

An Introduction to the Datini Archives: Early Capitalism in Renaissance Tuscany

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Dedicated, with respect and affection, to Jim and Lynne Doti.

As a mathematician, I wasn't sure what topic I (Daniele C. Struppa) could choose to write something in honor of two colleagues, and friends, whom I profoundly respect like Jim and Lynne Doti. For sure, something that could be connected to economics, since both Jim and Lynne are distinguished and accomplished economists. And since Lynne has published and worked in the area of history of economics on an institutional level, I started to narrow my thoughts on aspects that might speak to the history of economics, especially as it concerns the way in which economic and financial considerations have shaped the development of the modern world. And maybe, because of my own disciplinary inclination as a mathematician, some moment in the history of economics when mathematics and its development played an important role. But what finally focused my attention was the Italian heritage that Jim always proudly remembers. And this became my own 'perfect storm'. I decided I was going to concentrate on a key moment in the history of Italian economic institutions. This is when I remembered reading a well-written class paper on this subject by my former student, Anja Kruslin, who agreed to coauthor this work. And so, this article is now a way in which both a professor and a student honor the contributions of Jim and Lynne to our university.

Chapman University, of course, is not new to the celebration of the unique contributions that Italians have given to the creation of modern capitalism. We should remember, for example, how on the campus grounds, there is a bust of Amadeo Giannini, the Italian American banker who founded the Bank of Italy in San Francisco in 1904, which later merged with Bank of America Los Angeles, to give birth to Bank of America. Giannini's presence on Chapman's campus is not simply a sign of respect for one of the great Italian-American entrepreneurs, but is particularly poignant because of the personal friendship between Giannini and our own Charles Clarke Chapman. The

interesting and intricate set of connections between these individuals, and the banks they helped create, is beautifully described in Lynne Doti's (1980) *Banking in Orange County: Early Years*.

But Chapman's acknowledgment of the intellectual contributions of Italians to the modern world goes well beyond relatively recent history. Indeed, among Chapman's many busts, which commemorate the more than 100 endowed chairs and professorships that Chapman boasts, we find the Italian Fra' Luca Pacioli (1447-1517) famous for many things, among which is the fact that he counted Leonardo da Vinci among his students (Leonardo himself illustrated Pacioli's treaty, *De Divina Proportione* with beautiful drawings of several regular solids), but whose real fame rests on his invention (or maybe refinement and codification of what had already been adopted in other cultures) of the 'partita doppia' or, as we call it in the Anglo-Saxon world, the 'double entry bookkeeping' (De Roover, 1956). And it was this idea, the notion that every transaction should be annotated both on the credits and on the debts ledger, that opened the path for the increasingly complicated accounting that the rapidly developing world of the early Renaissance needed.

In this short article, we have therefore decided to offer a modest introduction to a phenomenal archival record, available to scholars and students in the Tuscan city of Prato, and known under the name of the Datini Archive, named for the merchant Francesco Datini who painstakingly recorded his financial life from 1363 to 1410 when he passed away.

We offer this introduction, as well as a few reflections on what the Datini Archive tells us, as a sign of our affection and respect for Jim and Lynne. At the same time, we hope that these preliminary notes may serve as an incentive to students, maybe to those Chapman students who visit Italy and in particular Firenze (Florence) during their study-abroad semester, to investigate the origins of our current market systems by going straight to the sources. Few things are more instructive than the reading of original documents, since what later commentaries offer is almost unavoidably tainted by perspective, and the only way to really know, is to deal with unadulterated original sources.

Renaissance, Mathematics, and Accounting

Commercial arithmetic was likely developed by the Phoenicians, the great merchants of the early Mediterranean, whose colonies (starting from the Eastern Mediterranean coasts of what is now Lebanon) extended up to the Gibraltar straight (and possibly beyond, with a few routes going into Atlantic waters and touching Western Africa). But it was only the merging of the texts of different cultures (from Asia, as well as from the Mediterranean) that helped develop the means by which merchants regulated trade (for a more thorough discussion, see Kruslin, 2015). Mathematics, at least in the Hellenistic tradition, was a discipline that encompassed music, astronomy, arithmetic, and geometry (in what was known as the quadrivium), but with the increasing need for merchant transactions, it had developed an applied character (to help merchants in their business) next to its philosophical and almost mystical aspects (e.g., White, 2011). In a way, mathematics was losing (or at least was softening) its theoretical character, and

its development was instead becoming a necessity to the further development of the merchants' capital investments. Meanwhile, trade was able to grow even faster because the problems merchants faced before — of inventory, tracking, and making predictions — was solved by mathematics. This relatively basic math would later develop into more complex financial calculations, leading to new policies and institutions because it helped cut costs. While this is not an article on Renaissance mathematics, it is not incorrect to claim that the pressures from the work of the merchants, together with the increasing cultural contact between the world of Islam and the remnants of the Greek world, is the terrain on which Algebra eventually developed (Eves, 1990).

As strange as it may seem, the Italians, for a while, continued to use the quite impractical Roman numerals as the language of financial calculations. Even though transactions became more complex in nature due to the increased amount of exchanges, the Arabic numerals that had been made available in the 12th century were only adopted when the need for simple calculations became pressing. That need was not present until greater capital investment occurred, which was around the 14th century. While Hindu-Arabic numbers were much more efficient, it took 300 years for them to be introduced into mercantile activity. In 1299, their use was even banned by the Florentine *Arte di Cambio* — the Guild of Money Changers. What helped the integration of the new numeral system into the culture of business was the adoption of double entry bookkeeping that, while formalized by Luca Pacioli, had already surfaced in the Islamic and the Indian worlds (Lall Nigam, 1986; Zaid, 2004). One should not be surprised at what appears to be a cross-national exchange of ideas, since early Renaissance was marked by the increase of commercial routes.

Datini, an Italian international merchant and banker of whom we will speak more of later on, was one of the first to implement these new ideas in the 14th century. Datini's large international trading business and networks of credit, which spanned from London to Constantinople, were impractical to manage using the old European methods of accounting. In fact, now that we can browse through Datini's archives, we see clearly the transition from single to double entry bookkeeping because he kept accounts of his books for almost half of a century. His books show the use of single entry bookkeeping from 1367 to 1372, a transition period after 1372, and double entry starting in 1390 (Istituto Datini, n.d.; Kruslin, 2015).

But the success of markets needed more than just good bookkeeping. It required reliability, and risk management. Both these innovations came through the standardization of the transfer of goods and funds. This reliability was made possible through the increased use of and adjustment of the bills of exchange and checks. Once merchants reached the East, they would first handle their bills of exchange and bank transfers; these two instruments allowed the merchants to transfer funds, both within the same locality, as well as between distant cities (White, 2011). This allowed for one element of the danger of transferring goods to be eliminated, creating a consistent standard for borrowing. Commissions paid for honoring the bills of exchange served as a way to skirt the Church's ban on usury, thereby allowing a means for gaining interest. Datini was again one of the first to adopt the check as a new form of payment in 1398 when he opened a bank with a partner in Firenze. Checks ensured safety because they offered a method of transferring funds without having to carry actual cash in

person. Because funds could be transferred with relatively greater safety, the risk of loss that came from carrying and transferring more capital decreased tremendously. Hence, those with wealth had more incentive to use their capital in economic endeavors. The circulation of this capital alone was enough to inspire more market activity, and led to greater opportunity for investment.

We cannot do justice to this phenomenal period in one small section of this paper, but we hope to at least offer a stimulus for the readers, who will find in this space-time event (Italy in the 1300s) one of the most exciting instances of the development of mathematics together with the satisfaction of the social needs of a society in a rapid and revolutionary evolution.

The Datini Archive

Francesco Datini (1335-1410) was a wealthy merchant from the town of Prato, located approximately 16 miles northwest of Firenze. In the 14th century, this area was one of the most important cultural centers on the Italian peninsula. Italy, of course, did not exist as a political entity, but those were the years in which it began to take shape as a cultural entity. They were the years during which the Italian language was forged, as the Tuscan dialect became increasingly important, a reflection both of the economic power of Firenze, as well as of the work of literary giants such as Dante, Boccaccio, and Petrarca. And of course, those were the years that saw the ascent of the Medici family, and such an ascent meant the growth of commerce.

Prato itself follows along these fault lines. Its origins date back to the 10th century, as *Castrum Prati* (the Fortress of Prato), and we know that in the 11th century, the river Bisenzio that runs near the city was already being exploited to provide energy for machinery connected with a nascent textile industry.

This is the context in which the Datini family evolved. Francesco Datini's parents had died early (of the plague), his father Marco had been an inn-keeper, and Datini became a merchant after being an apprentice (as was the custom at the time), and began his commercial activities in Avignon, France which at the time (until 1378), was the seat of the pope. Datini moved back and forth between Prato, where he bought a 'casolare', where now his archive is being kept, and Avignon, where he married Margherita, the daughter of a very wealthy Florentine merchant. Interestingly enough, the archives that are available, contain a significant amount of correspondence between Datini and his wife, an important peephole into the life of a wealthy Tuscan family during the early Renaissance.

Datini, in a sense, exemplified the notion of global citizen, and it is remarkable to see how in a rather short period he was able to connect his activities under what we should call his own multinational background. Indeed, the activities of his original company in Avignon were intertwined first with those of three other companies he had built in Firenze, in Prato, and in Pisa, and eventually had a 'company system' encompassing eight branches (or 'fondaci' as Datini called them): namely Avignon, Prato, Pisa, Firenze, Genova, Barcelona, Valenza, and Majorca. It appears that the idea of the multinational holding is therefore not as modern as we may think!

And so, it was in 1363 that Francesco Datini began keeping a meticulous archive

composed of different ledgers, books, and correspondences. According to the official catalog that can be accessed online at the website of the *Archivi Datini* (Istituto Datini, n.d.), Datini's collection contains 602 accounting ledgers, and 592 envelopes of correspondence, which in turn contain about 150,000 letters.

It is a fascinating exercise to see the nature of the accounting ledgers that are contained in the archive itself. In addition to the book of debtors and creditors, the archive contains a variety of different books, including a book of pledges (*Quaderno delle Ricordanze*, the word *Ricordanze* meaning "things to be remembered"), a postal book (containing a record of all the correspondence), a real estate book ("possession" being the Italian word to denote real estate), a book of insurances, a book of the cargos, one for the orders, one for cash expenditures made in *fiorini*, the currency of Firenze, one for currency exchanges, and many others. Clearly, Francesco Datini and his partners had put in place a very well managed organization, capable of coordinating very complex business transactions across a large swath of land.

It is no less interesting to look at the correspondence that is preserved in the archive. There are essentially three kind of letters that are available in the archive. The first being commercial correspondence, which shows the relationships between the Datini fondaci (branches) and the various entities they were working with. Next, the private and family correspondence (which offers a view of familiar life in Renaissance Italy), and finally the more technical and specialized correspondences that include pledges, checks, insurances, currency exchanges, and other commercial data, that were then recorded in the ledgers. Browsing through this material gives us an idea of how the deals were put together, before they would find their final destination in the ledgers.

Lessons from The Archive

The historians of economics, and especially those interested in the history of economic institutions, could probably spend years combing through the archives and seeking hidden gems that would allow a precise reconstruction of the complex web of connections that the early markets were founded upon.

But from our less specialized perspective, one can still draw some general conclusions that appear to challenge views that, if not necessarily accepted in the scholarly world, appear to have gained a certain amount of popular and media credence.

Let us begin with the idea of globalization, as a relatively recent trend that has brought the world together, and that has altered the livelihood of populations across the globe. While it is certainly true that globalization has accelerated at a furious pace, and while its impact (both positive and negative) cannot be overstated, even a cursory look at the Datini archives shows a well-developed and artfully managed global enterprise. While centered in Prato, the branches of the Datini enterprise reached to France and Spain, but in fact, when we look at the letters that are contained in the correspondences of the archive, we find that the commercial partners who were working with Datini were located in 267 towns both in Italy and abroad. Among such cities, one has an idea of the extent of the network by simply mentioning the names of Bristol, Lisbona, Safi, Mecca, Tana, Ragusa, and Nurenberg. The network of the Datini business was,

therefore, laid across most of Europe, as well as the Middle East.

How was such commerce possible? It is clear again by looking at the correspondence, that we are in the presence of a strong multicultural enterprise. While most modern commercial letters are written in English (or maybe in French), the letters in the Datini archive represent a variety of different languages. Many such languages are forms of Italian (at the time, as we pointed out earlier, Italian did not exist as a language per se, but rather as a collection of regional forms), predominantly in Vulgar Tuscan. But in addition to Italian, we find letters in Latin (still very much a live language at the time), Catalan, Castilian, Provençal, Arabic, and Hebrew.

The multicultural aspect of the archive is also reflected in the multiple currencies that appear in different documents. The issue of currency conversion (and of what can be deduced to be different rates of inflation) is clearly another important pressure point for the development of simple mathematical techniques.

In addition to the global nature of the business, and its multicultural aspects, we cannot avoid seeing the beginning of the creation of capitalism and free markets. It is clear, for example, that the perilous nature of commerce (by ship, with the double dangers of foul play, and natural disasters), forced the introduction of insurances as ways to mitigate risk. The way in which cargos were allocated on different ships offer another interesting viewpoint on risk mitigation, and again raise questions as to the kind of mathematics that was necessary (mostly what we would consider simple Algebra in modern terms, but that at the time was exceedingly complicated, mostly because of the lack of the appropriate symbolism). At the same time, issues regarding the ability to charge interest on loans (something that was not allowed within Islam or Christianity), pushed the creativity of the merchants.

And finally, the complex nature of the corporate structures that the Datini archive shows in what are denoted as 'secret books', which indeed contain what we would call articles of incorporation of the various partnerships, as well as corporate contracts, and secret negotiations (though, for some reason, the secret books are only available for the Avignon branch).

In conclusion, we believe the Datini archive shows a picture of a most fecund moment in the history of the Western World, the birth of a commercial era, and the way in which mathematics and economics became partners in a development that has proved extremely successful for both disciplines.

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