namtare, under the seal of Ur-Ninurta. The harvest will remit this debt. They have sworn in the name of the king, in the intercalary month “Barley Harvest” in the year when Enamgalanna was made en priest of Inanna by extispicy, that they have not said nor will they say to the king and the chief household administrator “my field was ruined by flooding (or) was ruined by the storm”.

[TMH NF 1-2, 069](#) is the second Nippur text which is also an example of the borrower, perhaps for the reason that the anticipated damage from storm and flood did not materialise, foregoing a petition for relief. The text reads; obv. / [...] še gur/še ^den-lil₂-la₂/ki-ba si-ge-de₃/ki lugal-nam-tar-re-ta/ur-^dha-ia₃-ke₄/šu ba-ti/iti diri še sag₁₁-ku₅/mu enmah-gal-an-na en ^dinanna ba-hun/rev./še-bi buru₁₄ ama-bi gi₄-gi₄/e₂ ^den-lil₂-la₂-ka / i₃-ni-ku_x-ku_x-a/a-ša₃-mu u₄-de₃ ba-ab-[de₃]/a-e ba-ab-de₃/lugal-ra u₃ sanga nu-un-na-be₂-[a]/mu lugal-bi in-pa₃ /seal/ ur-^dha-ia₃/dub-sar/dumu engar-du₁₀/sagi. “[n] litres of barley, barley of (the temple household of) Enlil to be stored in that place, Ur-Haya received from Lugal-namtare, in the intercalary month of “Barley Harvest” in the year when Enmahgalanna was installed as en priestess of Innana. The harvest will remit this barley debt. He (Ur-Haya) has sworn in the name of the king that entering the temple household of Enlil he will not say to the king or to the chief household administrator, “my field was ruined by the storm or by flooding”.

The remaining Nippur witness of the phrase buru₁₄ ama-bi gi₄-gi₄, [NRVN 1, 179](#), also provides evidence of the forswearing of debt relief. This reads: obv. /3 še gur/še ur₅-ra ^den-lil₂-la₂/ki amar-šuba₂-ta/lugal-pa-e₃ gu-za-la₂/šu ba-ti/rev./buru₁₄ ama-bi gi₄-gi₄/iti sig₄-ka i₃-ib₂-gi₄ ?-gi₄ ?/a-ša₃-mu a-e₃ ba-re_x/a-ša₃-mu u₃-de₃ ba-re_x/ba-ra-ab-be₂-en₃/iti udru^{du₅}/mu hu-hu-nu-ri ba-hul. “900 litres of barley, barley loan of (the temple household) of Enlil, Lugal-pae, the throne bearer, received from Amar-šuba. The harvest will discharge the obligation. It (the debt) will be remitted in the month of the brick (month 3 May-June, a harvest month). “I will not say ‘My field was ruined by flooding, or, my field was ruined by the storm’”. Month “udru” (month 11, January-February). Year the Huhunuri were destroyed.

Confirmation that the phrase buru₁₄ ama-bi gi₄-gi₄ indicates that [MVN 13, 881 & 882](#) is a loan document is given by a Girsu contract, [PPAC 5, 1715](#), dated Š 31, which reads; obv./16 še gur lugal/ maš-bi 2¹/2 gin₂ ku₃-babbar/ba-

Debts redeemable with barley at harvest time may well have been incurred by cultivators to finance agricultural operations. This is arguably so for at least some of the loans which were made at times of sowing or irrigation. The maximum loan period in Table 5 is from ploughing to mid-harvest, about nine months and the shortest period is only 1 month during harvest, cf. [NUL 06](#) from Umma in which Alla has borrowed $\frac{1}{3}$ shekel of silver for 1 month during the harvest period. The debt was to be repaid in barley in month 5 (iti ri) at the end of the harvest, thus the loan was for 1 month during the harvest. Short duration loans, especially harvest loans, were usually made to provide for the immediate subsistence of the borrower's household and almost always in barley. However, although rarer, these kinds of loans could also be made in silver and both were usually interest bearing (Garfinkle 2004:5ff.). Alternatively, it is possible that Alla needed to borrow silver to hire labour to complete his harvest. One third of a shekel would hire one guruš for 20-30 workdays (Englund 2012b:129). Alla is required to repay the loan at the rate of 420 sila₃ of barley to 1 shekel of silver, which may be evidence of a customary rate of interest.

Some repayments of silver with barley at harvest probably embodied a penalty incurred by defaulting on repayment in silver. [NATN 266](#) in Table 5, which Garfinkle defined as a “productive” loan perhaps to be regarded as a fictitious arrangement, can be interpreted in this manner. The penalty was frequently a *duplum*, a repayment double the value of the loan (Garfinkle 2004:4). In [NATN 266](#), a silversmith was loaned 25 shekels of silver in month 6, the silver principal to be returned to Nippur in month 8, possibly, Garfinkle suggests, as a worked object. If he failed to return it when agreed, the silversmith was to measure out two gur of barley for each shekel of silver after the harvest, double the amount of barley normally considered equivalent to one shekel. In this event, the barley:silver ratio was 600 sila₃ barley to one shekel of silver rather than 300 to 1. The repayment of a *duplum* on default of a loan is explicit in [NRVN 1, 049](#).³⁷ As is apparent from the table 5 texts, and of significance to this discussion, it was quite usual in the Ur III period that a contractual penalty for default was to pay barley to redeem a loan made in silver. The penalty payments increased the rate of interest considerably and at its harshest doubled the value of the loan, though even harsher penalties such as imprisonment (cf. [NRVN 1, 049](#)) were available for non-payment (Lafont and Westbrook 2013:214).

[NATN 266](#) is unequivocal about the penalising nature of doubling the repayment of the principal if made in barley. The repayment after the harvest is explicitly contingent on a default no doubt because the loan period would be extended by some five or six months. It is not obvious however, that other texts in Table 5, which indicate that repayment in a harvest month is to be made with barley at a rate of two gur to one shekel of silver, double the amount borrowed, infer a contingent penalty payment. There are four other texts with repayment at this barley:silver rate; two from

la₂/rev./ur-^dlamma lu₂ lunga ^dnanše/šu ba-ti/še ur₅-ra-kam buru₁₄ ama-bi gi₄-gi₄/su-su-dam/iti še-sag₁₁-ku₅/mu dumu-lugal us₂-sa. “16 gur (4800 litres) barley by the royal measure, its interest $2\frac{1}{2}$ shekels of silver is small. Ur-Lamma, brewer of Nanše, received. It is barley on loan. The harvest will remit the debt. It will be replaced. Month of the Barley Harvest (Month 11), year after the king's daughter.

³⁷ [NRVN 1, 049](#) from Nippur reads: obv./ur-^dnusku-ke₄/ša₃-ku₃-ge-er/ku₃-gu₁₀ šum₂-ma-ab/in-na-du₁₁/ša₃-ku₃-ge-e/ur-^dnusku-ra/iti bara₂-za₃-gar e₂-eš₂ ub-hul/ku₃-zu maš₂-bi-a-bi-da/²/₃ ma-na ga-ra-la₂/in-na-du₁₁/tukum-bi nu-ra-la₂/rev./1 $\frac{1}{3}$ ma-na ku₃-babbar/ga-la₂ bi₂-du₁₁/mu lugal-bi in-pa₃/ur-sukkal bar-šu -gal₂ ^dnin-szubur-ka/ur-zu u₃ dumu a[?]-x-ni-a/lu₂-dingir-ra dumu amar-^dinanna/gu₃-u₂-gu lu₂ ka₂ ^dnin-hur-sag-ka/lu₂-inim-ma-bi-me/iti sig₄ ?-ga ? u₄ 16-kam /l.e./ [mu ^dšu-^dsuen] lugal-e na-mah in-du₃. “Ur-Nusku said to Šakuge, “Give me my silver”. Šakuge said to Ur-Nusku, “In the month of Placing the Throne in the Sanctuary, unless prison has made it impossible (destroyed it), let me weigh to you your silver and its interest (together worth) 40 shekels. If I have not weighed it to you (by then), let me weigh 80 shekels of silver”, he promised. He swore in the name of the king, 4 witnesses. Year Su-Suen, the king, erected a magnificent stele”. It would seem that Ur-Nusku's offer of a *duplum* in the event of further default on the loan is to avoid imprisonment, making, as he does, the plea that imprisonment will defeat his ability to repay the loan.

Nippur, [NATN 437](#) and [NATN 312](#) and two from Umma, [PPAC 5, 956](#) and [SANTAG 7, 172](#). All of these are formulaic and structured as straightforward short-term loans of silver to be repaid in barley. The first three comprise loans of relatively small amounts of silver – $\frac{1}{4}$ shekel, 1 shekel, $1\frac{1}{6}$ shekels – to be replaced or measured out, after a few months, in barley at harvest time.

[SANTAG 7, 172](#) is an exception recording the loan of a substantial weight of silver (15 shekels), to be repaid with 30 gur of barley after the harvest (egir buru₁₄). It would be usual for this text to follow an oral contract and even an earlier document which contained a requirement that the debtor double the amount he repaid in barley should he default. The text, however, does not record an oath to repay, is not witnessed, but is sealed by the debtor, who is a nu-banda₃ “captain”, subordinate of the military governor (egir šagina).

If [NATN 266](#) is left out of consideration as a “fictitious arrangement in which goods were ‘loaned’ to a craftsman for production” (Garfinkle 2004:4), the Table 5 texts may be considered to be “harvest loans” - those for a short duration which were required to be repaid, with interest, out of the next harvest (Garfinkle 2004:6). Repayment was usually made with barley but could also be made with silver.

The notion that these loans were to be repaid with interest, immediately raises an issue as to what value should be assumed as the barley equivalent of a shekel of silver. What is the barley:silver price ratio and what rate of interest can we assume? It is evident from Table 5, that with the exception of the ratio in [MVN 13, 246](#), the amount of barley to be repaid at harvest for each shekel of silver borrowed varies between 360 sila₃ and 600 sila₃. Most discussions of interest rates in the Ur III period conclude that the usual interest rates were 33% for barley loans and 20% for silver loans. Whether these texts should be regarded as barley loans or as silver loans is moot. Although it describes a silver loan Steinkeller (2001:56), for example, judges that [NATN 017](#) is effectively a barley loan with a 33% interest rate.³⁸ Clearly, if the widely accepted barley equivalent of 300 sila₃ per shekel is assumed, those loans of silver to be repaid at a rate of 360 sila₃ per shekel bear a 20% interest rate as for silver loans and those to be repaid at 400 sila₃ per shekel bear a 33% rate as for barley loans.

Out of 25 texts in Table 5 only six fall into this category; 19 replace the silver on loan with barley at rates varying from 420 sila₃ per shekel to 600 sila₃ per shekel. The mean barley:silver ratio in this range is 491 sila₃ per shekel, the median is 451:1 and the most frequently occurring (mode) ratio is 600:1. If we were to make the usual assumption that in the Ur III period, the barley equivalent of a shekel of silver was 300 sila₃ and the further assumption that all of these loans were interest bearing, the average interest rate in these 19 texts would be approximately 63%. Alternatively, an assumption that silver loans carried an interest rate of 20% would mean that the barley:silver ratio

³⁸ Steinkeller interprets obv. 1-3 /2¹/₂ gin₂ ku₃-babbar /1 1(barig) 4(ban₂) še gur-ta /ab-ši-ga₂-ar as “2¹/₂ shekels of silver (is the loan). For each (300 litres) of barley 400 litres were assessed (i.e. the interest is 33%)”, as opposed to “2¹/₂ shekels of silver (is the loan). Each shekel is being replaced by 400 litres of barley”, which more accurately reflects the fact that repayment of the silver loan is expected in barley to be measured out on the threshing floor. Given an assumption that 1 shekel of silver is the equivalent of 300 sila₃ (1 gur) of barley, no difference is made to the calculation that the interest rate is 33% as for a barley loan. The quantity of barley required to redeem the loan of principal plus interest is about 3¹/₃ gur (1000 sila₃). In lieu of repayment in barley, the borrower gives the lender a field for him to cultivate. Steinkeller suggests it is the šuku field of a member of a unit of eren₂, and probably equal in area to 4 iku. He further proposes that this field compensates for the interest only, which would be equal to about 250 litres of barley. However, a 4 iku field in Nippur could perhaps be expected to produce nearly 4¹/₂ gur (1350 sila₃) at 20 gur per bur₃ (Widell 2013:64). 2¹/₂ shekels at 300 sila₃ of barley per shekel is equivalent to 750 sila₃; 1350 minus 750 is 600 sila₃ of barley, so that even after costs of production are deducted, a 4 iku field could be expected to produce ample barley to redeem the loan of 2¹/₂ shekels of silver plus interest of 250 sila₃, otherwise the debt would not be redeemed.

varied between 340 and 540 sila₃ per shekel. A 33% interest rate would mean a variation in the ratio between 300 and 500 sila₃ per shekel. We could only imagine these to be variations in price or equivalents with the greatest difficulty. The variations in the rates at which barley is to replace silver in these loans is probably as much related to the motivations for the lenders to provide credit and the borrowers to need it as to variations in the price of barley or silver. These are discussed at length by Steinkeller (2002) and Garfinkle (2004) and vary from the willingness to provide short term interest free harvest loans to an extended family to schemes by lenders to acquire labour or land to support their own agricultural operations. The notion that varying penalty rates of interest on default have been imposed, though not explicit, is probably also an explanation. They also vary according to whether they are institutional or non-institutional loans. These variations compound the difficulties of using loan documents to provide evidence of the price of either barley or silver.

Receipts of silver with barley equivalent

Despite Garfinkle's stricture that we need to distinguish loan documents from some receipts which use similar terminology, it remains plausible that several of the receipts identified in Table 6 were precursors of or otherwise interconnected with a loan agreement. Garfinkle argued that the loan document contained a specific expectation that the loan would be repaid and can be defined as any agreement which required the repayment of the capital to the creditor (Garfinkle 2004:3). However, as anticipated earlier in discussing Table 5 entries, several of the receipts in Table 6, and in particular those from Nippur, could arguably precede a harvest loan. Four out of five of the Nippur receipts in the table are made in iti še-sag₁₁-ku₅ which is month twelve in Nippur, when according to Potts, the fields of young barley were irrigated before the harvest between two and four months later. Three of the Nippur records, [NATN 554](#), [TMH NF 1-2, 99](#), and [NATN 602](#), indicate that the silver received "is being replaced" (ab-ši-gar(-ra)) with a quantity of barley; and share this formulation with three of the Nippur loans, suggesting that the replacement is a continuing process perhaps to be completed later. It is possible that such an expectation became formalised in an ensuing loan agreement.

The phrase ab-ši-gar also suggests the quintessential meaning of nig₂-sa₁₀-am₃ is something other than price. [NATN 554](#) obv. 1¹/₂ gin₂ ku₃-babbar nig₂-sa₁₀-am₃//2 še gur ab-ši-gar translates to "1¹/₂ shekels of silver is being exchanged with 2 gur of barley", literally "1¹/₂ shekels of silver, the thing exchanged, 2 gur barley is replacing it". The barley:silver ratio in this receipt is 400 sila₃ per shekel and is therefore unlikely to represent the price of barley. The phrase nig₂-sa₁₀-am₃ in this text functions as še-bi in the comparable formula in [TMH NF 1-2, 99](#), in which the barley:silver ratio is 450:1. [NRVN 1, 194](#) a much broken text from Nippur, dated ŠS 3, apparently employs nig₂-sa₁₀-bi where we might expect še-bi and similarly may translate as "its equivalent" rather than "price" since the barley:silver ratio in this instance is 600 sila₃ per shekel. A meaning of "price" would suggest that barley was around half price with respect to silver, which could either imply a glut of barley or doubling in the price of silver. The penalties related to defaulted loans discussed earlier may be more relevant.

The texts with a Girsu provenance in Table 6 however, are clearly receipts with no apparent connection to loans. [MVN 09, 011](#) is an account debited with silver acquired from a number of people but principally from two officials, ur-^dnanše dumu ur-^dba-ba₆ and nam-ha-ni, which under the seals of the same two officials is to be transferred (ugu₂-a ga₂-ga₂-dam) to an account which is the responsibility (giri₃) of ur-ab-ba dumu ba-zi, as ku₃ a₂ zi₃-KA nu-ar₃-ra "silver of the labour of un-milled KA-flour". The silver expended in the account presumably represents the cost of barley (še-bi) to remunerate the labour in the form of barley rations. The barley:silver ratio is 270 sila₃ per shekel. This small account is almost certainly related to the institutional accounts of labour (geme₂ and gurus) days required to mill flour and groats, cf. [TIM 06, 04](#) and [Atiqot 4, pl. 02 07](#) both of which are nig₂-ka₉-ak a₂ zi₃ ar₃-ra "balanced accounts of the labour (to produce) milled flour".

Labour both to mill flour and to load it into boats for transport is accounted for in these two documents.

[JMEOS 12, 41 3488](#), on the other hand, receipts $\frac{5}{6}$ mina of silver, by “a farmer of (the temple of) Ningirsu” and two others, in exchange for 50 gur of barley at the rate of 300 sila₃ per shekel.

<i>Table 6. Silver receipts with barley equivalent</i>				
<i>Text sigla</i>	<i>Indicative phrases</i>	<i>Month date</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
MVN 09, 011	šu-nigin ₂ n gin ₂ ku ₃ -babbar ša ₃ -bi-ta, n gin ₂ n gur-ta, kišib ₃ PN, ku ₃ a ₂ zi ₃ -KA nu-ar ₃ -ra, ugu ₂ -a ga ₂ -ga ₂ -dam, giri ₃ PN,	iti še sag ₁₁ -ku ₅ (month 11) irrigation and first seedlings	Girsu	270
JMEOS 12, 41 3488	n gin ₂ ku ₃ -babbar, še-bi n gur, nig ₂ -sa ₁₀ -bi-še ₃ . PN1, PN2, PN3, [šu] ba-ti.	iti še-il ₂ -la (month 12) irrigation	Girsu	300
NRVN 1, 198	n gin ₂ ku ₃ -babbar n (gur) še-še ₃ , ki PN1-ta, PN2 šu ba-ti, (witnessed)	iti še sag ₁₁ -ku ₅ (month 12) irrigation	Nippur	450
NATN 554	n gin ₂ ku ₃ -babbar nig ₂ -sa ₁₀ -am ₃ , n še gur ab-ši-gar, ki-PN1-ta, PN2 šu ba-ti, (seal)	iti še sag ₁₁ -ku ₅ (month 12) irrigation	Nippur	400
NRVN 1, 194	n gin ₂ ku ₃ -babbar, nig ₂ -sa ₁₀ -bi, n še gur, ki PN-ta, PN, [witnessed], (seal).	[iti] šu-numun (month 4) storage of harvested grains	Nippur	600
TMH NF 1-2, 99	n gin ₂ ku ₃ -babbar, še-bi n še gur, ab-ši-gar-ra, ki-PN1-ta, PN2 šu ba-ti, (seal)	iti še sag ₁₁ -ku ₅ (month 12) irrigation	Nippur	450
NATN 602	n gin ₂ ku ₃ -babbar, še n gur-ta, ab-ši-gar, ki-PN1-ta, PN2 šu ba-ti, (witnessed)	iti še sag ₁₁ -ku ₅ (month 12) irrigation	Nippur	400
MVN 3, 186	n gin ₂ ku ₃ -babbar, še-bi n gur, PN1-ta, PN2, šu ba-ti, (seal)		Umma	240
Aleppo 457	n gin ₂ ku ₃ -babbar, še-bi n gur, PN1-ta, PN2, šu ba-ti, (seal)	iti ezem ^a šul-gi (month 10) end of late sowing/inactive	Umma	300
Nebraska 44	n gin ₂ ku ₃ -babbar, še-bi n gur, ku ₃ -bi year date ugu ₂ PN ba-a-gar, kišib PN, giri ₃ ku-li ensi ₂		Umma	298
BPOA 6, 560	n gin ₂ ku ₃ -babbar, še-bi n gur, ki-PN1-ta, mu PN2-še ₃	iti diri (intercalary month AS 6.13.00)	Umma	288
AUCT 3, 334	n gin ₂ ku ₃ -babbar, še-bi n gur, ki-PN1-ta, PN2 šu ba-ti, (seal)	iti pa ₄ -u ₂ -e (month 11) irrigation and first seedlings	Umma	504
SAT 2, 669	n gin ₂ ku ₃ -babbar, še-bi n gur, la ₂ -ia ₃ su-ga PN1, ugu ₂ PN2 ša ₁₃ -dub-ba-ka ba-a-gar. (seal)		Umma	300

Similarly, it seems certain that at least five of the six Umma texts document receipts of silver are not associated with loans or loan documents. Three of them certainly, or four probably, document the receipt and administration by senior officials of silver revenues of the Umma provincial government. [Nebraska 44](#) is a final accounting of payments of silver to Dadaga which can be matched with the same payments in an earlier receipt document (Ouyang 2013:48-50). Dadaga is one of several such officials who include Akala, Lu-kala, Gududu, Ur-e'e and others among whom is the ensi₂ of Umma. These officials may exclusively be the managers of both the silver revenues and expenditures of the Umma province. Revenues encompass the payment of taxes to the

province, payments of silver from grain cultivation, from animal husbandry, from the production of cash crops and from the hiring out of labour and other factor rents. The Umma texts of Table 6 are receipts of some of these revenues.

In [Nebraska 44](#) Dadaga is the ultimate recipient of seven payments of silver (ugu₂ da-da-ga ba-a-gar “debited to the account of Dadaga”) which is silver either for the year “when Kimaš was destroyed (Š 46) or the following (us₂-sa) year. Three of these payments are associated with animal products - sheepskins, sheep’s innards (sa udu) and sheep’s carcasses (ad₇ udu) - and the equivalent value of the silver in terms of the quantities of these products is given. Each payment is made via a shepherd. A fourth payment of silver is made in respect of a crop of sesame seeds and its equivalent value in this commodity is also given. Three of the payments of silver received by Dadaga of most concern to us here are averaged in Table 6. Ur-e’e, Lu-kala and Ku-li the governor also officiated in [Nebraska 44](#). A further payment of 18 ²/₃ shekels of silver with a barley equivalent of 5300 sila₃ (284 sila₃ per shekel) is recorded in the account and is acquired via (giri₃) ku-li ensi₂ as ku₃-bi mu si-[mu-ru-um^{ki}] lu-lu-bu^{ki} a-a [...] ga [...], perhaps “its silver for the year when Simurum and Lulubum [were destroyed/smashed...] Š 45. Another official of the administration, Ur-Šara son of Basag also receives a payment of silver of 1 ¹/₃ shekels of silver from purchases made by yet another official, Ikala. This silver is equivalent in value to 400 sila₃ of barley, a barley:silver ratio of 300 sila₃ per shekel. The five payments in silver with a barley equivalent, entered in the Appendix and averaged in Table 6 have a mean of approximately 1 gur of barley per shekel.

A(ya)kala, the scribe and son of Ur-nigar who became ensi₂ of Umma, as did his brother Dadaga (Dahl 2007), was one of the major recipients of the Umma administration’s silver revenue. The receipt [Aleppo 457](#) records that he received 60 shekels of silver with a barley equivalent of 60 gur via Dadaga in Š 45. The barley:silver ratio is again 300 sila₃ per shekel. A different a-kal-a, also a scribe but son of Lugal-nesage, a tax collector (en-ku₃), received 22 ³/₄ shekels of silver equivalent to 5460 sila₃ of barley in Š40 at a rate of 240 sila₃ per shekel cf. [MVN 3, 186](#). This Akala may well have been acting for his tax collector father in an official administrative capacity and the silver received would have been tax revenue.

It is less feasible to identify the silver received by Lu-kala in [AUCT 3, 334](#) as revenue of the Umma province since Lu-kala in this instance is the son of Ulu-di rather than the well attested son of Ur-e’e and member of the governor’s family, who was also one of the major recipients of Umma’s silver revenues. Further, the barley:silver ratio is 504 sila₃ per shekel suggesting that as in the case of some of the Nippur receipts this may be the precursor of a loan document imposing a penal replacement rate on default of repayment. The silver received by Ur-Šara a scribe and chief accountant (ugu₂ ur-^dšara₂ ša₁₃-dub-ba-ka ba-a-gar) in [SAT 2, 669](#) on the other hand, is clearly a payment to the provincial administration in respect of animal husbandry. Ur-Šara is debited with one shekel of silver with a barley equivalent of 300 sila₃ in repayment of arrears by Dagi an animal fatterer (la₂-ia₃ su-ga da-gi kurušda).³⁹ The barley:silver ratio in [BPOA 6, 560](#) is 288 sila₃ per shekel and the Umma document appears to be a somewhat laconic version of a simple receipt. In respect of what is unclear, however.

4. *Miscellaneous silver or barley disbursements with barley or silver equivalent*

Table 7 excerpts a miscellany of 20 texts, six with a Girsu provenance, four originate in Nippur and ten have a provenance of Umma. Some of the texts record a disbursement of barley with an equivalent value in silver while others disburse an amount of silver with an equivalent value in

³⁹ For the role of Ur-Šara, the chief accountant, in the administration of silver payments to the Umma institutions cf. Ouyang (2013: 90 *inter alia*).

barley. They also display a variety of contexts in which these disbursements occur, which largely defeats their classification alongside texts in our earlier tables.

The small and laconic Girsu text, [MVN 6, 151](#), is most probably a commitment to repay the interest on a barley loan, which, however, is to be repaid in silver. Nearly 75 gur of barley is to be replaced (su-su-dam) at a rate of 2½ shekels of silver per gur (i.e. 120 sila₃ barley per shekel) with 187¹/₃ shekels. If we suppose the barley equivalent of one shekel of silver to be the standard 300 sila₃, a payment equal to 120 sila₃ per shekel could represent an interest rate of 40% which compares with the usual interest rate on “customary” barley loans of 33% (Garfinkle 2004 :10). Since it was usual to repay customary loans in the same currency as the loan, repayment in silver may account for the higher interest rate. This notion may be supported by the equally small and laconic Nippur text, [NATN 381](#), which in this instance is a receipt of barley in Nippur month 11 of Šulgi 40. Like other Nippur receipts discussed in Table 6, it is feasible that it represents a precursor to a barley loan document. Four gur of barley is perhaps to be loaned, but its gur-measure has to be checked (4 še gur//gur-bi kab₂ di-dam) (Civil 1994:156), following which Aba-Enlilgin received a lesser amount from Ur-Nuska; only three gur and two barig (1020 sila₃ compared with 1200 sila₃) and its silver equivalent was ten shekels. Its barley:silver ratio was therefore 102 sila₃ per shekel, which possibly looks like an interest rate of 34% on a barley loan.

Each of the remaining five texts from Girsu, regardless of whether it expresses an equivalency of barley with silver or silver with barley, equates one gur of barley to a shekel of silver. Nevertheless, although each of them arose out of activities of the provincial administration, only two may be said to share the same context.

[LB 557](#) is “a balanced account of Madga barley” (nig₂-ka₉-ak še ma₂-ad-da-ga) from Š 47 and has a related text from the same year, [Nisaba 07, 10](#), which text is analysed and discussed at length by Heimpel (2009:33ff.). Heimpel’s analysis proposes that this latter text is a summary of the receipts of barley rations by their supervisors (ugula) from the Girsu administration for workers on mission to Madga. That document is compiled by a “scribe of the dock” Ur-Igalima, son of Atu. About 20% of the total barley received by the ugula remained unspent, - as a “deficit” (la₂-ia₃). [LB 557](#) probably complements [Nisaba 07, 10](#) and possibly other similar but unknown texts as well. It is subscribed nig₂-ka₉-ak še ma₂-ad-da-ga (and explicitly) giri₃ ugula erin₂-na-ke₄-ne “a balanced account of Madga barley via the overseers/supervisors of the workers” and records the return, via the ugula, of the barley previously unspent, in this case by each of them, to two persons who are officials of the provincial administration, nig₂-u₂-rum and ur-^dlamma. The two texts share several of the names of nine ugula and so may be complementary. Ur-Lamma receives two of the allocations in silver in lieu of barley, even though it is assigned from unspent barley. The barley:silver ratio in the one undamaged entry is 300 sila₃ per shekel. These are clearly accounts of the Girsu administration which paid each ugula the rations for their workers on a monthly basis, whether the workers were away on an assignment or not (Heimpel 2009:33). Rations which remained unpaid to workers were restored to the administration.

[ASJ 8,111 29](#), much destroyed on the reverse, is “a balanced account of barley removed” (nig₂-ka₉-ak še kar-ra). 136130 litres of “barley removed from the Marsh field” (še kar-ra a-ša₃ ambar) via (giri₃) Ur-Nanše plus a much smaller “unspent” (la₂-ia₃) quantity of 837 ²/₃ litres is nearly all distributed (zi-ga) among a number of officials of the administration. One of these is the ensi₂ who receives (under his seal) 22 shekels of silver in lieu of 22 gur (6600 litres) at a barley:silver ratio of 300 sila₃ per shekel.

[ITT 5, 06760](#) and [ITT 5, 06776](#) are both receipts of barley for the bala and have a barley:silver ratio of 300 sila₃ per shekel: the first for 134 gur equivalent to silver of 134 shekels replaces a deficit and the second is for 60 gur equivalent to 60 shekels of silver.

[BBVO 11, 257, 4N-T197](#) is an annual account of the Inanna temple in Nippur for a specialised activity and possibly distributes available assets (sag-nig₂-gur₁₁-ra-kam) of silver, barley and other commodities as cultic expenditure. Its function and content is discussed at length by Van Driel (1998:398) with some difficulty due to the extensive destruction of the obverse of the tablet. After the major expenditure of the assets, extra expenditure of commodities with a silver value of 60.03 shekels (ku₃ nig₂-diri-ga “silver of the excess”) was made. 32.06 shekels were taken away (diri de₆-a) and replaced with 12826 ²/₃ litres of barley at a barley:silver ratio of 400 sila₃ per shekel (1 gin₂ ku₃-babbar-a//1 1(barig 4(ban₂) še gur-ta//ab-ši-gar //še-ta ab-ta-zi, “400 litres barley to each shekel of silver has replaced it, it (the barley substitution) was deducted from the barley (component of the sag-nig₂-gur₁₁-ra)”).

The Nippur text, [NATN 605](#), is more of a curiosity. It records nine assignments of a total of 6610 litres of barley to nine separate individuals in Nippur month 12, perhaps just prior to the harvest. Four of these allocations are recorded with a silver equivalent (ku₃-bi) equal to 150 sila₃ of barley per shekel of silver. “Šeššešmu received the silver” (šeš-šeš -mu-ke₄//ku₃ šu ba-ti). A possible interpretation of the document is that it is an account of nine “harvest” barley loans with four of them bearing interest of 50% paid in silver, which Šeššešmu collected.

One of the ten Umma texts in Table 7 is explicit that barley is actually exchanged for silver, providing an unequivocal indication of the price of silver in terms of barley, indeed it is almost unique among all the texts collected in this study, in its relative unambiguity in this respect, with its sole companion being the Girsu text [CTNMC 53](#) which arguably witnesses an equally unequivocal description of an exchange of silver for barley. The Umma example, [YNER 08, 13](#), is a “balanced account of silver of the governor” (nig₂-ak₉-ak ku₃ ensi₂-ka), one of the accounts kept by the major administrators of the province’s silver revenue and expenditure. The “debits” are revenues of the Umma administration and show silver incoming to the account from four transactions in three different years in which barley has been exchanged for silver (še ku₃-še₃ sa₁₀-a). The barley:silver ratio in each of these transactions is 350, 340, 300 and 255 sila₃ per shekel of silver respectively, with a text average, entered in Table 7, of 311 sila₃ per shekel. In addition to the silver from these four transactions, the revenue includes silver from an ugula of a mill which has replaced arrears in a tithe of the governor. Approximately two-thirds of this revenue is expended to pay for a copper standard under the seal of the governor. The unspent balance of silver (la₂-ia₃) remained to the account of the governor. The account was managed via Lu-kala, who as we have noted already was one of the four principal administrators of the province’s silver revenue and expenditure.

[RA 9, 158](#) may also record the receipt of silver revenue by an official of the Umma administration. As in [Nebraska 44](#), this text may register the collection of revenue by Dadaga, already identified as another of the principal administrators of the province’s silver. “Ten shekels of silver is placed in the account of Dadaga at Umma to be verified, its barley is ten gur” 10 gin₂ ku₃-babbar ugu₂ da-da-ga//umma^{ki}-a gar-ra DU igi kar₂-[kar₂]-dam //še-bi 10 gur-am₃. The barley:silver ratio is clearly 300 sila₃ per shekel. The silver perhaps received by Dadaga is possibly a payment to the administration in respect of grain products (Ouyang 2013:62). The document is “an account of groats on hand” nig₂-ka₉-ak ninda nig₂-gal₂-[la]//“of the temple of the Lady of Zabala (Inanna) in Apisal”^dnin-zabala₃^{ki} a-[pi₄-sal₄^{ki}].⁴⁰ Supposing that the extensive blank spaces on both the obverse and reverse of the tablet do not impact on the interpretation of the text, it would seem that 540 litres of groats on hand per annum were accumulated for a period of 17 years 5 months to provide “available assets” (sag-nig₂-gur₁₁-ra-kam) from which (sa₃-bi-ta) the silver was placed to the account

⁴⁰ The translation of the reading ninda as “bread” in the neo-Sumerian period appears misleading. Most probably GAR represents a generic term for various types of groats (Damerow 2012:10 note 33).

of Dadaga. Should the blank spaces be assumed to be significant, it might then be possible that this is an exercise tablet with the assignment of silver to Dadaga having no relation to the first six lines or the subscript. Either interpretation has no bearing on the valuation by the temple managers that one gur of barley is equivalent to one shekel of silver.

[YNER 8, 21](#) is an Umma silver account of the province administration which contains two quantities of barley each with a silver equivalent value. The first of these is 108700 litres of barley and its silver (ku₃-bi) is approximately 543 ½ shekels giving a barley:silver ratio of 200 sila₃ per shekel. This barley with a smaller quantity of emmer wheat was delivered to a granary (guru₇ ku_x-ra). A smaller quantity of barley 9300 litres with a silver equivalent of 31 shekels, and therefore a barley:silver ratio of 300 sila₃ per shekel, together with 9000 litres of dates comprise the rations of potters (bahar₃ ma-da). These rations and the barley entered into the granary will be debited to the account of the supervisor of the granary. The silver value of these “credits” are expended from (sa₃-bi-ta.....zi-ga) the silver capital in the debit at the head of the account, the numbers of which are mostly destroyed.. Other items on the credit side of the account record provisions of silver for purchases of sesame oil, copper, various goods, and onion seeds together with purchases from Apisal by several of the Umma merchants.

A possible non-institutional Umma text which contains a barley:silver ratio of one gur per shekel of silver is [MAOG 04, 188 2](#) which is the receipt for the purchase money from the sale of a person. The price was paid in barley. The price (nig₂-sa₁₀-am₃) of the person is given as 15 gur of barley, equivalent to 15 shekels of silver (15 še gur lugal//ku₃ 15 gin₂-še₃).⁴¹

[TCL 05, 6051](#) is an institutional account from Umma verifying a barley:silver ratio of 300 sila₃ per shekel, though the quantities involved in the account are almost too small to merit a mention. Arrears or a deficit of 8 ⅓ sila₃ of barley have a silver equivalent (ku₃-bi) of 5 grains of silver at obv. (i) 1-2, which is the same as one gur of barley is equal to one shekel of silver. However, what is significant here is the context within which the ratio arises. The text is a collection of several surpluses and deficits of silver which emanate from acquiring a wide variety of commodities almost certainly via trade through a merchant. The subscript of the text reads diri la₂-ia₃ ku₃ ga₂-ra//lugal-nig₂-lagar-e dumu lugal-sag₁₀(IGI.ERIN₂)//giri ur-^dšara₂ ša₁₃-dub-ba “accumulated silver surpluses and deficits (of) Lugal-Niglagare son of Lugal-saga via/under the authority of Ur-Šara, the chief accountant”. Although we don’t have an attestation that lugal-nig₂-lagar-e was a merchant, his father lugal-sag₁₀ possibly has⁴² and that the merchants both received from and paid silver to the Umma administration out of their trading, is well established. [Nisaba 26, 002](#), purportedly some 15 years later than [TCL 05, 6051](#), is a silver account of one of the main administrators of the province’s silver, Gududu, (nig₂-ka₉-ak ku₃-ga//gu-du-du). In [Nisaba 26, 002](#), obv. (ii) 15-16, lugal-nig₂-lagar-e dumu lugal-sag₁₀ is attested as repaying arrears of 15 shekels of silver which Gududu collected. The account lists silver payments Gududu received in respect of various taxes, to replace deficits in cash crops and animal husbandry, the provision of a gift of silver rings for a statue of the king in the temple of the god Šara and expenditure on cultic objects such as standards of Guedena in Umma and Apisal.⁴³

⁴¹ There is some doubt regarding the provenance of this text. Both CDLI and BDTNS databases query an Umma location, which has to be extremely doubtful given a month date of iti me-ki-gal, the fact that the person was bought in u-pi₅^{ki} and the agreement witnessed and completed on the bank of the Diyala River (gu₂ i₇ dur-ul₃-ka). Of course, one of the parties to the transaction could have taken the receipt home to Umma. For a translation of the text, see Steinkeller (1989:321-2).

⁴² See [MVN 03, 186](#) envelope obv. 3 kišib₃ lugal-sag₁₀ dam-gar₃ and [JRAS 1939, 39](#) obv. 3 ki lugal-sag₁₀ dam-gar₃-ta.

⁴³ [Nisaba 26, 002](#) is discussed at length by D’Agostino and Pomponio (2014).

With the exception of the much broken and indecipherable [UTI 5, 3497](#), which has a barley:silver ratio of 260 sila₃ per shekel, the remainder of the Umma texts in table 7 exhibit ratios which vary between 120 and 155 sila₃ per shekel, a half or less of the assumed Ur III average. All are small texts. Two of them are identifiable as receipts but offer no possibility of suggesting why the ratio is what it is.

<i>Table 7. Miscellaneous Silver or Barley Disbursements with barley or silver equivalent</i>				
<i>Text sigla</i>	<i>Subscript</i>	<i>Indicative phrases</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
MVN 6, 151	seal	<i>n še gur lugal n gin₂-ta, ku₃-bi n gin₂, še zi₃ KA, [ki] PN1, PN2 su-su-dam.</i>	Girsu	120
LB 557	nig ₂ -ka ₉ -ak še ma ₂ -ad-da-ga, giri ugula erin ₂ -na-ke ₄ -ne	ša ₃ -bi-ta, la ₂ -ia, n gin ₂ ku ₃ (-babbar), še-bi n gur, PN šu ba-ti,	Girsu	300
ASJ 8.111 29	nig ₂ -ka ₉ -ak še kar-ra	ša ₃ -bi-ta, la ₂ -ia, n gin ₂ ku ₃ -babbar, še-bi n gur, kišib ₃ ensi ₂ , ugu ₂ PN ba-a-gar, zi-ga.	Girsu	300
ITT 5, 06760	bala-še ₃ , giri ₃ PN3	<i>n še gur lugal, ku₃-bi n gin₂, la₂-ia₃ su-ga, ki-PN1-ta, PN2 šu ba-ti.</i>	Girsu	300
ITT 5, 06776	bala-še ₃ , giri ₃ PN3	<i>n še gur lugal, ku₃-bi n gin₂, ki-PN1-ta, PN2 šu ba-ti.</i>	Girsu	300
Nisaba 7.11	Totals silver and barley.	šu-nigin ₂ n gin ₂ ku ₃ -babbar, ša ₃ -bi-ta, n še gur ku ₃ (-bi) n gin ₂	Girsu	300
NATN 381	date	<i>n še gur // ku₃-bi n gin₂, ki PN1-ta, PN2 šu ba-ti.</i>	Nippur	102
BBVO 11, 257. 4N-T197	nig ₂ -ka ₉ -ak e ₂ - ^q inanna _{1,1} ,iti-bi 12-am ₃	si-i ₃ -tum, [sag]-nig ₂ -gur ₁₁ -ra-kam, [ša ₃]-bi ta, zi-ga-am ₃ , n gin ₂ ku ₃ -babbar, diri de ₆ -a, še-bi n gur, 1 gin ₂ ku ₃ -babbar-a, n še gur-ta, ab-ši-gar, še-ta ab-ta-zi.	Nippur	400
TMH NF 1-2, 59	ki PN ba-zi	i ₃ -bi ₂ -za e ₂ -gal, n še gur ku ₃ -bi n gin ₂ ,	Nippur	242
NATN 605	total barley, date	<i>n še gur lugal, ku₃-bi n gin₂, PN-ke₄ ku₃ šu ba-ti, šu-nigin₂ n še gur.</i>	Nippur	150
SAT 2, 33	date	<i>n(barig) še, ku₃-bi n gin₂, la₂-ia₃ še zi-ga</i>	Umma	144
CST 721	ki-PN-ta, kišib ₃ PN, (seal)	<i>n(barig) še lugal, ku₃-bi n gin₂, sa₂-du₁₁ ^qšara₂, PN šu ba-ti</i>	Umma	121
RA 9, 158	nig ₂ -ka ₉ -ak ninda nig ₂ -gal ₂ -[la], DN1 GN1, PN2	sag-nig ₂ -gur ₁₁ -ra-kam, ša ₃ -bi-ta, n gin ₂ ku ₃ -babbar ugu ₂ PN1 umma ^{ki} -a gar-ra DU igi kar ₂ -kar ₂]-dam, še-bi n gur-am ₃ .	Umma	300
TCL 05, 6051	diri la ₂ -ia ₃ ku ₃ ga ₂ -ra, PN1, giri ₃ PN2 ša ₁₃ -dub-ba	la ₂ -ia ₃ n sila ₃ še, ku ₃ -bi n še// la ₂ -ia ₃ -am ₃ . diri...// diri-ga-am ₃ .	Umma	300
YNER 8, 21	zi -[ga]-am ₃ , date	ša ₃ -bi-ta, n še gur, ku ₃ -bi n gin ₂ .	Umma	250
YNER 08, 13	nig ₂ -ka ₉ -ak ku ₃ ensi ₂ -ka giri ₃ PN	<i>n še gur n gur-ta, ku₃-bi n gin₂, n gur, ku₃-bi n gin₂, še ku₃-še₃ sa₁₀-a, la₂-ia₃ su-ga, ša₃ -[bi]-ta, kišib₃ ensi₂-ka.</i>	Umma	311
AUCT 1, 330	date.	<i>n še gur lugal, ku₃-bi n gin₂, kišib₃ dib-ba</i>	Umma	154

<i>Table 7. Miscellaneous Silver or Barley Disbursements with barley or silver equivalent</i>				
<i>Text sigla</i>	<i>Subscript</i>	<i>Indicative phrases</i>	<i>Provenance</i>	<i>mean sila₃ barley per shekel silver</i>
		PN1, ki PN2-ta, e ₃ -e ₃ -de ₃ , PN3 šu ba-an-ti.		
TLB 03. 151	date.	n še gur, ku ₃ -bi n gin ₂ , giri ₃ PN	Umma	150
UTI 5. 3497	še su-ga ProfN1-a(k) ProfN2 u ₃ ProfN3, kišib ₃ še e ₂ -ta šu [su]- ba)?	n gin ₂ ku ₃ še-bi n gur.	Umma	260
MAOG 04. 188 2	<i>Purchase of Person with barley (witnessed)</i>	n še gur lugal, ku ₃ n gin ₂ -še ₃ , nig ₂ -sa ₁₀ - am ₃ PN1-še ₃ , ki-PN2- ta, PN3 šu ba-an-ti.	Umma?	300

Variations in barley:silver price ratios

It is evident from the foregoing that the barley:silver price ratios vary considerably with both the geographic origin of a text and the administrative context in which these ratios occur, whether or not we understand them as prices or equivalents. The value of barley relative to silver arguably varies for quite other reasons than those of abundance or shortage due to natural events, or because of changes in the market and therefore the demand for and supply of one or the other of these commodities. The statistics of the distribution of the ratios collected in the Appendix, measure and locate this variation.

Of primary importance is to note the limited geographic coverage of the sample as well as the limitations imposed by its size. In total, there are merely 157 observations of the ratio in the data and these are witnessed in texts from only three provenances, Girsu (71 or 45%), Umma (59 or 38%) and Nippur (27 or 17%). The Nippur statistics, for convenience include the single observation from nearby Puzriš-Dagan. Given that the Ur III state may have had some 19 core provinces covering a relatively large geographical area (Sharlach 2004:7-8), pretence that our data has any valid application statistically in discussing prices in the neo-Sumerian economy generally tends to the heroic.

The statistics at the foot of the Appendix list are equivalent to those derived by Snell (1982:147) for the whole distribution of prices for his “Grains”. The doubling of the sample produces small differences from his results but only in the mean of the distribution. In Snell’s terms, the overall mean of my distribution is 0.57 še of silver per sila₃ of barley (316 sila₃ per shekel) compared with his 0.62 (290 sila₃ per shekel). The median values of barley remain the same, 0.60 še per sila₃ or 300 sila₃ (1 gur) per shekel. The statistics also illustrates that the mode or most frequently occurring value is also 300 sila₃ per shekel increasing the probability that one gur of barley is equal in value to one shekel of silver. Of equal note, however, is the variability in the distribution of about 95 sila₃ per shekel as measured by the standard deviation. On the reasonable assumption that the real mean of the population of barley:silver ratios, as opposed to the sample mean, is equal to one gur per shekel, one standard deviation is equal to nearly a third of a gur.

The variability in the barley:silver ratio is significantly different in the sub-samples from each of the three Ur III provinces for which we have data. The sample mean in the Girsu data is 293 sila₃ per shekel, though the median and the mode values are both still equal to 300 sila₃ per shekel. However, the variability in the sample as measured by the standard deviation is much less at 33 sila₃ per shekel. The Umma data more closely reflects the overall statistics. The Umma mean is 312 sila₃ per shekel with a standard deviation of 99 sila₃ per shekel, again nearly a third of a gur. The median and mode values are both equal to 300 sila₃ per gur. On the other hand, the Nippur data presents a quite different picture from either Girsu or Umma. The mean is 387 sila₃ per shekel with a standard deviation of 150 sila₃ per shekel while the median and the mode are both 400 sila₃

per shekel, so that the Nippur distribution peaks at a point a third of a gur above the overall population mean.

The differences are best illustrated by the diagram in Figure 2. The bar chart compares the normalised distributions of the barley:silver price ratios for Girsu, Umma and Nippur by plotting the standardized or z -scores of each of the ratios.⁴⁴ Such a distribution has a zero mean and one standard deviation above the mean is +1 and below the mean is -1. The zero mean is equivalent to a mean of 300 sila₃ (one gur) of barley per shekel (gin₂) of silver. It is evident that the distribution of the Girsu price ratios peak at this average value. The majority, 65%, of the Girsu ratios are 300 sila₃ per shekel compared with only 31% in the Umma data, the distribution of which nevertheless peaks at this average. The rather fewer Nippur ratios have none at this population mean. The Nippur distribution peaks with 41% of cases at one standard deviation above the mean, which in the Nippur data is equivalent to 400 sila₃ per shekel; a significant 33% above the zero mean.⁴⁵ The Nippur distribution can also be seen to have much greater variability than that in either the Girsu or Umma data, with as many as 19% of cases at two standard deviations above the zero mean and some 15% at about one and a half standard deviations below the mean. It is evident from the diagram that the next most and still substantially dispersed distribution is that of Umma, with the Girsu data showing much less variability.

The influence of context on variability

The differing administrative contexts and purposes of the accounts in which the barley:silver ratios occur, rather than abundance or scarcity, or the trading of barley for silver in a market system - even one characterised by barter - arguably determine most of the variations evident in the value of the ratios. The texts in the first four of these tables, predominantly if not entirely, recount the activities of the institutions of the provincial governments and are accounts kept by these institutions.

Tables 1 and 2 excerpt balanced accounts which record deliveries of barley from individuals, possibly farmers or sharecroppers among others, owed to an institution of government. The deliveries reduce deficits in barley remaining from previous years or are remittances required in the current year. Deliveries are often recorded as deliveries to replace arrears. The large majority of such deliveries are of barley, but a few repayments are made with silver in lieu of barley. Some of the accounts in Table 1 relate to deficits remaining and incurred by the activities of storekeepers of institutional facilities such as a flour mill, while in Table 2 the balanced accounts are related to the activities of named individuals or in one case those of the household of a major-domo. The latter also record deliveries of barley to the institutions and some of silver in lieu. 22 of the 23 texts in these two tables are from Girsu, the odd one out has a provenance of Umma. Only 6 of these texts do not register an average barley:silver ratio of 300 sila₃ per shekel, and of those only two are as much as a barig (60 sila₃) less than this, while the remainder are half that amount away from the one gur per shekel mean. It is particularly noteworthy that the sole text from Umma in this category also records a barley:silver ratio of one gur per shekel. The institutional context for most if not all of these texts suggests that where barley was required to be delivered to the provincial administration and silver was accepted in lieu, the quantity of barley to be set against the deficit may have been fixed at this ratio. If so, it is likely that this “administered price” or equivalency was set by the provincial government.

⁴⁴ The small size of the sample does not really permit an accurate *statistical* application of this particular methodology. I have adopted the approach of standardizing the scores to produce an appropriate diagrammatic comparison of the variability in so called barley:silver prices.

⁴⁵ Co-incidentally the rate of interest on a barley loan!

Figure 2. Variation in barley:silver ratios in Ur III period



An equivalency of 300 sila₃ of barley per shekel of silver is also largely supported by the accounts detailed in Table 3. For the most part, these are accounts of allocations or “expenditures” from barley assets of the provincial institutions for a wide variety of purposes including the payment of taxes, interest on barley loans and field rents. Eight out of ten of the texts originate from Girsu and two are from Umma. Six out of ten record a barley to silver equivalency of 300 sila₃ per shekel including one of the Umma texts. However, the remaining four texts indicate more variability in the barley:silver ratio, for which in most cases it is difficult to offer an explanation.

Barley is the principal staple commodity supplied as “capital” or “available assets” by the provincial administrations to merchants, to acquire via them those commodities required by but not produced by the temples or other state institutions themselves. All but one of the sixteen “merchant accounts”, which supply barley to merchants as capital, emanate from Umma. The sole exception from Girsu, values the equivalency between barley and silver in a ratio of 300 sila₃ per shekel. Even though the balanced merchant accounts record only the expenditure of barley “assets” from surpluses produced by Umma institutions, considerably more variation exists in the barley to silver equivalencies in these texts. The values assigned to barley components of the sag-nig₂-gur₁₁-ra in the Umma merchant accounts vary from 225 sila₃ per shekel to 420 sila₃ per shekel. Only eight out of 22 of the Umma values are equal to 300 sila₃ per shekel. If we assume that the “administered” mean value of barley relative to silver was one gur equals one shekel in Umma as in Girsu, perhaps evidenced by the median value in the statistics, the barley:silver ratio in the merchant texts varies from 1¼ barig per shekel below this population mean to two barig per shekel above the mean although if outliers in the distribution are ignored it is evident from Figure 1 that the standard deviation is one barig per shekel. Thus, in the merchant texts the barley:silver ratio could have been equal to $1 \pm \frac{1}{5}$ gur per shekel. The Umma merchant accounts from which these data were extracted are from a 30-year period dated from Š 33 to ŠS 7 and it is also noticeable from Figure 1 that variations in the ratio are largely unsystematic.

The magnitude of these variations in the silver values of barley in the capital sections of the merchant accounts is not sufficiently large as to infer that the administration did not pursue a norm of one gur per shekel in its internal accounting systems. It may be that disbursements and acquisitions in the merchant accounts are valued in silver to iron out fluctuations in the staple surpluses expended to acquire commodities from the merchants. If the barley surplus available to exchange for other commodities, after internal institutional needs are satisfied in any one accounting period, was plentiful, the additional amount of silver required as “capital” would be lower and the barley per shekel would appear higher than 300 sila₃. Thus, the so-called price of barley would appear low. And vice versa, if the available surplus of barley was smaller than required to balance the silver value of commodities for which “capital” was exchanged, the balancing amount of silver required would be higher, the amount of barley per shekel would appear less than 300 sila₃ and the price thus higher. These variations might readily be administrative adjustments around the standard one gur per shekel and not determined in a market. Resources available to satisfy institutional demands for non-staple commodities can in this manner be stabilized. For such a mechanism to be effective, silver as well as barley needs to circulate as money as between institution, merchant and producers of commodities. But then we can readily assume it did, as proposed by Steinkeller (2004: 108), so that transfers of silver and commodities took place to “private” individuals, leaving them in possession of liquid funds to spend in local markets.

Frequent variations in surpluses probably depended more on shifting demands for rations to remunerate workers employed by institutions than on the occurrence or not of natural disasters. The overall level of demand for rations (wages) varied as a function of seasonal and other periodic changes in the level of labour requirements for different agricultural and other operations whereas the remuneration per person was unlikely to vary. The notion of the use of silver as a stabilizer to support the activities on behalf of the institutions by the merchants is credible in such circumstances.

Even allowing that different institutional organisations may have existed in Girsu and Umma, it is usually inferred that they standardised administrative and accounting systems.⁴⁶ This inference is partly supported by the small Umma account [Ontario 2, 442](#) in Table 1 and unequivocally by the exactly Umma-like balanced merchant account, [MVN 11, 101](#), from Girsu in Table 4. However, there is a marked contrast in the nature of the accounts from the institutions of Girsu and Umma in our available data sample. The primary focus of the texts of Tables 1 and 2 is to register the deliveries of barley quotas due from their agricultural activities exacted by the institutions. These provide the barley incomes of the institutions for redistribution in rations and in other expenditures. Almost all of these texts are from Girsu. The majority of texts recording expenditures of barley and some silver in lieu of barley by institutions on state taxation and the cultivation of fields in Table 3 are from Girsu with only a couple from Umma.

It is only after the barley and other staples needed to satisfy these essential functions of the administration have been allocated that surpluses arise which can be used to acquire the variety of other luxury and day-to-day commodities required by the temples, palaces and other institutions of the Ur III state. An administered barley:silver price ratio of one gur per shekel may be much

⁴⁶ Steinkeller (1991:16-17) locates Šulgi's administrative reforms to the second half of his reign, after Š 21. Among these reforms were the creation of a unified administrative system for the whole of Babylonia; the introduction of the bala taxation system; the creation of a state bureaucratic apparatus and scribal schools with standardised training; the reform of the writing system; the introduction of new accounting and recording procedures and new types of archival records; the reorganisation of the system of weights and measures; the introduction of the “Reichskalender” which became official throughout the Ur III state, all of which created an apparatus which may have enabled the “administration” of prices.

more visible in the categories from Girsu defined by Tables 1-3, but exhibit more variability in the “capital” section of the merchant accounts from Umma for the reasons suggested.

The variability introduced into the distribution of price ratios by the Umma merchant accounts is substantially accentuated if ratios from silver loans to be repaid with barley and from receipts of silver with a barley equivalent are also included. This is not so of the Umma receipts, however. The majority of these are not associated with loans, but record silver received by the governing administration mostly at a barley:silver ratio close to 300 sila₃ per shekel. These loan and receipt documents are excerpted in Tables 5 and 6. Most of the loan documents originate in both Umma and Nippur, equal numbers of which stem from each place. The likely impact of these ratios on the overall variability in the complete sample is highlighted by the Nippur data. The distribution of the Nippur barley:silver ratios, even including four in the miscellaneous group (Table 7), has no observation at a mean of 300 sila₃ per shekel and exhibits a much greater dispersal in the ratios than either of the Umma or Girsu distributions.

Figure 2 clearly illustrates the dispersal created by the loan documents and receipts in the distribution of barley:silver price if it is assumed that the barley repayment is equivalent in value to the loaned silver. In other words, that there is no interest on the loan. A more reasonable assumption is that the loans in Table 6 are mostly “harvest loans” which incur a rate of interest. The average of the Nippur data is 400 sila₃ per shekel, a third higher than one gur is equal to one shekel, which is the 33% interest rate on a barley loan. However, the dispersal around this mean in the data is considerable and in some records the ratio suggests an interest rate of 20% appropriate to a silver loan. We noted earlier that penalty repayments of up to double the capital loaned may also contribute to the variability. For these rates of “interest” to apply, however, it has to be assumed that the real barley to silver equivalent value or price ratio was the standard one gur per shekel, which contradicts the miasma of the low Nippur “grain” prices suggested by Snell’s analysis in his Table 6.

The miscellany of texts in Table 7 also shows wide variations in the barley:silver ratio. Except for one, the Girsu texts which are accounts from the institutions, produce a ratio of 300 sila₃ per shekel. The variability in the price ratio is greater in the Umma texts and is again more marked in the Nippur texts. Three of these texts perhaps merit further observations. The Nippur text from the temple of Innana, [BBVO 11, 257, 4N-T197](#) values the barley:silver ratio at 400 sila₃ per shekel. Figure 2 shows this to be the same as the mean of the Nippur ratios, which gives pause for thought that the Nippur population average may actually be 400 sila₃ per shekel rather than 300, partially negating some of the arguments put forward in respect of the Nippur loan documents.

A second text of interest, [MAOG 04, 188 2](#), is a receipt for 15 gur of barley paid to purchase a person. Its silver equivalent is given as 15 shekels. The document may flow from a transaction of a non-institutional household but nevertheless assumes a price ratio of 300 sila₃ per shekel.

Noteworthy in a discussion of the barley:silver price is the Table 7 text from Umma, [YNER 08, 13](#) a balanced silver account of the ensi₂. This is possibly a second example among the 157 texts examined in this study, which explicitly describes quantities of barley from three successive years as “barley exchanged for silver”, though [CTNMC 53](#) more laconically defines the exchange simply as “barley for silver”. The four barley:silver ratios are 350, 340, 300 and 255 sila₃ per shekel or 1 gur ± 5 ban₂ per shekel.

Some preliminary conclusions

A cursory view of this analysis might conclude that, irrespective of a doubling of the size of the sample of barley:silver prices, does not differ from Snell’s 1982 finding with respect to the price of “grain”. Rather, it might be said to replicate his overall result. The median value of one gur

barley per shekel of silver is here the same as that in his earlier study. Further, the most frequent value in the data, the mode, is the same at one gur per shekel. The average values are little different. Snell decided that his median values were more appropriate as a measure of prices than the mean and that the median value of one gur per shekel was the price of barley.

However, this was simply a statistical measure of central tendency in a widely dispersed distribution in the light of which Snell disputed Maurice Lambert's proposal that there was a fixed ratio between silver and barley. He was unconvinced that, in view of the many deviant prices even in official documents, such a ratio was either promulgated by the state or sanctioned by tradition (Snell 1982: 185). Nonetheless, that the institutional implementation of a fixed bi-monetary price ratio or equivalency of one gur of barley per shekel is essential to the administration of the Ur III state economy as a foundation to most commodity prices, remains the view of scholars such as Englund and Hudson *inter alia*. Significant misgivings surround this view nonetheless, even among those who espouse it. These are generated by the variability in the barley:silver ratio in many documents and, like Englund, we can often only speculate as to its causes. However, it is evident from this study that much of this variation is inculcated by the incompatible geneses of the source data.

An initial constraint in all Ur III data related to commodity values or prices is that imposed not only by the limited size of the data samples which can be collected, but also by bias built in by the distribution of tablet provenances and of their purposes in the whole of the Ur III corpus. Compounding the difficulties of the small size of a geographically skewed sample, the most explanatory source of the variability in the barley:silver ratio derives from the differing contexts in which they occur. These contexts are different with regard to the function of the accounts and other documents in which transactions in barley and silver are recorded and to whether or not either barley or silver is a unit of account or a payment in lieu. Texts can be assembled into a contextual typology of the barley:silver prices into which all but a minority can be classified. This categorisation of the texts reveals further biases in the sample of price ratios. The asymmetrical contexts of the sample are broadly coincident with its geographical skewness.

Three groups of texts have provenances almost entirely from Girsu. These are concerned with either the delivery of barley to institutions or the disbursement of barley from them. Each contains either a delivery or an expenditure of silver in lieu of barley. In these accounts the unit of account is barley. Payments are in silver, the barley equivalent (*še-bi*) of which is used to convert the silver to barley for accounting purposes. Only two or three texts are from Umma. No other province of the Ur III state is represented in these texts. In the first two of these groups the barley:silver ratio, with few exceptions, is 300 *sil₃* per shekel. In the third, 300 *sil₃* per shekel is again predominant, although there is some fairly insubstantial variation from it.

In contrast, the merchant accounts, excepting one from Girsu, emanate from Umma. Since these accounts are balanced in silver, the unit of account is silver (*ku₃-bi*) and is used in the valuation of the commodities acquired from the merchants as well as in the conversion to a silver value of surpluses of staples expended to acquire these commodities. The variations in barley surpluses remaining after the demand for barley within the internal institutional economy had been met, probably explains the departures from what may have been an administratively fixed norm of 300 *sil₃* of barley per shekel, a ratio which certainly did occur in the merchant accounts. It might be asked whether this value would appear randomly from market feedback in such a small sample of these texts, in one, let alone in eight out of 22 observations.

The loan documents are also lumpily distributed geographically. Their provenances are almost equally shared between Umma and Nippur. All of these describe silver loans to be repaid in barley. In these *še-bi* does not represent a unit of account but indicates that the loan is to be redeemed

with a payment of barley. The widely dispersed values of barley per shekel may reflect different rates of interest and penalty payments. The loan documents are best omitted from the data as a barley:silver ratio estimated from them is unlikely to be a measure of barley prices or equivalencies. We can only make sense of them if we assume that the value of barley is 300 sila₃ per shekel. It then is possible to compute interest rates and penalty payments. To assume that the data measures a barley:silver ratio or a price introduces a great deal of unlikely variance into the overall distribution. Similar arguments apply to receipt documents, though not to the institutional receipts from Umma, and even though we lack the obvious reassurance in those that barley is to repay silver. Their geographical distribution largely replicates that of the loan documents.⁴⁷

Perhaps twelve from 20 texts in the miscellaneous set of texts are accounts from institutions and of these some seven testify to barley:silver ratios of 300 sila₃ per shekel. The majority of these are accounts of Girsu institutions. Seven of the remaining eight texts have very low ratios, which if interpreted to be prices would suggest very high barley prices indeed. Most of these texts were beyond my construal but it remains doubtful that these ratios represent prices. Such prices are even less likely when a possible non-institutional text of uncertain provenance records the purchase of a person for a quantity of silver with a barley equivalent of 300 sila₃ per shekel. The majority of the texts in this miscellany reinforce the probable existence of administered prices at this fixed rate.

In summary, there are several general conclusions to be drawn from this study. Although as scholars have observed, there is no apparent evidence in the Ur III texts of an explicit decree that a barley:silver price ratio was fixed at one gur per shekel, it seems clear from the barley accounts which comprise the large majority of Girsu texts, that barley primarily functions as the unit of account and where silver was paid in lieu of barley it was valued at one gur for each shekel. This ratio was a barley:silver equivalency no different from that argued by Polanyi or Hudson's bi-monetary price ratio, fixed and administered by the Girsu institutions.

How far the governmental use of this equivalency can be asserted to extend beyond the Girsu institutions is almost another *argumentum ex silentio*. The bulk of the texts from Umma in this collection are a quite different animal from the Girsu barley accounts. The Umma texts are divided between the merchant texts and silver loan documents and receipts. While the merchant texts are obviously accounts kept by the Umma provincial administration the price ratio can only be computed from the barley surpluses via a silver unit of account entered in the "debits" or "capital" section. The loan and related receipt documents should be discounted from consideration. Evidence from receipts of silver by the Umma institutions, however, indicates ratios compatible with a decreed barley:silver price ratio.

There is little evidence at all in these texts for the direct exchange of barley and silver, let alone in a manner which would testify to the determination of barley or silver prices in a market. Only two texts, one from Girsu and one from Umma, record transactions which involve the direct exchange of barley for silver. In both instances these describe the acquisition of quantities of silver by the palace for quantities of barley. The consequent barley:silver ratios might be deemed prices but it remains difficult to argue that they were determined by the laws of supply and demand. The Girsu

⁴⁷ If the loan documents and receipts are omitted from the sample, the mean barley:silver ratio for the whole study area is reduced from 316 sila₃ per shekel to 281 sila₃ per shekel. The median and the mode stay the same at 300 but the std. dev. in the ratio reduces from 95 to 57 sila₃ per shekel. The variability around 1 gur per shekel reduces from $\pm 1/3$ gur to $\pm 1/5$ gur. The Nippur data in the distribution essentially disappears, the picture in Girsu is largely unchanged while the reduction in the overall variability in the data is mirrored in the Umma distribution, in which the mean reduces from 312 to 277 sila₃ per shekel, the median and the mode are both 300 and the std. dev. reduces from 99 to 67 sila₃ per shekel. The Umma data remains considerably more dispersed than the Girsu distribution mainly because they arise from different contexts.

price ratio is consistent with the notion of a standard administered price, while the Umma range suggests that even if barter produced some variation in the settled price, the target price in such exchanges was the standard price ratio.

The data we do have, though skewed and partial, would suggest that the Ur III administrations may indeed have adopted a bi-monetary price ratio as a norm with which to value transfers in internal systems. How much the possibility of such a norm helped influenced the level and structure of prices of other staple and non-staple commodities is a subject for further study.

Appendix

Text ID	Unit	Ratio	Account Type
Š 31 (Girsu) CTNMC 53***	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 31 (Umma) SAT 2, 33	ku ₃ -bi	144	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
Š 32 (Girsu) CTNMC 53***	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 33 (Girsu) CTNMC 53***	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 33 (Umma) SNAT 276	ku ₃ -bi	200	Table 4. Barley expenditures in merchant accounts
Š 33 (Umma) SNAT 276	ku ₃ -bi	300	Table 4. Barley expenditures in merchant accounts
Š 35 (Girsu) CT 1, pl.04-05, BM 17744***	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 37 (Girsu) Nisaba 13, 54	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 38 (Girsu) MVN 9, 96***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 38 (Girsu) TLB 03, 150***	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 38 (Umma) CST 721***	ku ₃ -bi	121	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
Š 39 (Umma) MVN 13, 246	še-bi	240	Table 5. Loans of silver with repayment in barley
Š 39 (Girsu) Nisaba 13, 53	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 39 (Girsu) Nisaba 18, 95	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 39 (Girsu) MVN 6, 151	ku ₃ -bi	120	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
Š 39 (Girsu) Nisaba 07, 21	še-bi	299	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 40 (Umma) MVN 3, 186***	še-bi	240	Table 6. Silver receipts with barley equivalent
Š 40 (Girsu) HLC 81 (pl.32)	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 40 (Nippur) NATN 381***	ku ₃ -bi	102	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
Š 40 (Girsu) CT 07, pl.21, BM 13165***	še-bi	240	Table 3. Expenditures from barley assets on the bala and other
Š 42 (Girsu) CT 10, pl.44, BM 018962***	še-bi	240	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 42 (Girsu) CT 07, pl.46, BM 017774***	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 42 (Girsu) HSS 4, 24	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 42 (Girsu) HLC 39 (pl. 70)	še-bi	240	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 43 (Umma) Aleppo 457	še-bi	300	Table 6. Silver receipts with barley equivalent
Š 43 (Puz-Dag) MVN 13, 881 & 882	še-bi	360	Table 5. Loans of silver with repayment in barley
Š 43 (Girsu) HSS 4, 24	še-bi	242	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 43 (Girsu) HLC 270 (pl.125)	še-bi	240	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 43 (Girsu) MVN 11, 76	še-bi	300	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 43 (Girsu) ASJ 13, 230 74	še-bi	240	Table 3. Expenditures from barley assets on the bala and other
Š 43 (Girsu) PPAC 5, 707	še-bi	333	Table 2. nig ₂ -ka ₉ -ak PN with silver paid in lieu of barley delivery
Š 44 (Girsu) MVN 11, 101***	ku ₃ -bi	300	Table 4. Barley expenditures in merchant accounts
Š 45 (Umma) Nebraska 44	še-bi	284	Table 6. Silver receipts with barley equivalent
Š 45 (Girsu) MVN 8, 179	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 45 (Girsu) TUT 119***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 45 (Girsu) TUT 119***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 45 (Girsu) HLC 091 (pl. 031)***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 45 (Girsu) HLC 091 (pl. 031)***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Umma) Nebraska 44	še-bi	300	Table 6. Silver receipts with barley equivalent
Š 46 (Girsu) CM 26, 143	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 46 (Girsu) CM 26, 143	še-bi	300	Table 3. Expenditures from barley assets on the bala and other
Š 46 (Girsu) TIM 06, 02***	še-bi	294	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Girsu) TIM 06, 02***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Girsu) TIM 06, 02***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Girsu) TIM 06, 02***	še-bi	346	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Girsu) TIM 06, 02***	še-bi	299	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 46 (Girsu) TIM 06, 02***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Umma) Nebraska 44	še-bi	300	Table 6. Silver receipts with barley equivalent
Š 47 (Umma) Nebraska 44	še-bi	307	Table 6. Silver receipts with barley equivalent
Š 47 (Umma) Nebraska 44	še-bi	300	Table 6. Silver receipts with barley equivalent
Š 47 (Umma) AUCT 1, 98	še-bi	452	Table 5. Loans of silver with repayment in barley
Š 47 (Nippur) NRVN 1, 200	[nig ₂]-sa ₁₀ -bi	430	Table 5. Loans of silver with repayment in barley
Š 47 (Girsu) MVN 8, 179	še-bi	376	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) MVN 8, 179	še-bi	307	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) MVN 8, 179	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) MVN 8, 179	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) MVN 12, 175	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) MVN 12, 175	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) LB 557	še-bi	300	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
Š 47 (Girsu) CT 09, pl. 44, BM 019038***	še-bi	299	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) CT 09, pl. 44, BM 019038***	še-bi	299	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) CT 09, pl. 44, BM 019038***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Girsu) CT 09, pl. 44, BM 019038***	še-bi	296	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 47 (Nippur) NRVN 1, 198***	še-še ₃	450	Table 6. Silver receipts with barley equivalent
Š 47 (Girsu) MVN 09, 011	še-bi	270	Table 6. Silver receipts with barley equivalent
Š 47 (Girsu) MVN 09, 011	še-bi	270	Table 6. Silver receipts with barley equivalent
Š 48 (Umma) AUCT 1, 965	še-bi	444	Table 5. Loans of silver with repayment in barley
Š 48 (Girsu) CT 07, pl. 05-06, BM 012934***	še-bi	300	Table 1. nig ₂ -ka ₉ -ak si-i ₃ -tum: silver paid in lieu of barley delivery
Š 48 (Girsu) ASJ 8, 111 29	še-bi	300	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
AS 1 (Umma) RA 9, 158	še-bi	300	Table 7. Misc. silver or barley disbursements with barley or silver equivalent
AS 1 (Umma) SAT 2, 669	še-bi	300	Table 6. Silver receipts with barley equivalent
AS 1 (Girsu) KM 89534	še-bi	300	Table 3. Expenditures from barley assets on the bala and other

AS 1 (Girsu) MCS 8, 74 Liv 51 63 34	še-bi	200	<i>Table 3. Expenditures from barley assets on the bala and other</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	297	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	303	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	290	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	307	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 1 (Girsu) Nisaba 7, 7	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
AS 2 (Umma) YNER 8, 1***	ku ₃ -bi	225	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 2 (Umma) YNER 8, 1***	ku ₃ -bi	240	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 2 (Umma) TCL 05, 6051***	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
AS 2 (Umma) Fs Jones 216	ku ₃ -bi	240	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 3 (Umma) HUCA 30, 113-114***	ku ₃ -bi	300	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 3 (Umma) SANTAG 6, 119	ku ₃ -bi	277	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 5 (Umma) TCL 5, 6056***	ku ₃ -bi	300	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 5 (Umma) YNER 08, 07***	ku ₃ -bi	360	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 5 (Umma) SNAT 434	še-bi	300	<i>Table 3. Expenditures from barley assets on the bala and other</i>
AS 5 (Umma?) MAOG 04, 188 2***	gin ₂ -še ₃	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
AS 6 (Umma) BPOA 6, 560	še-bi	288	<i>Table 6. Silver receipts with barley equivalent</i>
AS 6 (Umma) JRAS 1939, 32***	ku ₃ -bi	270	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 6 (Umma) STA 23***	ku ₃ -bi	295	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 7 (Nippur) TMH NF 1-2, 072***	še-bi	420	<i>Table 5. Loans of silver with repayment in barley</i>
AS 7 (Nippur) CST 036***	nig ₂ -sa ₁₀ -am ₃ -bi	440	<i>Table 5. Loans of silver with repayment in barley</i>
AS 7 (Umma) YNER 08, 11***	ku ₃ -bi	288	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 7 (Umma) YNER 08, 11***	ku ₃ -bi	300	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 8 (Umma) MVN 01, 240***	ku ₃ -bi	225	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 8 (Umma) YOS 18, 123***	ku ₃ -bi	300	<i>Table 4. Barley expenditures in merchant accounts</i>
AS 9 (Nippur) BBVO 11, 257, 4N-T197	gur-ta	400	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
AS 9 (Girsu) NYPL 387***	gur-ta	360	<i>Table 5. Loans of silver with repayment in barley</i>
AS 9 (Umma) AUCT 1, 330	ku ₃ -bi	154	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 2 (Umma) TCL 5, 5680***	ku ₃ -bi	339	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 2 (Umma) TCL 5, 5680***	ku ₃ -bi	317	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 3 (Umma) SNAT 490	ku ₃ -bi	225	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 3 (Nippur) NATN 379***	še-bi	360	<i>Table 5. Loans of silver with repayment in barley</i>
ŠS 3 (Nippur) NATN 554***	nig ₂ -sa ₁₀ -am ₃	400	<i>Table 6. Silver receipts with barley equivalent</i>
ŠS 3 (Nippur) NRVN 1, 199***	še-bi	480	<i>Table 5. Loans of silver with repayment in barley</i>
ŠS 3 (Nippur) NRVN 1, 194***	nig ₂ -sa ₁₀ -bi	600	<i>Table 6. Silver receipts with barley equivalent</i>
ŠS 4 (Umma) SAT 3, 1652	še-bi	150	<i>Table 3. Expenditures from barley assets on the bala and other</i>
ŠS 4 Umma) YNER 8, 21***	ku ₃ -bi	200	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 4 Umma) YNER 8, 21***	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 4 (Girsu) MVN 6, 507***	še-bi	300	<i>Table 2. nig₂-ka₉-ak PN with silver paid in lieu of barley delivery</i>
ŠS 4 (Girsu) ITT 5, 06760	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 4 (Girsu) ITT 5, 06776***	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 5 (Nippur) NYPL 390***	še-bi	400	<i>Table 5. Loans of silver with repayment in barley</i>
ŠS 5 (Nippur) NATN 266	gur-ta	600	<i>Table 5. Loans of silver with repayment in barley</i>
ŠS 5 (Umma) YNER 08, 13***	ku ₃ -bi	350	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 5 (Umma) YNER 08, 13***	ku ₃ -bi	340	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 5 (Umma) YNER 08, 13***	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 5 (Umma) YNER 08, 13***	ku ₃ -bi	255	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
ŠS 5 (Umma) YNER 08, 15***	ku ₃ -bi	300	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 6 (Umma) YNER 8, 14***	ku ₃ -bi	420	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 7 (Umma) YNER 08, 15***	ku ₃ -bi	420	<i>Table 4. Barley expenditures in merchant accounts</i>
ŠS 8 (Nippur) TMH NF 1-2, 99***	še-bi	450	<i>Table 6. Silver receipts with barley equivalent</i>
ŠS 9 (Umma) PPAC 5, 956	še-bi	600	<i>Table 5. Loans of silver with repayment in barley</i>
ŠS 9 (Girsu) JMEOs 12, 41 3488***	še-bi	300	<i>Table 6. Silver receipts with barley equivalent</i>
IS 1 (Umma) NUL 06	še-bi	420	<i>Table 5. Loans of silver with repayment in barley</i>
IS 1 (Umma) SANTAG 7, 172	še-bi	600	<i>Table 5. Loans of silver with repayment in barley</i>
IS 1 (Nippur) NATN 437***	še-bi	600	<i>Table 5. Loans of silver with repayment in barley</i>
IS 1 (Nippur) TMH NF 1-2, 33***	še-bi	540	<i>Table 5. Loans of silver with repayment in barley</i>
IS 1 (Umma) TLB 03, 151***	ku ₃ -bi	150	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
IS 2 (Nippur) NATN 312***	še-bi	600	<i>Table 5. Loans of silver with repayment in barley</i>
IS 2 (Nippur) TMH NF 1-2, 060***	še-bi	481	<i>Table 5. Loans of silver with repayment in barley</i>
IS 2 (Nippur) NATN 602***	gur-ta	400	<i>Table 6. Silver receipts with barley equivalent</i>
IS 2 (Umma) YOS 04, 049***	gur-ta	450	<i>Table 5. Loans of silver with repayment in barley</i>
IS 3 (Umma) SAT 3, 1987	gur-ta	360	<i>Table 5. Loans of silver with repayment in barley</i>
IS 3 (Umma) YOS 4, 48***	še-bi	420	<i>Table 5. Loans of silver with repayment in barley</i>
IS 3 (Nippur) NATN 121***	še-bi	450	<i>Table 5. Loans of silver with repayment in barley</i>
IS 4 (Umma) YOS 4, 27***	še-bi	450	<i>Table 5. Loans of silver with repayment in barley</i>
IS 4 (Umma) YOS 4, 20***	še-bi	450	<i>Table 5. Loans of silver with repayment in barley</i>
IS 4 (Nippur) NATN 017***	gur-ta	400	<i>Table 5. Loans of silver with repayment in barley</i>
Undated (Umma) AUCT 3, 334	še-bi	504	<i>Table 6. Silver receipts with barley equivalent</i>

Undated (Umma) UTI 5, 3497	še-bi	260	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Umma) Ontario 2, 442	še-bi	300	<i>Table 1. nig₂-ka₉-ak si-i₃-tum: silver paid in lieu of barley delivery</i>
Undated (Nippur) TMH NF 1-2, 59	ku ₃ -bi	226	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Nippur) TMH NF 1-2, 59	ku ₃ -bi	258	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Nippur) NATN 605***	ku ₃ -bi	150	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Nippur) NATN 605***	ku ₃ -bi	163	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Nippur) NATN 605***	ku ₃ -bi	150	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Nippur) NATN 605***	ku ₃ -bi	150	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Girsu) Nisaba 7,11	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
Undated (Girsu) Nisaba 7,11	ku ₃ -bi	300	<i>Table 7. Misc. silver or barley disbursements with barley or silver equivalent</i>
	Mean	316	
	Standard Deviation	95	
	Median	300	
	Mode	300	

*** denotes texts also present in Snell's table 6.

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