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# The Historical Significance of Double-entry Bookkeeping: Some Non-Sombartian Claims

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**ABSTRACT** *Werner Sombart's views on the connection between double-entry bookkeeping and the rise of capitalism are well known and have been influential. In recent decades other views – independent of Sombart's – claiming historical significance for double entry have also been published. Three of these disparate claims are considered in this article: the connection between double entry and Manichaeism; the influence of the rhetoric of double entry; and double entry and the recognition in Western Europe of zero as a number.*

**KEY WORDS:** Accounting history, Werner Sombart, Manichaeism, rhetoric, zero, Luca Pacioli

## Introduction

Werner Sombart (1863–1941), economist, sociologist and economic historian, was the first prominent scholar to claim great historical significance for double-entry bookkeeping ('DEB'). Writing at the beginning of the twentieth century, he asserted: 'Capitalism without double-entry bookkeeping is simply inconceivable'. He elaborated this proposition in some detail. The success of his advocacy of the historical significance of DEB is attested by statements in numerous books and articles by historians (working in different branches of history) which stem, directly or indirectly, from Sombart's exuberant discussion which extends over six pages of *Der moderne Kapitalismus*.<sup>1</sup>

The influence of Sombart's ideas has not been limited to historians. I recall seeing a statement in an in-flight magazine linking capitalism and DEB. The system is referred to in two modern plays. In John Osborne's *Luther. A Play*, a knight addresses the corpse of a peasant as follows: 'They say, you know, that the profit motive ... was born with the invention of double entry book-keeping in the monasteries. Book-keeping! ... In the monasteries, and ages before any of us had ever got round to burning them down.' Dieter Forte, in a satirical play also involving Martin Luther (*Martin Luther & Thomas Munzer oder Die Einführung der Buchhaltung*, 1971) includes

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a scene in which the emperor Maximilian discusses his precarious finances with Jakob Fugger and his head bookkeeper Matthäus Schwarz, and in which DEB features. The writing indicates a knowledge of some of Sombart's ideas.<sup>2</sup> References to DEB occur in literary works published before 1900, but obviously have no Sombartian echoes. Examples include the often-quoted statement about the beauty of DEB made by a character in Goethe's *Wilhelm Meister*; the statement in Flaubert's *Madame Bovary* that the heroine kept her husband's books by DEB; and the statement in Stendhal's *Le rouge et le noir* that Julien Sorel advised his employer to introduce DEB for his own estates.

It is not my purpose in this paper to review or discuss what has been called the Sombart thesis. The purpose is to set out and review claims that have been made for the historical significance of DEB (or systematic bookkeeping, a term sometimes used as a synonym) which are independent of Sombart's views. The non-Sombartian claims examined here relate to three disparate subjects: DEB and Manichaeism or Manichaeistic notions; the rhetoric of DEB, the legitimization of capitalist enterprise and profits, and the validation of the merchant's probity; and DEB and the mathematical concepts of zero and negative numbers. The three claims are discussed, in turn, in the next three sections. A short final section has some concluding observations,

### Double Entry and Manichaeism

Professor Alfred Crosby was Professor of American studies, history and geography at the University of Texas, Austin, when his wide-ranging book *The Measure of Reality: Quantification and Western Society, 1250–1600* was published in 1997. Chapter ten is on 'Book-keeping', and much of it concerns DEB and Luca Pacioli. Crosby, who is not a follower of Sombart, writes that DEB 'did not change the world. It was not even essential for capitalism'. Nevertheless, Crosby does not doubt the historical importance of DEB. I concentrate on one paragraph, which in its context clearly refers to the double entry system (Crosby, 1997: pp. 219, 220):

The Venetian style, *alla veneziana*,<sup>3</sup> encouraged us in our often useful and sometimes pernicious practice of dividing everything into black or white, good or evil, useful or useless, part of the problem or part of the solution – either this or that. When Western historians look for the founts of our enduring Manichaeism, they point to the Persian prophet Manes himself and to Aristotle and his concept of the 'excluded middle'. Let me suggest that the influence of these men has been less than that of money, which speaks to us so eloquently in balance sheets. Money is never middle-ish. Every time an accountant has divided everything within his or her purview into plus or minus, our inclination to categorize all experience as this or as that has gained validation.

Thus, according to Crosby, in practice DEB has promoted, supported or entrenched Manichaeistic ideas and attitudes.<sup>4</sup> These are deep waters for an historian of accounting to try to navigate or plumb. Perhaps some comments may nevertheless help.

That debit entries and credit entries in an account are opposites or off-setting contraries is implicit in the balancing of an account: the balance being the difference between the sum of the debits and the sum of the credits. As John Mair, author of two best-selling books on bookkeeping in the eighteenth century, put it, 'Accompts in the Ledger

consist of two parts, which in their Nature are directly opposed to and the Reverse of one another . . .’ (Mair, 1736: p. 12). The opposition of debit and credit is also evident in the use in Florence (and elsewhere in Tuscany) of the terms ‘ought to give’ (*deve dare*) and ‘ought to have’ (*deve avere*) – or variants – to distinguish debit entries and credit entries, respectively, in ledger accounts.<sup>5</sup>

The use of the terms *deve dare* and *deve avere* as opposites appears, however, in Tuscan ledgers well before the emergence of DEB around 1300. They are found, for example, in the earliest surviving business account book of the second millennium in Europe – the fragments of a ledger kept in Bologna in 1211 by a firm of Florentine merchants or bankers.<sup>6</sup> Moreover, the opposition of debit entries and credit entries on facing pages of a ledger (i.e. a ledger *alla veneziana*) appeared in numerous ledgers in Italy, and in Europe generally, of sole proprietorships and partnerships which did not keep accounts on the DEB system long after that system had become available. Debit and credit entries were made in ledger accounts for each of their debtors and creditors. Thus, if Crosby is right in his claim, that claim should apply also to so-called single-entry bookkeeping – a term commonly applied by historians to denote all business bookkeeping arrangements other than DEB. Single-entry bookkeeping arrangements preceded DEB, and were widely used in Western Europe until well into the nineteenth century.

The opposition between debits and credits has been noted in a few literary works. After some days on his ‘horrid island’, the ship-wrecked Robinson Crusoe ‘drew up the State of [his] Affairs in writing’, and he ‘stated it very impartially, like Debtor and Creditor, the Comforts I enjoy’d, against the Miseries I suffered’. The left-hand side of the statement is headed ‘Evil’ and the right-hand side, ‘Good’. Emphasis on the opposition of debits and credits is central in the late B.S. Johnson’s novel *Christie Malry’s Own Double-Entry*, published in 1973, the year of the author’s suicide. In this short, entertaining but somewhat saddening novel, the eponymous hero keeps a bilateral account, ‘CHRISTIE MALRY in account with THEM’. The debit side is headed ‘Aggravation’, the credit side, ‘Recompense’. The final page of the account is closed with a large debit balance (aggravations well in excess of recompenses), which is ‘written off as Bad Debt’.<sup>7</sup>

Rather surprisingly, perhaps, Daniel Defoe’s depiction of debits as ‘evil’ and credits as ‘good’ in Crusoe’s account cannot be applied so simply and starkly to DEB as it is used in business. This is because, taken in isolation, a debit balance on some ledger accounts can be ‘good’ from the perspective of the business (e.g. cash; a debtor’s indebtedness), whilst on other ledger accounts it can be ‘bad’ (e.g. bad debts; expenses). The same is true for credit balances. This aspect of DEB must have puzzled many students of the subject through the ages. It certainly puzzled Prince Maurice of Nassau when, at his request, he was being taught the system by the celebrated scientist, mathematician and man of affairs, Simon Stevin, towards the end of the sixteenth century. The Prince asked the sensible question: ‘The entries in the ledger are in debit and credit, which of each are to my advantage and which to my disadvantage?’ Stevin’s attempt at elucidation began promisingly, but I doubt whether the Prince could have been wholly satisfied with the explanation.<sup>8</sup>

Returning to Crosby’s contention, one may ask whether it is not too simple to jump from a technical feature of DEB (but which is also present in some single-entry bookkeeping arrangements) to a feature of the mind-set of many people, and to argue that familiarity with the former leads to promotion and reinforcement of the latter.

In his book *Frozen Desire* (1997), the novelist and historian James Buchan has a chapter on Pacioli and DEB. He is critical of many of Sombart's ideas, notably those of linking the DEB system to the systems of Galileo and Newton, and of detecting in DEB, in embryonic form, the ideas of gravity, the conservation of energy and the circulation of the blood.<sup>9</sup> Buchan warns his readers to keep their heads 'amid the Sombartian intoxication' (Buchan, 1997: p. 68):

For we might just [as] easily say that the duality of double-entry, which regulates both the accuracy and the completeness of the account, gave rise to Hegel's famous notion of the duality of historical events; and through Hegel to Marx's satirical masterpiece, *The Eighteenth Brumaire of Louis Bonaparte*.

Perhaps Crosby may have fallen victim to Sombartian intoxication. However, it is not possible, of course, to adduce evidence that can refute Crosby's hypothesis conclusively: it is not that kind of hypothesis.<sup>10</sup>

### The Rhetoric of Double-Entry Bookkeeping

The word 'rhetoric' appears in the titles of two journal articles that deal with aspects of the origins, history and influence of DEB, by Professor Aho (1985) and Professors Carruthers and Espeland (1991) respectively. (I will refer to Carruthers and Espeland as 'CE'.) In each case the authors claim to establish that rhetoric (in the sense of techniques used to make an argument convincing or persuasive) played an important part in the origination and acceptance of DEB.<sup>11</sup>

These two articles range widely and include interesting material. However, both articles fail by a very wide margin to establish their main propositions, which can be encapsulated as follows: DEB was valued by businessmen because of its inherent rhetoric – the ability of a double-entry ledger, as such, to persuade its 'audience' (which in Aho's case included its owner) that the business to which it related was honestly conducted, that the business was morally sound, and that the system of private enterprise and profit-making was ethically justified.

In considering this highly improbable role of DEB, I will narrow the focus of my comments on the basic propositions which are clearly set out in Aho's article. Here are five quotations (1985: pp. 42, 42, 35, 33, 43):

- (i) ... since for every debit there is an equal and corresponding credit ['debit', in error, in the original], the profits and capital of the business are justly earned ...<sup>12</sup>
- (ii) It is safe to conclude that in part because of these rhetorical dimensions DEB was initially adopted and rapidly disseminated throughout Christian Europe. No other method of accounting could lay claim to characteristics which, when combined, must have made a powerful and favorable impression on its audience.
- (iii) The balance sheet derivation of the double-entry ledger proves that the business in question practises justice ...<sup>13</sup>
- (iv) The conclusion of the balance sheet, then, is not simply that such and such is the net worth of our business, but rather that such profit is morally legitimate. And it is so, because it arises from a fundamentally equitable and balanced transaction. 'We owe

no more than we have received and we have no more than what we have already given'.

- (v) We might say desperately he [the business man] needed to account for his life in a way that would not only convince the community of his rectitude, but more importantly, himself. Double-entry bookkeeping answered this need ... DEB provided the apology for the rational pursuit of wealth *par excellence* ...<sup>14</sup>

Aho reached fanciful and erroneous conclusions by failing, *inter alia*, to appreciate that the double-entry system was as able to record the affairs of the most unscrupulous money-lender or crooked business man as it was those of an honest and moral business man. The business man or his bookkeeper could readily find an account to be debited or credited however fraudulent or immoral the transaction.<sup>15</sup> The double-entry system was not capable of sanitizing transactions that, at the particular time and place, were generally regarded as illicit, morally reprehensible or inequitable.

Moreover, it is not clear who the 'audience' was to whom DEB ledgers – or their balance accounts, the antecedents of modern balance sheets – were supposedly addressed. Business men were not likely to show their ledgers to outsiders. They did not do so unless required to do so in the case of disputes, or in connection with the payment of taxes or in bankruptcy proceedings. Ordinarily, other business men and members of the community at large would have had no way of knowing whether a particular firm kept its books by double entry.<sup>16</sup> Even in the case of most joint stock companies in the years before 1800 few individuals other than their directors, shareholders and some employees would have had access to ledgers or would have seen copies of the balance accounts. As regards the late nineteenth century and subsequently, the fact that the vast majority of public companies used DEB and that their published (or otherwise available) balance sheets balanced, did not, of course, inhibit social and economic critics of private enterprise and private profit-making from deploring the prevailing economic system.

The central Aho theses, if they were valid, would lead one to expect that DEB would have been eagerly and rapidly adopted by business men in Italy and, from the sixteenth century onwards also by business men in other European countries. Indeed, according to Aho, partly 'because of [the] rhetorical dimensions' of DEB, it was 'rapidly disseminated throughout Christian Europe'. However, even if one were to exclude from consideration the large number of small businesses that were unlikely to have used DEB, it is reasonably certain that the spread of the system was rather slow in Western Europe until at least the eighteenth century, and its use still rather patchy in that century. Prominent business firms that did not use DEB included the following: Andrea Banchi, a leading silk merchant/manufacturer in fifteenth-century Florence; Plantin, the famous Antwerp printer and publisher, kept his books by DEB for a period of only four years (the Plantin business did not adopt the system until the nineteenth century); the powerful Fugger of Augsburg did not use the system when the firm was at the peak of its wealth and political influence in the early sixteenth century; and the Rothschild banks did not introduce DEB until the twentieth century.<sup>17</sup> Professor Lemarchand has shown that many large joint stock companies in seventeenth- and eighteenth-century France operated without DEB. (Lemarchand noted that the Compagnie d'Anzin, one of the largest users of fixed capital, did not use DEB until the nineteenth century. He observed that a leading French economic historian stated that the Anzin company was 'the prototype of the modern capitalist company').<sup>18</sup> DEB was unusual in medium or large-scale farming and

mining enterprises before 1800.<sup>19</sup> Such business firms would have been able to recruit and employ employees who were familiar with DEB.

Aho relies for a major part of his analysis and interpretation on the fact that a double-entry ledger without errors always balances: the total of debit balances equals the total of credit balances (which also means that the total of all debit entries equals the total of all credit entries) in the ledger. If, because of this inherent property or feature of the system, a double-entry ledger or its derived balance account was able to persuade its 'audience' that the business activities recorded in it were morally sound and the profits justified, one would expect that business men using DEB would have been careful to ensure that their ledgers were error-free and did in fact balance. Yet there is ample evidence of double-entry ledgers and balance accounts that were out of balance; and in some instances a single entry, to contrive the balancing of the ledger, is clearly indicated as such. I have elsewhere provided a list of Italian examples of (mainly) prominent firms spanning the years from 1411 to 1569. Further examples are various balance accounts of the important Florentine Cambini Bank in the period 1431 to 1458. Copies of some of these balance accounts, as also some 'unbalanced' Medici Bank balance accounts, were submitted as part of tax returns to the tax authorities in Florence, and so had an external audience.<sup>20</sup>

According to Aho, the rhetoric of DEB was addressed not only to the community at large, 'but more importantly', to the business man himself. It was he who needed assurance that his business activities were just and legitimate; and his double-entry ledger supplied that assurance. It is surely bizarre or naïve to suppose that any medieval or Renaissance merchant or banker who happened to have serious misgivings about his own rectitude or the morality of his activities would have had those misgivings expunged from his mind by the rhetoric of his double-entry ledger. At this point it is possible to produce a fifteenth-century witness.

The ledgers of Francesco di Marco Datini, the 'merchant of Prato', are fine examples of early DEB as practised in Tuscany. Datini amassed a fortune. However, like many other merchants or bankers in fifteenth-century Italy, towards the end of his life (he died in 1410) Datini had an 'afflicted conscience', and he 'dedicated himself to repentance in his old age. He went on pilgrimages, fasted, and at the end left nearly all his enormous estate (75,000 *fiorini*) to works of charity – all of which did not free him from a sense of guilt and "melancholy"' (Gurevich, 1990: pp. 272–273). His ledgers did not assuage his worried conscience.

I have discussed Professor Aho's central ideas at some length. I can deal more briefly with the article of Professors Carruthers and Espeland. Many of my criticisms of Aho's conclusions apply *mutatis mutandis* to their work. Here I will confine myself to their views on two topics.

CE claim that Luca Pacioli's text on DEB 'had its own rhetorical agenda'. The evidence they advance in support of this statement is Aho's supposed demonstration that:

Pacioli's method of double-entry bookkeeping corresponded in form to classic Ciceronian rhetoric. The elements of an account, as set forth by Pacioli, were the *inventio* (the inventory), and the *dispositio* (memorandum, journal, and ledger). It was no coincidence that these corresponded exactly to the first two elements of an argument according to Cicero ... If Pacioli's methods were followed, the accounting books of a business would be structured as a convincing argument.

And the method Pacioli prescribed could, according to CE, be used to ‘convince skeptics of the legitimacy of commerce in general and of the integrity of the business enterprise in particular’ (CE, 1991: pp. 37–38).

However, the terms *inventario* (not *inventio*) and *dispositione* used by Pacioli did not refer to the ‘elements of an account, as set forth by Pacioli’ (or anyone else). Pacioli explained that he divided his *text* into two parts. It is evident that the passage in CE confuses the arrangement of the material in an expository text with the structure of a double-entry account or of DEB itself. The confusing nature of the passage is exacerbated by the fact that Aho did not discuss the inventory in his section on *inventio* but, instead, in the section on *dispositione*.<sup>21</sup>

I turn to the second topic. CE make the following statement (CE, 1991: p. 61):

As a symbol of rationality, double-entry bookkeeping legitimised business activities, even when the actual accounts did not conform, or conformed only loosely, to the strict method. If the issue for businessmen using double-entry accounts had been rationality, then why would their practice of keeping books have been so sloppy? The symbolic advantages were foremost in those cases. The haphazard diffusion of the practice of the technique only affirms the rhetorical aspects we have emphasized.

This passage is extraordinary – extraordinary, even in an article with many extraordinary statements. Though the article is about DEB and its rhetorical powers, it now appears that accounts not kept in the double-entry system also could have those powers. No indication is given as to how far a set of accounts had to deviate from the double-entry system for it to lose those powers.

The authors seem to have been the victims of their own rhetoric.

Apart from its rhetoric, Aho also claims to identify ‘another attraction of DEB for those who adapted [presumably ‘adopted’] it – namely, its beauty’ (Aho, 1985: p. 41). This also helped to recommend DEB to Luca Pacioli. In a footnote Aho makes two references to Pacioli’s *Summa*, without giving any details. The first reference is to chapter 14 of the exposition of bookkeeping. There Pacioli explains that in a column on the left-hand side of the journal the bookkeeper inserts two numbers, one above the other, for each entry. The two numbers are the folio numbers of the two ledger accounts indicated in the entry. Some bookkeepers, states Pacioli, include a horizontal line between the two numbers, so that it is like a fraction. However, Pacioli says it looks more beautiful without a dividing line ‘... e piu bello senza tramezzo ...’). But Pacioli adds that it does not matter (*non fa caso*). The second reference is to a statement made in chapter 15 proposing the use of roman numerals (letters of the alphabet, in upper-case form) to indicate the year at the head of each ledger account. Pacioli says this is ‘for greater beauty’ (*per piu bellezza*). He adds that it does not matter much if you do not do this: *non fa caso* (Pacioli, 1494: fo 202). These two examples do not, of course, relate to any important feature of DEB. They relate, instead, to trivial details which according to Pacioli do not matter. They have no conceivable connection with the following statement in the relevant part of the Aho text (which reflects Alberti’s conception of the ideal building):

The most aesthetically pleasing and thus most persuasive ledger style would be that modeled after the congruent discordancies of our own bodies. But this would be



none other than a format resembling a double-entry ledger, in which each debit is off-set against its equal and antipodal credit.

No evidence has been advanced which establishes that Pacioli considered DEB to be beautiful, or that merchants adopted DEB because they perceived it to be beautiful.

### DEB, Zero and Negative Numbers

Professor Robert Kaplan, a mathematician, has written an entertaining and instructive book on the 'natural history of zero': *The Nothing that Is: A Natural History of Zero* (1999). The book includes an account of the struggle between those who favoured the use of the counting board (abacus) and those who advocated the use of Arabic numerals in making calculations. Widespread recognition in Europe of zero as a number eventually emerged, with significant consequences.

Kaplan assigns a key role to DEB in this battle in which the reigning 'champion', the counting board, was defeated in due course. It has to be said, however, that Kaplan's discussion is faulty as far as DEB is concerned – though the faults do not necessarily invalidate the conjecture of the connection between DEB and the acceptance of zero as a number.

As Kaplan puts it, 'the rising tide of commerce swelled the demand for careful calculations and records of transactions'. According to him, the 'need for accurate accounting amidst burgeoning data led to the invention in Italy of double-entry bookkeeping some time before 1340'. The way in which DEB led to recognition and use of zero as a number is not clearly elucidated in the remainder of a long paragraph which purports to explain the 'simple idea' underlying the 'invention'. The exposition is rather a muddle, and will not be comprehensible to readers who do not already have some understanding of DEB. However, Kaplan then describes more clearly the 'role that zero plays': it is 'a balance-point between negative and positive amounts ...'. It is implied that debits and credits are positive and negative numbers (or perhaps *vice versa*?). The new way of thinking attributable to DEB helped to make 'negative numbers as real as their positive counterparts; and the friction of these mutually exclusive bodies, in turn, redefined zero'. Elsewhere it is also stated that in DEB 'zero was the balancing-point of debit and credit. It is through this miraculous hoop of zero that positives turn to negatives ...' (Kaplan, 1999: pp. 108, 110, 142).

Professor Margaret Wertheim, a philosopher, in a review of the Kaplan book, also expressed the central idea concerning zero and DEB. The system 'required that credits and debits be balanced out to zero'. 'Slowly, zero came to be seen as one point along a spectrum – the fulcrum of a line that stretched indefinitely to the left with the negative numbers and indefinitely to the right with the positives'. Unfortunately, Wertheim spoils the story when she writes: 'All those zeros at the bottom of all those columns of figures gradually imparted to zero the status of a genuine number' (Wertheim, 2000: p. 29). However, there are not 'all those zeros' in early or later double-entry ledgers or ledger accounts. (A bilateral ledger account that is in balance, i.e. with the total of debit entries equal to the total of credit entries, does not exhibit a zero to indicate that there is neither a debit nor a credit balance in that account: that is indicated by the equality between the totals on the two sides of the account.)

Suppose, with Professor Kaplan, that DEB did play an important part in the recognition of zero as a number along the lines he proposes. Then it would be only fit and proper to

give *single-entry* bookkeeping a share of the credit. In a single-entry set of accounts, the account of a particular person (or firm) with whom the owner of the ledger had dealings could over a period of years sometimes have had debit balances and sometimes credit balances. For example, the person could be a banker who sometimes was indebted to the ledger-owner and at other times was a creditor of his; or, to take another example, the person could be a merchant from whom the ledger-owner sometimes bought merchandise on credit, and to whom at other times he sold merchandise or credit. The idea of a spectrum stretching from credit balances to debit balances could as plausibly have been conceived by users of single-entry ledgers as by users of double-entry ledgers.

## Concluding Observations

Edwin S. Hunt, retired businessman and now a professor of history, has referred to ‘the mystique around which economic historians in the past have tended to wrap’ DEB, which is ‘a simple record-keeping system’ (Hunt, 1994: p. 101, n.2). It is not only economic historians who have been beguiled by the DEB system and its mysteries, as this article shows. John Lanchester, a successful novelist, has described DEB as ‘the most important business tool ever invented’, and it has made possible ‘modern accounting techniques, and therefore all of modern business life, and therefore the whole structure of capitalism and the organization of contemporary society . . .’ (Lanchester, 2001: p. 4).<sup>22</sup> Not even Werner Sombart went quite as far as that.

## Notes

1. Sombart (1924: pp. 118–124). The first edition was published in 1902. The 1924 edition (the 6th edition, described as an unaltered reprint of the 2nd edition) is regarded as the best edition. The quotation in the text above is a translation of the half-sentence: ‘Man kann schlechthin Kapitalismus ohne doppelte Buchhaltung nicht denken . . .’.
2. In a well-known passage Sombart wrote that the merchant using DEB necessarily has only one objective, namely to increase value comprehended only quantitatively. When he looks at his accounts, he does not see boots or ship’s cargoes, nor flour or cotton, but exclusively money amounts that increase or decrease (Sombart, 1924: pp. 119–120). In Forte there is the following passage which distinctly reflects this idea and other Sombartian notions:

Fugger: Jetzt wird nur noch Geld notiert. Nicht mehr Wagenladungen oder Schiffsladungen. Kanonen, Tuche, Mehl, Wolle, Kupfer. Nur noch Geld. Waren, Tiere, Menschen, alles wird zu Kapital, das sich vermehren musz.

Schwarz: Und die Buchhaltung ist die Seele des Kapitals.

....

Fugger: Die gröszte Erfindung der Menschheit . . .

When Maximilian says that DEB must be the work of the Devil, Schwarz replies that it is thoroughly Christian, invented by a Franciscan [i.e. Pacioli] (‘Durchaus christlich. Von einem Franziskaner erfunden’).

Jakob Fugger, known as ‘Jakob der Reiche’ (Jakob the Rich), was the driving force in the exceedingly wealthy Fugger family partnership in Augsburg from 1511 until his death in 1526. Fugger enterprises were engaged in money-lending, other financial operations, trading and mining. Schwarz was his chief bookkeeper for many years, and also served his successor, Anthoni.

3. A ledger *alla veneziana* was one in which debit entries appeared on the left-hand page and credit entries on the right-hand page of a ledger opening. The use of a ledger *alla veneziana* was not limited to DEB, but was also very widely used outside that system.

4. *Manes* was founder of a religious system in which Satan was represented as co-eternal with God.
5. The terms *deve dare* and *deve avere* obviously are appropriate to personal accounts, i.e. accounts for the firm's debtors and creditors. The terms were in due course also applied to *nominal* accounts (e.g. expense accounts) and *real* accounts (e.g. merchandise accounts).

In sixteenth and seventeenth-century England the literal translations 'ought (or owith) to give' and 'ought (or owith) to have' were sometimes used. Thus entries in John Isham's ledger (1558–1565) generally take the formulation as in 'Seugar owith to gyve ...' and 'Seugar owith to have ...' (Ramsay, 1962: pp. 69–70). The Isham ledger is not in DEB. The ledger of Daniel Harvey, brother of the more famous William, runs from 1623 to 1646, and is in DEB. Harvey generally used other terms to distinguish between debit and credit entries, e.g. 'Ballance of my former Bookes is Debitor ...' and 'Ballance of my former Bookes is Creditor ...'. This formulation, or variants of it, seems to have ousted the earlier Italianate formulation. The Harvey ledger is in Guildhall Library, London.

6. The fragments of this ledger are reproduced and partly transcribed in Melis (1972: pp. 378–379), and discussed in Lee (1994: pp. 160–196).
7. The 'Final' account is on the last page of the book, with the words 'Account Closed' written across it. The biggest debit entry ('Aggravation') is for 'Socialism not given a chance', and the biggest credit entry ('Recompense') is for 'Death of 20,479 innocent west Londoners'.
8. Stevin (1608: p. 25): 'Les postes se mettent au Grand livre avec debet & credit, lequel de deux tend à mon advantage, lequel à mon arrièrage?' (The Dutch version of Stevin's book was published in 1607.) For a discussion of the conversation, see Yamey (1974: pp. 154–155).  
Journalists and others who are not familiar with the intricacies of DEB often equate debit with something negative or adverse. This practice perhaps is the result of the word 'credit' having several other meanings in English, including 'commendation bestowed on account of an action, quality, etc.' (*Shorter OED*).
9. See Sombart (1924: pp. 118–19). Kaplan, some of whose ideas are examined in the penultimate section of this article, seems to agree with Sombart, though the latter is not mentioned, that DEB led to important scientific discoveries. Kaplan writes (1999: pp. 110–111) that DEB introduced a 'new vocabulary'. His examples reflect the duality of entries in the system and the exchange element in transactions: 'Didn't this new vocabulary lead in time to the framing in physics of its conservation laws: matter, momentum, energy neither created or destroyed but exchanged – and to such insights as Newton's Third Law of Motion – for every action there is an equal and opposite reaction?'.
10. Buchan may also have undergone a spell of Sombartian intoxication when he wrote: 'Above all, Luca [Pacioli] laid the foundation of the modern conception of profit, not as some vague increase in possession, as in antiquity, but as something hard, even crystalline, mathematical and open to empirical test at *any time whatever* through an interlocking system of books' (Buchan, 1997: p. 68; emphasis in the original).
11. Thompson's article (1991) includes the word 'rhetorical' in its title. But I do not consider that article here. As regards rhetoric, Thompson is largely concerned with the question how Pacioli made use of rhetoric in the section on bookkeeping in his *Summa* (1494). My focus here is different: it is on whether the rhetoric of DEB was significant in ways such as those proposed by Aho and CE.  
Thompson states (1991: p. 582): 'There is much to admire and agree with in Aho's analysis.' He does not indicate whether he agrees with Aho's views on the significance of the rhetoric of DEB.  
I have considered some of Thompson's remarks concerning Pacioli in Yamey (1994(c): pp. 54–56; 64 n.6).
12. CE go so far as to write that 'double-entry accounts documented a man's frugality, acumen, and industry. With personal qualities such as these, a businessman could maintain both his reputation and his credit' (1991: p. 52).
13. In the rest of the passage from which the quotation is taken, Aho claims that the balance sheet proves, *inter alia*, that the firm 'has discharged its debts from loans and purchases from its creditors in proportion to what it has received from them ...'; that 'it has paid income taxes, emergency levies, tithes, and restitution to possible victims of unfair sales, discharging its debt to God, Church, and Commune (legal) ...'. 'As accurate as they might otherwise be, no other bookkeeping procedure can provide such a visible and thus compelling demonstration of the ethicality of private enterprise as DEB'.
14. According to CE (1991: p. 64), 'Throughout its history, the double-entry method has played a crucial rhetorical role in legitimating an expanding capitalist economic system'.  
In a review of a biography of Adam Smith, James Buchan has written (1995: p. 13): 'The force of *The Wealth of Nations* is that, like Fra Pacioli's treatise on double-entry bookkeeping in 1494, it reproduces commercial knowledge and practice in the vernacular, and like that great work provides them with respectability'.

15. A good example is the cover-up of a sixteenth-century mercantile fraud is discussed in Brulez (1959: pp. 16–21). The ledger involved was kept in double entry.
16. According to a verse in Dutch which was well known in the seventeenth century, the merchant says (in free translation): ‘Please feel free to come into my counting-house/Look into all the corners/But keep your hands in your pockets/And your eyes out of the books’ Bicci (1991: p. 397).  
A merchant may, of course, on occasions have shown a debtor or creditor his particular account in the ledger. There are examples in which the merchant’s debtor (or creditor) wrote in his personal account (in the merchant’s ledger) that he confirmed the balance on the account. See, for example, Pickl (1966: p. 96). Pickl’s book is about the oldest surviving business account book in Austria.
17. On Banchi, F de Roover (1966); on Plantin, Voet (1969–72: vols 2, 4–5); on the Fugger, Schiele (1967: p. 52); on the Rothschilds, Ferguson (1998: pp. 111, 970). For other examples of the use of single-entry bookkeeping by prominent business firms, see Yamey (1997: pp. 13–15).
18. Lemarchand (1993: pp. 141–160; 1994: pp. 119–145). For the Anzin company (1993: p. 140).
19. For British coal-mining, see Hatcher (1993: pp. 301–306, 329 *et passim*).
20. See Yamey (1994b: pp. 255–257); for Cambini, Tognetti (1999: pp. 132, 138, 145).  
Errors that upset the equilibrium of double-entry ledgers were not of course confined to Italian ledgers.
21. For a more extensive discussion, see Yamey (1994a: pp. 100–101).
22. In Lanchester’s novel *Mr Phillips* (2000), the main character fell ‘in love with the double entry book system, when he trained to be an accountant’.

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