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Enlisting accounting history in the contest between competing visions of accounting systems: Tommaso Zerbi and the origin of double-entry bookkeeping

Introduction

The interest in biographical research in accounting history has grown in recent years (Bisman, 2012), with several scholars documenting the pioneering contributions of accounting practitioners and academics, both at the local and international level (Burrows, 2019; Carnegie and Parker, 1996; Clarke, 2005; Cobbin and Burrows, 2020; Edwards, 1994; Parker, 2002; Shelton and Jacobs, 2015; Talbot, 2010). Within this field of literature, research on the life and work of renowned accounting historians has focused on several authors, including Anderson (Chandler and Edwards, 2019), De Roover (Blomquist, 1975; Herlihy, 1972; Lapeyre, 1975), Hatfield (Parker, 2002), Hernández (Carmona, 2002), Kojima (Courtis, 1997), Littleton (Bedford and Ziegler, 1976; Zimmermann, 1996), Schumer (Anderson, 2002) and Yamey (Baladouni, 1996; Parker, 1996).

The significant interest shown by Italian scholars in the development of accounting theory and practice (Coronella et al., 2017; Maran and Leoni, 2019) means that biographical research represents an important tool for Italian academics to delve into the contributions of distinguished scholars such as Fabio Besta (Andrei et al., 2017; Sargiacomo et al., 2012), Alberto Ceccherelli (Antonelli and Sargiacomo, 2015), Federigo Melis (Martinelli, 1976; Padroni, 1976), Tito Antoni (Antonelli, 2017) and Gino Zappa (Canziani, 1994; Capalbo and Clarke, 2006). Despite this interest, the work of Tommaso Zerbi, an influential author in the debate on medieval accounting history,

is yet to attract the attention of accounting historians. The importance of Zerbi's work was quickly understood by his peers, with the impact of his ideas spreading in Italy and abroad. As a result, Zerbi's contributions, although entirely in Italian, are widely quoted by the international literature, from De Roover's (1955) well-known work to more recently that of Sangster (2016). Zerbi's historical research has been also mentioned and appreciated by experts of other disciplines (Le Goff, 1960, 1991; Pirenne, 1963), which is unusual for those investigating accounting history matters (Walker, 2009).

Zerbi's works were published in the course of twenty years, from 1935 to 1955, when the historiographical debate about the origin of double-entry bookkeeping (hereafter DEB) in Italy and beyond was at its fiercest (De Roover 1937b, 1938, 1941, 1944; Peragallo, 1938; Yamey, 1947, 1949). In Italy the first decades of the 20th century were characterised by a harsh doctrinal debate between the supporters of Fabio Besta and his well-established *sistema patrimoniale* (capital-centred accounting system) and those of the nascent *sistema del reddito* (profit-centred accounting system). If the focus of a capital-centred accounting system was the identification of capital and the form it took, the essential element of a profit-centred accounting system was the accurate calculation of profit. This meant that the functioning of the accounts, the relevance of year-end adjustments and the emphasis given to the balance sheet and the income statement differed markedly. This struggle was not purely academic for establishing the pre-eminence of one system over the other would have meant exercising decisive influence on business practice at a time when accounting practices were still heterogeneous and there were no generally accepted accounting standards. Being a follower of Gino Zappa, the main proponent of the profit-centred accounting system

(Zappa, 1937), Zerbi was fully committed to demonstrating the superiority of Zappa's conception of accounting systems.

Zerbi contributed to this contest by enlisting an unusual weapon, accounting history research. He developed a distinctive conception of DEB, one which was fully consistent with the main tenets of the profit-centred vision of accounting systems, and sought to find early evidence of the adoption of such method in ancient medieval account books. By demonstrating that the first uses of DEB were consistent with a profit-centred conception of an accounting system, he would legitimise Zappa's thought. In carrying out his studies, Zerbi sought to emphasise the originality and relevance of his work by broadening the compass of extant research. The great Italian accounting historians of the first half of the 20th century focused almost exclusively on the accounting practices in use in Genoa, Venice and Tuscan cities. Research had therefore considered the *cartulari* of Genoa's public authorities and the ledgers and journals of Venetian companies (Besta, 1910), the account books of the Medici's bank (Ceccherelli, 1910, 1913), the accounting system developed by Francesco di Marco Datini (Corsani, 1922), the trading books of the Peruzzi family (Sapori, 1934), the accounting books of the trading companies of Siena, Pisa and Florence (Melis, 1950), the books of Alberti del Giudice (Sapori, 1952) and other Florentine businessmen (Castellani, 1952), all dating from the 14th century to the 15th century. Zerbi did not limit his attention to these sources, but considered the accounting practices of banks, merchants and public organisations of the Duchy of Milan between the mid-14th century and the mid-15th century, which had escaped the attention of the scholars of his time.

This study contributes to biographical studies of prominent accounting historians by considering a scholar who to date has not attracted the interest of the literature. Unlike

most biographical research the paper does not merely provide a rendition of an author's life and work (Burrows, 2019), but it examines Zerbi's work in close connection with the context in which it was developed (Hopwood, 1983), therefore providing an investigation of the impact of the historical and organisational conditions under which Zerbi's thought rose and matured. In doing so, the paper does not seek to stigmatise Zerbi's remarkable achievements as the self-interested product of an ideological use of accounting history research. Rather, it reinforces how personal circumstances, professional competition and ambition can be potent drivers that have a significant impact on the development of accounting theory and practice (Mann et al., 2016). The study therefore emphasises the political and militant role that accounting history may play in academic communities (Gomes, 2008; Napier, 2006; Richardson, 2008; Zan, 1994).

The study also adds to the debate on the development of DEB which saw in Zerbi an eminent contributor. Not only did he focus his attention on accounting records which had never been considered before, his insights on what can be considered DEB and the role of the double-entry method stimulated intense debate both in Italy and abroad (De Roover, 1937a, 1957; Edler, 1938). It has been often observed that a tension exists between local and global accounting history research, with the choice of subject and focus often depending on the academic background of the author (Antonelli and D'Alessio, 2014; Carmona, 2004, 2006; Lukka and Kasanen, 1996; Lai et al., 2015). This study enables a deep understanding of the nature, roles and development of a distinguished scholar's theoretical contributions in a local, time-specific context (Carnegie and Williams, 2001: 105) but also their impact on international debates on

accounting theory and practice (Edwards, 1994: xiv), thereby reconciling, at least in part, the tension between local and global research.

To achieve its goals, the paper is organised as follows: the second section describes the sources and method of the study. The third section includes Zerbi's biography. The fourth section identifies the main tenets of the capital-centred and profit-centred accounting systems whilst the fifth presents the results of Zerbi's extensive analysis of medieval accounting practices. The last section discusses the findings of the work and offers some brief concluding remarks.

Sources and method

The primary sources consulted for this paper are Tommaso Zerbi's printed historical works. A full list of these works has been prepared based on Zerbi's biographies (Amaduzzi, 2001; Staffico, 2001) and an analysis of the online archive of the National Central Library of Florence, where a copy of each book published in Italy is stored. Table 1 lists the historical works by Zerbi that have been accessed for the purpose of this study. These works focus on many different aspects of the economic life of private and public organisations operating in the Duchy of Milan between the mid-14th and the mid-15th century. Although the focus of Zerbi's books is the Duchy of Milan, they also discuss the accounting practices in use in Genoa, Venice and Tuscany and therefore enable an understanding of the author's opinion on whether they could be considered 'real' double-entry based sets of accounts. As a result, Zerbi's extensive historical works have been reviewed to appreciate the contribution that they have made to the analysis and understanding of accounting practices, especially the development of the DEB system.

Insert Table 1 here

To document Zerbi's political achievements and professional life and gather further information on the social and historical context in which he worked, we accessed books and essays on the history of Republican Italy (Buzzacchi, 2016; Di Capua, 2004; Ornaghi, 2010). Also consulted was Zerbi's page in the Italian Chamber of Deputies website (<http://storia.camera.it/deputato/tommaso-zerbi-19080327>). Moreover, the relationship between Zerbi and the Italian academia of his time is relevant to this study for it provides the means to understand the impact on Zerbi's work of the specific conception of an accounting system propounded by Gino Zappa and his followers, which sought to counter Fabio Besta's dominant thought. Such academic relationship has been identified and reviewed through evidence, notes, and references in Zerbi's biographies written by accounting scholars (Amaduzzi, 2001; Mazza, 2004; Staffico, 2001) and books on the academic life of Milan's universities (Magri, 2003; Romani, 2015). Moreover, Besta's (1909, 1910, 1916) *La ragioneria* and Zappa's (1937) *Il reddito d'impresa* were also reviewed to document the main tenets of the two leading theories that animated accounting academic debate in the first half of the 20th century in Italy and to fully appreciate the scientific humus out of which Zerbi's work grew and matured.

To appreciate the extent of Zerbi's contributions to the debate on the origins of DEB and how these were received at the international level, the reviews of Zerbi's works in international journals were accessed, along with comments on Zerbi's historiographical positions in articles and books. This has enabled an understanding of

the impact of Zerbi's work in accounting history in the form of support or rejection of his position or references to his thought.

Academic and political life of Tommaso Zerbi

Tommaso Zerbi was born in Cermenate, near Como, on 27th March 1908, into a family of traders and landowners (Di Capua, 2004). After completing his secondary studies at the archbishop's colleges in Saronno and Tradate, where he graduated as an accountant, in 1926 Zerbi enrolled in Bocconi University. Here he graduated in economics with full honours in 1930, with a thesis on *Mussolini the economist: demographic policy and agricultural policy*. During his years at Bocconi University, Zerbi met Gino Zappa and became one of his research students (Amaduzzi, 2001). In 1932 Zerbi moved to the Catholic University of the Sacred Heart, also in Milan, to study at the Institute of Business Management directed by Pietro Onida, another of Zappa's followers and a renowned accounting scholar himself (Magri, 2003). In 1935, Zerbi went back to Bocconi University, where he qualified as a teacher and was awarded a lecturing post (Amaduzzi, 2004).

Zerbi's academic achievements were coupled with political activism. Following the Nazi occupation of northern Italy Zerbi joined the partisan formations who fought the occupiers and created underground connections among Milan's Catholic partisansⁱ. So prominent was his role that he became the main representative of a partisan formation made up of Bocconi University students (Romani, 2015). Zerbi's political activism did not end with the Second World War. He directed a political magazine in 1945 (Ornaghi, 2010) and in the same year was appointed secretary of Milan's Cristian Democratic Party (Di Capua, 2004)ⁱⁱ. On 2nd June 1946 Zerbi was elected a member of the national

assembly tasked with the high honour of drafting the new Italian Constitution. Zerbi was elected a member of the Chamber of Deputies in 1948 and 1953 and served as undersecretary to the Minister of Budget from 1951 to 1953 (Di Capua, 2004).

In 1958 Zerbi was awarded a full professorship at the University of Palermo (Amaduzzi, 2001). In 1959 he moved back to Milan as the director of the Institute of Business Management at the Catholic University of the Sacred Heart, a post he held until 1978. In his career he also held other important offices, including that of deputy president for Milan's Trade Fair (Colombo et al., 2003), president of the National Nuclear Company (Amaduzzi, 2001), member of the Board of Governors of the People's Bank of Milan and president of Briantea Bank (Mazza, 2004). Zerbi retired in 1983 (Magri, 2003) and died on 13th March 2001, at the age of ninety-three.

Zerbi's academic career and scientific efforts were closely linked with the thought of Gino Zappa, one of most influential Italian experts in accounting between the 1930s and the 1950s (Canziani, 1994; Galassi and Mattessich, 2004; Lai et al., 2015; Viganò, 1998). In this period Zappa expected his students to fully adhere to his theories, regardless of their field of investigation (Zan, 1994). This was particularly obvious when Zappa propounded his profit-centred view of accounting systems, which openly challenged the by-then dominant capital-centred conception developed by Fabio Besta.

Competing conceptions of accounting systems in the Italian academia

The capital-centred accounting system (Besta, 1909, 1910,1916) and the profit-centred accounting system (Zappa, 1937) differed in several aspects, most especially their goal, the types of transactions recorded, the functioning of the accounts, the year-end adjustments and the content of the financial statements.

In Besta's capital-centred accounting system, the defining element of a concern was its wealth in the form of 'capital'. This was very obvious from the very first pages of his book *La ragioneria* where he stated that a concern is "the sum of phenomena, businesses and relationships which are founded on an amount of capital" (Besta, 1909: 3). This vision was linked to the characteristics of Italian business in the last decades of the 19th century, when Besta started to develop his thought, the main trait of which was the accumulation of capital by the aristocracy and bourgeoisie landowners (Catturi, 1989; Monastra, 1958; Paolini, 1990; Perrone, 1986). As a result, Besta's system aimed at ensuring that at any moment it was possible to calculate the wealth of a concern and identify the form it took. Profit was of secondary importance and indirectly linked to the wealth of the business. Profit was determined as the net sum of the variations involving the individual elements of the wealth of a concern, that is its assets and liabilities, in a given period (Besta, 1910: 278).

Besta's system was concerned with both the transactions involving third parties and those internal to the business, such as the movement of products between different stages of production or the deterioration of goods (Besta, 1910: 279). According to Besta, the dual aspect of accounting meant that transactions were observed "in relation to their 'real' aspect – the increases and decreases of assets or liabilities, and in relation to their 'ideal' aspect – increases and decreases in net wealth" (Sargiacomo et al., 2012: 254). Consistently, Besta identified two sets of accounts, the "real accounts" and the "net accounts" (Besta, 1910: 326).

"Real accounts" were used to record the 'original' element of each transaction, that is the variation in the individual items of assets and liabilities that triggered the need to record the transaction itself (Besta, 1909: 83-86). This variation then caused an entry in

a “net account” which explained the reason behind the change in assets and liabilities in the form of gains or losses that modified the net wealth of a concern (Besta, 1910: 331)ⁱⁱⁱ. All of the accounts in a capital-centred accounting system were bilateral for they could be debited and credited (Besta, 1910: 353). Year-end adjustments were only needed if the value of the assets and liabilities at the end of the accounting period did not reflect their current replacement value (Sargiacomo et al., 2012), which caused amendments including the identification of bad debts or the calculation of the value lost by goods (Besta, 1909: 232). Although Besta’s system allowed the preparation of an income statement, the balance sheet was the most important component of a concern’s financial statements and was used to provide details on every asset and liability of the business, along with its capital (Besta, 1916: 606).

Zappa believed that the capital-centred accounting system was ill-suited to serve the needs of the developing Italian economy in the first decades of the 20th century, which saw the diffusion of partnerships and companies where partners and shareholders were interested in the generation and distribution of profits (Catturi, 1989; Ferraris Franceschi, 1994). It was therefore profit, not wealth, that was the defining element of a concern. As a result, an accounting system’s goal was the calculation of profit, and only indirectly the identification of the wealth of the business and the form it took (Zappa, 1937: 427). As it is the case of modern systems, Zappa’s double-entry system was only concerned with transactions involving third parties (Zappa, 1937: 38-40), which were recorded by means of “real accounts” and “nominal accounts”, which in turn consisted of “profit accounts” and “capital accounts”. As in Besta’s system, double entries were triggered by an entry in a “real account”. Nevertheless, to Zappa, “real accounts” were only concerned with cash movements, including those in the form of trade payables and

trade receivables (Zappa, 1937: 214-215). The reason for these immediate or deferred movements in cash was then 'explained' by variations in the remaining types of accounts. Surprisingly, Zappa included among the "profit accounts" not only revenue and expenses but also the properties of the business and debts and credits arising from financing transactions (Zappa, 1937: 689-706). "Capital accounts" related to the components of a business's capital, including reserves (Zappa, 1937: 425-426). In Zappa's thought, "real accounts" and "capital accounts" were bilateral and could therefore be debited and credited, whereas "profit accounts" could only be either debited or credited (Zappa, 1937: 512, 624, 719).

Year-end adjustments were crucial and extensive in Zappa's system for they were needed to identify the profit accumulated in a specific period, normally one year. The elements of the income statement were rectified or integrated to match revenues and expenses arising in the accounting period concerned, thus enabling an accurate calculation of the profit for the year (Zappa, 1937: 626-644). The main document in a business's set of financial statements was the income statement, which analytically identified the revenues and expenses for the business and determined the profit for the year. Only after the calculation of profit could the balance sheet be prepared and profit added to the figure of capital (Zappa, 1937: 709), consistent with Zappa's definition of profit as the "increase in capital in a given period, generated by managing a concern" (Zappa, 1937: 277). Unlike Besta's system, assets and liabilities were not directly calculated but were identified by aggregating balances in different accounts opened during the year (receivables, payables, cash) and at its end. As a result, assets comprised cash and receivables, but also non-current assets, inventory and prepayments, the values

of which were identified at the end of the year. Liabilities included debts, accruals and provisions.

The adoption by a scholar of Besta's or Zappa's understandings, which are summarised in Table 2, had an impact on the way in which accounting history research was carried out, as is shown by the notable case of Tommaso Zerbi.

Insert Table 2 here

Zerbi's analysis of medieval accounting practices

Criteria and sources

Existing historical research at the time when Zerbi started his work on the accounting practices of the Duchy of Milan had been almost exclusively carried out by Besta and his followers. This meant that this research was entirely based on a capital-centred vision of accounting systems. According to such vision, an accounting system was based on DEB if there was a double series of accounts ("real" and "net" accounts, even if consisting of just a capital account), two sections per account, and double entries. No other condition needed to be met: no specific accounts, closing procedures or the presence of an income statement and a balance sheet.

The effects of Zerbi embracing the profit-centred vision of accounting systems on his approach to the study of the origin of DEB had a number of consequences. The accounts opened by medieval merchants, banks and public organisations must have been consistent with those used in the profit-centred accounting systems envisaged by Zappa. In particular, Zerbi required the presence of trade payables, trade receivables and cash accounts, without which there could have been no unambiguous starting point for

recording a transaction. Zerbi also reinforced the importance of ensuring that each entry in the cash account would have a corresponding record in another account to produce a true, meaningful double-entry. Having double-entries for other accounts but not the cash account was not acceptable. This inevitably made him break with all the accounting history scholars that accepted the application of the DEB even in the absence of a full integration of the cash account into the DEB system (Zerbi, 1993: XX)^{iv}. Moreover, since the purpose of the profit-centred accounting system was the identification of the profit figure, it was essential for the system used by ancient organisations to enable the calculation of profit. This meant that the system would need to identify revenues and expenses for a specific period. As a result, year-end adjustments were seen as critical by Zerbi, even in the absence of a set of financial statements.

It should be noted that within the context analysed by Zerbi the presentation currency changed in time and space. The private and public organisations he studied used as many as three currencies at the same time in their accounts, which caused the need to convert transactions from one currency to another (Zerbi, 1955b: 23-27). This was particularly challenging when exchange rates differed and fluctuated. Nevertheless, Zerbi did not believe that having one single presentation currency was a prerequisite for the DEB system (Zerbi, 1952: 22; Zerbi, 1955b: 71-77). Here he clearly departed from Besta (1891; 1910) who claimed that having a single currency was essential for it was the only means of ensuring a reliable measurement of the elements of a business's wealth.

To understand the transition from the original tabular system^v in use in medieval accounting to DEB, Zerbi focussed on the period from the mid-14th century to the mid-15th century which also in Besta's opinion led to the development of the DEB system

(Besta, 1910). Unlike the other accounting historians of his time, Zerbi mostly focused on the accounting practices of the Duchy of Milan, which at the time was ruled by the Visconti family (Zerbi, 1952: 28). The study of the Duchy's overlooked documents is the most original aspect of Zerbi's contributions to accounting history. His extensive, painstaking work on these sources is shown in Table 3, which presents the original documents accessed by Zerbi in seven different archives. Moreover, Zerbi consulted sources from the archives of Tuscany, Genoa and Venice which had been analysed by contemporary scholars. This enabled Zerbi to compare practices across different Italian regions and join the debate on what constituted DEB and its early origin (Zerbi, 1952: 31).

Insert Table 3 here

Accounting practices in the Duchy of Milan

In his analysis of the accounting practices in the Duchy of Milan Zerbi considered different types of businesses, including banks, manufacturing companies and traders. The extant ledgers of *Banco di Giacomo da Giussano* (Giacomo from Giussano Bank) date back to 1356-1359. The ledgers were supported by an account book (Zerbi, 1935: 29-32). These books offer ample evidence of the engagements of the bank, which included the municipal government, the army, suppliers and other bankers, along with loans and advances for the salaries of the garrisons seconded to Piacenza (Zerbi, 1955a: 13-17; 33-35).

The account books of *Banco Del Maino* (Del Maino Bank) for the years between 1394 and 1410 included accounts with separate juxtaposed sections for deposits, giro

accounts, current accounts and credit notes, which were opened in people's names and arranged in alphabetical order in the ledger (Zerbi, 1952: 88-93). The bank mainly held savings accounts, treasury accounts and short-term savings certificates (Zerbi, 1952, 93-108, 114-119). Negotiations in foreign currencies were influenced by fluctuations in exchange rates, the results of which were recorded in a "*Cambia*" (Currency gains/losses) account (Zerbi, 1952, 108-114). The bank used the money to grant loans at high interest rates, and the interest receivable was recorded in a "*Utilità*" (Gains) account (Zerbi, 1955a: 55-62). Adjustments to incorrect records included amendments or cancellations in a suspense account called "*Errori*" (Errors) (Zerbi, 1952: 119-121). Lastly, there was a bilateral "*Banchum*" (Bank) account, in which interest payable and interest receivable, losses and gains from negotiations of goods, discounts received, bad debts, wages, rent, stationery expenses and other running costs were summarised on the debit (expenses and losses) or credit side (revenues and gains) (Zerbi, 1952: 124).

The ledger of *Società di Catalogna Serrainerio & Dugnano* (Catalonia Company of Serrainerio & Dugnano) reviewed by Zerbi for 1396-1397 was in *lire*, *soldi* and imperial *denari* (Zerbi, 1936b). Presentation currencies sometimes referred to their gold content, sometimes to their silver content, so there were problems comparing the purchasing power of the actual currency and the value of the reporting currency (Zerbi, 1952: 281-288). The chosen bookkeeping system was an evolution of the tabular method. The purchase of goods to be sold overseas or beyond the Alps was recorded in the trade payables account, to which costs were charged. When goods were sold, the amount was recorded in the trade receivables account. Overheads and additional revenues were directly recorded, whenever feasible, in the transactions to which they referred, and the rest in the profit and loss account. The *Società di Catalogna*

Serrainerio & Dugnano received advance payments from bankers and traders and accrued interest payable, which was recorded in a “*Perdite*” (Losses) account (Zerbi, 1955a: 63-65). After many misadventures and troubles, the company wound up in 1397 and drew up the final liquidation accounts, which included an estimate of the profit achieved and the sharing of unsold stock, credits and debts between the shareholders (Zerbi, 1952: 249-272).

Zerbi reviewed six ledgers of the *Azienda mercantile di Marco Serrainerio* (Trade Company of Marco Serrainerio), which replaced the *Società di Catalogna Serrainerio & Dugnano*, from 1402 to 1407. These records were impacted by the circulation of gold and silver coins, with the cash account recording transactions in multiple currencies (Zerbi, 1955b). Serrainerio ceased using lire based on the gold standard and preferred to opt for the less valuable silver standard. The consequence was that such transition caused inconsistencies in the accounts that had been recorded at different times. This was the reason why Serrainerio, despite estimating the income for a specific period, did not clearly identify the profit achieved by his business and add it to the existing capital (Zerbi, 1952: 275-276, 292-300, 306-310). As a result, the company seemed to have adopted a DEB system although such system did not enable Serrainerio to make a correct calculation of profit and capital because of the multiplicity of currencies (Zerbi, 1952: 310).

Zerbi also reviewed the “*Libro giallo del 1427*” (Yellow Book, 1427) of the *Banco di Giovanni Borromeo*, a bank with branches in Lombardy and London. The ledger included an account book and showed the accounts in juxtaposed separate sections (Zerbi, 1952: 311-315). The “real accounts” included trade receivables and payables, borrowers, suppliers and account holders. A cash account was also present and occupied

54 of the 600 pages of the ledger (Zerbi, 1952: 320-325). The “profit accounts” included a “*Disavanzi ed avanzi*” (Profits and losses) account, which recorded interest payable and receivable, losses and gains on currency and overheads. Inventory was estimated, when a listing was available, at the prevalent average wholesale price. Goods were recorded at their net book value when there was no current market listing, as in the case of gold items, jewellery, sapphires and diamonds. The “*Disavanzi ed avanzi*” account ended with the calculation of the net profit (Zerbi, 1952: 325-340). The *Banco di Giovanni Borromeo* also worked as a wholesaler of grains, textiles and raw materials. The bank accrued interest on this brokerage, with related interest recorded in a “*Discrezione*” (Revenues) account (Zerbi, 1955a: 45-53). Finally, Zerbi managed to prepare an income statement and a balance sheet from the surviving records of the business, something that Giovanni and his accountant never did (Zerbi, 1955a: 345-351).

Zerbi consulted the ledger of *Compagnia di Filippo Borromei & Compagni di Londra* (Filippo Borromei & Co. of London) (1436-1439). The ledger included an account book. The value of purchases was recorded in the trade payables account, whilst that of sales was included in the trade receivables account. Unsold stock was separately recorded. The net capital was calculated in an account in the name of *Filippo Borromei e Co. di Brugia* (Zerbi, 1952: 413-419). Zerbi mentioned the 1436 and 1438 financial statements from the accounts of *Compagnia di Filippo Borromei & Compagni di Londra*, which had never been drawn up by the business but which he prepared himself (Zerbi, 1952: 419-423).

In Zerbi’s opinion, only a few of the records he analysed were kept according to the DEB system (see Table 4). Giacomo da Giussano’s bookkeeping system was not based

on a DEB system but was rather the archetype of the tabular method (Zerbi, 1935: 37). The lack of accounts for the calculation of the business's capital and profit or loss made the accounting system of *Banco Del Maino* only partially consistent with the DEB system, a hybrid system mostly similar to the tabular method (Zerbi, 1952: 131). The ledgers of *Società di Catalogna Serrainerio & Dugnano* and *Azienda mercantile di Marco Serrainerio* showed the formal features of a DEB system but they did not enable a reliable profit calculation. Year-end adjustment entries were present but the multiplicity of currencies and the switch from the gold to the silver standard did not enable the accountants to properly calculate the profit and the capital for the concern (Zerbi, 1952: 274, 310). Finally, the accounting systems of the *Banco di Giovanni Borromeo* and *Compagnia di Filippo Borromei & Compagni di Londra* were consistently kept according the DEB system. Furthermore, such systems were believed by Zerbi to be the oldest examples of DEB and yearly profit calculation (Zerbi, 1952: 367, 424).

Insert Table 4 here

Accounting practices in Tuscany, Genoa and Venice

Zerbi's investigation of the origin of DEB was not limited to the Duchy of Milan for he also reviewed the accounting practices emerging from the archival records preserved in Tuscany, Genoa and Venice. This enabled him to question the findings of other accounting historians who had studied DEB in the first half of the 20th century. At the time there was general consensus around Tuscan accounting practices being the earliest evidence of a DEB system in Italy (Ceccherelli, 1910, 1913; Woolf, 1912;

Littleton, 1933; De Roover, 1937b; Melis, 1950). Zerbi reviewed the 1211 accounts of unnamed Florentine bankers and the books of the Florence-based Peruzzi, Bardi, Alberti and Del Bene companies. All the accounts he reviewed were laid out as separate overlapping sections, their form differing remarkably from the tabular method in use in the Duchy of Milan. The 1382 ledger of an unnamed merchant house based in Pisa, the 1383 “*Libro giallo B*” (Yellow Book “B”) of Francesco di Marco Datini and the Florentine ledger of Paliano di Falco were laid out as juxtaposed separate sections (Zerbi, 1952: 36-41, 43-53).

The review of the account books of the Pisa-based *Francesco di Marco Datini Company* from 1382 to 1408 revealed a mixed accounting procedure. Accounts opened for owners, creditors and debtors were in juxtaposed separate sections whilst accounts opened for goods, revenues and expenses were in separate overlapping sections. There was no cash account, which to Zerbi was an essential feature of a DEB system, and the functioning of the “nominal accounts” was not clear. Zerbi concluded that Datini’s bookkeeping system was not based on the DEB method (Zerbi, 1952: 130-136). Zerbi investigated the 1395-1396 ledger of Averardo de’ Medici, which had been the focus of studies by Ceccherelli (1913), De Roover (1948) and Melis (1950). Zerbi found an incomplete implementation of the DEB method, as he could not find clearly identifiable double entries involving the cash account. Zerbi thought that the ledger could have been the basis for records following the tabular method. In the ledger reference was often made to the “*Libro secreto F*” (Secret Book “F”), which Zerbi could not locate. As a result, he was not able to fully understand the links between the entries in different books, hence he was unable to find conclusive evidence of the use of DEB by the Medici’s bank (Zerbi, 1952: 125-130).

The 1391 ledger of *Banco Lippi & Del Bene* (Lippi & Del Bene Bank) was in juxtaposed separate sections and was one of the very first specimens of a Tuscan book kept in the Venetian manner which also recorded transactions using Venetian *ducati* as the main currency. There was one account for each of the two owners, which recorded the value of capital belonging to them, a cash account and accounts for the processing of batches of metal to be returned to the mint. The bank also used trade receivables and payables accounts and a “*Disavanzi e avanzi*” account to record expenses and revenues. Zerbi concluded that there were hints of a use of the DEB method although the underlying rationale for its functioning was not entirely clear (Zerbi, 1952: 216-236).

Genoa’s accounting practices were considered to be extremely important, especially by Besta (1910), and some of its ledgers showed a compelling application of the double-entry method. Zerbi examined several books, including: the “*Cartularium salvatoris portus et moduli*”, the “*Cartularum massariorum sapientum*” and the “*Cartularium magistrorum racionalium*” for the 1340 Municipality of Genoa, followed by the books of the *maestri razionali* (auditors) and the *massari dei savi* (magistrates) (1348, 1352, 1353), the “*Cartulari massariorum guerre*” (1352, 1353, 1357), the “*Cartulari officii assignacionis mutuorum*” (1343, 1350, 1351), the cash book of the Lomellini Bank (1386), and the ledgers of Bank of San Giorgio (1408). According to Zerbi, the 1340 books were kept in accordance with the DEB system (Zerbi, 1952: 105). Nevertheless, it was the lack of a gradual, progressive transition from a native, primeval form of accounting to a more advanced, consistent form of DEB that convinced Zerbi to consider Genoa’s accounting practices as unrelated to the historical process that led to the diffusion of DEB (Zerbi, 1952: 53-58). Zerbi (1952: 181-203) considered these

practices to be peculiar, non-representative events, and highlighted the lack of a cash account in the governmental ledgers.

Venetian accounting practices were the most recent of those considered by Zerbi, but also the most advanced. The most important account books reviewed by Zerbi were Grimani's ledger (1408-1409), "*Libro vecchio real*" (the Old Book, 1410-1417) and "*Libro nuovo real*" (the New Book, 1406) of Fraternal Soranzo, "*Zornal A*" (Journal "A", 1430-1440) and "*Mastro A*" (Ledger "A") of Andrea Barbarigo (1430-1434) and Giacomo Badoer's ledger (1436-3149). These sources were partly reproduced in Zerbi's (1952) book, where the author stated that they were all based on the DEB system.

Grimani's ledger that recorded the transactions of a household was mainly based on the DEB system but some of its entries lacked a corresponding record which would complete the double entry. As to the books of Fraternal Soranzo, one was incomplete and poorly preserved whilst the second was put together in more recent times to be used as evidence in a dispute. Andrea Barbarigo's "*Zornal A*" was the earliest extant specimen of a Venetian DEB ledger: it showed the dates, accounts, descriptions and amounts for each transaction, which were recorded by means of fractions whereby the account to be debited was the numerator and the account to be credited the denominator. Andrea Barbarigo's "*Mastro A*" used both "real accounts" and "nominal accounts" as expected in a profit-centred accounting system, and also presented a closing balance sheet, although the inventory and the result from the "*Viaxi*" (Travels) that were still ongoing at the closing date were not estimated. Badoer's ledger included a net capital account identifying the wealth of the business on the first page, a family expense account, and several accounts opened for goods, journeys and insurance (Zerbi, 1952: 369-412).

The main findings of Zerbi's work on the Tuscan, Genoese and Venetian books are summarised in Table 5. Following the tenets of Zappa's profit-centred accounting system, Zerbi established that the accounting systems of Francesco di Marco Datini and Averardo de' Medici were not based on DEB. In the accounting systems of Lippi & Del Bene Bank, of the Municipality of Genoa and the Venetian companies Grimani, Soranzo, Barbarigo and Badoer, Zerbi detected the use of "real accounts" and "nominal accounts". However, none of them presented year-end adjustments or provided a clear procedure to close the accounts at the end of the accounting period and, thus, no profit calculation, each of which were critical elements of a profit-centred accounting system (Zerbi, 1952).

Insert Table 5 here

Zerbi's work and the international debate on double-entry bookkeeping

Zerbi was not personally interested in engaging with international historiography for he rated it as inferior to the Italian (Riparbelli, 1952), which he was interested in disproving. However, he discussed several issues that were crucial to the international literature, most especially how and why the DEB system was born in Italy in the Middle Ages. Even if all of Zerbi's works had been published in Italian and were targeting an Italian readership, they prominently featured in international accounting history literature.

Zerbi's work was praised by De Roover (1937a), most especially his *La banca nell'ordinamento finanziario visconteo* (Zerbi, 1935) and *Il mastro a partito doppia di un'azienda mercantile del Trecento* (Zerbi, 1936b). These publications were seen as

extremely useful by De Roover, who also noticed how they offered a unique opportunity to appreciate the ancient, unexplored ledgers of Italian trading and banking companies (De Roover, 1937a: 444-445). These two books were also reviewed by Edler (1938), who emphasised the uniqueness of the accounting records considered therein and the importance of the evidence provided for studies in business history (Edler, 1938: 127). The merits of Zerbi in bringing new, remarkable primary sources to the attention of the international community were also underlined by Martinelli (1977), who frequently referred to Zerbi's contributions in his work. The accounting records that Zerbi reproduced in his books were discussed in Martinelli's article on the origin of the DEB system, most especially the "*Liber tabulle A*" of *Banco di Giacomo da Giussano* (Martinelli, 1977). Martinelli also agreed with Zerbi in identifying Giovanni Borromeo's 1427 ledger as the first example of the application of the DEB system, at least in Lombardy (Martinelli, 1977: 13).

Also reviewed by De Roover (1957) were Zerbi's *Moneta effettiva e moneta di conto nelle fonti contabili di storia economica* (Zerbi, 1955b) and *Credito e interesse in Lombardia nei secc. XIV e XV* (Zerbi, 1955a). De Roover underlined the usefulness and originality of Zerbi's approach, although he also pointed out several limitations, most especially the lack of attention for the regulations issued by public bodies on currencies, metal contents, inflation and usury (De Roover, 1957: 181). De Roover (1955) also showed keen interest in the ongoing debate on the origin of DEB developed by Italian scholars. He focused in particular on Besta's (1910) findings and the position of both Melis (1950) and Zerbi (1952). De Roover described how Zerbi, along with Melis, rejected Besta's conclusions about the DEB system being born in Genoa. Zerbi opted for Lombardy, Melis for Tuscany. Each of them, though, adopted different criteria to

investigate the bookkeeping systems: Zerbi's were stricter, whilst Melis's criteria were seen by De Roover as too lax and hence inaccurate (De Roover, 1955: 410). Although he recognised the contributions of Zerbi, De Roover departed from him by considering Averardo de' Medici's accounts to be clearly based on the DEB system (De Roover, 1955: 412-413). De Roover followed Zerbi in his historical and methodological investigation, but disagreed with him when he claimed that the only evolutionary process that led to the rise of DEB must have been the one described by Zerbi himself about the Duchy of Milan. De Roover noted how accounting systems may have evolved differently in the other Italian regional states (De Roover, 1955: 412). De Roover also commented on Zerbi's attempt at preparing year-end statements from Giovanni Borromeo's 1427 records. He praised Zerbi's expertise and dedication by stating that "his comments are especially illuminating: they practically constitute an auditor's report on the operation of a medieval firm. All this is very useful from the point of view of economic and business history" (De Roover, 1955: 415). However, he also warned that reconstructions of financial statements according to modern methods may not be useful to accounting historians for medieval bookkeepers did not proceed in the same way as modern accountants (De Roover, 1955: 415).

In 1956, De Roover commented on Zerbi's works again. After confirming how the criteria he adopted were a defining feature of Zerbi's work (De Roover, 1956: 115), De Roover discussed the presence of closing procedures as a prerequisite for the existence of a DEB system, along with the influence of many circulating currencies and the difference in their metal content on the accuracy and consistency of the DEB system (De Roover, 1956: 138-139). He also reviewed the role of the cash account in a DEB system, another of the key contributions of Zerbi (De Roover, 1956: 141). Lastly, De

Roover expressed his appreciation of Zerbi's investigation of *Banco di Giovanni Borromeo*, especially for his findings on the recording of overseas transactions (De Roover, 1956: 155).

The evidence reproduced in Zerbi's books was considered and discussed in Yamey's writings about the techniques for keeping double-entry accounts in the ledger, mainly hinting at the 1457 account book of Milan's *Ospedale Maggiore* (Yamey, 1979: 327). In a later study of medieval accounting practices, Yamey focused on the ledger of *Banco Del Maino* (Yamey, 2000: 8). Finally, Sangster provided an overview of the Italian debate about the earliest DEB applications by reviewing the most widely discussed archival sources (Sangster, 2016). In his analysis Sangster emphasised two distinctive traits of Zerbi's historical interpretation. The first was the tabular method as a prerequisite for the evolutionary process leading to the rise of DEB, the second was the presence of a cash account in the ledger (Sangster, 2016: 301).

Highly unusual for an accounting scholar, Zerbi's contributions were also recognised by prominent medieval historians. Zerbi's *La banca nell'ordinamento finanziario visconteo* (Zerbi, 1935) and *Moneta effettiva e moneta di conto nelle fonti contabili di storia economica* (Zerbi, 1955b) were used as precious sources of evidence by Le Goff (1960, 1991) and Pirenne (1963). Zerbi's work on the accounting tools in use in the Duchy of Milan was used by these renowned French scholars to document the development of accounting and commercial practices in Italy and abroad. Moreover, the book *Aspetti economico tecnici del mercato di Milano nel Trecento* (Zerbi, 1936a) was cited in the monumental work *The Cambridge Economic History of Europe* (Postan et al., 1963: 610) in the discussion of the economic development of medieval Italy.

Conclusion

This study has analysed the contributions of Tommaso Zerbi to the debate about the origin of DEB and has sought to interpret his work in light of the peculiar setting in which it was developed (Hopwood, 1983). Unlike other Italian scholars such as Antoni, Besta, Ceccherelli, Melis and Zappa, whose lives and main contributions have already been widely investigated (Canziani, 1994; Garner, 1976; Martinelli, 1976; Padroni, 1976; Sargiacomo et al, 2012; Antonelli and Sargiacomo, 2015; Antonelli, 2017), Tommaso Zerbi is yet to attract the interest of accounting historians.

Zerbi regarded the origin of the DEB system as a long transition from the tabular method to a more complex bookkeeping system that included all “real accounts” (most especially the cash account) and “nominal accounts” (“income” and “capital” accounts) together with year-end adjustments and the calculation of profit. As a result, his notion of DEB differed significantly from that of Besta (1910) and his followers. The dominance of accounting history scholars embracing a capital-centred vision of accounting systems meant that the evidence found in about sixty years of archival research on the origin of DEB carried out by Besta and his supporters corroborated the assumption that the capital-centred accounting method was the earliest bookkeeping system. This research provided further support to Besta and his followers and ensured that their system could have been seen as the purest, noblest form of accounting, so much so that it was worthy of being widely adopted by contemporary companies (Antonelli and D’Alessio, 2014; Coronella et al., 2017; Sargiacomo et al., 2012). To tackle the detrimental impact of existing studies on his profit-centred conception, Zappa himself entrusted Zerbi with the important duty to develop historical research that would provide legitimation for his vision of accounting systems. For Zappa and his

followers, contesting a thesis which had been traditionally debated among the supporters of the capital-centred vision of accounting systems was a highly symbolic means to weaken the competing understanding of accounting brought forward by Besta and his followers (Lai et al., 2015; Zambon and Zan, 2000; Zan, 1994).

The relevance of the task allocated to Zerbi was confirmed when he received a full professorship for his efforts, which was awarded by a panel of professors who were under the influence of Zappa and who highly valued Zerbi's historical studies (Canziani, 1994; Mazza, 2004). This practice was highly unusual at the time, when accounting history publications were scarcely valued by promotion committees. It therefore testifies to the relevance placed by Zappa on Zerbi's work as a means to contribute to the emergence of his profit-centred vision of accounting systems. At the same time, the achievement of a full professorship would have added further scientific weight to Zerbi's theses.

Zerbi was therefore called to find archival records as evidence of the earliest application of profit-based accounting (Zerbi, 1952: 20). The choice of the Duchy of Milan was useful to increase the originality of his work by considering sources which were still untouched by accounting historians. At the same time, finding the first traces of DEB in Milan and its dominions would have also served the purpose of contributing to the renown of Zappa and Zerbi's university, which was located in Milan. Zerbi, therefore, disregarded earlier Genoese, Venetian and Tuscan accounting practices as not fully consistent with the tenets of 'true' double-entry bookkeeping and identified the first forms of DEB in the 15th century accounts of the *Banco di Giovanni Borromeo* and *Compagnia di Filippo Borromei & Compagni di Londra*.

Although Zerbi's findings were extensively criticised by other Italian academics (Anselmi, 1995; Canziani, 1995; Coronella, 2014; D'Ippolito, 1967; Giannessi, 1954; Serra, 1999; 2005; Turco, 1999), who agreed that DEB rose much earlier than Zerbi thought, his work attracted the interest of international scholars. Given the 'political' purpose of his work, this may have been a serendipitous effect for Zerbi was not interested in engaging in debates with non-Italian authors. Nevertheless, his efforts were praised by several scholars, who enthusiastically welcomed his analysis of the unexplored accounting records of the Duchy of Milan (De Roover, 1937a; Edler, 1938; Martinelli, 1977). Although most international authors were unconvinced by his attempt to trace the origin DEB to the 15th century Duchy of Milan and his focus on profit calculation (De Roover, 1955; Yamey, 1949), Zerbi's findings stimulated the interest of international accounting scholars who engaged in discussing his findings and used them as evidence for their work (De Roover, 1955, 1956; Martinelli, 1977; Sangster, 2016; Yamey, 1979, 2000). This also included authors from fields other than accounting history (Le Goff, 1960, 1991; Pirenne, 1963; Postan et al., 1963).

The study has contributed to the accounting history literature by means of an innovative approach to biographical research, one which is not limited to the documentation of the lives and work of prominent accounting practitioners and scholars (Burrows, 2019). It has therefore provided insights on the militant role of accounting history research in the achievement of goals that go beyond the investigation of ancient accounting practices (Zan, 1994; Gomes, 2008; Antonelli and D'Alessio, 2014). As demonstrated by the notable case of Tommaso Zerbi, accounting history research is not a value-free endeavour in the advancement of knowledge but it can be significantly influenced by personal circumstances and professional competition (Mann et al., 2016).

Moreover, the study has shown how the theoretical contributions of a scholar who was interested in taking a role in a local, time-specific discussion (Carnegie and Williams, 2001) can have an impact on international debates on accounting theory and practice.

Future studies could further investigate the potential of accounting history research in furthering interested agendas by analysing the practical and theoretical contributions of accounting scholars in light of the context in which they carried out their work. Moreover, the tension between the local and global scope of research could be further explored (Lukka and Kasanen, 1996) by considering how local knowledge can spread beyond the borders of a country and the barriers, such as language (Andrew et al., 2019), which may hinder the diffusion of local knowledge internationally. International comparisons on the work of eminent accounting scholars could also be developed (Carnegie and Napier, 2002).

ⁱ Italian partisan formations were inspired by different political views, with the most prominent being the Communist and the Catholic.

ⁱⁱ The Christian Democratic Party was a centrist, Catholic-inspired party founded in 1943. It was the successor of the Italian People's Party, established in 1919, which was the first Catholic party in Italy backed by the Roman Catholic Church. It represented the 'approved' way for Catholics to engage in politics. With Pius IX *Non expedit* Bull Catholics were prevented from taking part in the Reign of Italy's political life following the latter's threat to the integrity of the Papal States. Only in 1919 was this ban lifted by Pope Benedict XV.

ⁱⁱⁱ Although this was the elementary functioning of Besta's system, it should be noted that there were transactions that did not have an impact on the net wealth of a business and involved two "real accounts", such as when a business purchased new properties.

^{iv} Besta (1910) and his followers (Ceccherelli, 1910, 1913; Melis, 1950) spoke of "incomplete capital-centred accounting systems" when just some of the assets accounts were linked to the business's net capital account by means of double entries. To Besta, the presence of an "incomplete capital-centred accounting system" was still consistent with the use of DEB.

^v In the pages that follow, reference is made to different ways of presenting double entries (Antinori, 2004). In the tabular method in use in the Duchy of Milan the debit and credit sections of an account were kept separate, with the debit section on the left-hand side and the credit section on the right-hand side, but presented on the same page. The followers of the 'Venetian method' used juxtaposed separate sections whereby the debit section was presented on the left-hand page of a book whilst the credit section was presented on the right-hand page. The 'Florentine method' established the use of overlapping separate sections, with both sections of an account on the same page but with the debit side on top and the credit side underneath.

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Table 1. Accounting history publications by Zerbi

Date	Original title	Translation
1935	<i>La banca nell'ordinamento finanziario visconteo</i>	<i>A bank in the Visconti finance system</i>
1936a	<i>Aspetti economico tecnici del mercato di Milano nel Trecento</i>	<i>Economic aspects of the Milan market in the XIV century</i>
1936b	<i>Il mastro a partita doppia di un'azienda mercantile del Trecento</i>	<i>The ledger of a merchant in the XIV century</i>
1943	<i>La genesi della partita doppia</i>	<i>The genesis of double-entry bookkeeping</i>
1952	<i>Le origini della partita doppia</i>	<i>The origins of double-entry bookkeeping</i>
1955a	<i>Credito e interesse in Lombardia nei secc. XIV e XV</i>	<i>Credit and interest in Lombardy, XIV and XV centuries</i>
1955b	<i>Moneta effettiva e moneta di conto nelle fonti contabili di storia economica</i>	<i>Functional currency and presentation currency according in the accounting records</i>
1969	<i>L'ordinamento aziendale della 'fabbrica' del Duomo di Milano secondo i 'Capitoli del 1387'</i>	<i>Economic organisation of Milan Cathedral according to the 'Chapters of 1387'</i>
1993	<i>Il liber tabulle rationum nella economia viscontea del '300</i>	<i>The 'tabular' account book in the Visconti economy, XIV century</i>

Table 2. The main tenets of the capital-centred and profit-centred accounting systems

	<i>Capital-centred accounting system</i>	<i>Profit-centred accounting system</i>
<i>School founder</i>	Fabio Besta	Gino Zappa
<i>Italian terms</i>	<i>Sistema patrimoniale</i>	<i>Sistema del reddito</i>
<i>Aim</i>	Accumulation of capital	Profit calculation
<i>Focus</i>	Transactions with third parties Internal operations	Transactions with third parties
<i>Accounts used for recording transactions</i>	Real accounts (assets and liabilities) Net accounts (changes in the net wealth of the business)	Real accounts (cash, trade receivables and trade payables) Profit accounts (expenses, revenues, finance debts and credits) Capital accounts (capital, reserves, profit/loss)
<i>Accounts for assets and liabilities</i>	Real accounts (assets and liabilities) Capital accounts	Assets: - Real accounts (cash, trade receivables) - Prepaid costs Liabilities: - Real accounts (trade payables) - Deferred costs, unearned revenues - Capital accounts (capital, reserves, profit/loss)
<i>Year-end adjustments</i>	Limited to changes in the value of assets and liabilities	Extensive, needed to match revenues and expenses and calculate the profit for the period
<i>Financial statements</i>	Balance sheet and income statement, with a focus on the balance sheet	Balance sheet and income statement, with a focus on the income statement

Sources: Besta, 1909, 1910, 1916; Zappa, 1937.

Table 3. Sources used by Zerbi

<i>Archivio della Fabbrica del Duomo di Milano (Banco di Giacomo da Giussano)</i>		
Liber tabulle "A" (Reg. 1-bis)	1356-1357	Zerbi, 1935: 29; 1936a: 21; 1943: 48, 98, 102-103, 125; 1952: 101, 118, 122; 1955a: 13; 1955b: 24, 33-35.
Liber tabulle "B"	1358-1359	Zerbi, 1935: 29.
Liber tabulle "C" (Reg. 1)	1356-1359	Zerbi, 1935: 29; 1955b: 107; 1955a: 13; 1936a: 21.
Liber tabulle "D"	1356-1359	Zerbi, 1952: 42.
<i>Archivio della Fabbrica del Duomo di Milano (Banco Del Maino)</i>		
Liber tabulle (Reg. 27)	1394	Zerbi, 1936a: 12; 1943: 92-97, 104-112, 126; 1952: 88, 92-99, 102-103, 107-118, 120-121, 123, 149; 1955a: 56; 1955b: 39, 41.
Liber tabulle (Reg. 42)	1396	Zerbi, 1952: 88; 1955a: 56; 1955b: 40.
Liber tabulle (Reg. 48)	1399	Zerbi, 1952: 88 1955a: 56 1955b: 40.
Liber tabulle (Reg. 53)	1400	Zerbi, 1952: 88, 289-292 1955a: 56 1955b: 40.
<i>Archivio della Fabbrica del Duomo di Milano (Ditta Serrainerio)</i>		
Mastro della Società di Catalogna Serrainerio & Dugnano (Reg. 39)	1396-1397	Zerbi, 1936a: 35 1943: 82-83, 252-287 1952: 82-83, 237-274, 281-287 1955a: 64 1955b: 30.
Mastro di Marco Serrainerio (Reg. 64)	1402-1403	Zerbi, 1952: 292-300, 308-310 1955b: 36.
<i>Archivio della Fabbrica del Duomo di Milano (Fabbrica)</i>		
Liber dati et recepti facti per Thomaxium de Casale (Reg. 2/a)	1378	Zerbi, 1955b: 108
Liber dati et recepti facti per Beltramolum di Conago (Reg. 25)	1387	Zerbi, 1955b: 108.
Liber bulletarum offitij rationatoris Fabrice (Reg. 10)	1388	Zerbi, 1955b: 108.
Liber diversarum prestantiarum pro Fabrica Cathedralis (Reg. 8/c)	1388-90	Zerbi, 1955b: 52.
Liber Intratarum et Expensarum Fabrice (Reg. 6, 12, 25, 34, 46, 51)	1389-1398	Zerbi, 1943: 152 1955b: 26, 76, 107, 108.
Liber oblationum causa Jubilei (Reg. 15)	1391	Zerbi, 1943: 163 1952: 159 1955b: 69.
Liber intrate danariorum ed diversarum rerum pro Fabrice (Reg. 17, 20, 22, 26, 32, 49, 51)	1391-1400	Zerbi, 1955b: 56, 68, 72, 76, 78, 108
Liber hereditatis per q.am M. Crivellum Mercatorem Mediolani	--	Zerbi, 1955b: 108.
Liber ferramentorum et utensilium (Reg. 14, 16, 33, 44, 54, 58, 65-bis, 85, 87, 94, 110, 125, 129)	1391-1417	Zerbi, 1943: 79-80 1952: 75-77 1955b: 108.
Libri consignationum (Reg. 449)	1407-1408	Zerbi, 1952: 72.
Libri consignationum (Reg. 544, 563)	1412, 1432	Zerbi, 1955b: 108.
<i>Archivio dell'Ospedale Maggiore di Milano</i>		
Liber debitorum et creditorum Hospitalis Novi Mediolani (Cod. 65)	1394-1410	Zerbi, 1955a: 23 1952: 79-80.
Mastro	1394	Zerbi, 1943: 79-80 1955b: 26.
Mastro	1458	Zerbi, 1952: 59.
Mastro	1460	Zerbi, 1952: 453-488.
Mastro del lazzeretto	1488	Zerbi, 1952: 59.
<i>Archivio Borromeo di Milano</i>		
Mastro tabulare di Vitaliano Borromeo	1421	Zerbi, 1952: 305.
Mastro di Giovanni Borromeo (Reg. 4)	1427	Zerbi, 1952: 311-338, 340-343, 354-363 1955a: 45.
Mastro di Giovanni Borromeo (Reg. 6)	1428	Zerbi, 1952: 338, 344 1955a: 45.
Mastro della "Compagnia di Filippo Borromei & Compagni di Londra"	1436-1439	Zerbi, 1952: 403-446.
Mastro (Reg. 10)	1440	Zerbi, 1955b: 107.
<i>Archivio di Stato di Reggio Emilia</i>		
Mastri della tesoreria comunale	1385-	Zerbi, 1952: 208-213; Zerbi, 1955b: 51.
Registri di crediti e debiti, detti di San Prospero	1388-	Zerbi, 1955b: 51.
Liber tabulae	1428	Zerbi, 1955b: 51.

Table 4. Main evidence from the Lombard archives examined by Zerbi

<i>Organization</i>	<i>Period</i>	<i>Account books</i>	<i>Accounting system</i>	<i>DEB</i>
Giacomo from Giussano Bank	1356-9	Ledgers	Tabular system	No
Del Maino Bank	1394-1410	Ledgers	Tabular system and nominal accounts	Partly Capital and profit and loss accounts are missing
Catalonia Partnership of Serrainerio & Dugnano	1396-7	Ledgers	Real accounts and nominal accounts Year-end adjustments Three currencies	Yes but profit calculation is missing
Trade Company of Marco Serrainerio	1402-7	Ledgers	Real accounts and nominal accounts Year-end adjustments	Yes but system is affected by multiplicity of currencies and profit calculation is missing
Giovanni Borromeo Bank	1427	Ledger	Real accounts and nominal accounts Year-end adjustments	Yes Profit calculation is included Balance sheet and income statement are added by Zerbi
Filippo Borromei & Co. Partnership of London	1436-9	Ledger	Real accounts and nominal accounts Year-end adjustments	Yes Profit calculation is included Balance sheet and income statement are added by Zerbi

Sources: Zerbi, 1935, 1936b, 1952, 1955a.

Table 5. Main evidence from the Genoese, Venetian and Tuscan archives examined by Zerbi

<i>Organization</i>	<i>Period</i>	<i>Place</i>	<i>Account books</i>	<i>Accounting system</i>	<i>DEB</i>
Francesco di Marco Datini	1382	Prato	Ledgers	Real accounts and nominal accounts, but with no clear order	No
Averardo De' Medici	1395-6	Florence	Ledger	Real accounts and nominal accounts Double entries not completed for the cash account	No
Banco Lippi & Del Bene	1391	Padua / Florence	Ledger	Real accounts and nominal accounts	Partly Profit calculation is missing
Commune of Genoa	1340	Genoa	Cartulari	Real accounts and nominal accounts	Partly Profit calculation is missing
Grimani	1408-9	Venice	Ledger	Real accounts and nominal accounts	Partly Profit calculation is missing
Fraterna Soranzo	1406	Venice	Ledger	Real accounts and nominal accounts	Partly Profit calculation is missing
Andrea Barbarigo	1430-40	Venice	Journal & ledger	Real accounts and nominal accounts	Partly Profit calculation is missing
Giacomo Badoer	1436-9	Venice	Ledger	Real accounts and nominal accounts	Partly Profit calculation is missing

Source: Zerbi, 1952.