

THE ACCOUNTING METHODS OF THE “OPERA DEL DUOMO” OF ORVIETO, FROM ITS ORIGINS TO THE 16TH CENTURY STATUTE REFORM: SINGLE OR DOUBLE-ENTRY BOOKKEEPING?

LOS MÉTODOS CONTABLES DE LA "OPERA DEL DUOMO" DE ORVIETO, DESDE SUS ORÍGENES HASTA LA REFORMA DEL ESTATUTO DEL S. XVI: ¿CONTABILIDAD POR PARTIDA SIMPLE O DOBLE?

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ABSTRACT

The “Opera del Duomo” is the institution, still in existence, which was responsible for the construction of the cathedral in Orvieto. Over the centuries there have been many changes to its structure, in part due to continual conflict between the public administration and religious organizations. In accordance with the interpretation of the development of accounting as a result of its historical context, and, in particular, its organizational structure, this paper aims, through an analysis of the accounting registers and books of the Opera, to investigate “if” and “when” it is possible to observe the introduction of the double-entry bookkeeping method, and its role and function in the Opera’s structure.

RESUMEN

La “Opera del Duomo” es la institución, que todavía existe, que ha sido responsable de la construcción de la Catedral de Orvieto. A través de los siglos ha habido muchos cambios en términos de su estructura, en parte debido a la persistencia del conflicto entre el gobierno (administración pública) y las organizaciones religiosas. De acuerdo con la posición que interpreta el fenómeno de la contabilidad a los efectos de su contexto histórico y en particular, de su estructura organizativa, el intento del estudio, a través de un análisis de los registros y libros contables de la ópera, es analizar “sí” y “cuando” es posible comprobar la introducción del método de contabilidad de doble entrada y lo que es su papel y función en la estructura de la Opera.

KEYWORDS:

Religious Organizations, Accounting, Religion, History, Italy, 16th Century

PALABRAS CLAVE:

Instituciones religiosas, Contabilidad, Religión, Historia, Italia, Siglo XVI

1. Introduction, Methodology and Structure of the Paper

The *Opera del Duomo* of Orvieto is an ecclesiastical institution that was founded at the end of the 13th Century. While initially simply concerned with the technicalities of the management of the construction of the cathedral, it later took on a financial and economical role in the administration of money donated by the faithful for the construction of the cathedral. It was not long before a gradual (if not definitive) process of “laicization” took place, with representatives of the *Comune* (municipality) joining the organization, along with an increase in the participation of the laity in the institution’s affairs. In this manner, the *Opera* became a less “religious” and more “cultural” organization.

This detail highlights the identity and cohesion of the community of Orvieto, which considers the cathedral to be not only home to the Eucharistic miracle of Bolsena, but also a strong symbol of territorial identity and values. The *Opera del Duomo* has represented a point of reference for the town down the centuries, despite frequent struggles between the Church and the public administration for control of the institution. The *Opera* continues to exist today as an autonomous non-profit organization, with the purpose of maintaining and conserving the cathedral and administering its assets.

This paper is based on an archival and documental study of the registers and statutes of the *Opera*, through an analysis of accounting documents that can still be consulted from the period between the origin of the institution and the middle of 16th Century. These centuries saw the completion of the construction of the cathedral, as well as a change of emphasis, from the management of the construction site to the management of the institution. Furthermore, from an organizational standpoint, the latter period also saw the modification of the original statute, and the introduction of important new elements regarding administrative activities.

The aim of this paper concerns an analysis of the changes in the accounting and organization systems that corresponded with the evolution of the *Opera del Duomo*, from the origins of the institution to the statutory reform of 1553, in order to ascertain “whether”, “when”, and “why” double-entry bookkeeping was introduced, through an archival analysis of the *Opera*’s accountancy books and registers.

With regard to this aim, criteria now recognized in accounting literature (ZERBI, 1952; DI TORO, DI PIETRA, 1999; ANTINORI, 2003) can be considered as indicators of the use of double-entry bookkeeping, such as divided and opposite sections in accounts, the counterbalance, the existence of various books and registers, such as the “*Libro giornale*” (ledger), and the relationship between the registers that were kept. In particular, according to the position which interprets the phenomenon of accounting as a result of its historical context (CARNEGIE, NAPIER, 1996; BURNS, SCAPENS, 2000), and organizational structure (HOPWOOD, 1990), the analysis focuses on the role of the *Opera*’s accounting system, its interrelationship with the organization (BRACCI *et al.*, 2010), and the changes it underwent when structural modifications took place.

As for “why” double-entry bookkeeping was introduced, according to Hernández Borreguero (2011), this innovative accounting system may have been caused by: a legislative

measure (the a law that imposed the implementation of a particular accounting system), the capacity/ability of an accountant (whose knowledge of new accounting methods might have encourage their introduction), a “subjective factor” (physiological resistance to change), and an “objective factor” (correspondence and adequacy between economic reality and accounting method).

These arguments are of particular interest as they refer to a religious institution (CARMONA, EZZAMEL, 2006), its operations (VILLALUENGA DE GRACIA, 2005, 2012; PRIETO *et al.*, 2006; CILLANUEVA DE SANTOS, 2008, 2009) and its administration (ÁLVAREZ-DARDET ESPEJO *et al.*, 2006; LEARDINI, ROSSI, 2013). Such organisations have always been of interest to historians, not only for their great wealth, but also for the existence of many accounting books that “contain and disseminate over time a variety of information that is extremely useful for scholars of the history of the Church and its religious communities, or those who want to fully reconstruct a particular historical framework” (Our translation, DI PIETRA, 2005: 366). This period is also considered important in international literature on accounting history (CARNEGIE, NAPIER, 1996), and it allows for an understanding of the development of accounting, despite being a problematic period for research, due to difficulties associated with the “availability of usable primary sources, the interpretation of handwriting, the translation of ancient Italian or dialects to modern language, and dealing with the different archival methods adopted over time” (BRACCI *et al.*, 2010: 488).

The documents used as primary sources are in the archive of *Opera del Duomo*, which is almost complete, and contains seven centuries of *Fabrica* history (RICCETTI, 2007), with more than one thousand registers and various documents “dating back to the thirteenth century, with the first forms of accounting records made on loose sheets of parchment and a number of papal bulls of indulgence” (Our translation, ANDREANI, ROSSETTI, 2009: 33). The section of greatest interest is known as *Contabilità* (Accounting) or *Fondo delle Entrate e delle Uscite* (Income and Expenditure Fund) (*Table 1*), and contains a large collection of paper registers, account books, letters and contracts. These documents contain the records of the daily workings of the *Opera*, following accounting methods that came into favour among merchants in the second half of the sixteenth century¹.

In particular, this section features the registers of *Camerari*, or *Camerlenghi* (a type of chamberlain) (from 1321 to 1647), registers of *Cassieri* (cashiers) (from 1551 to 1768), and also regards the *Libro Giornale*, *Quinternuccio Longo* and *Libro Grosso*, registers of income and expenditure (from 1769 to 1860), *Memoriali* (from 1356 to 1796) written by *Camerlenghi*, registers of *Riformanze* (from 1373 to 1866), which detail all decisions taken by the board of the *Opera*, with regard to the management and organization of the institution, and *Memorie e Contratti* (from 1353 to 1753), which detail information about rent and property, labour contracts, and certain provisions for the organization of labour (ANDREANI, ROSSETTI, 2009).

Despite the close interrelation between the above-mentioned registers, this analysis has as its principal focus the account books written by *Camerlenghi* and *Cassieri*, between 1321

¹ It is quite clear that the reference to the “mercantile style” contained in the statute of 1553 refers to the double entry method of bookkeeping, as a result of the widespread and well-known work of Luca Pacioli. See MILLS (1994); TURCO (2002); CAVAZZONI (2006); RICCABONI *et al.* (2006).

(dating back to the first book recording the income and expenditure of the institution) and the end of the sixteenth century, in order to reach a detailed understanding of the accounting methods².

	14 th -15 th Centuries	16 th Century	17 th Century	18 th Century
Camerlengo (Chamberlain)	- Memoriale - L. entrate e uscite - L. dei creditori	- Memoriale - L. dei conti	- Memoriale - L. dei conti	- Memoriale - L. dei conti
Cassiere (Cashier)	*****	- Quinternuccio - L. grosso - L. giornale	- Quinternuccio - L. di cassa e dei beni	- Quinternuccio - L. di cassa e dei beni - L. mastro
	*****	- L. dei creditori - L. dei debitori - Libri delle tenute	- L. dei creditori - L. dei debitori - Libri delle tenute	- L. provisionati - L. dei censi - L. dei debitori - L. degli affitti - L. generazioni - L. ricevute - Libri delle tenute

Table 1: Books and registers of the Opera del Duomo

This paper is divided into two main parts, in order to analyze not only the documents in the *Opera* archives, but also the historical context in which organizational and management decisions were made, through the adoption of a synchronic approach (AMADUZZI, 1997; SERVALLI, 2007), as “*management and accounting institutions, concepts, processes and techniques are what the past, contemporaneously reinterpreted and transformed, has made them*” (PARKER, 1999: 18).

The first part regards the description of the context and, to this sense, after a literature review on the evolution of the characteristics of double-entry bookkeeping (section 2) and a description of Orvieto’s social and economical developments during the period of analysis (section 3), an in-depth study follows which outlines the regulatory developments of the *Fabbriceria* institution, from its origin to the middle of 16th century (section 4 and section 5), alongside the history of *Opera del Duomo* of Orvieto.

The second part contains the analysis of the documents kept in the *Opera del Duomo* archives, and a comparison between texts, books and registers, in order to outline the relationship between the evolution of accounting techniques and practices and the *Opera’s* statute and to indicate which accounting practices were decreed in formal terms and which, in contrast, may have been the result of customs and habits (section 6 and section 7).

² “The series of documents that detail expenditure on the construction of the cathedral in the *Opera* archives date back to 1321, the year that saw the establishment of a truly ordered *Fabbrica* office. At the time expenses were first noted in the Municipality records, and those books, even if they still existed in part in the past century, are lost today, and we no longer know where to look for them, as all my research over the many years that I have collected folk memories has proved fruitless”. (*Our translation*) See. L. Fumi (1821, p. 3).

2. The evolution of double-entry bookkeeping method

The period under analysis (the 13th-16th centuries) represents, in terms of accounting practices, a fundamental phase, that saw profound change in terms of techniques, methodology, and development. All these practices became part of the double-entry bookkeeping method, with its first description in the famous treatise “*De Computis et Scripturis*” by Pacioli Summa (1494). Pacioli’s work represents a “summary document” of a long lasting process, through which accountancy took on an increasingly significant role in all institutions, and its improvement through the development of more precise and complete models reflects the growth and complexity of organizations and their operations.

The double-entry bookkeeping method can be seen as the final stage of an evolutionary process, the successful development of a practical accounting technique for the management of institutions of increasing size and territorial boundaries. By the 15th century, “*all the conditions for a positive evolution of accounting and its spread to all operations had occurred*” (Our translation, ANTINORI, 2004: 18) Indeed, merchants’ and bankers’ accounting books and registers highlighted how, between the end of the 13th Century and the beginning of the 14th, accounting systems had advanced in many Italian regions, and the transition from the single to double-entry bookkeeping method may represent the development of a new awareness among businesses that they needed to manage their economic development better.

The “merchant method” of bookkeeping (double-entry bookkeeping) is widely considered to indicate the end of an era, representing an important landmark that concluded the medieval era and laid the foundations of modern accounting (SOMBART, 1925). There is more uncertainty, however, about the timeframe regarding the origins of the double-entry bookkeeping method. Some scholars (i.e.: BESTA, 1922; ZERBI, 1952) tried to identify, through an analysis of medieval merchant registers or printing works, the period when it is possible to date the emergence of the modern method of merchant accounting, no longer identifiable with the publication of Pacioli’s “*Summa*”.

During the 20th Century, many studies attempted to demonstrate the existence of double-entry bookkeeping method, both through the presence of specific formal elements in merchant bookkeeping, and the “*relationships between historical circumstances and accounting events*” (Our translation, ANTONELLI, D’ALESSIO, 2011: 54).

Littleton was among the leading scholars to research the origins of double-entry bookkeeping. He identifies three specific elements, the presence of which demonstrate the existence of the balancing method, although he also considered other conditions to be essential, such as the art of bookkeeping, arithmetic, money, private property, the existence of local markets, and the accumulation of capital (LITTLETON, 1923). These are: the duality of books (the ledger and journal); the duality in the sections of accounts (to increase and decrease a specific object); and the duality of consequent annotations (the “debtor” and “creditor” sections) (ANTONELLI, 2013). The author considers this double annotation to be the precise element that allows for the double-entry bookkeeping method to be distinguished clearly (LITTLETON, 1933).

Melis was another scholar who focused his attention on the presence of a double series of accounts, arguing that is necessary to understand the motivation behind the double annota-

tions, rather than their effects. As the principal object of analysis, he also identifies capital, which has to be investigated both through the study of its individual parts (cash, debts, credits etc.), and (the key element) through the analysis of the total “mass”. Hence two series of accounts are identified: one on the specific analysis of wealth, the other its total investigation (MELIS, 1952). In the light of these considerations, the author concludes that only the capitalist, with whom he associates the spread of this accounting method, would have found it necessary to control the variations of his wealth, both totally and in its individual parts. It should be noted that Sombart had arrived at the same conclusion some years earlier, arguing that only the double-entry bookkeeping method can measure the value of capital and its variations, and associated this accounting method with the origins of modern capitalism (SOMBART, 1925).

De Roover, at least in his early works, highlights the formal aspects of the accounting method, in order to find a minimal “framework” to identify the balancing methodology (DE ROOVER, 1937). The author considers the division in two separate sections in the ledger, and its link with both the accounts and the books system, to be essential (ANTONELLI, 2013). Later, he partially modifies his position, and comes to the conclusion that, in any case, accounting has to be set up for a correct and separate identification of the assets, liabilities and capital of the enterprise (DE ROOVER, 1955).

The issue of the origin of the double-entry bookkeeping method does not appear to have been resolved, as most studies do not agree on generally or completely accepted positions (SANGSTER, 2012; ANTONELLI, 2013). Therefore, it is probably impossible to identify a specific date, person or place with which to associate the first application of the double-entry method, because its spread is almost certainly related to the development of markets and economic realities over the centuries (PATERNOSTRO, 2009).

3. The Economical and Social Context (13th-16th Centuries)

Orvieto was established as a municipal institution (*Comune*) in about 1150 A.D., through an agreement between Pope Adrian the 4th, two consules and two nobles of the town. A phase of territorial conquest soon began, and Orvieto expanded its territory over a large part of central Italy (DELLA FINA, FRATINI, 2007), followed by the first modifications to the government of the town. At the end of the 12th century, the consules were substituted by a *Podestà*, a new official with fundamental powers in the municipal government. In this period, the inhabitants actively participated in political life, and enjoyed their wealth, which derived from artisan crafts, as the population reached about 15,000 (in the same period, Florence had 50,000 inhabitants).

The 13th century was the richest period: the main source of income was agriculture, herding and farming; in these years of great development, the town grew rapidly and the wealth of the population increased. Through a new kind of tax (*Colletta*), an innovative indirect taxation system applied to all commercial transactions, the *Comune* also began to finance the construction of buildings and monuments, as well as several wars against neighbouring communities for territorial supremacy. Four citizens, representatives of the four districts of the town, collected this tax, while the ultimate responsibility for its collection was assigned to the *Camerlengo*, who had to report all amounts cashed in and used.

In this period (1290) the *Opera del Duomo* was established, in order to regulate and manage one of the most important artistic monuments in Italy: the cathedral. The *Opera* is a unique institution, belonging to *Fabbricerie* (“*Fabricae Ecclesiae*”), volunteer organizations that had as their aim the construction of cathedrals and monasteries, and their maintenance over time³.

The end of this century was also the end of a prosperous period, mostly due to the end of the democratic system (1354), when the Orvieto became a Papal territory, and was reduced to the status of a simple provincial town. During the 15th century, the long period of decadence persisted because of the struggles between the Malcorini and Muffati, two local noble families (MONTEMARTE, 1816). Orvieto saw a brief period of tranquillity at the end of the century, thanks in the main to Papal interventions; the agreement between the Papal state and the Muffati family concerned a co-administration of the *Comune*, which however gave the Pope the main political and administrative functions. In these years of reconciliation it was possible to continue the construction of the cathedral, and finish important architectural details such as the beautiful façade. Fidelity to the Papal state also allowed Orvieto to reacquire neighbouring territories, reconstructing the landholdings of the 14th Century.

These years also represented a period of great change for the town: *Monti di pietà* and *Monti del grano* (a type of pawnshop) were founded, the latter for charitable causes, as they addressed their activities solely to the poorest and needy (AVALLONE, 2007). Orvieto also became an important stronghold where the Pope could take refuge from continuous attacks against Rome by Charles the 5th. Despite these innovations, however, the economic situation was fairly stagnant, based only on commercial and artisan activities, and Orvieto could not regain its former glory.

³ These institutions, while officially recognized by law in recent times – through Lateran Pacts in 1929 – have their origins at the beginning of the 5th Century, under the Pontificates of Pope Simplicio and Pope Gelasio. They divided all ecclesiastical properties, until then under the control of bishops, into four parts:

- *quarta episcopi*, to provide for the bishop and his “*famiglia*”;
- *quarta cleri*, to provide for the secular clergy;
- *quarta pauperum*, to provide for the needs of Christ’s poor;
- *quarta fabricae*, divided into *sacra tecta* (to provide for the maintenance of sacred buildings) and *luminaria ecclesiae* (to provide for all fundamental religious purchases).

In particular, *fabbriceria* or *fabbrica* arose from the funds destined for the latter aim, and can be defined as “*income useful for the maintenance of churches and cathedrals, for repairs to sacred buildings, for ornamentation, and for any other expenses that are fundamental for religious celebration. Those known as the Fabbriceri are any individuals – be they men of the clergy, or lay members of the church – who manage these funds and supervise such works*” (Our translation, MORONI, 1820: 259).

Initially, all funds destined for the building and maintenance of churches were under the direct control of the bishops, but later they came under the responsibility of archdeacons and parish priests. The latter, however, “*were not able to conduct temporal and spiritual affairs at the same time*” and were soon released from this commitment in favour of “*appropriate secular individuals known for their zeal and probity*” (Our translation, MORONI, 1820: 259). However, these individuals were still held accountable for their management activities to the archbishops, bishops, archdeacons, parish priests and all corporations behind the institution.

However, one of the most important changes was when the medieval municipalities developed, and the construction of religious buildings became the responsibility of all members of the *communitas*. Consequently, this period saw the creation of stable organizations of (both religious and lay) people, with the aim of providing for the maintenance of the church, and the management of church properties.

4. The Organization of the *Opera del Duomo* of Orvieto

The foundation of the *Opera del Duomo* of Orvieto coincided with the laying of the first stone of the cathedral on November 13th 1290, under the pontificate of Pope Nicola the 4th (FUMI, 1821). At this point it would have been impossible to make a distinction between the construction site and the *Opera*. The latter, as a consequence, had a very simple organizational structure, with an ecclesiastical dean (*operarius*) who controlled the construction of the Cathedral; probably supported by two or more laymen, he had technical responsibility for the construction project, and administrated bequests in favour of the construction of the church. With regard to the way the *operarius* operated, in addition to two controllers, there were also two other *probi viri* (honest men), replaced on a monthly basis, who had to check the accounts, and two others charged with the responsibility of examining the administration of the *Fabbriceria*.

Some years later, however, the ecclesiastical nature of this institution was to become less significant, and it assumed the structure of a “civic event”, also partly as a result of disagreements between Pope Bonifacio the 8th and Orvieto Council. In 1295, in fact, alongside the *operarius*, who remained responsible for the technical aspects of the construction site, two or three municipal officials (*sovvrastanti* or *superstites*) were introduced, with responsibility for administrative functions. In this way the process of laicization began, which would eventually see the Church completely excluded from the management of the institution.

August 1300 saw the first municipal regulation that introduced specific rules regarding *Fabbriceria*, through a formalization of the managerial relationship between the Church and the Municipality: the position of *operarius* remained, although he was now a simple site supervisor, along with the four *superstites*; the major change saw the introduction of the *camerlengo* or *camerario* (an institutional administrator), a notary, and two auditors, charged with the responsibility to control and approve all expenses. The Statute indicates:

“Ex autoritate Comunis et populi dicto Civitatis Urbevetane ac etiam deliberazione per Cives seculares habentes auctoritatem ab ipso Comune eligantur et deputentur quatuor boni et diligentes Cives Urbevetani in Superstites dicti Operis et Fabrice predictae [...] et unus bonus et idoneus Civis Urbevetanus et Camerarius dicte Fabrice, et unus bonus et expertus Notarius et scriba” (art. 4) (*Municipality and inhabitants have the authority to indicate four honest men as Superstites of Opera and Fabbrica, one honest and suitable man as Camerario and one honest and expert man as Notary*). (Our translation).

and, with regard to auditors:

“Revisores et Ratiocinatores rationis [...] duo boni cives Urbevetani idonei et experti ad ipsam rationem revidendum et calculandum» (art. 35) (*As auditors two honest, suitable men, who are experts in auditing and accounting processes*). (Our translation).

In the same period, the first autonomous management of financial funds was also introduced, by means of a *truncho* (charity box) for the collection of donations towards the construction of the cathedral. These developments can be highlighted as the first steps towards an autonomous administration and a formal legal structure.

During the 16th century there was a progressive separation between the *Duomo*, which attended to architectural matters, and the *Opera*, which managed administrative affairs. In the same period, the construction site grew, and came to employ more than two hundred workers. This led to reorganization, through the substitution of the *operarius* with an autonomous technician (*universalis caput magister*) and four *superstites*, who represented the four areas (*quartieri*) into which the town was divided. This mixed management (Church-Municipality) model came to an end with the approval of the first Statute (1421), which took into account the Papal bull of Martino the 5th that removed the role of the clergy in favour of a lay administration. In this Statute the role of the *sovrastanti* (*superstites*) was confirmed, while the figure of the notary was empowered, with the responsibility for keeping accounts, the income and expense books, and the registers of decisions regarding sales and charitable activities. The *camerario* also remained, with the responsibility to receive income and take care of the expenses and daily needs of the institution.

As with any other municipal positions, all *fabbrica* officials were chosen from a public *bussolo* (box) that contained the names of all secular citizens that were not debtors of the *Opera*.

“Et omnes dicti officiales sint et esse debeant seculares et extrahantur de bussolo [...] sicut alii Offitiales dicti comunis”(art. 4) (*All these officials have to be extracted from a box [...] as with all other Municipal officials*).
(Our translation).

The daily operations of the institution were precisely and rigidly regulated: the *camerlengo* was not able to incur any expenses without the authorization of the *sovrastanti*, and nor was he able to distribute loans or offer credit to the *Opera*'s clients. At the end of his administration he had to make an inventory of all properties and calculate any cash surplus, in order to leave it to his successor, and only after this was checked by the auditors of all accounts.

The years following the enactment of the first statute were not characterized by changes in the organization of the institution, but rather by a significant increase in its assets: in this period, in fact, the institution acquired the estates of the Prodo and Benano castles, and the Sala territories near Orvieto. The year 1553 saw the first Statute modification that reorganized the *Fabbriceria* of Orvieto, also due to changes in the economical and social context. The *camerlengo* also became supervisor of the Cathedral and sacristy, and the point of reference for all properties and acquired territories. As an administrator of justice, the *camerlengo* also had the responsibility to contact vassals and workers, through a public hearing organized three times a week, and to draw up the *Memoriale*, a register containing the description of all properties, along with accessories and boundaries.

As the Statute indicates:

“Detto camerlengo debia fare un libro grosso intitolato memoriale dela fabrica, nel quale habia et debia scrivere o far scrivere tutte et singule possessione, tenute, tanto situate come vignate, pratide, olivate, case, botteghe, molini et altre cose spettante et pertinente ad detta fabrica” (Cap. I, art. 7) (*the Camerlengo has to draw up a large book, titled the journal, in which he must list all properties, such as vineyards, pastures, olive groves, houses, workshops, and mills, and everything else belonging to the fabrica*). (Our translation).

Four *sovrastranti* remained to supervise his work, becoming to all effects and purposes a true auditing board (*numeretto or piccolo consiglio*), with the responsibility to verify the annual accounts.

The most important innovation of the statute was the introduction of the *cassiere* (cashier), or *computista* (accountant), in place of the notary; this figure had the role of drawing up three registers (the *Libro giornale*, *Quinternuccio longo* and *Libro grosso*), and the books of creditors and debtors, which were communicated on a monthly basis. His administrative tasks were, in any case, strictly controlled: he was only able to spend on behalf of the *camerlengo*, who only provided him with the necessary amounts of money and goods to carry out his business during the year.

5. The Accounting of the *Opera del Duomo* of Orvieto

The analysis of the accounting practices of the *Fabbrica* can be divided into two main branches: one pertains to the building of the cathedral and deals, on the one hand, with revenues from donations, bequests and contributions, and, on the other, expenses related to the costs incurred in the construction of the cathedral; the second branch regards the management of the three territories (La Sala, Prodo and Benano) and their assets.

It is clear that the first branch of activity was of greater importance than the second during the entire period of the construction of the cathedral, not only for the number of operations involved, but also their value. In the transcriptions of single accounting records, it is possible to find all the principal cathedral craftsmen listed: Lorenzo Maitani, Ippolito Scalza, Luca Signorelli, and many others. This explains the centralization of accounting, and the lack of attention paid to surveys of land held. These, in fact, reached a greater degree of autonomy and value in accounting terms once the Cathedral had been completed, through a systematization of accounting records, in order to define both the results of operations, and the status of the heritage of individual estates.

From 1321 until the Statute modification of 1553, the *camerlengo* was responsible for bookkeeping and administration. From 1421, he was assisted by the *sovrastranti* and a notary in making entries pertaining to all operations regarding the building of the cathedral and the administration of all income from landed properties. The notary was also obliged to keep two (authentic and public) originals of the income and expenditure book (FUMI, 1821). In the registers of this period, written in Latin, accounting practice was based on a simple methodology,

with only income and expenses listed. There was no a balance sheet, nor even a simple *ris-tretto di cassa* (cash summary), which was introduced later, during the 17th Century.

At the beginning of every year, the *camerlengo* had to draw up all the past credits of the *Fabbrica* in a specific book, writing, on the left hand side, the names of those who had an unpaid debt to the institution, the total credit and its origin, alongside chronological collections on the right page; the latter was connected, by registration, to the income and expenses book. These debts were often only partially collected, and sometimes after many years, or even paid by the debtor's heirs, highlighting a lack of attention to the recovery of credits. The *camerlengo* was responsible for everything concerning the institution, including properties, furnishings, utensils and more, and had to draw up *Memoriale*, in which he made an inventory of all goods received from his predecessor, and everything he had to administer and pass on to his successor, together with cash in hand.

At the beginning of 1554 a more articulated accounting system was introduced. The Statute reform introduced the *cassiere* in place of the notary, and redefined the function of the *camerlengo*, who had to draw up the *Memoriale* and *Libro dei Conti* (Book of accounts).

“Camerlengo habi da avere un ministro quale si deba chiamare cassiere o computista, al quale possa comettere ed ordinare quanto giudicherà necessario et expediente ad beneficio del culto divino et dele altre ordinarie facende et medesimamente ordinarli tutto quello harà da spendere” (Cap. I, art. 6) (the *Camerlengo must be accompanied by a cashier who is obliged to manage goods for worship and other ordinary activities, putting all expenses in order*). (Our translation).

And also:

“Detto Camerlengo sia tenuto et obligato fare un altro libro intitolato libro dei conti dove debia scrivere et anotare in debito et credito tutto quello ch'in nome suo pervenisse alle mani del ditto cassiere, et similmente sicundo l'ordine predetto si spendesse et tener conto di tutti i mandati qual facessi, et altrimenti facendo per ciaschuna volta contrafarà, caschi in pena di diece scudi [...] et di più sia tenuto alla restituzione del doppio” (Cap. I, art. 8) (the *Camerlengo also has to draw up a book called Book of Accounts, where he must annotate, as credits and debits, everything delivered to the cashier, along with information about all operations. Otherwise he has to pay ten “scudi” and give back double the amount*). (Our translation).

The former register, which existed before the Statute reform, was augmented with new contents: information about property, estates, goods, and everything else concerning the institution, with indications about boundaries, measures, hamlets, and places where all listed goods are held: the purpose of these records was to offer more certainty about income levels, and it represented the starting point for trading operations. The *Libro dei conti* (book of ac-

counts) was very important: this register contained annotations about money and goods assigned to the *camerlengo* by his predecessor, and their consignment to the *cassiere*.

“*Il Camerlengo subito che li verranno ale mani l’entrate rendite et proventi di detta fabbrica li debba haver consegnate in mano del suo Cassiere e tale consignatione notarla al suo libro facendo debitore il detto cassiere all’incontro del suo credito mercantilmente*» (Cap. 1, art. 13) (the *Camerlengo* has to deliver all *Fabrica* income to the cashier in a timely fashion, and he must register this delivery in his books, in the merchant manner, with the cashier as a debtor and himself as a creditor). (Our translation).

At the end of his annual mandate, the *camerlengo* had to account for everything administered, and return goods and registers. The latter were consigned by his successor to the auditors for a final verification of income and expenses. This operation was typical of accounting procedures in Italian institutions of the same period (BRACCI *et al.*, 2010). The *cassiere* drew up three main books: the *Giornale* for daily activities; the *Quinternuccio longo* for ordinary and extraordinary operations; and the *Libro grosso* (ledger), in which he registered incomes and expenses, in the “merchant style”, along with all other aspects covered in the other two registers (Cap. 2, art. 5).

This was a highly articulated accounting system, based on a separation between the *camerlengo*, who governed the institution (under the control of *sovrastanti*) and the *cassiere*, who followed orders, and directly managed funds from the *Fabbrica*. This distinction involved many strictly interrelated accounting operations, which were not intended to systematize information, nor arrive at annual results or a measurement of capital, but rather to provide transversal control and certification of what was done on a daily basis.

The management model was very simple: the *camerlengo*, after the acquisition of goods and money from his predecessor, immediately handed them over to the *cassiere* (Cap. 2, art. 7). These operations were registered in the *Libro dei Conti*⁴, as the responsibility of the former, where credit for the *camerlengo* (for the previous consignment) was noted on the left, and the debt of the *cassiere* on the right. Following this, the *cassiere* took note of this operation in the *Quinternuccio longo*, then in the *Libro giornale*, and finally in the *Libro grosso*. All operations that took place over the year followed the same procedure, with the exception of the *Libro dei conti*, which was no longer referenced. During the year the *cassiere* did not buy goods, but only managed what he received from the *camerlengo*; he also received rent money, paid salaries to workers, and all expenses relating to the daily administration of the *Fabbrica*, the latter noted down in an account called *Spese straordinarie* (extraordinary expenses).

⁴ In the archive of the *Opera del Duomo*, this register is catalogued as “*Libro del Camerlengo*”.

6. The Contents Of The *Opera*'s Accounting Books: From Single to Double-Entry Bookkeeping Method?

In the light of the reflections about the evolution of the accounting system over centuries, there follows a description of the contents of each of the *Opera*'s registers, and how such accounts were held, in order to confirm the use of the double-entry bookkeeping method.

The *Libro dei conti* registered, almost exclusively, goods (wheat, barley, rye, legumes, walnut, fodder, millet, garlic, wine, lupines, hemp) that were received from the three properties held by the institution, and acquired by the *camerlengo*, who was responsible for their administration; these goods were then given to the *cassiere* for handling. The left sheet of the register, personally written by the *camerlengo*, notes the quantity (not the value) of the received goods; similarly, the right, written by the *cassiere*, details the quantity received. This direct transcription allows for the supposition that this form of registration acted as a receipt, with a correlating assumption of responsibility for the transaction.

The *Quinternuccio longo*, so named (*longo* = long) for its long and thin form, begins with a qualitative inventory of furnishings, jewels, blankets, and so on, held by the *Fabbrica* at the time of the appointment of a new *camerlengo*. All the previous year's goods from the three properties are registered, with a connected entry in the *Libro dei Conti* (book of accounts), in which all acquisitions are registered. This respects the rules of double-entry bookkeeping, as it is registered on the right side of the *Quinternuccio longo*. Following this, and in chronological order, but without a clearly apparent methodology, there follows the registration of all operations that involve the movement of money, in which the first operation is the consignment of any cash surplus. These entries make reference to the page of the *Libro giornale* (Day book), which details the registration, while the *Quinternuccio* ends with an inventory of residual goods to be left for the next *camerlengo*.

The *Libro giornale* (Day journal) represents a more articulated register, and can be divided into two parts (MONTRONE, CHIRIELEISON, 2009): the first (general part) deals, in chronological order, with all operations that result in a variation of cash accounts (*Cassa*), as income or expenditure. Formally, single entries do not comply with the rules set out by Pacioli (ANTINORI, 1960); there is a lack of the particle “*Per*” (for), before the creditor account and the particle “*A*” (to), before the debtor account. However, it is possible to recognize that this operation occurs in connection with two specific accounts, due to the description near the operation, and a link on the left side to the *Libro grosso* sheets (n. creditor account sheet/ n. debtor account sheet). In the second part, which can be called “sectional”, there are distinct indications about goods transferred by predecessors (“*beni residuati*”, residual goods account) and current goods (“*beni raccolti*”, collected goods account), with income written on the left sheet (along with any final result) and all expenditure relating to these goods on the right. If the expenditure is connected to a sale, there is a further registration in the first part of the *Libro giornale*; it is interesting to note that these latter registrations seem to be a simple duplication of what was already to be found in the *Libro grosso*.

This register contains all accounts used during the year, and is drawn up by the *cassiere*, following the requirement to draw up, through debits and credits, a cash account (headed “REGISTER OF 1554”). This register is normally anticipated by a *Rubrica* (column), which lists

the names of individual ledgers, linked with the correspondent page number. Only five accounts are used in the *Libro grosso: cassa* (cash), *spese straordinarie* (extraordinary expenses), *beni* (goods), *creditori* (creditors) and *debitori* (debtors). Formally, in the description of each operation, there is always a connection to the respective sheet in the *Libro giornale*, in which the entry was drawn up, and to the sheet of the *Libro grosso* itself, which contains the second correlated account.

7. The Interlinking Relationships Between Books Of Accounts

To provide for a better understanding of the administrative structure, there follows an outline of the links between the accounting books of the *Opera del Duomo*:

a) Libro dei Conti (<i>accounts book</i>)		b) Quinternuccio lungo
<p>C. 24</p> <p>Io ... Camerlengo della Fabbrica ... ho havuto da M. cassiere del mio antecessore scudi 40 di moneta in questo di 29 gennaio 1556 quale ho consignate a M. ... mio cassiere si come appare qui all'incontro dicho</p> <p><i>(I... the Chamberlain of the Fabbrica received from the former Cashier 40 "scudi"⁵ on January, 29th, 1556 and I gave them to my new Cashier as noted here...)</i></p> <p style="text-align: right;">_____40</p>	<p>C. 24</p> <p>Io ... cassier della Fabbrica ho ricevuti da M. ... Camerlengo quaranta di moneta avuti in questo di 29 gennaio 1556</p> <p><i>(I...the Cashier of the Fabbrica received from the Chamberlain 40 "scudi" on January, 29th, 1556)</i></p> <p style="text-align: right;">_____40</p>	<p>C. 15</p> <p>Entrata di denaro (<i>cash inflows</i>)</p> <p>Io M. ... quale cassier della Fabbrica ho ricevuto da M. ... Camerlengo quaranta di moneta avuti da M. ... Camerlengo antecessore per mano di M. ... suo cassier come appare nel libro del Camerlengo a C. 24 e riportato libro giornale a C. 3</p> <p><i>(I...the Cashier of the Fabbrica received from ... the Chamberlain 40 "scudi" received from ... the former Chamberlain at the hands of ... his Cashier as appears here on page 24 and on the Day book on page 3)</i></p> <p style="text-align: right;">_____40</p>

⁵ The “Scudo”, “Baiocco”, “Iuly”, and “Paulo” are different types of money.

c) Libro Giornale (<i>day book</i>)	d) Libro Grosso (<i>ledger</i>)	
<p style="text-align: center;">C. 3</p> <p>3\25 A Cassa di mio conto adì 29 di Gennaio 1556 scudi 40 di moneta a ragione di 10 pauli e scudo avuti da M.... camerlengo per le mani di M. ... già cassiere di detta fabbrica nell'anno 1555 mio antecessore come appare nel mio quinternuccio a C. 15 fanno si al detto M. ... già cassier posti in avere a Libro a C. 25</p> <p style="text-align: center;"><i>(in the cash account, today January 29th 1556, 40 scudi for 10 “pauli” and “scudo” received bythe Chamberlain at the hands ofthe former Cashier of this Fabbrica in 1555 my predecessor as appears in my Quinternuccio on page 15 and in the Ledger on page 25)</i></p> <p style="text-align: right;">_____40</p>	<p style="text-align: center;">C.3</p> <p>Cassa di mio conto deve dar scudi 40 di moneta a ragione di 10 pauli et scudo sono stati avuti contanti da M. ... camerlengo per mano di M. ... già cassiere di detta fabbrica nell'anno 1555 mio antecessore a buon conto delli denari residuati come appare al mio giornale a C. 3 fanno si buoni a detto M. già cassier posti aver di questo a C. 25</p> <p style="text-align: center;"><i>(the cash account has to give 40 “scudi” and 10 “pauli” and “scudo” received by ... the Chamberlain at the hands of ... the former Cashier of this Fabbrica, my predecessor, as residual as appears on my Day book on page 3 and here on page 25)</i></p> <p style="text-align: right;">_____40</p>	
		<p style="text-align: center;">C. 25</p> <p>M. ... già camerlengo e M. ... cassier di detta Fabbrica devono avere scudi 40 di moneta sono tanti pagati contanti, come appare in giornale a C. 3, posti a Cassa dare in questo a C. 3.</p> <p style="text-align: center;"><i>(...the Chamberlain and ... the Cashier of this Fabbrica have to receive 40 “scudi” as appears in the Day book on page 3 and in the cash account in this book on page 3)</i></p>

	_____40
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The “*Cassa*” (cash) account, in which the first registration is a transfer of residual money from the previous year, contains all variations in income (left page) and expenditure (right page) pertaining to *Fabbrica* activities.

Conto Cassa (<i>cash account</i>)	
<p>R° - Cassa di mio conto deve dar scudi 12 et baiocchi 3 sono si tanti posti haver in questo a C. 3, per resto di quel conto come si vede⁶</p> <p style="text-align: center;"><i>(the cash account has to give 12 “scudi” and 3 “baiocchi” it appears on page 3 as residual of the account)</i></p> <p style="text-align: right;">_____12:3</p> <p>....</p>	<p>Cassa di mio conto deve haver adì XI di febraro ba: 62 sono tanti dati a M. ... canonico per sua provisione del mese febraro 1556 per le messe della Fabbrica, posto dare a C. 23</p> <p style="text-align: center;"><i>(the cash account has to receive today, February 11st, 62 “baiocchi” have been given to ... the Canonical for the Masses of February 1556 as a debit on page 23)</i></p> <p style="text-align: right;">_____ :62</p> <p>...</p> <p>R° - Cassa deve haver ba: 60 sono tanti posti dar in questo a C. 27</p> <p style="text-align: center;"><i>(the cash account has to receive 60 “baiocchi” as appears on page 27 of this book)</i></p> <p style="text-align: right;">_____ :60</p>

The “*Spese straordinarie*” (extraordinary expenses) account contains all costs regarding day-to-day management and casual work.

⁶ The symbol “R°” indicates the results of the accounts of the previous pages.

Conto Spese Straordinarie (<i>extraordinary expenses account</i>)	
<p>R° - Spese straordinarie devono dare scudi 46 e ba: 34 sono tanti posti haver in questo a C. 19 saldo di quel conto come si vede</p> <p>(the <i>extraordinary expenses account</i> has to give 46 “scudi” and 34 “baiocchi” as appears in this book on page 19 of that account as is clear...)</p> <hr style="width: 100%;"/> <p style="text-align: right;">6:34</p> <p>....</p> <p>Adi 2 di aprile 3 iuly pagati al sagrestano per ... come appare al giornale a C. 10 buoni a cassa a C. 33</p> <p>(today, April 2nd, 3 “iuly” paid to the sacristan as appears in the Day book on page 10 and in the cash book on page 33) _____:30</p>	<p>R° - Spese straordinarie devono haver scudi 61 e ba: 59 sono tanti posti haver in questo a C. 44 per saldo di questo conto</p> <p>(the <i>extraordinary expenses account</i> has to receive 61 “scudi” and 59 “baiocchi” as appears in this book on page 44 as residual of this ac- count) _____ 61:5 9</p>

Due to their frequency, these accounts can be found in several parts of the Libro Grosso. It is notable that only the balance is carried over to the new sheet, resulting in the loss, at least with regard to the cash account, of fundamental information concerning the total amount of income and expenditure, which was also to be controlled by auditors. This may be one of the causes that brought about a change in practice: at the beginning of the 17th century the balance was no longer calculated, as there was only a transfer of the total amount of credits and debits, thus on the last page of the “Cassa” account it was possible to arrive at the total amount of all income and expenditure during the year.

The accounts that dealt with funds derived from property are also important; as has been noted, distinct ledgers were used for residual funds from the previous year and current funds.

The credit sections in all these accounts held indications of the initially received quantity (on the left, with regard to the description of the operation), without any counterpart in the *Libro Grosso*. The debtor section noted: i) sales made, with an indication of the given quantity (on the left, with regard to the description of the operation) and price (on the right, with regard to the description of the operation); ii) quantities used for internal needs and charities; iii) quantities lent. The counterparts were, respectively, the “Cassa” account for sales (with reference to entries in the *Libro Giornale*), the “Spese straordinarie” account for internal use and charities (the latter were rarely written up in a separate account), and the “Beni imprestati” (lent goods) account for loans. The account is, consequently, only balanced in terms of quantity;

this is worth noting, as it represents the residual quantity of goods given to the *camerlengo* to be passed on to his successors.

Conto beni residuati (Grano) (<i>residual good's account – wheat</i>)	
<p>Stara Grano de mio conto residuato alla Sala⁷ 116 deve dare scudi 0 some quattordeci et stara quattro de grano a misura rasa consignatoci alla sala in mano di M. ... da M. ... camerlengo mio antecessore et M. ... suo cassier appare in mio giornale a C. 80</p> <p style="text-align: center;"><i>(the Sala's residual wheat account has to give 0 "scudi" 14 "some" e 4 "stara"⁸ deliv- ered to us by the hands of ... the previous Chamberlain and ...his Cashier, as appears in my Day book on page 80)</i></p> <p style="text-align: right;">_____0</p>	<p style="text-align: center;">... ...</p> <p>Stara</p> <p>2 Grano di contro deve haver scudi 0 per grano mandato a Orvieto a far biscotti e zuccherini per la collatione delli preti la mattina del corpus domini⁹ secondo il solito posto spese straordinarie a C. 104</p> <p style="text-align: center;"><i>(the wheat account has to have 0 "scudi" for wheat delivered to Orvieto to make biscuits and cakes for the priests' breakfast on the morning of Corpus Domini, according to the usual extraor- dinary expenses on page 104)</i></p> <p style="text-align: center;">... ...</p> <p>2 _____0</p> <p style="text-align: center;">... ...</p> <p>Et deve haver scudi 0 sono per stara 2 de grano havemo consegnato alli mi successori nel granaio di Orvieto come ne havemo quietanza apresso a noi</p> <p style="text-align: center;"><i>(and it has to have 0 "scudi" for 2 "stara of wheat given to my successor in the Orvieto's granary)</i></p> <p style="text-align: right;">_____0</p>

⁷ “Sala” and “Prodo” were properties held by the *Fabrica* near Orvieto.

⁸ The “soma” and “stara” are units of measurement.

⁹ Corpus Domini is an important Catholic feast that marks the miracle of transubstantiation.

Conto beni raccolti (Spelta) (<i>collected good's account – spelled wheat</i>)	
<p>Stara 53 Spelta raccolta in questo anno a Prodo deve dar sono per la valuta di some 5 stara 5 de spelta a misura corrente raccolta di terratico da più persone nel presente anno a Prodo quale remisurata a cecho del carrara torno stara 53</p> <p style="text-align: right;">_____0</p> <p style="text-align: center;"><i>(Spelled wheat collected this year in Prodo's property account has to give 5 "some" and 5 "stare" to more people in this current year in Prodo and recalculate 53 "stare")</i></p>	<p>Stara 5 Spelta raccolta in questo anno a Prodo deve haver carlini 10 sono per stara 5 de spelta finita per F. fattore a più persone come al suo libro a C. 21 posti cassa dar a C. 136</p> <p style="text-align: right;">_____ :75</p> <p style="text-align: center;"><i>(Spelled wheat collected this year in Prodo's property account has to have 10 "carlini" for 10 "stare" of spelled wheat for the farmer for more people, as appears in his book on page 21 and in the cash account on page 136)</i></p> <p>29</p> <p>Et deve haver scudi 4 e ba: 35 sono per stara 29 de spelta finita a varie persone sotto diversi giorni appare dal giornale a C. 66 posti cassa a C. 179</p> <p style="text-align: right;">_____4:35</p> <p style="text-align: center;"><i>(and it has to have 4 "scudi" and 35 "baiocchi" of spelled wheat for several people on different days, as appears in the Day book on page 66 and the cash account on page 179)</i></p> <p>53</p> <p>Et deve haver scudi 0 sono per some 2 e stara 3 de spelta residuata a Prodo consegnata ali nostri successori come ne havemo quitanza.</p> <p style="text-align: center;"><i>(and it has to have 0 "scudi" and 3 "stare" of residual spelled wheat of Prodo given to our successor as we have received)</i></p>

Accounts that dealt with annual contractual relationships and rent on properties also had an interesting operating structure. With regard to the former, at the beginning of the year an account dedicated to workers was opened in the debtor section, which indicated all annual debts and the working relationships with the institution. This had neither a counterpart in the *Libro grosso* nor an entry in the *Libro giornale*. The cost of the operation, therefore, was not clear, as there was only a link to the *Libro dei conti* or *Libro dei contratti* (book of contracts). Following this, when the monthly salaries were paid, the account was written in the creditors’ section, with a counterpart in the *Cassa* account. The payments, of course, were to be found in both the *Libro giornale* and the *Quinternuccio longo*.

Conto al Soggetto lavoratore (<i>worker account</i>)	
<p>Spese di M. ... deve dare ba: 30 (3 Iuly) avuti contanti et lui pagati ... adì 15 di febraro 1556 appare in giornale a C. 5 buoni a cassa a C. 7</p> <p style="text-align: right;">:30</p> <p>(Mr...’s expenses account has to give 30 “baiocchi” and 3 “Iuly” had by cash and paid to him...today February, 15 th 1556, as appears in the Day book on page 5 and the cash account on page 7)</p> <p>Et adì 4 de marzo Iuly tre per sua provisione del mese di febraro pagati contanti a lui ... come appare in giornale a C. 6 buoni a cassa a C. 27</p> <p style="text-align: right;">:30</p> <p>...</p> <p>(and today, March, 4 th 3 “Iuly” are paid in cash to him for the month of February...as appears in the Day book on page 6 and the cash account on page 27)</p>	<p>Spese di M. ... deve haver per sua provisione scudi tre et baiocchi sessanta in detto anno 1556 da pagarsi mese per mese, dico</p> <p style="text-align: right;">3:60</p> <p>(Mr...’s expenses account has to have for his salary 3 “scudi” and 60 “baiocchi” for this year 1556 to be paid each month)</p>

Similarly, but inversely, this also occurred with regard to rent, because at the beginning of the period an account was set up for the debtor, with the registration of the entire amount of annual rent written in the creditor section, without either a counterpart in the *Libro grosso*, nor registration in the *Libro giornale* and, therefore, without arriving at a measure of income.

When the debt was collected, the same account was noted in the debtor section, with a counterpart in the *Cassa* account; the income was then recorded in the *Libro giornale* and *Quinternuccio longo*.

Notwithstanding the various books presented, the continuous interconnections, the structure of individual entries and the statute’s explicit reference to the “mercantile style”, the aim of the adopted accounting system was clearly only to highlight a cash surplus or deficit, and the final quantities of goods, in order to pass the latter on to the subsequent *camerlenghi* or *cassieri*. As a result, it is possible to highlight the lack of any initiative to draw up a balance sheet, even approximately, take stock of the final value of goods, or arrive at the final total of annual income accrued from the management of the institution’s properties.

8. Conclusions

This analysis of the registers and statutes highlights a number of interesting points for reflection with regard to the aim of this paper, a study of the introduction of the double-entry bookkeeping method in the organization of the *Opera del Duomo* in Orvieto.

According to various authors (for example: ZERBI, 1952; ANTINORI, 2003) on the origin of the double-entry bookkeeping system, and after an analysis of formal profiles, it is possible to consider that this accounting method was employed, due to the presence of a multiplicity of accounting books and registers (*Memoriale*, *Libro dei conti*, *Libro grosso*, *Libro giornale*, *Quinternuccio longo*, *Libro dei creditori e dei debitori*) and their close interconnections. In particular, as Sangster asserts, “the genesis of double entry occurred when transfers were recorded between accounts for debtors and creditors in both effected accounts” (2012: 2). In reality, the interconnections between the registers appear to be more complex, such as the transfer of funds between the *camerlengo* and *cassiere*. This operation involved a number of entries in different books, closely related with specific references. Firstly, the *camerlengo*’s *Libro dei conti* was annotated on the right (the section “*avere*”) with the money transfer to the cashier, who immediately transcribed the received amount in the *Quinternuccio*. Subsequently, the cashier registered the operation in the *Libro giornale*, with a qualitative and quantitative description, specifying the references to the accounts and pages of the *Libro mastro* involved. In this latter register, therefore, two different accounts were used (double annotation) in opposite sections of the book: the right side (“*dare*”) for the cash account and left side (“*avere*”) for the *camerlengo*’s account. An analysis of the registers highlights the duplicity of the annotations of the *Libro mastro* (LITTLETON, 1933; MELIS, 1952) and the link between the account systems and the books (DE ROOVER, 1955).

As for the reasons that led to the changes in the accounting system (HERNÁNDEZ BORREGUERO, 2011), it can be argued that the growing complexity of the organization (objective factor) strongly contributed to an acceleration of the introduction of the double-entry bookkeeping method, formalized in the Statute modification of 1553. Specifically, starting from the first reform of the 15th century, and the progressive separation of the Church and Municipality in the management of the *Opera*, a growing need for transparency and competence can be perceived; consequently, a new figure was introduced (the cashier), who was responsible for the registration of all activities (subjective factor), and the interrelations between *camer-*

lengo and *cassiere* were augmented. It is also noteworthy that the progressive laicization of the institution seems to be correlated with the modification of the organizational structure and the introduction of the new accounting system. This could perhaps be related to laymen becoming part of the organization of the *Opera*, some of whom were likely to be part of the merchant class, and thus aware of the double-entry bookkeeping system, also thanks to Pacioli's work.

Despite this apparently increase in complexity, however, the system was never complete and, in any case, there is no indication of any intention to arrive at a periodical result or measurement of the extent of capital. The principal aim of the bookkeeping appears, in the end, to have been the formal cross-certification of the *cassiere* and *camerlengo*, and thus it can be generally considered to have been a tool for legitimization among the officials of the *Opera* institution.

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