
Pacioli's Innovation in Accounting: Business or Academic Affairs

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Abstract:

*According to the accounting literature there is no evidence for earlier use of “double-entry”, as documented by Luca Pacioli in his *Summa de Arithmetica Geometrica Proportioni et Proportionalita* (1494), before the 13th century AD. Littleton’s popular thesis links double-entry to the increased intensity in modern times (as compared with in antiquity) of two (all inclusive) groups of economic and technical “antecedents”, while Hoskin and Macve (1986) explain the articulation of double-entry in early Renaissance as an aspect of the new way of writing the text (“new textuality”), that was being developed around same time in Europe by scholars who saw in it (and in accounting, albeit with no particular interest in double-entry itself then) the potential of new power-knowledge relationships. In this study we attempt to explore if double entry, the innovative method for the accounting technology, is business or academic affairs.*

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1. Introduction

As Geoffrey de ste Croix demonstrated (Greek and Roman Accounting' in Littleton & Yamey, 1956), there is no support for the belief that the technique of “double-entry bookkeeping” was in use in the ancient Greek and Roman world and there is no sufficient evidence to even begin an argument on the subject with regards to previous civilizations. The earliest use of “double-entry” is believed to be in the 13th century AD as documented by Luca Pacioli in his *Summa de Arithmetica Geometrica Proportioni et Proportionalita*, 1494.

From the views advanced since then for explaining the maturing of double-entry in early Renaissance Italy, we distinguish that of Littleton's (1933) and Hoskin and Macve's (1986), for the two could be seen integrated in a context that narrows the area of inquiry, a general one being the first and sharp and inquisitive the second. Accordingly, Littleton's popular thesis links double-entry to the increased intensity in modern times (as compared with in antiquity) of two (all inclusive) groups of economic and technical “antecedents” (see Notes 1), while Hoskin and Macve (1986) explain the articulation of double-entry in early Renaissance as an aspect of the new way of writing the text (“new textuality”), that was being developed around same time in Europe by scholars who saw in it (and in accounting, albeit with no particular interest in double-entry itself then) the potential of new power-knowledge relationships.

Acrobateing between such as the above theses in this study we attempt to ascertain those double-entry illuminating circumstances in early Renaissance next to, and yet apart from, the academic developments of the period within which Hoskin and Macve (1986) place it and in more precise than Littleton's terms. It is not an easy task but apprehensive of the rather problematic relationship of accounting with academia, in this paper we propose to turn the focus on certain new entrepreneurial activities and business-technology developments in the Italian city-states which accounting is found bound-up with (Hyde 1979) making the apocalypse of double-entry not only “inevitable” (Hoskin and Macve 1986, p.120) given “the new textuality's” technology too now, but also predetermining its development (within and together with accounting) in a course of its own outside the University.

With regards to Accounting's (problematic) relationship with academia (vis-à-vis that with business) and its corresponding consequences there because, a representative case - study could be made out of their brief and only encounter through Pacioli. Luca Pacioli must have written his *Arithmetica* on bookkeeping more on the basis of his business experience than on his scholar training on the subject. For, besides being a distinguished scholar (as he had to be to report on double-entry as he did) he was also (according to Mills, 1994) an apprentice in the family of Folco di Belfolci – who was well versed in business-and later again he was

boarded by businessman Rompiasi on account of whom he travelled on merchant ships and from which “on-site training” he must remembered the business details that appear in his *Arithmetica*. And yet accounting, as a discourse, was not to benefit from such a distinguished academic visit so as to be able to link-up with the other academic subjects that were being reorganized around that period in Europe.

Such a course of inquiry just hinted is encouraged by Bloom and Debessay (1984, p.3), for example, who suggest that the evolution of accounting, in its today well accepted function of providing information for users decisions, can be more clearly followed if seen through the framework of the evolution of business enterprises, and by Freear (1984, p.2) and de Roover (1955, p.417) but Costouros too (1972), who observe that documented accounting practices had spontaneously reacted to and appear to be in accord with the basic ideas of meeting the informational needs of users in a changing socio-economic environment (despite constraints of high cost of materials recording and popular illiteracy) and influenced, we may say, by the attitudes of entrepreneurs and practitioners who together decide what (practical) accounting system an entity will use.

At the same time, it is in vain to attempt to explain the development and near universal adoption today of double-entry accounting in modern financial reckoning and reporting by discerning any serious preoccupation of academia and literature by the discipline or any allusions to Accountancy's contribution to knowledge and its participation in scientific problematization. Bookkeeping is scarcely mentioned in classical literature and only with contempt though the function of accountants was considered important enough in ancient Athens, for example, to have ten of them by random appointment included in their administrative system, and in major knowledge developments and reorganizations in Western civilization (namely in classic Greece, the Hellenistic times and in early Renaissance), accounting was either completely absent as a discourse or it was clearly dissociated from the Universities (Durham, 1992) while no clear link is identified between double entry accounting and the improvement of “rational economic decision” in modern times (Burchell et al., 1980) or in antiquity (Macve, 1985).

Our main argument could thus be based on the problematic relationship of accounting and academia- as compared with that of business-through history, on the one hand, and on the novice business practices during the apocalypse of double-entry in early Renaissance Italy, on the other, more in line with Homburger's view (rather than Littleton's) that the evolution of accounting procedures and thought the centuries has been due largely to the changing demands of the social units to be served rather than to technological developments and discoveries relating to the procedural aspects of accounting (in L. Housmanidis, ed., 1974, p. 111), we concentrate on the strong return of entrepreneurship with new credit and financial needs in the Italian city states of 12th and 13th centuries AD that we consider prime

precipatory developments and circumstances of double entry's last, and perhaps final transformation.

2. Enterprising in Early Renaissance

The formalization of the famous debit-credit double entry in accounting technology in early renaissance cannot but be studied in relation to other, more primary developments that were taking place during the same time in education and (especially) in business with which accounting is found bound-up according to several accounting historians, (e.g. Hyde; Hoskin and Macve, 1986, Durham, 1992) and which are seen as a "major breakthrough in the use of literacy in the field of long-distance commerce and finance", (Hyde, 1979, p.113).

Basically, entrepreneurship awakens from medieval dozing and starts to pick-up where the Greeks left it just before the heavy Roman administration set-in and slowed it down and into the stagnation, eventually, of the middle ages. In education, scholarship was also ready to reassert its role in social transformation, coming from underground, where, in a way, it went during the Dark Ages.

The position of the businessman started to improve markedly as now he was facing a different climate where even the church began to change its attitudes toward business; people saw that business was good for all. The Italian city-states realized this very early, since their geographical location made them very conscious of the importance of commerce, especially at international level where now the supply and demand factors of its process were to be found. These were banks, traders, middlemen, partners, industrialists, workers and so on, involved in the process of financing, manufacturing and marketing the goods needed to satisfy the constantly increasing demand. The crusades, on the other hand, not only discovered new ways and products of "spicing" the miserable and deprived, until then, human life, but provided also the men for the first business liaisons in the Middle East area through those men who chose not to return home.

Thus in many instances, in the case of the Italian city-states of this period, the completion of trade and production related transactions required the transcending of the immediate geographical vicinity and the extension or creation of business facilities in distant points and states. Couco mutually, the cycle of business transactions (money-thing-money) was lengthened, both in terms of intermediate phases and total time, while more people were becoming involved and the realization of profit and other settlements had to be delayed. This necessitated the filling of the gap by credit extension or borrowed money and for the first time in history credit acquired importance and a domain of its own while the available capital came for the first time the sizable demand of growing business enterprises thanks to the banks of Venice, Genoa, and Florence.

Significant to the practice of finance and credit-and particularly to the transfer of the later the geographically expanding market- was the development of credit techniques and instruments (simple credit advices at first and later bills of exchange, cheques, bank notes, etc) and facilities at international level as they could affect the transfer of debts and claims with minimum actual cash money.

In a basic sense, credit was not an entirely new business practice in the Italian city-states. It was practiced in ancient Athens too (see Pasio's banking in Costouros 1972); new was the systematic transfer of third parties' debts and claims in the books of bankers and agents who acted as intermediaries and the multiple such transfer could take by credit advices and through the operation of an extended national and international network. All these together and each one alone constitute a significant difference between then and antiquity and not only in kind but in degree of effectiveness too.

3. Monitoring Credit and Credit-Transfer in Early Renaissance

As we drive our discussion closer to the point we set out at the beginning, it becomes obvious that the important to our analysis aspect of the entrepreneurial circumstances in early Renaissance Italy must be the credit transactions and the multiple, consecutive transfer of debts and claims arising from or related to such transactions and sustained (until settled) by the new banking and finance facilities referred to earlier. These concomitant to the expanding enterprising novel banking and finance practices (that Leone reports on and several other writers pay attention to e.g. Hoskin & Macve, 1986, Hyde, 1979; and de Roover, 1974), "all had as object the national and international mobilization of money and credits" (Leone 1983, p. 623); and this instrumentation and facilitation of long-distance credit-transfer that Leone describes, stand out not as only new and peculiar to the period around the emergence of double-entry, enterprising circumstances but are also, reported to be a "major breakthrough in the use of literacy in the field of long-distance commerce and finance", (Hyde, 1979, p. 113).

For the move of credit around, the system depended on a massive network of correspondents (Leone, p.620), often bankers themselves, operating a series of correspondence accounts using the so called "bills of advice" that provided information on changes in exchange rates, also others bearing orders for remittances or drafts on other places or banks, and registered all transactions as debits and credits and over time reduced cash transfers to a minimum since the multiple bilateral operations between agencies could be regulated very small settlements. The reduction of cash transfer should be viewed as only one of the effects of surging credit in the period; another event was, as we mentioned earlier, the filling of the gap that was created by the lengthening of the business cycle in the new enterprising.

For accounting important was its ability to effectively respond to the necessity of recording such credit transactions and especially the multiple transfers of credits – and monitoring them in its grasshopper – style course until they were finally liquidated. In such a setting, the appropriate technique would make contribution not so much to the creditor's bookkeeping when first credit was extended and only a debtor's notation in single entry would suffice as the balance of the entity's physical accounts could be determined by physical inventory given also the small holdings and the proprietorship style of the time but to the monitoring of subsequent transfers of the original debts and claims.

Such moves unavoidably had to be dealt with in double terms for two accounts were affected now, the old and the new creditor's or debtor's while the recording was made (according to Leone, 1983, p.620) and the circumstances illustrated in our exposition in the books of the intermediary banks or agent. Now, the (spatial) approximation and conjugation, in effect, of two records into one and of same entity are making more obvious the doubt in which the transaction on hand had, and could, be portrayed in the books of the recording entity, and the monitoring itself more efficient.

Other to be dealt with in a similar manner situations were also developing and always in the context of credit extension. Such were the cases with. original credit issue through fiduciary money (see also Hoskin & Macve, 1986) or with the use of credit instruments such as the bill of exchange and until such instruments obtained an accepted identity and autonomy of its own as titles and records. The first bill of exchange is reported in 1291AD in Florence according to Y. Renouard in Houmanidis, 2008 p. 495) while its first endorsement in 1410AD according to Houmanidis, (p. 495). The bank note is reported in the second half of 13th century according to A. Fanfani, (1955) in Houmanidis (2008) and the first personal (cheques were drawn in 1374 at the bank of Parazone e Donato, (F. Melis, 1955, p.63). In such vacuum it was necessary to the early Renaissance accountants or businessmen themselves to mark in their books and through them monitor the issue and/or a transfer of credit, sometimes multiple and consecutive; Hoskin & Macve note "the underlying point is that these distant credit operations had to be marked down in the intern's books in double form" (1986, p.12).

The explanation Mills (1994) offers, with regards a credit situation too whereby a credit entry was needed to fill the gap created because the corresponding real item was for whatever reasons missing but intended to be recognized, (p.84), does not address the absolute necessity of two entries, a debit and a credit.

At this point, it is appropriate to present the explanation in our thesis vis-à-vis our pivotal, indeed, thesis of Hoskin and Macve, (1986) who, as we mentioned in the beginning, explain the emergence of double-entry in same period as an aspect of the

new textuality. It is clear now and well accepted from the point of view of this thesis, how new textuality in general and particular its new “gridded order and control” (Hoskin and Macve, p.108) and its visually oriented lay out of the texts could have provided the basic technology for the arrangement of accounting books by accounts and also how the (new) systems of referencing contributed to the connection of journal and ledger entries. To make this point stronger and our case even harder we could bring in the similar views on the contribution of the lay-out of the accounting books by individual accounts to double-entry’s development concurrent of Italian accounting historians too (e.g. V Alfieri in his *La Partita Doppia applicata alle scripture delle Antiche Aziende Mercantili Veneziani*, Milano, 1891, as reported by Houmanidis, 1980, p.490).

Still, as the clock did not create an interest in time – measurement (but the other way around) so we believe couldn’t the development of new writing technology have aroused people’s interest in double-entry? A basic technological development does not itself convey individual messages to every particular social subset; it is rather the other way around whereby somewhere in those subsets of social works the respective circumstances make obvious (even to the lay man) the application of solutions that can draw on current basic technology or on a general concept’s basic aspects.

This in our approach – vis-à-vis Hoskin and Macve’s thesis – is that this, on new-textuality, presumably, based accounting technology could have been drawn upon only in a context of problematization with the recording of credit transfers; and where such system of individual accounts and double postings, actually, (as most probably the operations in the accounts at first were directly done without the use of journal entries) was the only way to monitor the transfers indicated to the intermediaries on an advice by which, clearly and unavoidably, the accounts of two (third) parties were to be affected simultaneously, and (which is most important) in one and the same set of books, one marked “to give” and the other “to receive” or “de dare” and “be havere” correspondingly in old Italian. It is obvious now that in such setting the articulation and operationalization of the ancient, and always present in exchange transactions, principle of duality into credit and debit double entry was for it a matter of “falling into its place” while its extension to the other non-nominal accounts was a matter of natural development and of practice by those who, according to Hoskin and Macve (1986, p.120), dealt most fully with credit transfers.

The words debit and credit come from the old Italian debito and credito which come from the Latin debitum, debt, and creditum, trust, from debeo and credo, correspondingly, meaning to owe (he who has gotten something on credit), and to trust (he who has given something and stands to receive back that or its equivalent in value). What is more important, the original words found in the early ledger accounts (those presented by Pacioli, for example) are as simple as “dedare” – to give, and “de

havere” – to receive, describing in old Italian vernacular what was exactly the situation on hand and what needed to be recorded there of e.g. who stands to owe and who to receive from there on, in personified accounts that portrayed the personal relationship established by the issue of credit. The application in the process later of this initial wording to all accounts was simply a matter of natural development.

The following are samples of such early Renaissance ledger entries from Pacioli’s *De Computis et Scripturis* part of his *Summa* ([resented by Hernandez-Esteve, 1994, pp. 78-79):

<p><i>Lodovico dipiero forestai de dare a di. XIII novebre, 1493, L.44.S.1.D.8 porto contati in pstaca, posto cas sa avere a car 2 L 44 S 1 d 8</i></p>	<p><i>Lodovico dipiero forestai de havere a di. 22, novebre 1493, L. 20. S. 4. D.2 sono p parte di pagamento. E per lui Celia promissi a nostro piacere fracescho datonio cavalcati posto dare a c. 2. L. 20 S 4 D 2</i></p>
<p><i>Fransesco dantonio caval cati de dare a di. 12 di nove bre. 1493, L. 20. S. 4 D. 2. Cip misse anostro piacer p lodo vico di pieroforestai a c.2 L. 20 S. 4 D. 2</i></p>	

And which could be translated as follows:

<p>Lodovico dipiero forestai “to give” as of 14 November 1493, L.44.S.1.D.8, for an amount borrowed by him, and posted to cash as “to receive” in folio 2. L 44 S 1 D 8</p>	<p>Lodovico dipiero forestai “to receive” as of 22 Noember 1493, L. 20 S. 4. D. 2 as partial payment promised for him to use at our convebience by Fransescho d’ Antonio Cavalcanti, and posted “to give” in folio 2. L. 20 S. 4 D.2</p>
<p>Fransesco dantonio cavalcanti “to give” as of 12 November 1493 L. 20 S. 4 D. 2..... lodo vico di pieroforestai a c. 2 L. 20 S. 4 D. 2</p>	

The non-defining person or number on infinitive form “de dare” and “de havere” was very appropriate for repetitive use referring to a future obligation and claim respectively. Emphasizing this futuristic or promissory meaning, apparently, Gei jbeek (1974, p.14) translates “de dare” and “de havere” as “shall give” and “shall have or receive” where “shall” is used with a simple infinitive, indicating futurity.

4. The Intertemporal Emphasis within Accounting Entries

Credit in general and especially credit transfer must have acted not only as a stimuli for the development of recording techniques throughout the history of trade (including primitive exchanges) but up to some time (in most countries up to industrial revolution) it was considered the only important enough aspect of a transaction worth to be recording (see for example Mills, 1994, p.84). The view that credit transactions were the main (if not the only) worth recording, in time when business (and by extension accounting) were asserting their role in social making, is also supported by the details to which emphasis seemed to be ascribed to the various formats or entries through time.

Thus in classic Greece, when accounting was in obscurity, we see that the account of Timotheus at the bank of Pasio shows the physical flow of the money that went through it, and, though several "credit" entries are included therein, no effort is apparent in portraying and monitoring in a more permanent fashion the (personal) credit relationships which were created therein between Timitheus and Philondas, for example. The account runs more like in the charge-discharge style vis-à-vis the bank and each customer separately and as if settlement is eminent or no other –between same or other persons – credit transactions were anticipated; the position – as debtor or creditor – of each party was thus not underlined. This same omission is apparent in the way accounts were maintained in Greek and Roman times (shown earlier) though the two points between which the flow of the commodity is taking place is designated more clearly now by the words from and to (see note 3). Strangely enough, monitoring debts was essential in primitive times by the use of engravings on two pieces of wood, one for each party in the exchange, (Balis, 1978).

Lemarchand (1994) sets forward the hypothesis that "the first role assigned to commercial accounting was the monitoring of the position of debtors and creditors", (p.138) and in (p.140), he has Sellon, an 18th century director of a French manufacturing company, saying that the primary function of accounting is overseeing of third party accounts while in another instance and another place, the Greek island of Chios in 13th century AD, the Italian company Mahona di Scio is reported as systematically neglecting to record transactions relating to income from owned sources while it recorded all revenues from sources turned over to by third parties to offset debts to the company, (Damalas, 1991).

The same interest is reflected in the charge-discharge system of medieval times whereby stewards had to account for what were charged with initially (and with subsequent produce of the estate) by showing where the difference went. From a similar view point, Mattesish (1994, p.39) regards such format of entry as one that portrays "physical transfer of goods" between "an input location", debit, "to an output location", credit. On the other hand, the early Renaissance Italian accountants

– merchants themselves, perhaps, in the beginning are according to Melis, 1950, p.342. Hum, p.489) – make an entry in a (personifying) way that connects a debtor to a creditor, giving thus emphasis to the personal (credit) relationship between the persons in the transaction. From there on the debit-credit double entry cuts free from personification and serves all kinds of an entity's accounts.

This was, we could concede, the case with double entry's is formalization. The necessity to monitor the distant and multiple transfer of credit in early Renaissance Italian city-states commerce, unfolding in a new technological environment of writing the text in the new visual lay out (by individual accounts, in the case of business literature) constitute the particular circumstances within which accountants were enabled to achieve the articulation of double-entry technique; contrary to what many came to believe, help from Arabic numerals came later as its use started after D.E was well established, (Durhan, 1992, p.50).

As simple as it may seem the above account of the apocalypse of double-entry, it is also suggested (however from a different lower point) by other accounting historians, e.g Hoskin and Macve (1986, p.120) when they say that “the underlying point is that, no matter how these distant credit operations developed in the process later with the use of fiduciary money, drafts and bills of exchange, discounted or not, they had to be marked down in the intermediary agents books unavoidably in double form”, (and specifically, in the form of a debit and a credit or “debito” and “credito”), adding that “clearly, the process which had its shortcomings and limitations in the beginning was taken farthest by those who dealt most fully with the sophisticated money instruments”, a reference to the bankers and agents of the time, and it may even be fair to say that given the nature of the new money (fiduciary and money of account), the movement towards double-entry was inevitable as it was impossible before” their reference in time apparently being to the period before the diffusion of the new textuality rather than before the new enterprising in early renaissance.

5. Academic Developments in Renaissance

5.1 Accounting and the New Textuality

The academic developments that were taking place around the end of medieval times are reported to have contributed (catalytically, according to some e.g. Hoskin and Macve, 1986, not so constructively according to Durham, 1992) to the progress of accounting around same time in Europe. Of these developments, some technological ones – as compared to institutional – are conventionalized by Hoskin and Macve (1986) into the “new textuality” or the new mode of re – writing the text. By 13th century this new textuality” develops into a technical enterprise of re-writing the primary text, both internally and externally, deploying space and numbers in a new

systematic way that is characterized by a new visually oriented lay out and systems of referencing with which codex and portions of text are designated, (Hoskin and Macve. p.111) and in compassing slowly but steadily all forms of written expression, including commercial reckoning. Arabic numerals were widely known by about 1300, though not generally adopted until the second half of 15th century in Italy, (Durham, 1992, p.50). The key intermediaries in the deployment of this new kind of writing were pedagogues, concerned primarily with problems of knowledge but exercise of power as well which these new knowledge techniques accorded to its masters. The techniques that the new knowledge was expressed in included archiving, cross-referencing and particularly more systematic examination in a number of new formations of power, (e.g. audit).

It is obvious that several writers (and particularly Hoskin and Macve, 1986) make their connection of the pedagogues' influence upon accounting in early Renaissance through "new textuality" the internal re-writing of the text into accounts and the double writing of money, (p.114) which would later eventuate into double-entry and after the process was taken farthest by those who dealt most fully with the sophisticated money instruments", (p.120). From these techniques of the new textuality, new systems of accounting draw whether these were single or double-entry, for recording purposes and accounts keeping, first, and eventually developing into or supporting such systematic examinations of written statements of incoming are outgoings and of the honesty of administrators, (p.112) and eventually into such modern discourses of audit and control. Control and audit – new power – knowledge relationships for pedagogues (at first) will later develop into professions and provide along with other related subjects (e.g costing) the basis of modern management.

As Hoskin and Macve note, however, the process of these accounting related developments was carrying on without double-entry. The acknowledgement of D.E and its adoption in Europe (except in Italy) was to be delayed while other accounting historians seem to blame (as far as academia is concerned for the delay) the lack of interest by academia in the vocational subject of accounting (Dunham, 1992, see also Note 2) and its disassociation from University. Hoskin and Macve attribute the late implementation (19th century) of D.E in the financial world to the late introduction of the arithmetic mark in education and from there to commercial reckoning as a powerful micro-technology of calculation.

5.2. The Arithmetical Mark

The development of the examination techniques by late medieval pedagogues continues and it will, according to Hoskin and Macve (1986), result to the establishment of the arithmetic mark as the ultimate way of written evaluation of human performance "for the purpose of control and for the construction of value" (p.126). This, they note, accounting (as a discipline historically connected and

identified with such purpose) presumably could not do – in extending and fulfilling its historical mission – by itself and without the mark, as it was a memorizing and not a calculating process.

But while its invention could have marked the locus of intersection between accounting and academia through which accounting would acquire power and its place in modern economics by applying the new micro-technology of the mathematical marking system in the financial arena (producing accountability and profitability through calculation and education did first on pupils) and attracting the interest of academia, accounting's progress stumble on and its calculative image was easily shattered by such unhappy economic events as inflation and demands from the users of accounting information for more accurate valuation and (even) prediction. From our point of view the mathematical mark, while it benefited accounting as much as it did any other discipline and function it has very little to do with double-entry and debit and credit sign in particular. Debit and credit in accounting today serve the designation of the points (accounts) between which values (however determined) flow. Accurate valuation is a problem to accounting today but does not relate to D.E. The mark cannot add and subtract values from places (accounts) simultaneously and conjunctively as Dr, Cr can (which is important to commercial reckoning and reporting) without losing by this generalization its original property to underline in its unique way a debtor and a creditor or a estimation and a source (flow) before it (as original entry) is disseminated into various accounts. That the arithmetic mark cannot do.

Could the eventuation of double-entry be placed amidst these developments alone or it would be more fair and benefit its understanding and exemplification if we bring into play those contemporary novel commercial and financial activities presented above and with which accounting is reported to be found bound up (Hyde, 1979, p.11e)? Was the contribution of new textuality through the new visual layout of accounts sufficient to conceptualize double-entry and if so what we are to say about its initial expression in such old Italian words “de dare” and “de havere” which relate more to the familiar “habitant” of business and commerce rather than to that at scholarship's the academics of which neither in adiquity nor in modern times had exhibited a genuine and continuous interest in the practical discourse of accounting.

The new textuality based internal re-writing of the accounts – double or single entry supported – is an important and inseparable aspect of accounting's technology but this can be traced also to prehistoric times (according to Mattessich, 1994, pp. 17-19, and exhibiting even a double in ledger accounts in some of that time's peculiar accounting forms discovered by Schmandt-Besserat in prehistoric Near East) and should not be seen as peculiar to early Renaissance accounting's practices and circumstances. The reactivation of entrepreneurship in early renaissance with some

new and specific practices in banking and finance, however in an accidental way, illuminated double-entry upon the accounts of new textuality.

5.3 The Reorganization of Academic Subjects

During the period of early Renaissance (in Italy especially) two inter-related processes took place in education which affected accounting – the gradual dissociation of accounting from Universities, and a revision of the University curriculum itself. The first of these processes must be related to the vocational emphasis that scholars themselves gave accounting in their effort to promote it outside the University, (and perhaps gain from teaching it as one scholar in 12th century Bologna seems to even advertise the subject, if we read correctly Hoskin and Macve, 1986, 9.116) as they reportedly did in many independent business schools that were set-up by individuals in main business and administrative centers, e.g. the English court or Chancery and the Italian city of Florence, (quote). This change resulted in a weakening of the educational tradition which maintained the old connection among accounting, law, and “grammar”. By the sixteenth century, commercial arithmetic was taught entirely outside the university environment, (Smith, 1925, p.186-192 and Littleton and Yamey, 1956, pp. 185-214).

One reason that it had become too complex to be studied within the so called notarial art in the law faculties, this dissemination and popularization of relevant to accounting knowledge by teachers outside and beyond the confines of the university – where up to now the great majority of clerks and accountants were trained – must have had by itself an additional degrading effect on the discipline of accounting just about when the new technology of double-entry was making its first steps.

But it was not only the parting from old college companions that must have affected fifteen-century accounting practice. At the same time, the content of education, particularly at advanced levels, was changing. In a revolution instigated by such fourteenth – century figures as Petrarch, a new scholarship deliberately cast aside much Medieval learning and sought to return to the supposed purity and nobility of the Greek and Roman classics. This new vision of learning carried with it the risk of exposure to the attitudes of classical antiquity, distinctly contemptuous of practical affairs such as bookkeeping (scarcely mentioned in classical literature, where, as Durhan notes (p.47), one of the new passages from classical literature in which a bookkeeper is explicitly mentioned is in Petronius Satyricon (ed. Heseltine, 1930, p.92), a picaresque work and in a context deliberately designed to show contempt for bookkeeping, while Hatfield (1977, p.8) remarks that before and until the industrial revolution the subject had fallen into academic disrepute.

In a more general sense, this new vision demanded and resulted to a distinct reorganization of knowledge and scholarship, of analogous, perhaps,

contemporaneous significance to the reorganization of classic scholarship that took place in Hellenistic times when the what we call today science discourses branched out from philosophy.

In pursuing our point on academia's role in accounting's progress from Renaissance on we must say that accounting was to wait even more and for other reasons and, specifically, until the examinational and disciplinary potentialities, that were recognized in the mark, were also seen of perfect and rewarding as well applicability in management and such other discourses and professions as costing and audit, all of which had to accept, reluctantly perhaps, the double-entry accounting technique.

Thus, and while the reorganization of many university discourses was still in the air, commercial reckoning went its own way outside the university. Under these circumstances it is not surprising that accounting was not able to link-up with the new course of mathematics – that was reorganized as a pure course, freed from its semantic aspects and numerology, (Durham, p.48) and it took accountancy until the second half of 20th century to start worrying about its valuation and measuring deficiencies. Noteworthy is also around the same time, and immediately following the publicity of double-entry by Pacioli and its adoption by Italian estates and business, the hasty decline of accounting literature that had flourished in the 13th and early 14th centuries, (Oschinsky 1971, pp. 61-62). This decline could be explained as a symptom of a quick disappointment of writers (and academics in general) by the well defined and of vocational significance (only) new accounting technology in business.

6. Pacioli

The work of Pacioli "*Summa de Arithmetica Geometrica Proportioni e Proportionalita*" could be significant in a multiple points of view though it is today referred to by accounting historians primarily as the first printed account on double-entry bookkeeping. As its title proclaims it, this work is an attempt of a comprehensive treatment of the entire mathematics-related discourses of the time. Regarding its accounting aspects, we must note the interesting view of Hoskin and Macve (1986) who see it not simply as an attempt to unify all knowledge related through mathematical terms but essentially (and perhaps subconsciously) an expression of the inter-relation between the various alphanumeric discourses which had developed over the previous centuries, (p.123).

One way or the other, such inter-relation was, however, to be only temporary and short-lived. Though Pacioli is reported as a very influential person of his time (he was what we may call a doctor of divinity and a professor) and double-entry accounting could not have had a better reporter, it seems that it failed to maintain the momentum given to it (by Pacioli) and keep up with the progress of other discourses; and this confirms our view that the complete and straightforward – and one,

therefore, that cannot be subject to scientific questioning method of recording – could not endure an association with other (scientific) discourses. The significance (as we understand) that Hoskin and Macve which to attribute to double entry's connection with academia can be realized only within the context and under the focus of their particularly vigorous analysis of the importance, presumably, of the scholarly enterprise of new textuality upon the accounts of which however accidentally, D.E was illuminated in early Renaissance.

Double-entry could not have been invented neither accounting in general developed by pedagogues, (in an academic sense), except as a vocational course in para-University business schools. Any relation of double-entry accounting technology and academia can be viewed from our point of view as superficial and, accidental. The fact that Pacioli was, indeed, an academic in the maximum sense of his time, and not a businessman, makes it even more difficult to defend double-entry's scientific record, as it was, indeed, given by him the chance to link-up with other scientific discourses being developed or reorganized at that time and failed.

One of Durham's explanations for the failure of Pacioli's attempt to unify accounting with mathematics (an attempt that is to be undertaken by several accounting researchers in modern times again) is the sheer size of the *Summa* (that it could not be studied as a whole perhaps, he way intended to mean (1992, p.50); and another explanation given by him too is that double-entry, now, accounting, being a clear, complete and straight forward technique – yet new and needed to be studied and acquired nevertheless – and with the publicity it received through its inclusion in the work of a famous scholar, offered accountants a secure professional status through a craft that could be isolated and conveniently studied alone and apart from the rest of the material (in the *Summa*) that were rather irrelevant or too theoretical for the practical bookkeeper. Perhaps the fact also that the *Summa* was written in Italian vernacular and not the more prestigious ancient Latin had a degrading effect too. In any case accounting was separated from the rest of the book and took a life of its own, (Durham, 1992, p.60; see also Freear, p.9).

7. Conclusion

Only until the marvelous awakening of the Renaissance period with the expansion of commerce and its (novel) credit transactions and practices therein, on the one hand, and the new – writing technology, on the other, was double-entry perhaps “impossible” while its evolution was indeed, “inevitable” (Hoskin and Macve, 1986, p.120) to its final form given the obvious double dimension of the exchange transaction and the eventually realized necessity to monitor the accounting of both parties involved in a transaction. This necessity was realized as we attempted to illustrate in the credit transfer practices of the early Renaissance enterprising. Each one of the different forms of recording entry's expression we meet through time

reflect the needs upon which social functions (entrepreneurship, administration, and occasionally scholarship) placed emphasis and gave them recording (memorizing) priority.

In the academic side, this very inevitability of the appearance of double-entry-which Hoskin and Macve admit and yet they let it be seen as an aspect and product of (presumably) purposeful and scientific working by late medieval scholars – is what makes also the invention of double-entry unavoidable, accidental, and therefore, non-scientific. For it is well accepted in modern scientia, that science is knowledge arising from purposeful (and not accidental) research (see for example M. Gaffikin, 1984, p.12). In addition, and with regards to scientific method, double-entry being complete, straight forward and leaving no room for dispute or improvement, does not possess the falsifiability element and the tentativeness on the basis of which empirical knowledge is accepted into the body of empirical science, according to Poper (1959, pp. 42-54). This later is, we suspect, the one characteristic that makes double-entry accounting unattractive to scientific inquiry and it condemns the discipline in academic obscurity as long as it does not develop a theory that every discipline must be intensified with, and methods to deal with such problems as valuation, but continues to rest comfortably on principles and standards. Regarding the issue of valuation and accounting, however, we must point out the double-entry has nothing to do with calculation and valuation for it carries whatever is placed on its debit and credit signs and however that is calculated.

The exception we take in relation to Littleton and Hoskin and Macve as well, is that we believe it was the particular entrepreneurial activities (the extension and consecutive transfer of credit necessitated by the lengthening of the business cycle and of the transaction to include more intermediating and geographically distant factors) in early Renaissance Italy that made double-entry perhaps not exactly inevitable but the obvious and useful form into which it had to fall. Of course, these can be seen as taking place within the wider awakening of social activity in (early) Renaissance including but not implicating, we believe, scholarship except through its “new textuality” on which the lay out by accounts of the accounting text was based.

Another point we want to make is that the one basic factor which we have to credit for the articulation and prevailing of double-entry in business accounting is, after all, entrepreneurship, albeit with view to its “new literacy” and activities in early Renaissance rather than to greater intensity that Littleton wants it to have among his other antecedents in these new times as compared with in antiquity.

The implication or not of scholarship in accounting’s evolution and progress can be properly appreciated if we examine its attitudes towards accounting during that critical time under examination and the way accounting, from its side, related to the academic developments at other periods too during which significant developments were taking place in education. It can be discerned that academia never had

accounting under its auspices while entrepreneurship, on the other hand, had always in accounting and its development a keen interest, natural and indisputable.

In doing so we have to distinguish (the development of) double entry from other, accounting and control related developments (audit, costing etc) that scholarship selectively took an interest in and promoted during early renaissance and in modern times when a power-knowledge relation potential was apparent in an accounting related discourse (compare the proliferation of seminars delivered today by university professors). This view was supported in this study by other researchers reports (too) with direct reference to the motives underlying the academics interest in accounting in early Renaissance (e.g new power-knowledge relationships by Hoskin and Macve 1986) and the complaints towards scholarship by other writers as well e.g Durham, 1992 and particularly Hatfield's (see Note 4) whose address, for example, is entitled, and actually is, A Defense of Bookkeeping against scholars throughout history.

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