

## SPECIFIC FEATURES OF DEPRECIATION ACCOUNTING AT THE END OF THE 12<sup>TH</sup> – EARLY 13<sup>TH</sup> CENTURIES

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### Abstract

Historical aspects of depreciation and impairment of assets have been the subject of a number of scientific studies. A lot of works have been considering this issue from the time of the Roman architect Marcus Vitruvius Pollio. But, unfortunately, the practice of depreciation and impairment of assets in the Medieval Europe during the period of 12th–15th centuries were insufficiently investigated, which, according to the authors, is quite unfair. It was during the formation of double-entry bookkeeping, when emergence of the main elements of modern accounting took place and understanding the need to reflect the results of the impairment of assets in accounting appeared, and that determined the main purpose of the research – deep analysis of the archival material in order to identify the facts of depreciation charging, determination of the specific algorithm for calculating the depreciation charging and the order of depreciation reflection in accounting. The discovery of four different examples of depreciation charging in the accounts of double-entry bookkeeping, two of them belonging to the end of the 12th – early 13th centuries, can be introduced as the result of the research. Equally important, a uniform method of assets impairment accounting did not exist; using the data from the medieval archives, the authors were able to identify two different methods: assets impairment accounting; algorithm for linear distribution of assets value according to the periods of useful life. The two earliest examples have been considered in the given paper.

**Keywords:** depreciation, impairment of assets, Medieval accounting

**JEL code:** M410, N800

### Introduction

In the article “Depreciation in Vitruvius” Tracey Rihll found that “Vitruvius has something interesting to say at *De architectura* 2.8.8” and presented the original text of this using (C. Fensterbusch, 1964): “Those structures made of soft rubble, for all their subtle attractiveness, are not the ones that will resist ruin as time passes. And thus when assessors are appointed to evaluate party walls, they never assess soft rubble walls according to their initial cost, but rather, when they look at the price recorded in the original contracts, they deduct 1/80th of that sum for each subsequent year, and the remaining amount is fixed as the current value of the walls. They have rendered judgement, in effect, that such walls cannot last more than 80 years)” (Rihll, p. 893).

The amortization process is the least studied among other issues of the historical bookkeeping studies. All most all publications related to the earlier stages of the bookkeeping science cite almost the same material. And in the given case the introduction of the paper did not contain anything new. Similar information is introduced in the works of many researchers. The au-

thors know it due to the translation of the book by Vitruvius into Russian almost in identical editing (Vitruvius, 1936, p. 62).

E. S. Hendriksen and M. F. Van Breda (Hendriksen and Van Breda, 1992, p. 30), with reference to Lyndon Lamarr (Lamarr), write: “There is an opinion, but arguable, that the notion “depreciation” was known to the bookkeepers of the Early Christian Rome”. As M. A. Chatfield (Chatfield, p. 39) and Y. V. Sokolov (Sokolov, 1996, p. 46) the very first definition of depreciation and the example of it were introduced by the Roman architect Vitruvius who defined depreciation as “the expired year price”.

Thus, we get an impression that the valuation of the long-term objects at their cost did not rise any doubt and even back then the idea of yearly equal distribution was known (Sokolov, 1996, p. 46).

Returning to the paper by T. E. Rihll (Rihll, 2013), we should specify in advance that its author has done very substantial and important work concerning the foundations of depreciation charging in the era of the pre-Christian world, has shown the views of Vitruvius’s contemporaries, has revealed the influence of the ancient world doctrine on modern theory and bookkeeping practice. The authors are grateful to T. E. Rihll for the reference to Leon Battista Alberti, “who studied Vitruvius intensively and who thereby opens the door to the possibility of transmission of the concept directly from Vitruvius to Renaissance Italy”, that will undoubtedly require a detailed study of the paper by A. W. Crosby (Crosby, pp. 199–222), in which the contribution of the famous pupil of “father of accounting” is described in detail.

At the same time “... the fact remains that evidence for real understanding of the concept of depreciation is wanting through most centuries in most places” (Rihll, p. 896) is proved by the research after 1588, that is the first example described in the book written by the Englishman G. Mellis (Mellis, 1588), well-known due to the book by A. C. Littleton (Littleton, 1966, pp. 223–241) and the publications of other authors (Leake; Macve; Woodward and others). It turns out that Rihll omits three, as we can say, the most important centuries of double-entry bookkeeping formation in general, and the procedures of depreciation treatment in particular, and her statement confirms it: “I have not been able to find evidence for it in Italian accounting up to and including Pacioli ...” (Rihll, 2013, p. 896).

More than ten-year experience of work in the archives of Northern Italy allowed the authors of the given paper to discover four early examples of depreciation charging on a double-entry accounts, two of them belong to the beginning of the 12<sup>th</sup> century.

### **Review of prior literature**

According to Littleton, “the issue ... that is, what should constitute a proper charge against revenue, gave rise to discussions of depreciation and renewals. A search for early mention of depreciation reveals that there were two ways of looking at the matter. One was to consider depreciating property as if it were the unsold merchandise of a simple proprietorship; the other was to relate depreciation to the maintenance of long-lived assets...” (Littleton, 1966, p. 223). Neither Luca Pacioli nor his direct followers did not raise this issue in their publications. According to Peter Ramsey: “It is impossible, however, to make any allowance for depreciation of stock or, of course, for the depreciation of fixed assets” (Ramsey, 1956, p. 199). R. R. Coomher proves the above mentioned: “Problems such as those arising out of the accounting records for depreciation are not considered” (Coomher, 1956, p. 214). One of the earliest bookkeeping texts in English is introduced by John Mellis in the book “A Briefe Instruction ...” (Mellis, 1588).

In the 1950 Federigo Melis dedicated a separate section to Giovanni Farolfi's company (1299–1300) (Melis, 1950, pp. 485–90), where he did not notice the account of Carte Stroziane serie II, 84bis, c. 83R, where the process of utensils depreciation charging was treated, but described it in 1972, providing the text with the photo of the account (Melis, 1972, pp. 384–385).

In 1956 R. de Roover described "Profit and Losses" account of Datini 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). De Roover left the depreciation point with just above mentioned two and a half lines of his attention. More was written by those who had never seen Datini's books. For instance, N. S. Pomazkov thought that "the actual cost of the household equipment was due to the examination results. The markdown sum was transferred from the household equipment to the profit from goods account" (Pomazkov, 1940, pp. 870–871). J. Richard stated that the first definition of depreciation was "any partial loss of property value as a result of the fact the cost of its fictitious liquidation during the current inventory is less than the cost shown by the previous inventory" (Richard, 2000, p. 54). There are some other examples which all researchers agree upon: in the middle of the century if the notion depreciation did exist it was associated with the periodical reassessment of the property and the difference in property cost of the previous and the current inventory was written off to the loss.

Our research has allowed to make known four early episodes of depreciation charging in the 13<sup>th</sup> century, which are characterized by three different methods: assets impairment accounting; attrition of assets by the method of constant sum; algorithm for linear distribution of the value of assets according to the periods of useful life.

### **The earliest depreciation accounting entry**

The equipment account on the folio Carte Stroziane serie II, 84 bis, c. 83R from the 1299–1300 book belonging to Toscana merchant Giovanni Farolfi from Salon (Provence) should be recognized as the earliest known example of depreciation charging.

Federigo Melis was one of the first who in 1950 described the book by Giovanni Farolfi (Melis, 1950, pp. 485–490). However, the account at the top of page 83R did not come in his view. The account, which reflects the procedure of depreciation charging, was described by Melis for the first time in 1972 (Melis, 1972, pp. 384–385). He also presented a photocopy of the account.

In 1952, the book by Giovanni Farolfi was translated by Arigo Castellani (Castellani), who did not identify the account of distribution of long-term assets value. The rest of the authors (and we know G. A. Lee (Lee), A. Martinelli (Martinelli) and F. Smith (Smith)) left depreciation issues without attention. Most likely, they did not work directly with the book and used the translation by A. Castellani.

Melis wrote the following about the nature of equipment accounts: "A large trade demanded the introduction of innovations in stores too, maybe not directly, but to some extent the stores still had to take care of how to introduce the goods to the customers as well. Firstly, they had to extend their trade grounds, then to install new equipment there, including cabinets, tables, containers, instrumentation and showcases (the "Exhibition") in general called inventory. All these demanded quite large investments and what, of course, was reasonable to do was to introduce "Inventory" account (which united everything that was important and was written over number of pages)" (Melis, 1972, p. 51).

The account relates to movable property – “utensils”. Due to the summing up of the financial year it was copied from the analytical books, and then the size of depreciation was recorded in the same analytical book. Probably this property was given to a new owner (Giovanni Filippi) or this property was just sold to him as unneeded. The accounts were kept by one of the partners. His name was Amatino Manucci. A special attention should be paid to his manner of bookkeeping. In this article we are going to look at utensils accounting and depreciation.

The money measurement is the French currency – a Turnua livre consisting of 20 s (sou) or 240 deniers (the nominal cost of sou is 12 deniers). Two accounts are written on page Carte Stroziane serie II, 84 bis, c. 83R: one deal with inventory, the second is expense account. To make it more visualized we publish (Figure 1) only the upper account which is of our interest.

Here is our translation of the passage:

1300.

Utensil **should give** on August 25, 300; what is recorded in the Book of Expenses, c. 7

**95 livrs, 5 sous**

February 27, '99; **they should have** what is written in the Book of Expenses, on c. 8

**26 livrs, 17 sous, 2 deniers**

The balance of 68 livrs 7 sous 10 deniers is defined in the first calende of September '99. Utensil for the certain sum is given to Giovanni Filippi, the sum of what he has to give is confirmed on c. 91

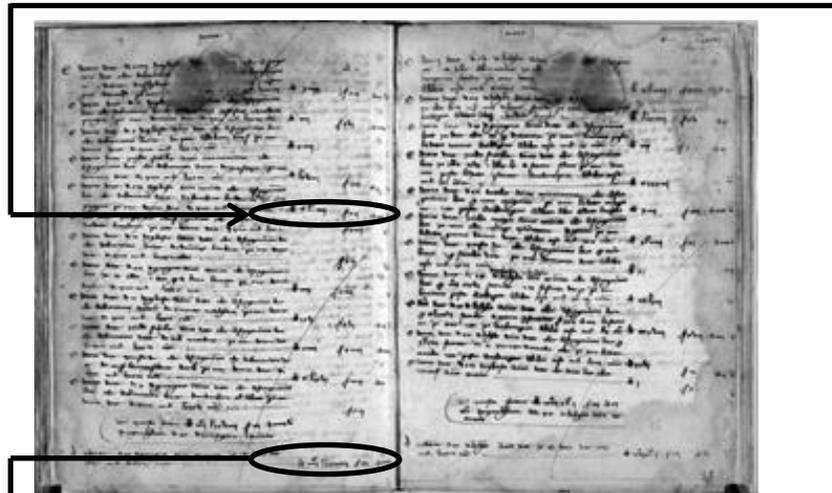
**68 livrs, 7 sous, 10 deniers**

The first entry characterizes the prime cost of the utensil (95 livrs 5 sous). The entry is made in the debit side of the account. This entry represents the accumulated total of the inventory list which could be kept in a special inventory book or in several pages. Today it is not possible to identify the type of data carrier and the list of nomenclature. It is possible that it could be an abstract from the total inventory list where the property for sale was written in. As it has been mentioned above the account resembles selling accounts which first appeared in Toscana and was widely used up to the end of the XV century.

The second and the third entries refer to the credit of the account. The second entry shows the depreciation (26 livres 17 sous 2 deniers). Presently it is not possible to identify the mechanism of depreciation, as “Book of Expenses”, on folio 7 and 8 of which there are references to the account, was completely lost, consequently, “Profit and Losses” account, to which depreciation was taken, was lost as well.

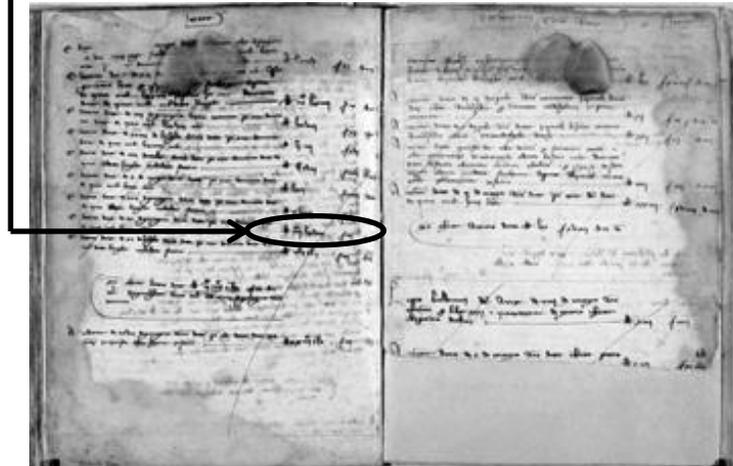
The third account captures the residual value (68 livres 7 sous 10 denier) which Giovanni Filippi should pay (**must give**).

Lee writes, “the fourth was the Book of Expenses (*quaderno delle spese*); there are references to pages from 6 to 37. Probably, there were accounts concerning the immovable inventory and current expenses and, maybe, some other entries. The corresponding entries appear in the Ledger; then the final totals upon the Book of Expenses were transferred to the immovable inventory accounts and the current expenses...” (Lee, p. 83–84). In our work we mention pages 7 and 8 from the Book of expenses. As it is written in the account the net book value equal to the sum of 68 livrs 7 sous 10 deniers was transferred to page 90V in Giovanni Farolfi’s structure of assets: “And he has to give to the calendar of September 1299 that we expect from him. What we have to gain from the furniture as it is defined on page 83, where he has to give 68 livrs 7 sous 10 deniers”.



Carte Stroziane serie II,84bis, c. 90 V)

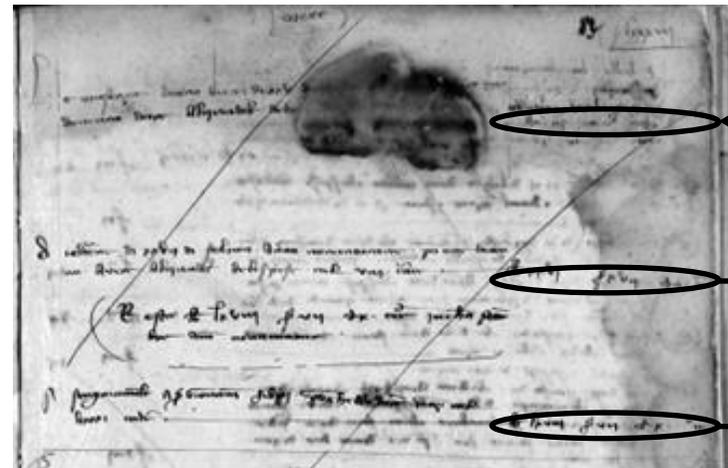
The debit side of the balance



Carte Stroziane serie II,84bis, c. 93 V)

Book of Expenses (fo. 7)

Utensil account (inventory)



Carte Stroziane serie II,84bis, c. 83 R)

«Profit and Losses»  
account (fo. 8)

Figure 1. The first experience of reflecting depreciation in the accounts using double entry method (Giovanni Farolfi's book, 1299—1300)

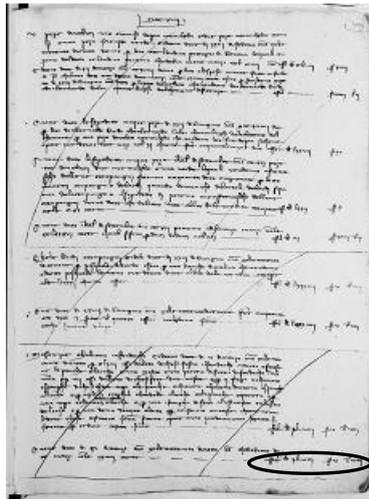
## An Early Example of Assets Impairment Accounting

In the Medieval times depreciation was mentioned in publications by Federigo Melis in 1950 (Melis, 1950) and 1972 (Melis, 1972). In the first (classical) work professor Melis found the calculation of the loss of value of home equipment and appliances in Calimala's company owned by Francesco Del Bene (1318–1324) (Melis, 1950, p. 515). At that Melis expressed surprise due to the fact “why Alberto Ceccherelli, who had previously worked with the given archival documents stored in the State Archive of the city of Florence, did not see it earlier” (ibid). However, the explanation to this as well as to Ceccherelli's research of the cost-accounting problems is given by Valerio Antonelli and Massimo Sargiacomo: “Although he remained very interested in the cost-accounting problems of modern firms, after his 1910 work, Ceccherelli did not continue with his studies into the earliest cost-accounting documents, convinced of the absence of any evidence different from that of Del Bene. In fact, it was only just before Ceccherelli passed away that Melis (1950, 547–574) found further archival evidence of cost-accounting practices in Italian medieval firms, while all other evidence from the Italian archives were only examined by accounting historians after 1958” (Antonelli, 2015, p. 132). Just above with the reference to (Ceccherelli, 1910, pp. 47–48) the same authors state the following: “Neither depreciation nor amortization 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” (ibid).

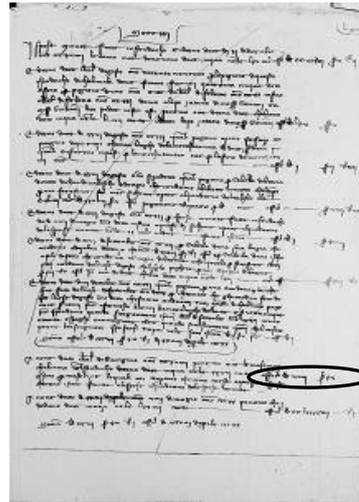
In Figure 2 we present a diagram in real accounts of the process of assets impairment accounting in Calimala's company when closing of accounts in 1321 took place. The set of books of Calimala's company was also studied by Alvaro Martinelli (Martinelli), we used his translations of individual items of the account. For impairment accounting, the account of Carte Del Bene 3.056 (28V) is intended. The accounting is performed in the Ledger (Black Book). The first entry in the account 28V reflects the transfer of the sum of historical cost lbs. 48 s. 5 d. 8 from the third bill on folio 8R: Furniture and fixture which we have in the shop must give us, on the 5th of March of the year 1318, we posted from where they had to give behind in folio 8, lbs. 48 s. 5 d. 8. Further, the incomings of assets are taken into consideration, for example, in correspondence with account 73R They must give, on the first of June of the year 1319, we posted from petty expenses made in the shop where they must give forward in folio 73; they are for furniture and fixture which have been charged to expenses, we will describe them here below: a fior. lbs. 9 s. 15. The total of furniture and fixture's cost as at the end of the reporting period, a fior., lbs. 100 s. 12 d. 8.

These parameters characterize the debit side of depreciation accounting. According to the credit side of the account the cost of the retired assets is taken into consideration: They have given, the said furniture and fixture, on the 2 of September of the year 1321, Perotto Chaperone gave for them cash s. 17 a fior. for a writing-desk and the sitting bench, which we sold for what they cost us, a fior. s. 17.

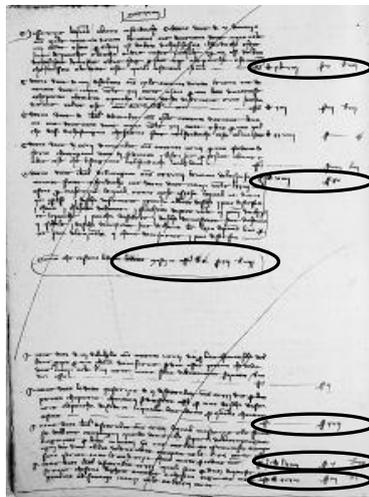
September 1, 1318 when closing the company and preparing for the opening the new one, the inventory and asset valuation according to value are carried out, which will be adopted in the new company. Inventory and valuation list is entered into the book of “Libro delle compravendite”, or the ledger of purchase and sales, on folio 120R. The sum of the net book value of assets lbs. 64 s. 10 d. 7 is transferred to the account of depreciation accounting in Blake Book: They have given, on the first of September of the year 1321, furniture and fixture which were held by Francesco del Bene and partners when Domenico withdrew from the company, valued by Lotto Manetti. We posted where the said Francesco and partners must give to the book of purchases and sales in folio 120, where all furniture and fixture which they held are orderly written, a fior. lbs. 64 s. 10 d. 7.



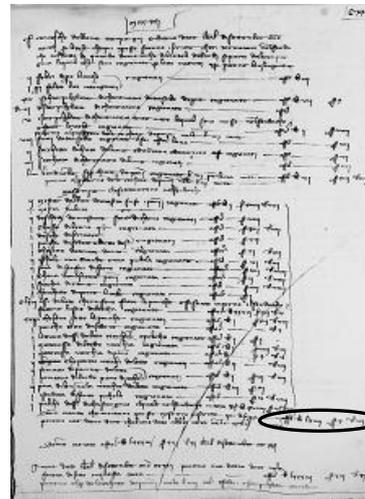
Carte Del Bene 3.013 (8R(3))



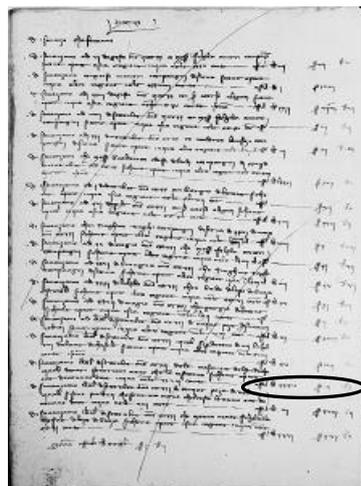
Carte Del Bene 3.145 (73R)



Carte Del Bene 3.056 (28V)



Carte Del Bene 2.170 (120R)



Carte Del Bene 3.290 (286V)

Figure 2. Diagram reflecting the impairment in the accounts of Calimala Francesco Del Bene's company (1318–1324)

The last entry is the calculation of assets impairment. The sum of impairment, lbs. 35 s. 3 d. 1, is transferred to the account of losses at the end of Black Book They have given, on the first of September 1321, (for money) which was lost on this furniture and fixtures which are consumed and old, and valued less; we posted to losses forward in folio 286, a fior. lbs. 35 s. 3 d. 1.

In this entry the accountant determined the amount of the amortization, which was debited to the “losses” account; at the same time the account “furniture and fixtures” was credited for the same amount.

## Conclusion

Long-term work in the archives of Northern Italy has allowed the authors to identify the four early examples of depreciation, which are distinguished by different methods. The earliest of the survived examples of depreciation charging, found in the General Ledger of the branch of the Tuscan merchant Giovanni Farolfi’s company in Provence has been presented. As the research has shown, in contrast to the statement of individual researchers concerning the application of the method of assets revaluation, there is the process of distribution of the assets cost according to the periods of useful life.

The loss of a number of books included in the accounting set as well as the absence of many pages of the book itself made it impossible to establish the precise calculation algorithm. However, the entry contents in the depreciation account is beyond no doubt in relation to the procedure adopted in the accounting. To the debit of depreciation account, the assets’ carrying value (including the acquisition of assets during the accounting period – historical) is entered. The sum of depreciation charge is put either on the account of charges or “Profit and Losses” account in “Book of Expenses”. The net book value is transferred to the balance in the structure of assets of the company’s owner.

The losses accounting due to impairment of long-term assets was established by the methods that are identical to the modern ones in Calimala’s company owned by Francesco Del Bene (1318–1324). The method used is substantially different from the method of distribution of the assets value according to the periods. In this case, the amount of losses from impairment is determined by the difference between the carrying (historical) value of assets and inventory value of the revalued assets of the enterprise to be closed. As in the first case, the sum of impairment is transferred to the account of losses or to “Profit and Losses” account.

In the subsequent publications we will offer the options of depreciation charging, using the reserved real algorithm of straight-line method.

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