

DEPRECIATION ACCOUNTING IN FRANCESCO DATINI'S COMPANIES

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Abstract

The issue of depreciation accounting in the era of double-entry bookkeeping origin is one of the least studied. The main aim of the carrying out research is to determine the existence of the algorithm and method for depreciation calculating in the medieval companies, based on the archival data, particularly, Francesco Datini's companies. The results of the research were the discovery in the archives and libraries of Italy of four early examples of depreciation charging, one of which relates to the impairment of assets, the other three are related to the distribution of assets value according to the periods of their useful life. The most significant result can be recognized as the discovery of the earliest, among the currently known, example of depreciation charging by straight-line method, with the preserved distinct algorithm.

Keywords: double-entry bookkeeping, account of equipment, depreciation, straight-line method.

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Introduction

In the sphere of historical accounting research, the issue concerning depreciation processes seems to be the least studied. In all the publications related to the given issue, approximately the same material is presented. As a rule, authors begin with the quotations belonging to Vitruvius, and then pass on to the period after 1588, to the example of impairment of assets accounting, described by John Mellis (Mellis, 1588). Such order of depreciation accounting presentation is observed in the fundamental work by A. C. Littleton (Littleton, 1966, pp. 223–241). In the function of modern proof, we can introduce the publication by T. E. Rihll (Rihll, p. 893–897). At the same time, publications on the early examples of depreciation charging in the period of double-entry bookkeeping origin are extremely rare, either in the period of large-scale archival research of the 20th century or in our day. We have found four early examples of depreciation charging dating from the 14th century, two of which occurred in Francesco Datini's companies in Pisa (1393–1394) and Barcelona (1399).

Review of prior literature

We find the mentioning of depreciation in the Middle Ages in the fundamental work by F. Melis (Melis, 1950, p. 515), where the discourse is about Calimala's company, owned by Francesco Del Bene. However, here the discussion is about the impairment of assets, but the authors uses the term "depreciation". The practice of depreciation in the company was described A. Martinelli (Martinelli, 1974, p. 536). In 1910 the book of Calimala's company was studied by A. Ceccherelli (Ceccherelli, 1910, pp. 47–8), who did not see on folio Carte Del

Bene 3.056 (28V) neither depreciation accounting, nor impairment of assets. In our day A. Ceccherelli's viewpoint was supported by V. Antonelli and M. Sargiacomo: "Neither depreciation nor depreciation of various assets, such as looms, shelves or stores, were written off. The net profitability was calculated at the company level, comparing gross profits of each consignment to the aforementioned overhead costs" (Antonelli, 2015, p. 132).

In 1972, F. Melis presented a photocopy of the account of depreciation of the immovable inventory in Farolfi's company (1300) (Melis, 1972, pp. 384–385). This account was mentioned by G. A. Lee (Lee, 1977, pp. 83–84), while A. Martinelli paid no attention to it.

In 1956 de Roover described "Profit and Loss" account of Datini's company in Barcelona (from July 11, 1397 to January 31, 1399), where "... depreciation, since the statement indicates that £16 17s. were written off on office equipment and charged to expenses" (Roover, 1956, p. 144). However, R. de Roover did not progress further than establishing the fact of depreciation charging, while in the account of "Office equipment" were yet to be discovered itself very interesting findings.

Depreciation of office equipment in F. Datini's company in Barcelona

As it is well known, depreciation accounting (by the method of allocation of the cost of long-term asset over periods in which the asset is used does not present much difficulty. The historical cost is entered on the debit side of account of asset (e.g. office equipment). Depreciation charged for the period (calculated in accordance with the company's algorithm) could be reflected on the credit side of the account in question. Net book value of the asset (the difference between the historical cost and depreciation charged) could be seen there as well. The charged depreciation is also reflected in the account of expenses or directly on the debit side of "Profit and Loss" account. The net book value of the asset (balance of account) is transferred to the trial balance or balance sheet. A similar situation took place in Giovanni Farolfi's company in 1300, however, the algorithm of depreciation charge was impossible to establish due to the loss of "Book of Expenses" and most pages of the Ledger.

When treating the impairment of assets in accounting, the rule accepted in Calimala's company (1321), functioned a completely different method of conducting accounting operations. The revalued value of the assets as at the end of the reporting period was deducted from the carrying value. The revealed difference characterized the calculated size of the impairment of assets, which was transferred either to the account of expenses or directly to debit "Profit and Loss" account.

Thus, we did not have a chance to observe the procedure of depreciation charging in practice, when the descriptions of the algorithm of distribution of long-term asset cost according to the periods actually survived. The authors believed that if a straight-line method of property cost existed in pre-Christian times, this means could revive in the Middle Ages as well. It was the paper by de Roover that opened the gate to the finding.

During one of the regular visits to the State Archives of Prato, which houses the archives of medieval merchant Francesco Datini, in the book Prato, AS, D. 801, about which wrote de Roover, we found "Profit and Loss" account (Prato, AS, D. 801, c. 389V–390R), a photocopy of which is shown in Figure 1 (The photocopies of the archival documents are presented in accordance with the release – letter №1346 / 28.13.10, record 1338/2013).

"Office equipment" account (Prato, AS, D. 801, c. 378V–379R) is established by means of cross-reference.

Table 1. The Translation of “Office Equipment” account of Francesco Datini company in Barcelona (January 31, 1399) (The Debit)

1398				Pounds	Shillings	pennies
Office equipment <i>should give</i> today, August 15, for a lot of the furniture that we have bought before today and which will be written in here, and for other old things which Luca del Sera left us when moved to Valencia						
1 a big bed with 2 bedside tables and 4 wooden tables				2	—	—
1 thick blanket				—	10	—
1 pair of bed sheets used for this very bed				5	10	—
1 pair of slippers				6	—	—
1 big blanket for this bed				2	—	—
1 towel in use				2	—	—
1 another kind of towel with «tassels»				—	16	10
1 big dinner table	Total					
1 small table						
1 chade						
1 set of Venetian furniture accessories which Simone has				2	5	—
1 old Pisa furniture accessories set				1	—	—
1 big table, new, for a big bedroom				2	—	—
The total sum of 24 pounds 1 shilling 10 pennies is transferred to the equipment account from page 351						
The sum of purchases which consists of several entries is in this book on page 351.						
1 pair of new big bed sheets	1	13	4			
1 big vermilion “Cielone” for bed	3	6	—			
1 ????	—	16	6			
1 bed sheet in use	—	19	6	6	15	4
And [this account] should be in this date forty-six of Barcelona pounds 4 shillings 8 pennies for the furniture in this book, on page 353. we wrote them with Gambarino.				46	4	8
We have also bought 1 cross element for bed from Bernardo Minne on August 28, it was recorded in Uscita in office equipment account on page 176				15	6	6
1 cross element						
1 mattress						
1 "Marfica" for bed						
1 thick blanket						
2 thick blankets in this book on page 370				7	6	8
2 big plates in this book on page 370				—	11	—
1 big set of furniture accessories from Leonardo di Castilione in Uscita on page 177				3	6	—
2 cabinet and safe from Govani Sopardo on page 249				8	5	—
Total				III.17.0		

The authors studied the translation of debit side of “Office equipment” account (Table 1). This indicates that the most part of the equipment had been in use before the stated date. We have some confirmations of the said above as we have found the books and the balance sheets of F. Datini’s company in Barcelona for the preceding five years.

Note, basically all entries in the debit of “Office equipment” account have correspondences directly to the Ledger (Prato, AS, D. 801). Two entries (with the sum of 15 pounds 6 shillings 3 pennies and 3 pounds 6 shillings) do correspond with the entries in “Book of cash inflows and outflows” (Entrata e Uscita – Prato, AS, D. 816, c. 176V and Prato, AS, D. 816, c. 177V). The entries in the Ledger describe utensil transferred from the balance 1397 or inherited from Luca del Sera. The entries from «Book of cash inflows and outflows» show the costs of the acquisition.

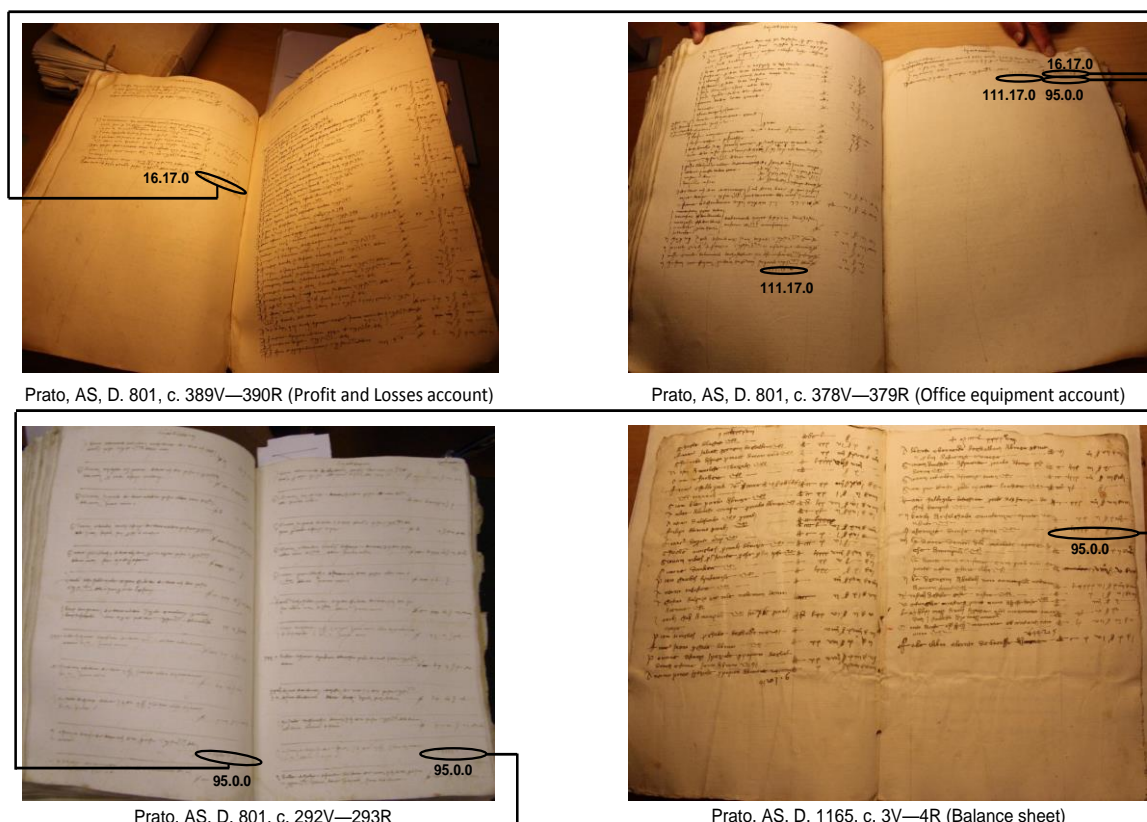


Figure 1. The early experience of depreciation in the double-entry bookkeeping system)

Now there is a credit side of the account (table 2). The first entry written in the Old Italian language says: "Masarizie di chasa de' dare a di XXXI di gienaio 1398 per danno **di masarizie in XVIII mesi abatuto a ragione di X per cento l'anno in questo** a c. 389". This means: "Office equipment should give on January 31, 1398 "wear and tear of furniture" **calculated over 18 months on the basis of 10 percent annually**, on page 389".

Table 2. The Translation into Russian of "Office Equipment" account of Francesco Datini company in Barcelona (January 31, 1399) (The Credit)

1398			
Office equipment should give on January 31, 1398 "wear and tear of furniture" calculated over 18 months on the basis of 10 percent annually, on page 389	16	17	0
The balance of this account, on page 293	95	0	0
Total	111.17.0		

Initially this work could bring just smile with the furniture set cost of 2 Barcelona gold pounds, and "a pair of slippers" cost 6 gold pounds. But the attention should be paid to the opening account date: August 15, 1398. The Accountant writes: "Office equipment should give today, August 15, for a lot of the furniture that we have bought before today and which will be written in here, and for other old things which Luca del Sera left us when moved to Valencia".

The words in bold are the direct confirmation of the fact that in *the middle of the century the means of straight-line method of long-lived equipment cost upon the periods of its use were used*. If to compare the accounting value of the office equipment of 111 gold Barcelona pounds 17 silver shillings (1 pound equaled to 20 shillings) and its depreciated cost of 95 gold pounds, the difference between them, which is equaled to the depreciation of 16 pounds 17

shillings, equals exactly to the sum of 15 percent of accounting cost or to the year and a half sum which is calculated out of 10 percent per year. This example reveals the usage of the straight-line method of depreciation, when the depreciation charges were written off directly to loss which depreciates the financial result. As it follows from Figure 1, the depreciation entry is transferred into the “Profit and Loss” account directly. The data of net book value of equipment first is registered in Memorial (Prato, D. № 801, c. 392V–393R – the eleventh entry), and only then it is transferred into the balance sheet.

Thus, it is possible to state that in F. Datini’s company in Barcelona (1399) depreciation charging was carried out by means of the straight-line method, at that the algorithm of the distribution of long-term asset value was recorded by the hand of a Medieval accountant in “Office Equipment” account.

The inventory of household goods and early depreciation in the company in Pisa

Is the peculiarity of depreciation charging in F. Datini’s company in Pisa in 1392–1394, why a special study is dedicated to it? The fact is that in the accounting of the company depreciation was charged 5 years before than in Barcelona. In Pisa the method of depreciation charging in equal sums without special accurate calculation was applied. What is more interesting, in the archives all the necessary materials, allowing to trace the whole accounting process, are stored.

So, first things first. Datini’s first individual enterprise in Pisa was established (officially) on January 28, 1383 after his return to his homeland (Prato, Tuscany) after 19-year stay in French Avignon. In the accounting system of the enterprise there were no long-term inventory account, no “Profit and Loss” account, consequently, there was no Trial Balance. After changing the management on August 20th, 1386, the enterprise was transformed into a new one (Second), which existed until June 30, 1392. Here, the first dual account of “Profit and Loss” was built. The mentioning of depreciation charging in the debit of the account was absent. “Profit and Loss” account was not balanced, because at this stage they still did not build balance. Since the enterprise was individual, Francesco withdrew all the profit without establishing any provision.

July 1, 1392 Datini transformed his individual enterprise into a company. On the one hand, “Florence” company joined the company in the capacity of the owners (Francesco Datini and Stoldo di Lorenzo), on the other hand, it was joined by Manno d’Albizo’s managing company in Pisa.

Datini’s company in Pisa (1392–1394) achieved a great success not only in financial and productive activity, but also in accounting development: accounting cycle was completed by trial balance. It is in the Ledger of the company (Prato, AS, D. № 361) where “Inventory list” was found, that was of particular interest for our study.

In Figure 2 “Diagram of depreciation charging” is presented. For the first time in one accounting cycle (from opening to closing the company) depreciation is charged twice. There is an explanation to this. While studying accounting books we found two “Profit and Loss” accounts in one accounting cycle; closing (1394) and intermediate (1393). The intermediate closed account of “Profit and Loss” was aimed to show how things were going as of a certain date. All this affected the procedure of depreciation accounting.

In Figure 3 and Figure 4 “Constructions of depreciation charging” are presented, corresponding to Figure 2, presented in the photocopies of real accounts distributed according to the periods of the company’s activity. As it follows from Figure 3 and the construction in Figure 4, the procedure of depreciation charging for the first period of the company’s activities

(1.07.1392–1.09.1393) was intended to include the charged depreciated sums into “Household Expenses” and in the subsequent period (02.09.1383 –13.07.1394) – directly into the construction of expenses in “Profit and Loss” account.

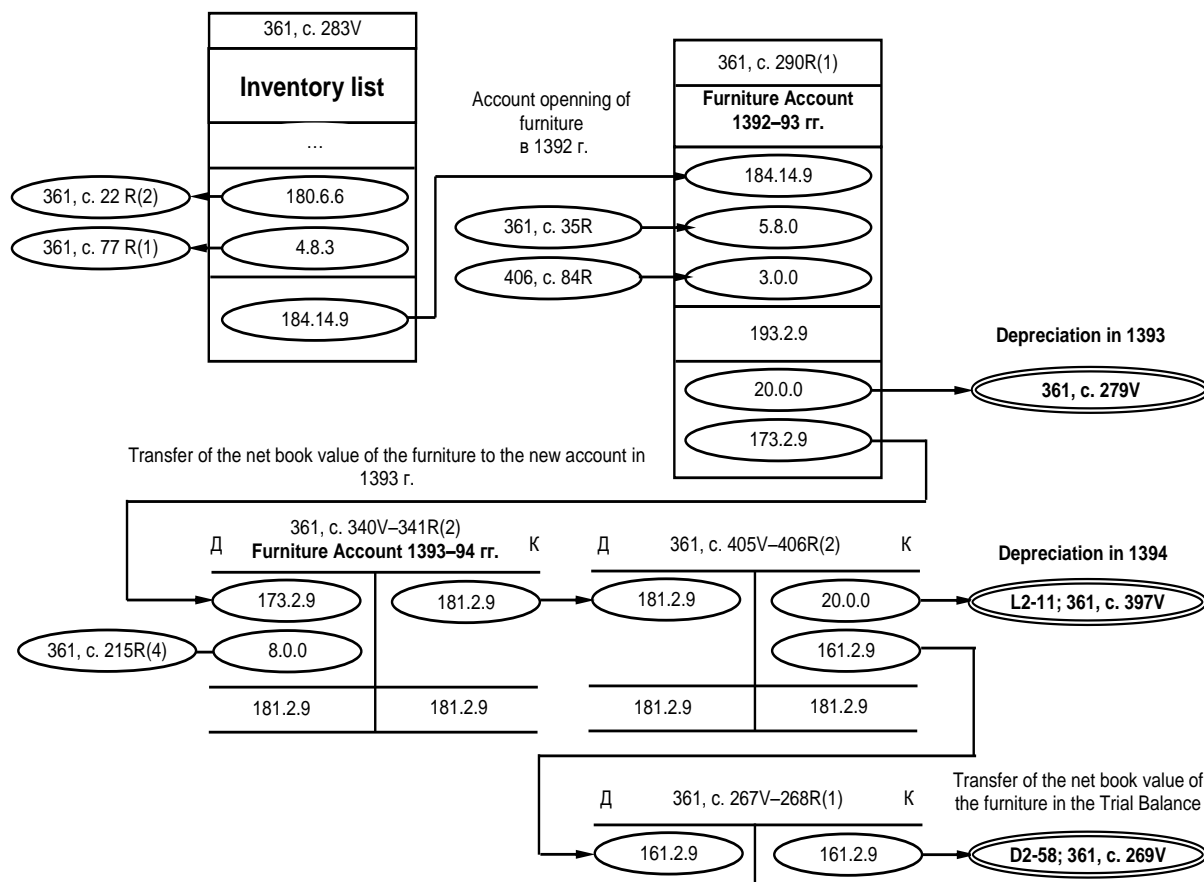


Figure 2. Diagram of depreciation charging with its inclusion into “Household Expenses” (1393) and “Losses” (1394), as well as the withdrawal and transfer of net book value in the Trial Balance

Let us analyze the procedure of depreciation charging of long-term equipment (furniture) accounting in stages. In Figure 3 it is clear that the total of “Furniture”, which is located directly in the Ledger (white, with letter “A”) Prato, AS, D. № 361 in the account on c. 283 V (and not as a separate small book, which ensured its safety) is f. 180 s. 6 d. 6 (in this case the currency of the city of Pisa – florins, soldi, dinars). The given amount is shown in correspondence with the credit of the account from the seller of furniture on Prato, AS, D. № 361, c. 22R (2). In addition, the assets are purchased in the amount of f. 4 s. 8 d. 3 (corresponding account of another seller of furniture on Prato, AS, D. № 361, c. 77R (1)). The total cost of the furniture was f. 184 s. 14 d. 9 in gold, that in the next step is transferred to the account of “Furniture” (Prato, AS, D. № 361, c. 290R (1)).

In the first half of 1393 2 more items of property were purchased. Both sums (f. 5, s. 8 d and f. 3) are shown in “Furniture” account. The first sum (f. 5 s. 8) is presented in correspondence with the seller’s account (Prato, AS, D. № 361, c. 35R), the second one (f. 3), is paid in cash, what is confirmed by the entry in Entrata e Uscita on Prato, AS, D. № 406, c. 84R.

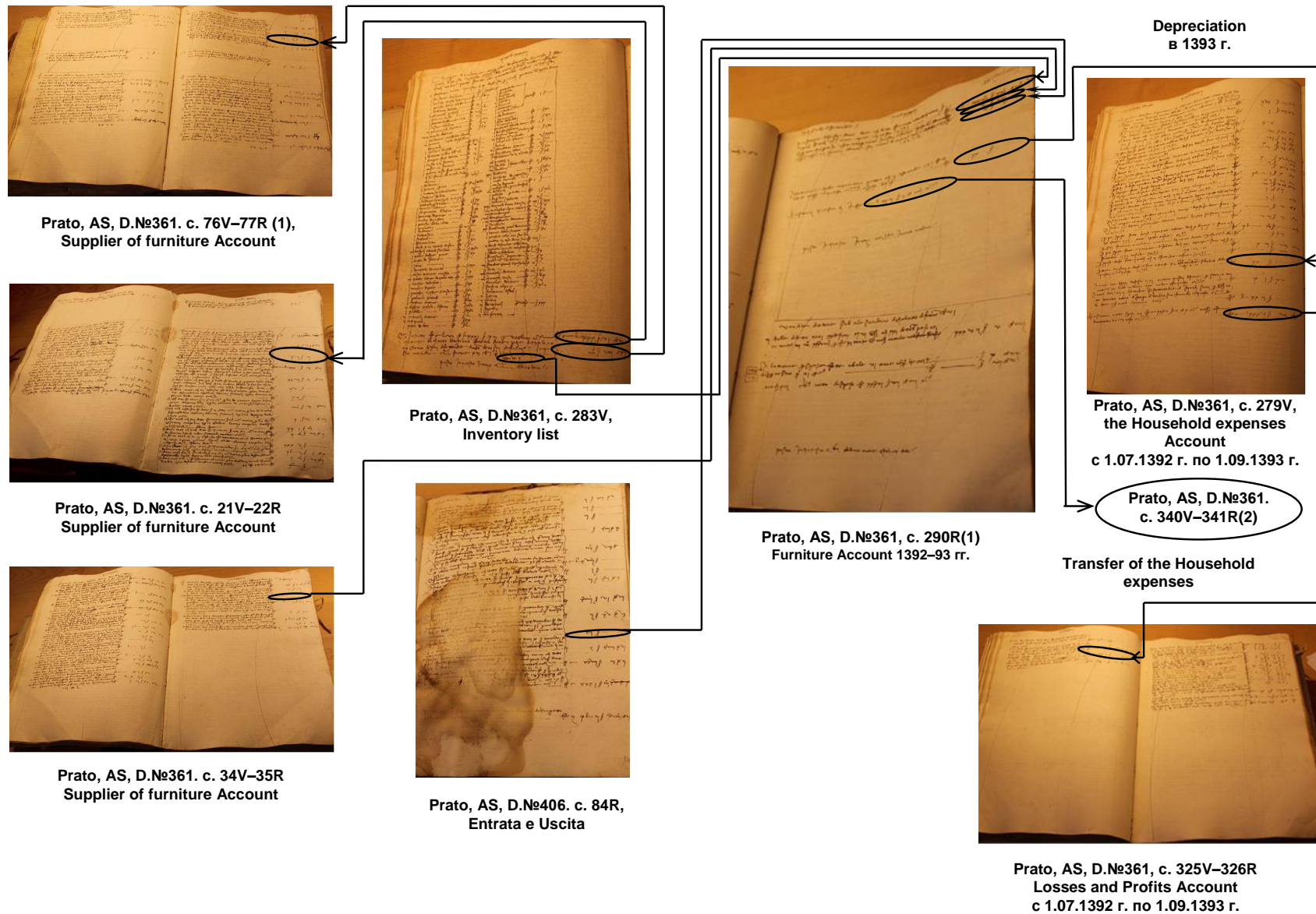


Figure 3. Construction of the diagram of depreciation charging with its inclusion into "Household Expenses" (09.01.1393)

The total inventory value as of the end of the period, selected by the accountant, in the accounting cycle (1 September 1393) amounted to f. 193 s. 2 d. 9. The calculated for the period (1.07.1392–1.09.1393), that is 420 days, depreciation equals f. 20 and transferred to “Household Expenses” account (Prato, AS, D. №361, c. 279V). The net book value of the furniture, f. 173 s. 2 d. 9, is transferred to a new “Furniture” account (Prato, AS, D. №361, c. 340V–341R).

In Figure 4 there is a continuation of the diagram’s layout, relating to the second period of the activity (2.09.1393–13.07.1394), that is 315 days. During the given period of time the only one item of furniture is purchased for f. 8, which is shown in the account of “Furniture” in correspondence with the seller’s account (Prato, AS, D. № 361, c. 214V–215R(4).

The newly formed cost of the furniture equals f. 181 s. 2 d. 9. It would seem that the accountant might charge the depreciation here (as was the case in the first instance). But he does not do it, but builds a new account of furniture (Prato, AS, D. № 361, c. 405V–406R(2), in which he transfers the new cost of the furniture. The debit record says: “Furniture for house and workshop *must give* on July, 13 f 181 s 2 d 9, in the book on c. 341...”. And only then, from the credit account of “Furniture” the sum of f. 181 s. 2 d. 9 is distributed to charged depreciation for the second period (f. 20) and net book value of the furniture (f. 161 s. 2 d. 9) about what the corresponding entries are made: “Furniture” in the house *must have* on July 13 f 20. It lost the value, as in the book on c. 397” and “And they *must have* the same day f 161 s 2 d. 9 in gold for the balance of this account, in this book on c. 267”.

Depreciation expenses of the cost of the furniture are directly included into “Debit” of “Profit and Loss” account (Prato, AS, D. № 361, c. 397 V). The line recording says: “For the damage and depreciation of furniture, as it worsened, f. 20, in this book on c. 406”. The net book value of the inventory is registered in the memorial record in the Ledger on folio Prato, AS, D. № 361, c. 267V–268R, and then is transferred to the Trial Balance, which is presented in the form of an account and covers 2 folios. The recording is entered on Prato, AS, D. № 361, c. 269V–270R and has the following text: “And on the same day in this book on c. 268 furniture for the house and workshop *must have*, in the Red Book B on c. 285, it *must give*”. In modern language, this means that the sum is entered in the balance account from the credit side of the account Prato, AS, D. № 361, c. 267V–268R, which is available in this book; in the new book (Red one with letter “B”) “Furniture” account will initially be in the debit on folio Prato, AS, D. № 362, c. 285V–286R.

Conclusion

Two of the earliest examples of depreciation charging are considered. Both examples are not related to the impairment of assets accounting. There is distribution of the value of long-term asset according to the periods.

The first example (F. Datini’s company in Barcelona, 1399) can be considered to be the earliest depreciation charging by the method of a straight-line method of the asset value according to the periods during ten years. Moreover, the algorithm of value distribution is fixed explicitly in the credit of “Office equipment” account.

In the second case (F. Datini’s company in Pisa, 1394) the method of writing-off constant sums (f. 20 per year) is applied. The sum of depreciation expenses was roughly equivalent to 10–11 annual interest rate. Depreciation expenses were strictly arranged by the years, at that the useful life of the inventory objects employment when applying deemed (legal) liquidations could significantly exceed the period of the enterprises’ activities.

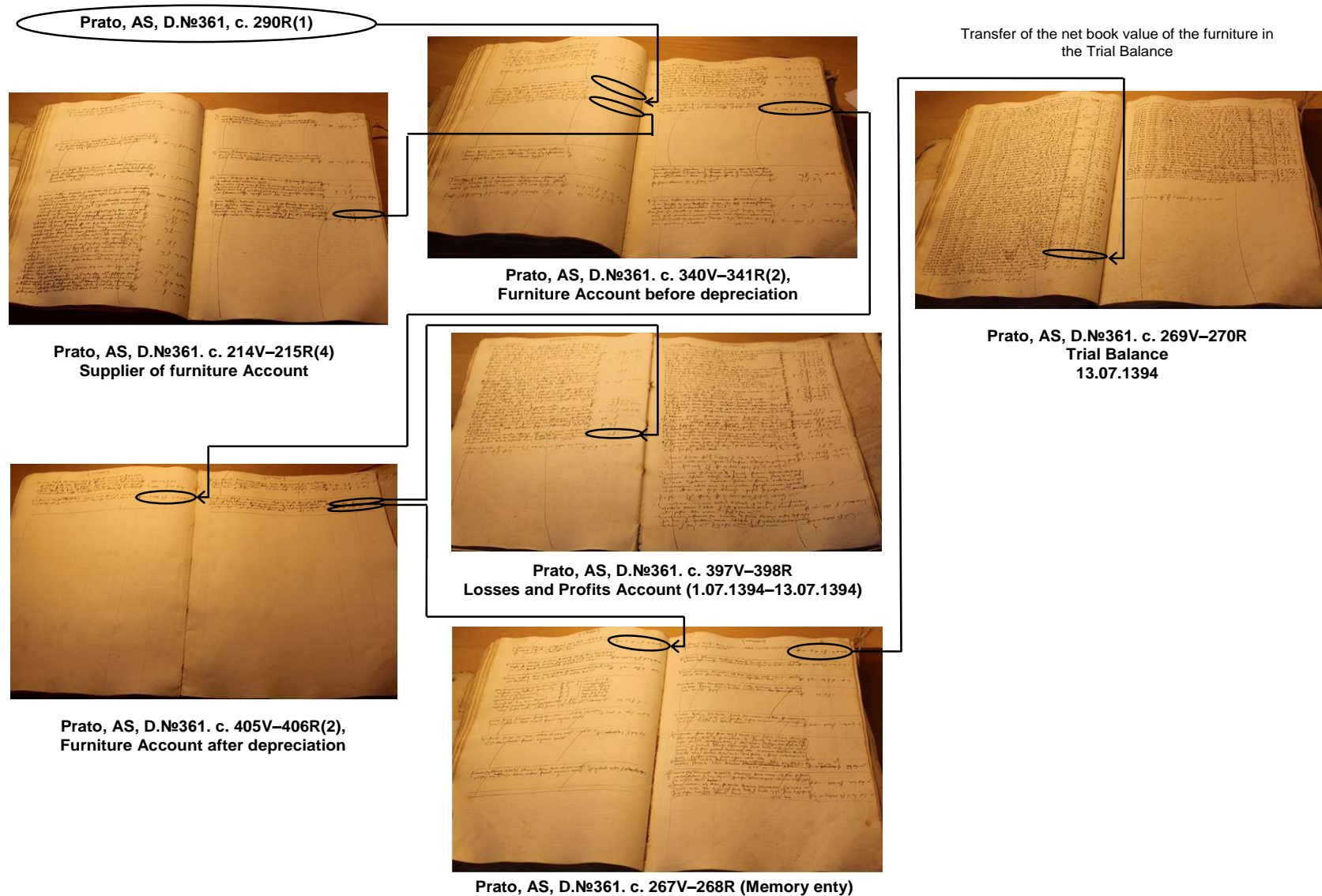


Figure 4. Construction of the diagram of depreciation charging, its inclusion into the reporting period expenses (L2–11) and the formation of the indicator of the Trial Balance (13.07.1394)

The authors intend to continue their study on the accounting books of the archives of Florence, Prato, Genoa and Venice, as well as the libraries of Florence.

Literature

Antonelli V, Sargiacomo M. (2015). Alberto Ceccherelli (1885–1958): pioneer in the history of accounting practice and leader in international dissemination. *Accounting History Review*, vol. 25, no. 2, pp. 121–144.

Archivio di Stato di Prato, Prato, AS, D., Fondaco di Pisa, Company Francesco di Marco Datini e Manno d'Albizo Degli Agli, Libri Grandi, 1392–1394, no. 361.

Archivio di Stato di Prato, Prato, AS, D., Fondaco di Barcellona, Company Francesco di Marco Datini e Luca Del Sera, Libri Grandi, 1397–1399, no. 801.

Ceccherelli, A. (1910). *Le scritture commerciali nelle antiche aziende fiorentine*. Firenze: Lastrucci.

De Roover, Raymond (1956). The development of accounting prior to Luca Pacioli according to the account-books of Medieval merchants. In: A. C. Littleton, B. S. Yamey, *Studies in the History of Accounting*. London: Sweet & Maxwell.

Lee, G. A. (1977). The coming of age of double entry: The Giovanni Farolfi ledger of 1299–1300, *The Accounting Historians Journal*, vol. 4, no. 2, pp. 79–95.

Littleton, A. C. (1966). *Accounting evolution to 1900* / A. C. Littleton. – New York: Russel & Russel.

Martinelli, A. (1974). *The origination and evolution of double entry bookkeeping to 1440*. Ph.D. Dissertation. North Texas State University.

Melis, F. (1972). *Documenti per la storia economica dei secoli XIII–XVI*. Leo S. Olschki, Firenze.

Melis, F. (1950). *Storia della ragioneria* / F. Melis. Bologna, Dott. Cesare zuffi – Editore.

Mellis, J., (1588). *A Brief Instruction and Manner How To Keep Books Of Accounts*. London: John Windett. Reprinted Scholar Press, 1980.

Rihll, T. E., (2013), *Depreciation in Vitruvius*. *The Classical Quarterly*, 63, pp. 893–897.