

Economic Credit and Elite Transformation in Renaissance Florence¹

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INTRODUCTION

Renaissance Florence, in interaction with other northern Italian city-states, was the birthplace of financial capitalism.² Northern Italian merchants and bankers virtually controlled and organized European international trade between roughly 1250 and 1500. While Venetians and Genoese for the most part controlled shipping, it was the Florentines who dominated international finance in all major European banking centers (Mueller 1997). Merchant-banking was not the only economic sector in which Florence excelled. Although by no means a monopolist, Florence was also a leading center in Europe for the production and distribution of first woolen and then silk textiles.

We accept this standard historical overview about the macroeconomic rise of financial capitalism (de Roover 1963). The trouble for historical and for social-science analyses is that “financial capitalism” in Florence does not fit our stereotypes of what is a market.³ Instead of impersonal exchange, driven only by considerations of price and quality of goods, Florentine merchants were deeply personalistic. Instead of price competition to capture each others’ customers, Florentine merchants were cooperative with and helpful toward their “competitors”. Instead of routinely distrusting each other, Florentine merchants somehow established *fiducia* or trust among themselves,⁴ expressed in economic practice through widespread credit and loans. Goldthwaite puts his finger squarely on the core phenomenon to explain:

It has been rarely remarked how seldom a competitive spirit comes into play in the relations among these [Renaissance Florentine] merchants. The vast correspondence of Datini and of the Medici themselves (the largest collections of business letters to survive before the sixteenth century) yields hardly a hint of competition... However individualistic the Florentine business world appears in contrast with the tight corporate structures elsewhere – the Venetian senate, the Hanseatic league, the south-German cartels, the London regulated companies – it was still permeated with something of the spirit of medieval corporatism. This is what the *fiducia* Florentine business historians make so much of really comes down to – that sense of trust in one another that in a way also kept everyone in line. (Goldthwaite 1987, pp. 23-24)

² By “financial capitalism” we refer to a list of innovative techniques in international banking: bills of exchange, account books with current accounts in double-entry bookkeeping (including bilateral format), partnership systems with branches in multiple European cities. During the early period of 1250-1300, a number of Tuscan cities competed in international merchant-banking, including Siena, Lucca and Pistoia as well as Florence. But in the early 1300s, Florence established dominance in this sector. For explanation of Siena’s demise, see English (1988).

³ The microeconomic model of perfect competition, descended from Adam Smith, provides a precise codification of the primary of these stereotypes, shared in essence by a wide range of researchers and policy makers. Defining features of this archetypal model of price competition include: deconcentration, free entry, impersonal trading, product homogeneity and divisibility, full information, and of course maximization of profits (in spite of the paradoxical equilibrium that profits are predicted to be zero). See McLean and Padgett (1997) for a statistical test of these features with Florentine data. Deviation of Florence from this standard competitive model goes deeper than the usual monopoly and oligopoly extensions, which are also part of the neoclassical framework.

⁴ Trust could certainly be lost through malfeasance, but the system was robust to occasional violations.

The clear-cut existence of economic personalism, however, does not imply that alternative images of “market” put forward by sociologists – for example, Granovetter’s “social embeddedness” (1985) or Coleman’s “social capital” (1994) – straightforwardly⁵ explain Florentine economic behavior either. Notions of generalized trust, either at the level of the city at large (Putnam 1993) or at the level of homogeneous ethnic subgroups (Greif 1994) would have struck Florentines as naïve.⁶ Florentines did not rely just on understanding handshakes (Macaulay 1963) and the norm of reciprocity (Gouldner 1960). They believed in precise mathematical accounting and accountability of each other. Core business relations were not usually long-term: business partnerships, though possibly renewable, usually were contracted for only three years.⁷ Indeed on average Florentine bankers devoted only 8 years of their lives to practicing their occupation,⁸ spending the rest of their life in other activities such as politics, diplomacy, farming, or philosophy. Somehow personalistic trust among Florentine businessmen was generated in situ in the face of fluidity, suspicion and turnover.

The goal of this article is to uncover the nature (both structure and mechanism) of this extremely innovative Florentine market, which appears to our contemporary but anachronistic eyes to be a hybrid – part social embeddedness in “traditional” Florentine society and part mathematical techniques of “modern” financial capitalism. Our route into this archeology will be through the study of economic credit.

Economic credit was not just a lubricant in this economy. In many ways this was its core achievement, the secret to Florentine success. “A French satirist, in the fifteenth century, marveled at the ability of the Italians to do business without money. In dealing with them, he said, one never sees or touches any money; all they need to do business is paper, pen, and ink.” (de Roover 1944, p. 381) This capacity to abolish hard money or currency in international exchange generated immense flexibility and liquidity within the Florentine merchant-banking system, for customers all over Europe to use, and was the reason for Florentine competitive advantage over other cities in international banking.

⁵ In the end, we will find Granovetter’s ideas on social embeddedness to be consistent with half of our story.

⁶ For example, Giovanni Morelli, a Florentine ex-wool merchant, wrote this to his sons: “Test your friend a hundred times and don’t let him mislead you [*t’abbottacciare*]. Moreover, he who demonstrates with his words that he is loyal and wise, trust him all the less, and in no way should you trust someone who offers himself to you.” (Branca 1986, pp. 177-78; translation by McLean). It has to be said that Morelli is a bit on the paranoid side, compared to other Florentine businessmen we have read, but one should never forget that Florence was the city of Machiavelli, not just the city of *fiducia*. It is more accurate to say that Florence was a city where trust-distrust was a central cognitive dimension, rather than to say that Florence was a land either of trust or of distrust. “Trust” is not an aggregate variable that can be assigned to collectivities.

⁷ On average, cambio banking partnerships (including renewals) lasted 4.6 years in the period 1348-95 and 4.7 years in the period 1465-95. These statistics were calculated from banking guild records: A.S.F. *Arte del Cambio* 11, 14, 15, 16. The time periods used in these calculations are slightly less than the 1340-99 and 1460-1500 data available to us, in order to minimize truncation effects.

⁸ More specifically, 8.2 years was the average number of years in which cambio bankers had active companies for period 1348-95. 7.8 was the average banking career length for period 1465-1495. These data were calculated from the banking guild records cited in the previous footnote.

“Paper, pen, and ink” refers to account books and to business letters, the volume of which surviving in Florentine archives is overwhelming, despite the huge rate of loss of documents. Together with equally impressive surviving archives of personal diaries and official state records, there would appear to be little that the meticulous Florentines did not commit to paper and to calculation. The level of Florentine literacy and numeracy throughout the society is impressive from any temporal perspective, much less that of the 1300s and 1400s. Yet when we look at the content of what is contained within these modern-appearing⁹ formats, be they in business, in personal or in state domains, we find a preoccupation with “traditional” social relations – *parenti*/family, *amici*/friends, and *vicini*/neighbors in Klapisch-Zuber’s (1985) insightful portrait. The “spirit of capitalism” in the sense of techniques is very tangible in the Florentine documents; yet the “spirit of capitalism” in Weber’s sense ([1904] 1984) of inner values is elusive. This superposition appears to be a paradox, yet we will find in the end that cross-cutting network structure, which induced controlled hybridity between “traditional” and “modern”, is precisely what made the Florentine credit system work.

We will conduct our archeology in the following steps: Firstly, we will examine a sample¹⁰ of archival and published Florentine business letters from the late fourteenth, fifteenth, and very early sixteenth centuries – concentrating modally on letters involving businessmen active during the 1427 period of our statistical work. The purpose of these textual materials is to uncover micro-mechanism, not global network structure. Mathematical account books, we will find, formalized anthropological gift-giving, among their other functions. Secondly, we will analyze commercial credits from the 1427 *catasto* or tax census. For reasons explained below, the 1427 *catasto* is in part an incredibly fine-grained snapshot of outstanding credits in all account books in the city (virtually all of which have now been lost), across all industries, at one point in time. We will analyze this unparalleled quantitative source first descriptively by tabulating leverage ratios by industry, Leontief input-output credit flows among industries, proportions relational versus transactional credits, and substantive content of credits. These tables will serve to document the incredibly impressive edifice of economic credit that the Florentines built. Then we will analyze these *catasto* data statistically through a series of logit regressions, which correlate inter-company credits with kinship, neighborhood, social-class, political-office, political-faction, and partnership-system relations among these companies’ partners. Through this method we will uncover the cross-cutting network topology of how economic commercial credit was constructed within the lattice of other social networks in Florentine society, especially within Florentine elites. At the end of the article we will speculate about the cognitive foundations for how the Florentines, reacting to new network structures induced after the Ciompi revolt, successfully fused traditional social content and mathematical form into their powerful multivocal conception of credit. This multivocality (Padgett and Ansell 1993), not of a person but of a technique, created dynamic feedbacks among the substantive domains of

⁹ Modern-appearing, that is, other than the fact that everything is hand-written. The invention of printing still lay in the future, an inconvenient fact for attempts to derive the Renaissance from printing (Eisenstein 1979).

¹⁰ This is a “sample of convenience” not a statistical sample. In the absence of any enumerated census of letters, the latter would have been impossible to construct.

economics, politics, and kinship, which in turn induced explosive growth in economic as well as in other forms of credit, such as patronage.¹¹

This article is the third in a trilogy of articles we have produced on the Florentine economy. McLean and Padgett (1997) statistically tested and rejected the hypothesis that these 1427 *catasto* commercial-credit data are consistent with the neo-classical microeconomic model of perfect competition. Padgett and McLean (2006) analyzed the invention and emergence of the Florentine partnership system in the 1380s. Here we trace the consequences for economic credit (and industrial plasticity) of the rapid diffusion in Florence of this organizational invention of the partnership system, due to the catalytic effect it had on rewiring traditional social networks among republican elites after the Ciompi revolt.

BUSINESS LETTERS AND ACCOUNTS

In sketching a textual portrait of Florentine merchant self-understanding, let us begin with account books. While double-entry bookkeeping was percolating throughout northern Italy during the first half of the fourteenth century, it became widespread in Florence in the late fourteenth century (de Roover [1956] 1974). Padgett and McLean (2006) documented that bilateral format in Florentine merchant account books – the physical layout of the pages often associated¹² with double-entry bookkeeping – became widespread in the 1380s, precisely in conjunction with the invention and rapid diffusion of the partnership system. From the point of view of credit, the most significant aspect of this change in accounting is its instantiation of the current account (*conto corrente*),¹³ which visually was so neatly displayed in bilateral-format pages. Simplifying a bit,¹⁴ to open up an account book in bilateral format was to place into clear sight the writer's own economic relationship with a single person or company. Credits (both monetary amounts and brief descriptions of content) between the writer and that person or company were listed on one side of the open book, and debts of the writer with that same person or company on the facing page. Such accounts usually were initiated with an opening deposit or a credit of some sort, but after that initiation a whole temporal series of transactions ensued, with accounting money (not necessarily physical money¹⁵) flowing both in and out, all registered neatly and precisely in parallel columns. Earlier more primitive single-entry account books, in contrast, were registers of the writer's

¹¹ We emphasize the stimulative effect of credit on macroeconomic growth, but we do not deny the downside, which is potential vulnerability to credit bubbles and crashes. The Florentine economy also experienced these, one more factor contributing to political-economic turbulence in Florentine history.

¹² Double-entry bookkeeping could be done without bilateral format, through an elaborate system of cross-references, but it was more cumbersome to do it that way.

¹³ In today's Italian Civil Code (chapter 26, articles 1823-24) *il conto corrente* refers to a contract between two private parties in which no money is exchanged but rather in which reciprocal credits are recorded. We thank Alessandro Lomi for bringing this modern descendent to our attention.

¹⁴ The possible complication is that there could be more than one account linking the same pair of persons, if multiple startup deposits or credits were made for whatever reasons. We use this fact statistically below.

¹⁵ In the 1416 founding contract of a company with partners Giovanni de' Medici, Benedetto and Larione de' Bardi, and Matteo di Andrea Barucci (A.S.F., MAP XCIV, p. 116), Matteo promised "to keep good accounts, as if they were money in cash."

transactions, ordered by date irrespective of alter, each described in paragraphs with complicated systems of cross-reference to help figure out whether the credit was ever repaid (de Roover 1974). To put this accounting difference simply: the foundational organizing unit of single-entry bookkeeping was the transaction, while the organizing unit of bilateral double-entry bookkeeping was the economic relationship.¹⁶ Current accounts were the vessel that contained and measured that relationship. Current accounts between merchants and analogous “accounts for use” (*conti di esercizio*) between merchants and manufacturers were therefore the primary technical means through which economic credits were managed in Florence.

We can illustrate this accounting practice, widespread by the mid-1420s, by the following preamble to a *libro grande* (ledger) of a businessman in our data set:

This ledger is that of Francesco and Niccolo di messer Simone Tornabuoni, resident in Florence, and it is called the black ledger [*libro grande*] marked K. And we will write in it each person who owes to us or is to have from us anything, starting with page 1 and continuing throughout the book, beginning on the first day of January, 1425. From page 2 to page 200 we will record every account (*conto*), both amounts to owe and amounts to receive, debtors and creditors generated from mercantile trade, or that depended upon trade. From page 200 to the end of the book we will record every debtor and creditor coming from *cambio* (bills of exchange) and all other affairs outside of trade. (A.S.F., MAP LXXXIV, p. 9)¹⁷

The guiding framework of accounts is just as clear in this author’s description as it is in the bilateral layout of the book itself.

At the international level, where different currencies were involved, current accounts could become quite complex, internally differentiating into four separate financial components: *nostro*/our and *vostro*/your accounts for each merchant-banking side of the ongoing economic relation (de Roover 1944).¹⁸ Essentially companies began to maintain quasi-permanent ‘bins’ within each other into which their credits and debts could be transferred at will on an ongoing basis. Such networks of open-ended credit involved both partnership systems, with legally separate branches linked through

¹⁶ There was a third transitional form of accounting in which credits were collected in the first half of the account book and debts in the second half, with elaborate cross-referencing between the two halves (de Roover 1974). This form permitted double-entry profit calculations without making current accounts the fundamental unit of the system. A good example of this intermediate form is the Alberti *libri mastri* of 1348-59, published by Goldthwaite et al. (1995). “Accounts with other firms or outside persons were opened, for the most part, for single transactions. If later a client presented himself another time, the accountant of the Alberti preferred to open new accounts.” (p. 113; Padgett translation) Truly on-going current accounts did exist in the 1348-59 Alberti *libri mastri*, but only for Alberti family members and for company employees (so-called *conti interni*).

¹⁷ This and all subsequent textual translations were done by McLean, unless otherwise noted.

¹⁸ The Bardi correspondence of 1404-05 and the *bilanci* in the 1427 *catasto*, discussed below, more commonly use the expressions *per noi* (for us, on our account) and *per voi* (for you, on your account).

common partners, and separately owned companies who did frequent business with each other – so-called *corrispondenti*.

Of what use for Florentine merchants were these sometimes complex systems of coordinated current accounts? The answers to this question are multiple.

Sometimes they were used to implement very specific short-term requests in a flexible, highly liquid manner. Giovanni da Pessano, Francesco Datini's branch manager in Milan, provides two banking examples, writing to his senior partner:

I want you to remit to me 200 florins as quickly as possible, and particularly I would have sent them to pay to you there, but Porino d'Alzate told me that they are worth, from there to here, five percent more, whence the exchange is better from there to here, than from here to there. And do this as quickly as you are able because I have need of them. (Frangioni 1994, letter #747, March 11, 1400)

You might want to change all of this money that ours in Avignon have remitted to you there, for me, to Venice instead, and make the letter of exchange say Zanobi di Taddeo [Gaddi] who resides in Venice, and this I do because I have need of cash in Venice for buying cotton. ... I pray that you do this immediately because there is a friend of mine who is leaving presently to go to Venice, and I want this said friend of mine to invest the money for me in Venice. (Frangioni 1994, letter #711, May 12, 1399)

Many similar examples, involving merchant trading as well as banking, could be cited. The economic relationship lurking behind such specific requests, either between companies linked through a partnership system or between companies linked as *corrispondenti*, was this:

Of the affairs you still have to complete here, point yourself still towards Pisa with my company there, and also write often to me in Bruges, because I am going to live there, and in three days I am leaving here to go there. With the grace of God I will stay there a little while, and if there is anything I can do for you, write to me of it and I will do it, for you and for your whole company, as if it were for myself alone. (Frangioni 1994, letter #657: Manno di ser Iacomo & co in Milan to the Datini company in Barcelona, March 24, 1397)

More impressive even than these routinized flows of specific requests were the open-ended, two-way agency relationships that were often set up through linked current accounts. Within specified constraints, *corrispondenti* and branch managers often were authorized to act flexibly on each others' economic behalf, taking advantage of local opportunities as they saw them even without explicit case-by-case approval¹⁹ by the party at risk. To spell this out: correspondent A would take discretionary action on behalf of correspondent B, charging B's current account in A's book, and recording therein A's

¹⁹ Such approval of course would have taken valuable time to secure under Renaissance communication technology.

actions taken and B's financial commitments.²⁰ This was really A giving credit to B, since this was B's account money but A's disposable cash being used. Typically B would do likewise for A, thereby paying back the "loan" not with cash but with reciprocated favors. The reciprocity of this two-way agency made Florentine *corrispondenti* relationships into an example of what anthropologists call social exchange (Mauss [1925] 1967, Strathern 1971). Namely, two exchange parties "make each other" – both in the sense of profit/loss and in the sense of honor/reputation – through mutual deposits and gifts. Of course there was more mathematical precision in Renaissance Florence than in New Guinea. But the basic trope of people advancing in these societies through others' giving to them is similar. In both cases, reputation, status and identities were created through gift exchange.²¹ Credits in this understanding are (as yet) unreciprocated gifts.

A good example of open-ended agency behavior, together with explicit constraints on that behavior, is the authorizing letter of Andrea Bardi to the Orlandini in Bruges, written on April 6, 1405:

Anything that comes to you for us, you may commit to Paris or London, if it be to your own [company] there, to ours in Barcelona, in Lucca to Bartolomeo Belbani & co, and in Venice to the Medici: continue in this way if no one instructs you otherwise. We do not wish you to lend [*credere*] our money, nor the money of our company to any Venetian or Lombard, nor to Antonio Quarti & co, nor to Niccolao Tonghi, nor to Filippo Rapondi or others that might bring business to you from Dino Rapondi of Paris. Follow these instructions, and with the others [with whom you correspond] do as you wish and as if it were for yourself, having always due regard to lending well and, again, not to get yourself too indebted with anyone [*avendo sempre buon riguardo al credere e ancora di non vi agiosare troppo con niuno*], and especially with those of Diamante degli Alberti & co. (A.S.F., MAP LXXXVII, p. 341r)

Clearly Andrea Bardi had specific people and companies on his black list, but other than that he trusted the Orlandini to act discretionarily in his interest, even though the Bardi and the Orlandini were two separate companies.²²

²⁰ The expression "pay it and post it to our account" (*pagate e ponete a nostro conto*) became a common feature of business correspondence in the 1390s (Frangioni 1994). The earliest example we found in Datini's Milan correspondence appears in late 1383 (Frangioni 1994, #334).

²¹ Of course this does not imply in any social-exchange economy that gifts were being given willy-nilly, with no calculation about likelihoods of reciprocation. But there was no guarantee of reciprocation, nor indeed any guarantee of profit at all. Hence this behavior was risky and vulnerable to theft.

²² It is notable here that even prohibited trade is specified more in terms of people than in terms of types of transactions. See also Andrea Bardi's letter to Domenico and Poldeo Pazzi in Paris, March 27, 1405 (A.S.F., MAP LXXXVII, 352r), where he instructs them to honor bills of exchange for any amount with the Tornabuoni of Bruges, the Medici of Venice, and the Bardi companies of Barcelona and Florence, but imposes limits of 500 or 1000 florins on exchanges involving certain other companies: the Sacchi, Antonio Grisolfi, Zanobi di Taddeo Gaddi of Venice, Guglielmo del Pontico of Lucca, and so on. Instructions written in 1441 for Gerozzo de' Pilli, the Medici's partner in London (A.S.F., MAP XCIV, 214f.) are more detailed and include a longer list of *corrispondenti*, but otherwise remain substantially the same as those written around 1400. These instructions are described in detail in de Roover (1966, p. 91).

A second example, missing a few verbs, assembled such dyadic *corrispondenti* relationships into longer chains of exchange:

You now have us to exchange with (*rispondere*), and so we will say to you: through our [branches], wherever they are, that is, Florence, London, Bruges, and Brabant; and also yours, that is Pisa and Barcelona; and Venice, by means of the Davanzati and Ghoadini; and Montpelier, by means of Deo Ambrogi, for all amounts; and in Avignon, the Benini, for 1000-1500 florins ... (Melis 1972, document 10)

So wrote Bartolomeo Rustichi, the manager of a newly opened Parisian branch of the Mannini company in Bruges, to the Datini company in Genoa on October 13, 1395, laying out his proposal for establishing a *corrispondente* relationship with Datini. Such chains were ‘pipes’ of liquidity linking multiple Florentine companies together (cf. Podolny 2001).

The word “to lend” in these and other Renaissance business letters is *credere* (Edler 1934, p. 34), which normally means “to believe” or “to believe in”. The language of medieval and Renaissance Italian expresses the idea that to offer someone credit typically meant having confidence in them, not only financially but also morally. “To give credit” and “to believe in someone” were essentially the same idea. Having credit was a sign that others trusted you to record your debts accurately, regard them seriously, and pay them promptly. It was also a sign that you were a person of honor and character (cf. Stuart 2003, Moulton 2003), in multiple domains including the economic.

Given such relational/agency authorizations, based on mutual assessments of character and honor, what sort of transactional behavior ensued? Content is too diverse to generalize easily about, but a merchant-trading example that gives some flavor is this:

Dearest brother, we have purchased from Bartolomeo del Nero many jewels. ... As you must know, dealing in these jewels is little my business, but seeing the need the said Bartolomeo has, we decided to serve him, and hearing from Bartolomeo your good reputation, and comforting ourselves that we would be well served in your hands, and would profit nicely by the sale, we decided and we are content that through you we will finish this business with all the jewels. (A.S.F, MAP LXXXVII, p. 339v)

So wrote Andrea de’ Bardi to Tommaso Sofia (obviously not literally his brother) in Barcelona on April 1, 1405, describing an economic favor he was doing for Bartolomeo del Nero. Andrea hoped to profit certainly, but his primary motivation was to help out a fellow merchant in need by acting as his agent with Tommaso.

It is notable how much the rhetoric of friendship (*amicizia*) and fictive kinship suffuses fifteenth-century Florentine business letters, especially among *corrispondenti* and branch partners, linked through current accounts.

Your offer we accept like dear friends (*chari amici*), and we see that by your Tommaso you have written concerning our condition and company: this he did as a worthy (*valente*) person and out of courtesy. ... And although you have many friends (*amici*) here who serve you, nonetheless we offer ourselves to all of your pleasures and, wanting advice concerning one thing or another, tell us and I will do it willingly (*faròllo volentieri*). (Frangioni 1994, letter #751: Giovanni Borromei to Datini and his company in Barcelona, April 1400)

As much as you offer to do with love in this matter, all of it we have observed, and we thank you for it, and we are certain you would do even more; and if anything occurs in Avignon or here that needs to be done, we will commit ourselves to you loyally (*con fidanza*), advising you of it first. ... As for us, you may do with us as you would with your own, and we will do all we can. Thus we have told your Tommaso and prayed him to have such confidence in us as one could with you. (Frangioni 1994, letter #606: Manno di ser Iacomo & co in Milan to the Datini company in Barcelona, December 16, 1396)

I will take confidence with you as I believe I may, and I would like that this confidence remain between us. (A.S.F., MAP LXXXVII, 353r: Francesco Bardi to Francesco Mannini in Bruges, June 5, 1405)

The final sentence of the Borromei letter is a common concluding element of much correspondence, but appears with particular regularity in patronage-related letters where writers assure recipients of their loyalty to each other (McLean 2007, chap. 4).

Interpreting business relations as friends was used not only when business was going well but also when business problems arose.

We want only what is owed to us. May it please you also to want to do thus, and truly, for in good faith not a little have we discussed this dispute between us. May you or yours also wish to settle it as is done between friends. And so let it please you that not having sent these letters [i.e., business correspondence germane to the dispute] to [your office in] Florence, to send them without further delay. (A.S.F., MAP LXXXVII, p. 339r: Andrea de' Bardi to the Orlandini company in Bruges, March 26, 1405)

In practically identical terms, Bardi also wrote to the Baldesi company in Bruges that “we have wanted, and still want, to settle this dispute as one must do between friends.” (A.S.F., MAP LXXXVII, p. 346r: July 6, 1405). And several times in the same letter he claimed to have acted toward them “with love and faith, as one must do between friends.” According to another letter he wrote the same day to the Orlandini (MAP LXXXVII, 347v), he believed that between friends “one may be more forthright in speech” [*più onestamente nel parlare*], and remarked that “we hold it dear that you have spoken from your heart at length” [*l'abbiamo charo che a noi diciate largamente l'animo vostro*].

Even when strong economic relationships went unequivocally bad, they still were discussed and evaluated in terms of friendship:

I am advised by many letters that Basciano [da Pessina] is not there. You will have spoken with him about these blessed accounts that, by his shortcomings, are not settled, and truly it is a great wrong; this is not the friendship (*amicizia*) and brotherhood (*fratelanza*) that I had with him, and he has not done well in clamming up with me (*pigliare gozzo*), and I don't know why... And I must observe that when he made accounts with me in Avignon, that amounted to 40,000 pounds or so, there was not even a penny missing, we had such a great relationship, so that one could go so far as to say that if I owed him 1000 florins, I would approach him and say to him how I considered him more than a brother (*più che fratello*), and I still do. And despite what he has done to me, I will never forget the love and brotherhood that was between him and me. (Frangione 1994, appendix, letter #8: Francesco Datini to Tieri di Benci in Avignon, August 4, 1392)

In the same letter, Datini went on to assert “I would come back a thousand miles to do my duty towards him and every other good affair; and it concerns his honor not to do likewise to me (*è di suo onore a non fare a mme il contrario*), even if I did not merit it.”

Business-letter discussions of honor came up most often in such times of economic trouble. In a dispute concerning a thousand florins missing because of the actions of a certain Michele, Andrea de' Bardi wrote to both Antonio di Sandro Cittadini and Domenico Pazzi in Paris that they should take action “for the honor of the said Michele” (A.S.F., MAP LXXXVII, pp. 343r-v). Honor, he noted elsewhere, required that *corrispondenti* look out for each other's salvation [*salvezza*] as well as their own (A.S.F., MAP LXXXVII, p. 345v: Andrea Bardi to Orlandini company in Paris, June 25, 1405).

In this context, complimenting someone about their honor might gain overtones of a veiled threat about loss of that honor:

Dearest friend, ...When I was there I spoke to you many times about the money that you owe to the heirs of your partner Antonio di Tuccio Manetti. And now Andrea di Buonaventura has arrived there, who comes there for this reason and for other business of his, and he has begged me that I write to you concerning this matter, and that I pray of you that you should wish to act towards him as the worthy man that you are. And I am quite certain it need not be said to you, that you will pay your debt to him in this matter, both out of duty, and also to lighten the burden on your heart [*sì per lo dovere e sì per rischaricare l'anima vostra*]. And I pray of you that you should wish to do this for them like the worthy man that you are. (Frangioni 1994, appendix, #18: Tommaso di ser Giovanni to Lorenzo di Tingo, May 28, 1400)

Florentines saw no contradiction between friendship and making money. Quite the opposite: theirs was an instrumental conception of friendship. One purpose of helping

each other was to make money, but also one purpose of making money was to make friends, through generosity or ‘liberality’ with gifts (Alberti [1433] 1971, p.). Stronger than discretionary goals, these two activities became normative duties²³ once cognitively linked. Profit and friendship were fused concepts in the Florentine understanding, all part of a social-exchange mentality of constructing each other through reciprocity.

While this instrumental side of Renaissance friendship is worth emphasizing, especially in an economic context, one should not jump to the cynical conclusion that economic friends were pursued only as “social capital” to help maximize individual profits. *Amicizia* language often glided smoothly into the language of fictive kinship, which conveys a sense of real loyalty. Datini saluted da Pessano as “dearest like a brother,” then proceeded to a recommendation of Bindo Piaciti, “who is to me like a son, and equally he is the brother of my wife.” Datini had advised Piaciti to look to da Pessano should he choose to get into the cotton trade; equally he now urged da Pessano to look to Piaciti for his *cambio* needs in Venice:

Above all, you may deal with him in everything as much as you will want, I will hold it to be well done, for in him and in you I trust as my own self... And in you I would trust as in a dear brother, inasmuch as Tommaso di Giovanni, my factor, has told me more than enough, and I offer such trust to the said Tommaso who is, as it were, a son to me, and so from now on may it be said forever that you make account of me like a dear brother, and thus I will do as regards you. (Frangioni 1994, appendix #23, December 7, 1401).

Nor should we assume that the Renaissance sense of *amicizia* had the same connotation of horizontal equality as does the English word “friendship” today (Silver 1989, 1990). Florentines could express friendship, even love, perhaps even more powerfully in subordination relationships, like father-son, than in horizontal ones.

Thus dearly I pray of you that I be recommended to you like your servant, as I call myself, and that you would wish to recommend me to yours in Avignon. If you need anything concerning the matter of Francesco di Bastiano, I am at your command, and you may do with me as you would your valet, for such I consider myself. Similarly, if I can do anything for you, demand it of me, and in everything you will be obeyed, as I have honor [*chomandati che di tuto seritti obidito chom’ò honore*] (Frangioni 1994, #703: Giovanni da Pesciano to Francesco Datini, August 3, 1398)

You have me in your hands, as transparent as a mirror and as unclouded as a pearl; may it all be for the best; what you like will be convenient for me to like, and I am perfectly satisfied. (Richards 1932, p. 137: Giovanni Maringi to ser Niccolo Michelozzi, October 29, 1501).²⁴

²³ Duties, we might add, whose performance was precisely measured.

²⁴ Lest these words be mistaken for “cheap talk”, Maringhi followed them up six months later with this astonishing commitment: “I therefore assure you that all which I have or may have in this world will be theirs [that is, Niccolo’s childrens’]. After my departure from this world, everything I have will go to them

This last example of a sales agent in Constantinople writing to his Florentine wool-textile supplier comes from a time period later than our other letters, and so expresses the extremes of clientage toward which Medici society was to trend. But this is only quantitatively, not qualitatively, different from behaviors and sentiments we observe in the early fifteenth-century focus of the study.

Without denying the reality of sometimes honest feelings, “it is useful to remember that although personal relations in the Renaissance were often accompanied by demonstrations of strong affection, it was the perception of moral obligation, not the modern criterion of psychological intimacy, that distinguished relations between friends from relations between strangers.” (Weissman 1982, p. 40). Leon Battista Alberti put it this way, through the mouth of his businessman character Giannozzo:

I should be glad to remain here with you as long as you like, but I see my friend whom I must help at the Palace. We made an appointment early this morning, and it will soon be time to appear there. I do not wish to fail my friend, for I have always liked helping others rather than asking for help myself, and I have always preferred having others under obligation to me rather than the opposite. I like doing him a favor, helping him as much as possible with words and deeds, not so much because I know he loves me, but because I know he is a good and just man. You must always regard good people as friends and you must always love and help the just even though you may not know them. (Alberti ([1433] 1971, p. 253)²⁵

Basically the same idea was expressed by an actual businessman as follows:

With regard to Galilei and company, I see that there is no more need of blandishments for in truth they do things like gentlemen. The letter which I have from them now is so full, so much to the point, and so agreeable that I feel under a permanent bond of obligation to them... Maintain close relations with them and we over here will always perform our part duly as we do every day; of this you and they will be the judge. (Richards 1932, p. 85: Giovanni Maringhi to ser Niccolo Michelozzi, May 4, 1501)

and such is my desire and my will, because all that I have has come from you and all is due you. I recognize that I have everything from you, so everything is to be left both to you and to yours. I need only my expenses because I do not in any way desire a wife, ever. And I wish to live and to die in your house, and this is said, once for all.” (Richards 1932, p. 170: Giovanni Maringhi to ser Niccolo Michelozzi, March 29, 1502).

²⁵ This same Giannozzo also said this: “LIONARDO: Being my friend... he would share all his fortune, desires and thoughts, and our common fortunes would not be his more than mine. GIANNOZZO: Could you tell me how many people you have found who have shared with you anything but words and trifles? Could you show me someone whom you could trust with the least of your secrets? The world is full of deceit. Remember what I tell you: if anyone tries to take something from you under any pretext, no matter how or with what wiles, he is not your true friend. I say he is not your true friend if he tries to take something from you, whether he asks for it as a gift or as a loan, whether he tries to get it through threats or through flattery.” (Alberti [1433] 1971, p. 247)

A final economic function of the credits and the letters that flowed through current accounts was to convey important information about future business opportunities and risks. Endless details about local exchange rates, material shortages, idiosyncratic needs, transportation routes, war and diplomacy were contained in Florentine business letters. *Corrispondenti* certainly did not discuss only the dyadic business between them. The only samples of this rich information that we will highlight here relate to the reputations of other merchants, since the main sanction in this economic system was that of collective ostracism from the dense flow of business and credit that poured through each node in this network.

Two examples will suffice for illustrating how this gossip mechanism worked:

We have heard via letters from Montpellier that this Guglielmo Pigniolo has lost the confidence [of others: *avea perduto la fede*]. We do not know if this is true. These times are too dangerous. Tell us what you hear of it, and similarly how the affairs of the Bocci are proceeding, having seen these fail and how many evils have come this year to merchants. We doubt these Germans have not had some thrashing, and I believe it could be worse, even a loss of 1000 florins. And thus we have decided for us in our company not to give to them money in exchange until anyone tells you otherwise. (A.S.F., MAP LXXXVII, p. 340r: Andrea de' Bardi to Lorenzo di Dinozzo & co in Avignon, April 4, 1405)

You see how the *cambio* activity is now. One had better have one's eyes open wide in lending, for every day new suspicions arise. Tell me how the firm of Diamante Alberti is managed and how you understand them to be doing business, because people have been speaking about them. ... Do not lend to them unless you hear otherwise from us, and make a note of it, that it does not slip your mind, so that we may in the end know how they are making out. Here they have plenty of possessions, but God knows if they are clear of obligations. (A.S.F., MAP LXXXVII, p. 353r: Francesco Bardi to Francesco Mannini in Bruges, June 5, 1405)

The flip side of these communications is illustrated by the following entry in 1408 in the private diary (*ricordanze*) of Goro Dati, a silk merchant in our data set whose business was deeply threatened by such gossip:

As a result of the adversity which overtook us in Barcelona, and of the lawsuits which followed it, and of the suspicions concerning Simone's ventures and the calumnies that were spread about, we were very short of credit. So we were forced to withdraw from business and collect whatever we could to pay our creditors, borrowing from friends and using all our ingenuity, suffering losses, high interest and expense in order to avoid bankruptcy and shame. Although my partner was in favor of going bankrupt so as to avoid some losses and expenditures, I was resolved to face ruin rather than loss of honor. (Brucker 1967, p. 130)

Florentine merchants only rarely used the word “reputation” (*fama*) – a word that connotes external appearance, like a commodity – to describe other merchants’ collective opinion about their performance. More commonly they used the word “honor” (*onore*) to refer to merchants’ collective evaluation of their interior characters or souls. The establishment and measurement of credit-worthiness through gossip among businessmen certainly was important to the discipline of Florentine markets. But in social exchange there is also the deeper idea of making each other through gifts. “For Paolo da Certaldo, ‘a man without a friend is like a body without a soul’ and ‘a man who loses his friends is worse than dead’.” (Weissman 1982, p. 28). This was no mere metaphor in Renaissance Florence. Because credit was the lifeblood of Florentine business, fellow businessmen made you by extending credit and business to you, and they could destroy you by withdrawing them from you.

Finally, the idea of *raccomandazione* was one defining feature of interpersonal interaction in Renaissance Florence (McLean 2007, chap. 6). By it, Florentines did not simply mean being recommended to others, and certainly not only being recommended to others for specific tasks or opportunities. *Raccomandazione* was equally, but more profoundly, a plea for recognition. To recommend oneself to another, as Florentines so formulaically did in the conclusions of their letters, was to ask *to be remembered* by another, to be kept in mind by another, to respect and be respected by another. To be in a circle of *raccomandazione* definitely could yield material benefits, but it also signified one’s membership in a community of people who promised to act responsibly and supportively towards each other, in a manner similar to explicit claims to honor. To deny the need for *raccomandazione* was not to deny its value, but to uphold the certainty of its being offered. This is the cultural meaning behind Bartolomeo Rustichi’s assertion to the Datini company in Genoa that

We do not recommend to you very much our own affairs: it does not seem to us necessary, but we consider you will undertake them employing such diligence as were they your own; and this we remind you, and pray of you and we will do the same for you. (Melis 1972, document 10: October 1395)

This was the Florentine self-understanding of two-way agency relationships, in markets but in other domains as well. The reciprocal-exchange monetary results of this were carefully tabulated in the open-ended current accounts that each party held in the others’ account books. Actual cash settlement among such merchants not only was often deferred but also could imply termination of trust.

THE INDUSTRIAL STRUCTURE OF COMMERCIAL CREDIT

The ultimate question in this article is this: how did the Florentines generate the hybrid social-interaction methods just described, which gave them their macroeconomic liquidity advantage in western Europe? Before answering this question, however, we will document what actually was produced by those methods. In the third section of this article, following this section, we will explore the social-network and the institutional

foundations underneath of the Florentine achievement, which catalyzed the methods of the previous section into action and reproduced them.

The statistical part of this study is possible because of the 1427 *catasto* or tax census, described at length in the pioneering book of David Herlihy and Christiane Klapisch-Zuber (1985). Herlihy and Klapisch computerized large portions of this rich archival source²⁶ and analyzed their data primarily from a demographic and family-history perspective. In addition to the data those authors coded, however, the *catasto* also contains extensive lists of debtors and creditors, with amounts owed, for each household tax return. Business *debitori* and *creditori* were included as distinct accounts within the household tax return of the lead partner in the company – yet another indication of the incomplete separation of personal from business in the Florentine world. Such lists of debts existed in the tax records because this innovative *catasto* for the first time in history systematically assessed taxes on the basis of net wealth – that is, assets minus liabilities. Debts, in other words, were tax deductible. Florentine law required the itemization of outstanding credits as well as debts in order to give tax officials the ability to disallow deductions, if one person's declared debit did not equal the other person's declared credit.

This remarkable breakthrough in public finance was possible only because of the highly commercialized character of Florence's underlying economy. Florentine merchants filled out one part of their 1427 tax returns by copying their account books into their tax declaration, as those account books existed as of the date of the tax submission.²⁷ Hence the 1427 *catasto* provides a high-resolution snapshot of the credits and debits of the entire Florentine economy at one specific, fleeting moment in time. Virtually all of the account books, out of which this information was originally drawn, subsequently have been lost.²⁸ This Florentine source in brief is unparalleled: there exists no other comparably comprehensive economic data set in early modern history,²⁹ nor, given source constraints, is there ever likely to be one.

The details of our coding of these *creditori* lists are reported in McLean and Padgett (1997); hence these will not be repeated here. Both personal and business debts were coded by McLean, even though only business debts and credits will be analyzed in this article.³⁰ The main coding rules relevant to this article are (a) that only debts of value greater than 10 florins were coded, and (b) that only debts to other Florentines were coded. An effect of the first coding rule is mostly to exclude artisans from our data set.

²⁶ The Herlihy-Klapisch data set is publicly available on line at www.stg.brown.edu/projects/catasto.

²⁷ Much historical study has gone into the assessment of the accuracy of information in reported *catasti* tax returns. The consensus is that the 1427 *catasto* is basically accurate, while later *catasti* are not (for example, Emigh 1996). Apparently, while Florentines eventually learned how to cheat on their taxes quite effectively, they did not do so immediately, perhaps because of the cross-checking design of the system. In any event, below we analyze existence versus nonexistence of a credit, not the reported value of the credit.

²⁸ Richard Goldthwaite has brought to our attention three surviving account books, which overlap with their *catasto* summaries: those of Andrea Banchi, silk manufacturer; Alamanno di Iacopo Salviati, wool manufacturer; and Lorenzo di Palla Strozzi, merchant-banker. We intend to consult these in the future.

²⁹ The only other study of pre-modern credit on this scale of which we are aware is Hoffman et al. (2000). That excellent study of Parisian bankers, however, covers a period two centuries after ours.

³⁰ The full data set contains 15,317 debts; the company subset analyzed here contains 4,735 debts.

An effect of the second coding rule is that trading among Florentines (even when they were resident abroad) is the focus of the data set, rather than trading between Florentines and foreigners. The joint effect of both constraints is that the data describe, with great richness, the structure of the export-oriented segment³¹ of the Florentine economy, as of 1427. This was the core of the Florentine economy, including both merchant-bankers and cloth manufacturers.

Within these constraints, coverage is thorough. Numerous passes through the *catasto* were performed, essentially on the logic of snowball sampling, in order to code a high percentage of companies' accounts or *bilanci*. Ultimately, 65.4% of the *bilanci* of active companies in our core industries were coded. Comprehensive coding was least successful for international merchant companies located abroad,³² for small low-quality wool companies whose accounts were hardest to distinguish from the credits and debits of the household, and for a number of companies who were connected to the export-oriented sector but were not formally located within any of the key industries we targeted. For Florence-based and Pisa-based banks, merchant-banks, silk manufacturing, high-quality wool manufacturing, and cloth-retail companies, the *bilanci* coding rate approached 80%. Debts were coded not among a predefined list of all companies (which list did not exist until this study), but rather among all companies and people meeting the above standards. As a result of our open-ended snowball procedure of coding credits to Florentine companies outside of previously coded *bilanci*, however, even the debits of companies whose accounts were not coded directly often were found indirectly in the credit accounts of coded companies. Because of such cross-ruffing, we were able to compile, for the first time, a complete census of companies active in the year 1427. A tabulation of this census, industry by industry, is presented in table 1. The detailed list of the companies underlying table 1 is publicly available on Padgett's web page: <http://home.uchicago.edu/~jpadgett>.

[table 1 about here]

We estimate, through procedures explained in Padgett and McLean (2002, p. 45), that 33.4% of the total number of all debits and credits of companies participating in the export-oriented industries of the Florentine economy were finally included in our commercial-debt data set. And we estimate that 62.3% of the total monetary value of all such debits and credits are included in our commercial-debt data set.³³

³¹ The export sector was comprised of the following industries: Merchant-banks, International; Merchant-banks, Florence/Pisa; Domestic Florentine banks; Silk manufacturers; Wool manufacturers, San Martino district (high quality); Wool manufacturers, other districts (lower quality); Cloth retailers; and Cloth dyers.

³² The compliance of these firms with *catasto* requirements evidently was handled with some flexibility, perhaps due to the special difficulties they faced in preparing and submitting their books for examination in Florence.

³³ These numbers may appear low for what purports to be a comprehensive picture of the Florentine economy, but these reported percentages are somewhat deceptive. Two types of transactions, present in our complete data set, are systematically excluded from analysis in this article: credits and debits with most firms and artisans working outside the export-oriented economy, and credits and debits with individuals rather than with companies. Had it been possible to calculate the more correct denominator of "all debits and credits among companies in export-oriented industries," percent coverage would have been very much higher than the conservative figures reported here.

The first questions we ask of these data are descriptive: How important was commercial credit to the Renaissance Florentine economy? In which markets did it figure most centrally? What was the ratio of relational to transactional credit in various markets? And in what types of economic exchanges was credit used?

One common way in finance of measuring the magnitude of credit is leverage: the ratio of outstanding debt to assets. The higher the ratio, the more important is credit in the operation of the company. Higher leverage can generate higher profits, but at greater economic risk. ‘Assets’ in the Florentine context primarily means the startup capital specified in the partnership contract, called *corpo*. Table 2 reports leverage so defined, and it also provides two more liberal definitions of ‘assets’, which progressively add to *corpo* the partners’ reinvestments of past profit and company inventory.³⁴

[table 2 about here]

Using the strict definition of leverage, our findings are that Florentine merchant-banks were leveraged at 5:1 of their *corpo*; that Florentine cloth retail and dyeing companies were leveraged at a little over 2:1 of their *corpo*; and that Florentine cloth production companies, wool and silk, were leveraged at about 1:1 of their *corpo*. These leverage ratios are not really comparable to modern figures, because modern firms borrow for the most part from specialized banks, whereas these companies ‘borrowed’ for the most part from their trading and exchange partners.³⁵ Nonetheless, the ordering of these ratios is consistent with the known facts that merchant-banks were more profitable as personal investments, but also more risky, than were wool and silk production companies (Goldthwaite 1968). In general, it is fair to say that virtually all Florentine companies, but especially merchant-banks, were highly leveraged and that most of their business was conducted on credit.

On average, larger and wealthier companies operated on higher leverage than did smaller companies.³⁶ The most extreme example in our data set was Cosimo de’ Medici’s bank branch in Rome, which had the highest outstanding debt of any company in Florence, yet its startup capital was zero.³⁷ Such an extreme case makes it clear that name, reputation, and connections were more central in the generation of commercial credit in fifteenth-century Florence than were economic assets, narrowly defined. Given the pervasiveness of doing business on credit, without other firms being willing to extend credit to a given firm, that firm could not really be in business at all.³⁸

³⁴ Fixed-cost assets in this setting were low. Cloth manufacturing occurred in the home through the putting-out system, and hence required low assets. Warehouses or *fondachi* were more valuable assets, but even these were not so large as to require depreciation (cost-accounting being an invention of the future).

³⁵ The stock market had not yet been invented.

³⁶ Of course they were larger and wealthier in the first place in part because of their success with credit.

³⁷ The rather astonishing total debt figure for this one branch was 158,238 florins. The corresponding total credit figure was 147,987 florins. Cosimo’s companies, like others but even more so, relied on massive volumes of two-way turnover and credit flow, organized through a partnership system (de Roover 1966).

³⁸ An example of this has already been provided in the quotation above from the diary of Gregorio Dati, one of the successful silk manufacturers in our data set. But to finish his story: After great difficulty having

To get oriented to the global network structure of these credit data, we present two alternative visualizations of interconnectivity in figures 1 and 2. Figure 1 in color presents a credit-network layout of the companies, produced through the Kamada-Kawai algorithm in Pajek (Batagelj and Mrvar 2006). The first thing to notice in figure 1 is simply the large numbers of credit dyads. Visually this raw economy-wide network is a dense black ball, impenetrable to the unassisted eye. The second more revealing thing to notice is the spatial arrangement of industries in relation to each other.

- (1) The wool sector is neatly in the right-hand half of this visualization of the economy, (a) with cloth-retail or *ritagliatori* companies (in brown) in the center of the wool sector, but not in the center of the economy as a whole, (b) with high-quality San Martino wool-manufacturing companies (in yellow) nearer the center of the overall Florentine economy, and (c) with lower-quality wool-manufacturing companies (in burnt yellow) around the periphery of the wool sector. (d) Dying or *tintori* companies (in white) are also located in the periphery of this large wool sector of the Florentine economy.
- (2) Silk-manufacturing companies (in blue) are clustered tightly and homogeneously in the southwest quadrant of this visualization.
- (3) International merchant-banks (in green), including Pisa, are located for the most part in the northwest quadrant of this visualization, less tightly clustered than silk.
- (4) A large proportion of domestic banks (in red) are spread in a band through the center of the economy, mediating between the other industries. But there also are marginal domestic banks spread around the periphery of the economy.

[figure 1 about here]

Figure 2 visualizes these data in a different way, as Leontief input-output flows of credit between and within industries. In particular, figure 2 shows observed deviations of credit flows from randomly expected credit flows, the latter calculated on the basis of aggregate volumes of industry credit alone. Four specific trading patterns are worth highlighting in this global picture of inter-industry credit flow:

- (a) Credit flow among merchant-banks of all three sorts (merchant-banks located in foreign countries, merchant-banks located in Pisa/Florence, and domestic banks) was massive. Metaphorically speaking, the merchant-banking sector was a whirlwind of products, bills of exchange, and credits cycling around inside the sector.

paid his debts, Dati was elected for the first time to political office (revealingly the Italian word for political office is also *onore*) in 1412. “This was the beginning of my recovery.” (Brucker 1967, p.124) The fact that Dati was a moderately wealthy silk manufacturer in our 1427 data set, with a taxable wealth of 3368 florins, shows that his principled stand in 1408 did indeed reestablish his own honor and therefore his company’s credit in his fellow merchants’ eyes.

- (b) Woolen-cloth consignments, from woolen-cloth manufacturers (*lanaiuoli*), flowed more to local cloth retailers (*ritagliatori*) in 1427 than to merchant-bankers.³⁹
- (c) In contrast, silk-cloth consignments, from silk-cloth manufacturers (*setaiuoli*) flowed more to merchant-bankers in 1427 than to local cloth retailers.⁴⁰ In reverse direction, *setaiuoli* received a higher flow of credits (including raw silk) from domestic banks, relative to statistical expectation, than did *lanaiuoli*.⁴¹
- (d) Silk firms in 1427 heavily exchanged with and gave credit to each other, whereas wool firms did not.

[figure 2 about here]

Credit pattern (a) documents statistically what we already know from textual sources: Florentine merchant-banks were not an industry of autonomous competing firms. They were a cooperative banking and trading network *system*, with merchant-bankers providing much liquidity and business to each other. This central fact, which we will explain in this article's third section, is the primary reason for the dynamism and adaptability of the Florentine economy.

Credit/trade patterns (b), (c) and (d) reflect recent trends in the Florentine economy in the early fifteenth century. The core of the Florentine economy in the fourteenth century had been the finishing, production, and export of woolen cloth. In the late 1200s and early 1300s, Florentine merchant-bankers in the *Calimala* guild imported unfinished cloth from Flanders and exported finished and dyed woolen cloth. By the mid 1300s, Florentine merchant-bankers in the *Cambio* and other guilds imported raw wool and exported completely manufactured woolen cloth. The Florentine wool-production industry, however, suffered serious and protracted contraction between 1373 and 1437,

³⁹ Since figure 2 is based on number of debts, rather than value of debts, one could conceivably challenge this statement on the ground that the value of average woolen-cloth sales to merchant-bankers was much greater than value of such sales to *ritagliatori* (Goldthwaite, personal communication). Statement (b), however, remains true even when re-calculated on basis of total florin value. Namely, the total monetary value of Wool, San Martino credits to all merchant-banks combined (that is, international merchant-bank, plus Pisa/Florence merchant-bank, plus domestic bank) was 40,592 florins, compared to credits of 58,392 florins to *ritagliatori*. And the total value of Wool, Other credits to all merchant-banks combined was 18,247 florins, compared to credits of 32,260 florins to *ritagliatori*. In fact, within our coding constraint of greater-than-or-equal-to 10 florins, there was not much difference in average value of woolen-cloth sales to *ritagliatori*, as compared to those made to export-oriented merchant-bankers in Pisa and to domestic bankers. There was a substantial difference in the average value of wool credits offered to *ritagliatori* compared to international merchant-bankers, however.

⁴⁰ Merchant-bankers still received roughly twice as much in volume of their cloth input from wool manufacturers as from silk manufacturers. Even though wool was on the decline, and silk on the rise, the older wool industry was still much larger in 1427 than the newer silk industry.

⁴¹ Again to measure this in terms of monetary value, rather than in terms of numbers of debts, domestic banks gave 33,662 florins of credits to *setaiuoli* in our data set; whereas they gave 27,080 florins to Wool, San Martino *lanaiuoli* and 15,682 florins to Wool, Other *lanaiuoli*. As baseline comparison, there were over two-and-a-half times more *lanaiuoli* companies than *setaiuoli* companies in 1427 (see table 1).

due primarily to aggressive expansion of woolen cloth production in England.⁴² The raw-material flow of prized English wool, upon which the high-end *San Martino* segment of woolen cloth production in Florence had depended, diminished, forcing a higher percentage of production of lower-quality woolen cloth, called *garbo*. The *San Martino* woolen cloth still left was sold both to merchant-bankers – especially those with warehouses in Pisa – and to *ritagliatori*, whereas *garbo* woolen cloth in this period was sold overwhelmingly to *ritagliatori*.⁴³

The Florentine merchant community and government, under the political control of the *popolani*-based Albizzi oligarchy at the time, responded to this economic crisis by trying aggressively to develop silk-cloth production (Dini 1993, Franceschi 1995, Mola 2000, Mola et al. 2000), in order to substitute for declining woolen-cloth production. The mechanism of this sponsorship was aggressive credit between merchant-bankers and new silk manufacturers (Tognetti 2002). Woolen-cloth production still exceeded the newer silk-cloth production in total volume, and also in total employment, but our data show that this centrally encouraged industrial transformation from wool to silk was well underway in 1427. Explaining how the Florentine economy so successfully adapted to its challenging international situation is a puzzle in the existing economic history of the period,⁴⁴ which the credit mechanisms illuminated in this article help to solve.

Motivated by our knowledge of how current accounts worked, in table 3 we subdivide aggregate credit flows into transactional and relational credits. “Relational credits” we define as credits between companies who had more than one cross-sectionally observed credit between them. “Transactional credits,” in complement, are those credits between companies who had only one observed credit between them.⁴⁵ Relational credits

⁴² The Florentine wool industry suffered a horrendous 72% decline in production from 1373 to its nadir of 1437 (Franceschi 1993, p. 13; Hoshino 1980, pp. 227-31; Tognetti 2002, p. 16). Debates continue about the causes of this crash, but the argument in the literature that seems the most compelling to us is the rapid growth of English woolen-cloth production in this same period (Carus-Wilson and Coleman 1963), which deprived Florence of much of its primary input – high-quality English raw wool (Hoshino 1980, p. 233).

⁴³ Hoshino (1980) showed that eventually, in the last half of the century, due to the Ottoman conquest of Byzantium, *garbo* woolen cloth found favor in international trade with the Levant. This is exactly the trade described in the Maringhi correspondence cited above: shipping raw silk to Florence from the east, and selling finished woolen cloth to the Turks. However, these events occurred well after 1427.

⁴⁴ There is a long and contentious literature, ably surveyed in Brown (1989), about whether or not there was a “depression in the Renaissance.” Lopez and Miskimin (1962) anchored one end of the debate; they pointed to the decline of the wool industry, among other things. Goldthwaite (1993) anchors the other; he points to the rise of the silk industry, among other things. No study based on a one-year cross-section, no matter how thorough, can resolve a debate about economic trends. We do regard the fifteenth-century adaptation of the Florentine economy as a success story, however, in the specific sense that the silk industry was developed to offset decline in the wool industry. Whether the successful development of silk was quantitatively enough to offset the sharp contraction of wool is a topic we leave to others to decide.

⁴⁵ Having only one outstanding debt at a time, of course, does not preclude that debt being part of an iterated sequence of debts, which we cannot measure with cross-sectional data. We can offer one piece of anecdotal evidence from the *catasto* records to support our strong sense that many of our so-called “transactional” credits were iterated. Parigi di Tommaso Corbinelli’s *bilanci* stand out for reporting the dates on which credits were initiated. One entry, a credit he had with the firm of Zanobi di Gherardo Corigiani & Co. for fifty-three florins, is crossed out and marked *pagato* on May 20. Subsequently, he records a credit with the same firm dated November 14. It is certain, therefore, that these reported

are of two types: (a) reciprocal credits, where credits flowed in both directions, and (b) multiple credits, where more than one outstanding credit existed in a single direction. Reciprocal credits are our statistical indicators of *corrispondenti* relationships.⁴⁶ Relational credits can be both reciprocal and multiple, although in the statistical analyses in the section following this one, we will enforce strict separation between these subtypes by constraining “multiple” to mean “multiple asymmetric.”

[table 3 about here]

The sheer existence of reciprocal and multiple credits in our data set is worthy of comment. ‘Relational’ is a fair label for multiple credits, because multiple credits means extending to someone a second (or more) credit even before they have paid off their first debt. Some sort of character assessment of or trust in the debtor by the creditor seems virtually a prerequisite for such behavior. ‘Relational’ is a fair label for reciprocal credits, because reciprocity epitomizes the anthropological logic of social exchange, as discussed in the previous section. It is notable in the Florentine case that credits flowed back and forth (for example, two credits one way and three credits the other way), without them being cancelled out into a net balance (for example, into one net credit owed). Each credit account ultimately had to be cleared separately, even if not necessarily in cash. Sometimes reciprocal credits occurred through two-way transactions being itemized and recorded individually, but more importantly they occurred through multiple current accounts that each party held in the books of the other (de Roover 1944). Reciprocated current accounts implemented *corrispondenti* relationships, as has already been described. In either variant of reciprocity, what we have here is yet another expression of the logic of social exchange, as implemented in account books – namely, instead of canceling offsetting debts, both parties are counted as mutually indebted to each other.

Within the high-volume merchant-banking sector, table 3 shows that 45% of the credits in our data were reciprocal credits, that 50% of the credits were multiple credits, and that 63% of the credits were relational credits of one version or the other. This verifies the impression from business letters that relational exchange was fundamental to the operation of Florentine merchant-banks.

Between banks and other companies, and among other companies, the proportion of total credits in relational form was not as high as it was among banks themselves, but it was still substantial. 33% of the credits in our data between banks and other companies were relational credits. Consignments between merchant-bankers and cloth producers – of raw materials in one direction and of finished cloth in the other – operated more on a one-at-a-time transactional-credit basis than on a “keep the books open” relational basis, even though a third of those credits were relational. 29% of the credits among non-bank

relational-credit figures underestimate the ‘true’ rate, were it possible to include ‘repeat business’ in our operational definition of relational exchange.

⁴⁶ This is a conservative indicator in the sense that stochastically it could happen that *corrispondenti* had only one *conto corrente* outstanding between them at a given moment in time. Reciprocity would have been observed had the observation time been longer. Many credits coded as “transactions” in this data set were actually *conti correnti*, since as explained below only 11% of the credits in the 1427 *catasto* reported substantive content.

companies were relational. Within the non-banking markets, relational trading often provided the base of a company's business, with the company seeking to expand transactionally around its relational foundation. Because of industry differences in degree of reliance on relational exchange, we run logit regressions in the next section separately by market-interface.

Finally in this section, table 4 provides information about the specific goods funded through relational and transactional credits. Unfortunately only 11% of our credits had their content or purpose listed in the *catasto*. No doubt all of these purposes were described completely in the original account books, but there was no tax reason for businessmen or their accountants to copy this textual detail into their abbreviated tax-return summaries. Nonetheless, even an 11% sample gives an adequate picture, as long as one is content with coarse-grained resolution.

[table 4 about here]

The modal activities reported in table 4 are what any knowledgeable historian would expect. Namely, among merchant-banks, the modal type of credit was the current account (*conto corrente*). In these cases, a single recorded "credit" in the tax returns summarized many recurrent business transactions.⁴⁷ Between merchant-banks and other companies, the modal credit activity was trading raw material for cloth, on consignment. Banking services, of many sorts, also were frequently provided on credit. Among some pairs of merchant-bankers and textile producers, accounts (*conti di esercizio*) to orchestrate recurrent trade existed, although this was not as routine as it was among merchant-bankers themselves. Among other mostly cloth-producing companies, the modal activity was lending raw materials and cloth to each other.

A major message about exchange content in table 4 is diversity. With the exception of trading among cloth producers and *ritagliatori*, which was fairly specialized in character, the goods and services exchanged among merchant-banks and between merchant-banks and other companies were remarkably wide ranging in content. In recurrent exchange relationships, merchant trading activities, banking activities and account activities (which really could cover anything: merchandise, bills of exchange, even daughters' dowries) all were mixed up – not just among merchant-banks but also between merchant-banks and others. While distinct in terms of guild membership, therefore, Florentine industries were not sharply differentiated in terms of actual exchange behavior. On the margins, Florentine industries blended into one another, with a single company quite capable of morphing its business into another "industry".⁴⁸

⁴⁷ Because of this fact, our statistical summary actually under-represents the significance of recurrent transactions funded through credit. When single unreciprocated credits (coded here as "transactional") actually were current accounts, then "relational" would have been a better linguistic description of that. We could have cleaned up this source of measurement error in our data if content information had been recorded for more than 11% of the credits.

⁴⁸ On the subject of domestic banks, Sergio Tognetti (1997) usefully has corrected one of Raymond de Roover's few mistakes. De Roover (1966, p. 14-15) had argued, very influentially, that Florentine banks were sharply divided into three distinct and unrelated types: *banchi di pegno* (pawnshops), *banchi a minuto* (small domestic banks), and *banchi grossi* (large international banks). De Roover himself studied only the

To document the degree of this company plasticity, we have tabulated on the right-hand side of table 4 the dispersion of multiple credits across content categories, among specific exchange partners, in those few cases where we were lucky enough to have more than one type of content reported. On average, exchange relations were more specialized between merchant-banks and others than they were among merchant-banks themselves. But still one should not imagine any iron-clad distinctions between industries; rather, there was a dyad-level continuum between specialism and generalism of goods and services traded, along which companies moved as their relations developed.⁴⁹ This built-in fluidity in content of exchange created the behavioral capacity for flexible adaptation in the Florentine economy as a whole. Industrial plasticity was one economic advantage of generalist social exchange.

In sum, commercial credit was foundational to the operation of the Renaissance Florentine economy, especially among merchant-bankers but also between merchant-bankers and textile producers. Relational credit, often recorded in *conti correnti* and *conti di esercizio*, was the logic through which much of this commercial credit worked. The economic exchange financed through credit was not specialized in content but was diverse both across the economy and between trading partners, as one would expect within a social-exchange logic.

THE SOCIAL EMBEDDEDNESS OF COMMERCIAL CREDIT

What explains the power and volume of this credit system in Renaissance Florence? We thoroughly agree with Weissman (1982, p. 35) that “there is scant reason to expect Renaissance economic exchanges, occurring within dense and multitextured social networks, to lack broader cultural meanings shared by other Renaissance exchange

latter. Based on a careful study of the extensive account books of the Cambini bank, Tognetti instead argued that overlap of the latter two types was substantial: international banks frequently had domestic bank branches, and domestic banks frequently were involved in lucrative international business. Our *catasto* data, based on 100% of the banks extant in 1427, strongly supports the position of Tognetti. On the other hand, Goldthwaite’s study (1985) of the small Cerchi *banco a minuto* in the 1450s reinforces de Roover’s original description. The resolution of this confusion is simple: there were two types of ‘domestic banks’, one of which was involved intimately in international business, and one of which was not. Our data on credits to and from the Domestic Bank industry are dominated by the former type of bank, because those banks were much bigger and more central in the Florentine economy than were the *banchi a minuto*, in 1427 at least.

⁴⁹ The fifteenth-century business and career of Andrea Banchi, thoroughly studied by Florence Edler de Roover, is a perfect illustration of this industrial fluidity of Florentine firms. Banchi without any doubt was a silk manufacturer (*setaiuolo*). Nonetheless, as Banchi went around all over Europe searching for silk-cocoon raw materials to buy and silk cloth to sell, he sometimes was paid in wool or other commodities, which then he had to dispose of (1966, p. 271). Banchi also acted like a banker, giving loans at interest to other *setaiuoli* “competitors” and to merchant-bankers (1966, p. 227). The Maringhi correspondence (Richards 1932) similarly has numerous examples of how the core woolen-cloth-for-raw-silk exchange was augmented with all sorts of other goods flowing between the parties: various types of cloth, ribbons, cotton, rugs, pepper, rhubarb, drugs, fox pelts, horses, cheese, sausage, even caviar (the latter four items seeming very close to personal gifts). Indeed in the Maringhi correspondence it seems clear that the stronger the personal relationship between the traders, the wider the range of commodities exchanged.

systems: gift giving, hospitality, the exchange of greetings, or the exchange of women.” Florentine businessmen were not only businessmen in the market, they were also kinsmen in their homes, neighbors on the street, republican office holders in city hall, status-conscious members of social classes, congregants in parishes, and faction feuders. One would expect everywhere, but especially in a world of social-exchange, that economic relations would be shaped by the particular matrix of other social relations in which those economic relations were embedded, if for no other reason that “single actions are moves in many games at once” (Padgett and Ansell 1993, p. 1263).

But this generic importance of multiple-role embedding (Granovetter 1985) does not settle the structuralist question of which roles are composed, how and why (White et al., 1976). Nor does it resolve the pragmatic problem of the consistency, contradiction or ambiguity of competing multiple roles and how to maneuver among them (Bourdieu 1977, Leifer 1991, Padgett and Ansell 1993, McLean 2007). Not all patternings of economic exchange across and within surrounding networks can be expected to have the same economic consequences. “Social embeddedness” in Renaissance Florence led to the glorious “birth of financial capitalism.” Yet elsewhere it has led to self-destructive pits of corruption.⁵⁰ One has to point to more than just an overlap between economic and social logics to explain why Florence came out differently.

Despite the powerful insight it yields into the micro-mechanisms of credit, moreover, the cultural trope of *amicizia*, so important in Florentine business and patronage (McLean 2007) letters, does not tightly constrain possible answers to these multiple-network questions. “Friendship” is a term that in any language is very capacious in its possible meanings. The very ambiguity of words like friend is what makes them useful as transposable linguistic tools for constructing new relations in novel settings (Sewell 1992). For this very reason, the generative plasticity of social-exchange “friendship” can be catalyzed in many ways, depending upon the regulatory context in which it sits. Economic and political consequences depend upon how this catalysis operates. At the end of the day, it really does matter whether “friend” behaviorally means loved one or Hollywood glad-hander.⁵¹

We approach these multiple-network regulatory questions inductively first by discovering the facts about the overlap between Florentine commercial credit and other social relationships in those merchants’ lives. In statistical analyses to follow, the commercial credits already described will become the dependent variable. For social-context independent variables, Padgett has collected and computerized a wide variety of primary-source and secondary-source data about the attributes and networks of these businessmen and others.⁵² namely, patrilineage,⁵³ marriage⁵⁴, neighborhood⁵⁵ (*gonfalone*

⁵⁰ This phenomenon in reality was not unknown in Florence, although self-awareness of corruption rose more acutely into Florentine consciousness in the subsequent Medici period.

⁵¹ Certainly Florentines like Giovanni Morelli, quoted above in footnote 6, and Leon Battista Alberti, quoted above in footnote 25, were acutely sensitive to distinctions like this, in their world of interactional deception.

⁵² These data, collected over twenty years, were coded for purposes of Padgett’s larger research project, which is documenting and studying the co-evolution of political, economic, and kinship networks in Florence over two centuries, from 1300 to 1500. Currently there are 53,152 Florentines in Padgett’s

and quarter), personal wealth,⁵⁶ political office-holding,⁵⁷ social-class membership,⁵⁸ and factional affiliation.⁵⁹ These data will be used to reconstruct the “dense and multitextured social network” context within which Florentine commercial credit operated.

ACCESS social-network database: 40,381 males and 12,771 females. Padgett gives thanks to David Sallach, Nick Collier and Xing Zhong for helping him to integrate ninety-six of his archival-source Excel files into this integrated relational-database format

⁵³ Parent-child relations were inferred (a) from last and middle names, since Florentine males took the name of their father as their own middle name: as in Giovanni di Francesco [in English, John (son) of Francis], and (b) from numerous collateral sources of dating information. Douglas White kindly wrote a computer matching algorithm that assisted in this linkage task, during our collaboration at the Santa Fe Institute, for which we thank him. This task is complicated by the fact that names are often not consistent across archival sources. Currently there are 1660 family genealogies in the dataset, viewable through Pajek.

⁵⁴ Dated marriages were coded from numerous sources, the most important being the fourteen (?) volumes of the *Carta dell’Ancisa*, located in the Archivio di Stato in Florence. Pierantonio dell’Ancisa was a seventeenth-century antiquarian who devoted his life to extracting and recording Florentine marriages out of extant dowry contracts. Most of the original dowry contracts, from which dell’Ancisa worked, have now been lost. There are 11,039 marriages in the current Padgett data set, estimated to comprise about 40-50% of all marriages between 1350 and 1500 of Florentines with last names (Padgett 1994).

⁵⁵ Florence was divided administratively into four quarters – Santo Spirito, Santa Croce, Santa Maria Novella, and San Giovanni. Each quarter in turn was subdivided into four *gonfaloni* or wards, making sixteen *gonfaloni* in all. We also coded residence in parish, when that information was recorded in the *castasto*. Cohn (1980) documents the importance of this fine-grained version of “neighborhood” for marriage. (There were 62 parishes in Florence.) Unfortunately this information was recorded only erratically in the *castasto*, there being no official tax reason to do so.

⁵⁶ Information on both neighborhood and taxable personal wealth is contained in the 1427 *castasto* itself and is publicly available online at www.stg.brown.edu/projects/castasto. In addition to integrating this online dataset into his relational dataset, Padgett has coded and computerized other Florentine tax censuses as well: namely, the 1351 *estimo*, the 1378 *prestanza*, the 1403 *prestanza*, and the 1458 *castasto*. (Padgett thanks Sam Cohn for providing him microfilm copies of the 1351 *estimo* and the 1378 *prestanza*.) Padgett also has integrated the 1480 *castasto* dataset of Molho and Kirshner, generously provided by Molho, into the ACCESS relational dataset.

⁵⁷ All members of the Priorate or city council from 1282 to 1500 (11,312 members in all) were coded by Padgett from the early eighteenth-century copies of the *Priorista* volumes located at the Newberry Library in Chicago. All members of the Mercanzia or commercial court from 1310 to 1500 (3,316 member in all) were coded by McLean and Padgett from the *Fondo della Mercanzia* located in the Archivio di Stato in Florence. Subsequent to our independent coding efforts, the *Tratte* office-holding data coded by David Herlihy before he died became available on the web, thanks to the labors of R. Burr Litchfield and his assistants: www.stg.brown.edu/projects/tratte. From these online resources, the political offices of *Buonuomini*, *Gonfalonieri*, and various guild consuls have been integrated into the relational dataset, with the valuable assistance of Xing Zhong. With coding help from Ethel Santacroce and Michael Heaney, and with computer assistance from Xing Zhong, the scrutiny votes in the elections of 1382, 1393, 1411 and 1433 also have been coded, computerized and integrated, although these data were not used in this article.

⁵⁸ Social class background, in the Florentine context, refers to the date of first entry of a patrilineal ancestor to the Priorate, and hence can be reconstructed from Priorate office-holding data, together with family genealogies. *Popolani* were Florentine patrilineages who first were elected to the Priorate from 1282 to 1342; new men were Florentine patrilineages who first entered the Priorate from 1343 to 1377; ‘new-new men’ (our label, not theirs) were Florentine patrilineages who first entered the Priorate from 1378 to 1433. Magnates were old ‘feudal’ families specifically prohibited from holding Priorate office in 1292 (Lansing 1991). Subsequently some of the branches of these families were rehabilitated through specific legislation (Klapisch 1988). If such legal rehabilitations entailed public separation from the root lineage through changing last names, those alterations in social status are registered in the dataset; if not, not. Any Florentine patrilineage not included in the above categories is here labeled “families never admitted to Priorate” (by 1433).

Businessmen and Partnerships

Before proceeding directly to this analysis of credit among companies, it will be useful to describe the companies themselves: Who were Florentine businessmen? And how did they make companies⁶⁰ through partnership?

Table 5 reports, by industry, the social-class backgrounds of active businessmen in 1427 Florence. Operationally measured by the age at which one's family first entered the ruling elite,⁶¹ social class was not the only classification of relevance to identity in this period, but it was the core republican definition of status (Brucker 1962, 1977). Social class was correlated with, but was by no means identical to, economic wealth (Martines 1963) and political power (Najemy 1982).

[table 5 about here]

Two-thirds of bankers and merchant-bankers at this time were socially upper class, either *popolani* or magnates (48% *popolani*, 18% magnates). In Padgett and McLean (2006), we traced the re-ascendance of the *popolani* into this position of industrial dominance. While the same individuals were not always equally active in both spheres, the *popolani* as a set of socially prestigious families were in control both of Florentine export markets and of the Albizzi 'oligarchic' political regime. Almost half of the economically declining, but still important, wool producers (*lanaiuoli*) were also upper class. Cloth retailers (*ritagliatori*) and the economically ascendant silk producers (*setaiuoli*) were socially lower status than merchant-bankers in 1427 – about two-thirds being new men, new-new men, or families not yet admitted to the Priorate.

In their various industries, how did these businessmen form themselves into companies? Table 6 presents logit regressions of partnership⁶² on various social-context variables of active businessmen in these industries – namely, same kinship (at various levels: nuclear family, patrilineage, nuclear-family in-laws,⁶³ and *parentado* or extended-family in-laws), same neighborhood (*gonfalone* or ward, and quarter), same social class (subdivided into *popolani* + magnates, new men + new-new men, and families never

⁵⁹ Membership in the 1433-4 Medici and Albizzi political factions, previously analyzed in Padgett and Ansell (1993), were originally reconstructed and reported in Kent (1978).

⁶⁰ The English word "company" derives from *compagni* or companions. The word "firm" is anachronistic.

⁶¹ Because of this Florentine definition, social status was profoundly rooted in Florence's tumultuous political history; indeed class was the social sediment of political history. The demographic boundaries between Florentine social classes were very distinct because past political upheavals were very distinct (Padgett and Ansell 1993, p. 1262).

⁶² The 'universe' of businessmen logically available to form partnerships with each other was taken to be the set of businessmen active as owners or partners of companies in the 1427 industry in question. The partnership dyadic dummy variable, therefore, equaled one if a partnership existed among a pair of such businessmen, and zero otherwise.

⁶³ In-law at the nuclear-family level means men in one partner's nuclear family (including brothers and sons) marrying women in the other partner's nuclear family. In-law at the *parentado* level means one partner marrying a woman with the same last name as his partner.

admitted to the Priorate), political office-holding⁶⁴ (Priorate, *buonuomini*, *gonfalonieri*, guild consuls, and Mercanzia), and same political faction (Medici party vs. Albizzi party). We summarize our regression results first for kinship, then for social class and neighborhood, and finally for political office-holding and faction.

[table 6 about here]

Kinship results are easy to describe: kinship was important in the formation of economic partnership in Florence wherever one looks. No Florentine historian will be surprised that kinship at the level of nuclear family was a powerful force in company formation in the *Quattrocento*. Across all industries, 20.2% of the partnerships in 1427 were among brothers or fathers and sons. Father-son partnering had declined from its measured peak in the early fourteenth century (Padgett 2001, pp. 246-7), but partnerships between brothers remained very common.

In contrast with universal agreement about the importance of nuclear family in company formation, there has been controversy among historians about the continued saliency of the extended family or patrilineage during the Renaissance. Patrilineage was essential in the formation of companies during the time of Dante and after (Sapori 1926, 1955, Renouard 1941). But Goldthwaite (1968, 1983) has argued for the diminished importance of patrilineage, especially in economics, in the later fourteenth and fifteenth centuries.⁶⁵ Arguing explicitly against him, F.W. Kent (1977) forcefully asserted the continued importance of patrilineage throughout the Renaissance.⁶⁶ Padgett and McLean (2006) found evidence for both sides of this dispute. Consistent with Goldthwaite, Padgett and McLean (2006, pp. 1513-15) found a slow and linear decline in the quantitative magnitudes of patrilineage (net of nuclear) coefficients for cambio-banking partnerships over the time period of 1350 to 1427. Consistent with Kent, however, those same coefficients remained statistically significant throughout that time period. Table 6 reconfirms for more industries the continued statistical significance of patrilineage for partnership, without addressing the contested issue of trends across time.

Padgett and McLean (2006, pp. 1513-15) also demonstrated an increasing correlation across time of partnership with marriage in the cambio-banking industry. That is, more frequently than in the past, early fifteenth-century banking partnerships were formed among in-laws, both at the nuclear family and at the extended-family level of *parentado*. To a limited extent, *parentado* displaced patrilineage in the economic domain of banking partnership. Table 6 reconfirms across more industries the causal significance in 1427 of marriage for forming partnerships,⁶⁷ even though for many industries the

⁶⁴ Political office-holding variables were coded in terms of “ever appeared” rather than “appeared at same time” – namely, political office-holding was coded “zero” if neither businessman in the pair had appeared in that office by 1427, “one” if one of the two businessmen in the pair had appeared by 1427, and “two” if both had appeared by 1427.

⁶⁵ See also Jacks and Caferro (2001, pp. 7-8).

⁶⁶ See also Cohn (1988, 1992).

⁶⁷ Perfect examples of this are provided in the dairy of the silk manufacturer Gregorio Dati, already cited in this article for other purposes. “We renewed our partnership on 1 January, 1393 when I undertook to invest 1,000 florins. I did not actually have the money but was about to get married – which I then did – and to

number of marriages among partners at the nuclear-family level that we were able to document was too small⁶⁸ to fully evaluate that hypothesis.

In all forms of kinship, there were only minor differences⁶⁹ in coefficient magnitudes across industries. Kinship was important to the process of company formation across the industrial board.

Neighborhood effects, in contrast, varied by industry. Living in the same *gonfalone* affected the likelihood of formation of partnerships in domestic banking and in silk, whereas living in the same quarter (excluding same *gonfalone*) was important in the formation of partnerships in international merchant-banking and in wool. Given that Florentine international merchant bankers for the most part were physically resident abroad,⁷⁰ the deeper neighborhood connectedness of domestic bankers than international merchant-bankers is not surprising. What is more surprising is the importance of neighborhood at the looser level of quarter even for businessmen resident abroad.

In general, these findings about the importance of neighborhood for partnership are consistent with the findings of other Florentine historians. The dense *piazza* and parish urban ecology of everyday Florentine life heavily influenced the sheer frequency of encounter, and thereby the generation of all sorts of relations. D. Kent (1978), D. Kent and F.W. Kent (1980), F.W. Kent (1987), and Eckstein (1995) have emphasized the importance of *gonfalone* in shaping basic sociality patterns of friends and enemies in Renaissance Florence.⁷¹ And Klapisch-Zuber (1985) has painted a vivid portrait of the Florentine fixations with *parenti*, *amici* and *vicini*. Given the dense social matrix that Florentine neighborhoods provided, finding economic partnerships to be shaped by

receive the dowry which procured me a larger share and more consideration in our company.” (Brucker 1967, p.110) “As already stated, I have undertaken [in 1403] to put up 2,000 florins [in a subsequent company]. This is how I propose to raise them: 1,370 florins are still due to me from my old partnership with Michele di ser Parente, as appears on page 118 of my ledger for stock and cash on hand. The rest I expect to obtain if I marry again this year, when I hope to find a woman with dowry as large as God may be pleased to grant me.” (ibid, p. 121). In Renaissance Florence the marriage market in dowries functioned as a capital market to start up new businesses.

⁶⁸ Within Padgett’s larger data set, in 1350-1379, 3.4% of domestic-bank partners were intermarried at the level of their nuclear families. In 1380-1433, in contrast, 12.1% of domestic-bank partners were intermarried, again at the level of their nuclear families. In the year 1427 specifically, however, not many marriages among partners’ nuclear families were located. Since Padgett’s data set includes about half of last-named marriages during these periods, actual intermarriage rates undoubtedly were higher than can explicitly be documented.

⁶⁹ From the results in table 6 one can make the cases that patrilineage was somewhat less important in the formation of international merchant-banking companies than it was in other industries, and that marriage was more important in silk-manufacturing companies than it was in other industries.

⁷⁰ In their cases, “*gonfalone*” and “quarter” referred to their Florentine legal residence (usually connected to their patrilineage), not to their physical presence.

⁷¹ Sam Cohn (1980, pp.115ff.) has pointed to the even smaller unit of parish as the locus of daily sociality, especially for workers and artisans. *Gonfalone* is the smallest spatial unit consistently measured in Florentine records. We coded parish memberships for many 1427 Florentines, from non-standardized text in the *catasto*. Unfortunately, coverage of parish in our data set was not substantial enough to include it in the regressions.

neighborhood comes as hardly a surprise. The contribution here is more to document industrial variation on this theme.

The findings about social class in these partnership regressions are fascinating. Social-class endogamy in partnership was very strong among domestic bankers, even controlling for kinship, neighborhood and politics. To put this another way, domestic banking companies were socially stratified, with *popolani* and magnate bankers dominating partnership systems and other peak companies within that industry, and with lower social-class bankers founding and running the more locally oriented domestic banks.⁷² Social-class endogamy in partnership was also evident in silk manufacturing, but for lower classes⁷³ only. No other industry exhibited any social-class endogamy. This very concentrated pattern of findings is closely related to the partnership-system story we told in Padgett and McLean (2006). Domestic banks became the headquarters of international partnership systems, far transcending their humble money-changing origins. Social-class endogamy among domestic bankers is a trace of the social and political rootedness of partnership systems in the Albizzean republican/oligarchic state. In response to the Ciompi revolt, cross-class social relationships throughout Florence shifted in their foundations from partnership, institutionalized in guilds, to clientage, institutionalized in republicanism (cf. Najemy 1982). The corollaries of this profound network transformation were that partnership headquarters at the very center of the economic system became more concentrated within social classes, and that political alliances at the very center of the state become less concentrated within social classes.

This social-class profile in banking partnership is similar to what was going on in Florentine marriage at the time. Within *popolani* and magnate social elites, neighborhood-based marriages were on the decline, and city-wide class-endogamous marriages were on the rise (Cohn 1980, Padgett 1994). This coincidence in the social patterning of banking and marriage was no accident: During the post-Ciompi political regime of the Albizzi, Florentine banking partnerships came increasingly to be correlated with marriage, thereby catalyzing the reproduction of partnership systems that stood at their intersection (Padgett and McLean 2006). Neighborhood remained central in the social landscape of most Florentines during the Renaissance, but the *popolani* and magnate social classes also reshaped two of their other traditional networks, banking partnership and marriage, to cross-cut and transcend their neighborhood bases, reaching out to each other to consolidate themselves organizationally as a city-wide elite.⁷⁴ Thus, while kinship and neighborhood statistical findings in table 6 reflect Florence's medieval past, the social-class findings reflect its more recent history.

⁷² See also figure 5 in Padgett and McLean (2006, p. 1526).

⁷³ The coefficient for (Among new men and new-new men) was not statistically significant, but it was almost so ($p = .079$).

⁷⁴ Cohn (1980, p. 37) reports that notaries in the 1300s routinely recorded all names with neighborhood appended, whereas elite names in the 1400s were recorded only as *cives Florentinis* or "citizen of Florence." Even more evidence supporting this observation comes from Eckstein (1995), who noted the withdrawal of social elites from *gonfalon* councils during the early Medici period, without their losing political control from afar (as long as they were on the right side of the Medici, that is).

Finally, it is easy to summarize the causal impacts of political office-holding⁷⁵ and of political faction⁷⁶ on economic partnership: there were none. By 1427, Florentine businessmen had learned to keep micro-political considerations out of their economic company-formation decisions (cf. Goldthwaite 1987). This is not to say that politics was unimportant for the structuring of markets. Quite the contrary, politics profoundly transformed the cultural and institutional ‘air’ that the Florentines breathed, thereby changing the generative rules that organized their markets. But in 1427 politics did not affect economics in the direct and obvious way of partnerships being formed for political reasons (or vice versa).

This conclusion, however, is temporally specific. During the immediate post-Ciampi aftermath of 1382-1400, political elections and offices had been directly central to the formation of both cambio-banking and international merchant-banking partnerships. Table 8 in Padgett and McLean (2006, p. 1513) documented how the political logic of cooptation, critical to the invention phase of partnership systems, gradually evolved into the regulatory mechanisms of marriage and social class, which then catalyzed the routine reproduction of partnership systems through channeling of access and careers. Our cross-sectional findings for 1427 in table 6 are consistent with this temporal process of the institutionalization of Florentine republicanism.

Commercial Credit: “Traditional” social foundations

We come now to the centerpiece of this article: logit-regression analyses of commercial credit among the 1427 companies just described, on various social-context attributes and networks of the Florentine partners that comprised them. These results are reported in the appendix of this article.

“Social-context variables” are the same list of kinship, neighborhood, social-class and political variables just described for the partnership regressions, plus a supplementary set of control variables: (a) null expectation of credit between companies, based on the sizes of the companies alone,⁷⁷ (b) dummy variables for whether company accounts were coded directly from the *catasto* or were inferred indirectly from trading partners’ accounts, (c) the total taxable wealth of all partners in the companies, as reported in the *catasto*, (d) numbers of higher-order triads (transitivity, cycles, in-triad and out-triad) in which observed dyadic credit was embedded,⁷⁸ and (e) market-interface dummy

⁷⁵ All political-office independent variables were constructed as follows: the percentage of partners, in both creditor and debtor companies, who had served in the office in question before 1427.

⁷⁶ “Political faction” is the percentage of partner dyads, between the two companies, in the faction in question.

⁷⁷ This computed like an expected count in a contingency table – namely, (total number of dichotomized credits of giving company) * (total number of dichotomized debits of receiving company) / (total number of dichotomized credits in the entire market interface that the giver and receiver are operating within). “Market interface” is the intersection of the set of companies in the industry of the giver and set of companies in the industry of the receiver. Given the eight industries analyzed here, there are 64 market interfaces within the overall Florentine economy.

⁷⁸ Padgett and Philippa Pattison are currently working on direct p-star modeling of these triadic and higher interdependencies among credits. In the current logit-regression setup, which formally assumes dyadic

variables to control for unmeasured industrial interdependencies, technological or otherwise. All regressions control statistically for unobserved heterogeneity among companies.⁷⁹

In the statistical setup of our dependent variable, commercial credit, we have self-consciously tried to operationalize the textual material presented above. In addition to predicting simply the presence or absence of a commercial credit tie between companies,⁸⁰ we also subdivide commercial credit into three dichotomous subtypes: reciprocal credits, asymmetrical multiple credits, and single one-way credits. As explained in the context of table 3, reciprocal credits are the subset of commercial credits where one or more credits between companies i and j are matched by one or more credits between companies j and i . Since most of these were implemented through current accounts or accounts of use, reciprocal credits are our statistical indicator of *corrispondenti* relations. Multiple asymmetric credits⁸¹ are commercial credits where more than one distinct credit is observed between companies i and j but no credit is observed in the reverse direction. Together, reciprocal and multiple credits can be called “relational credits”, since here Florentine businessmen were giving to each other new credits before their previous credits had been repaid. In contrast, the label we give to single one-way commercial credits, our last subtype, is “transactional credits”. If these distinctions, based on textual evidence, are behaviorally meaningful, then this should be confirmed through different profiles of social-embedding coefficients, which point to different social logics underlying these subtypes of economic exchange.

In discussing these credit findings, we will begin with the “traditional” social foundations of kinship and neighborhood before moving on to the more “modern” regulatory effects of partnership systems and republican political offices. Social class and marriage, while traditional in origins, had been reconfigured in behavioral use, making their classification ambiguous in this simple rhetorical scheme.

Kinship effects on commercial credit did not match the pervasiveness of the kinship effects on partnership: they were more focused in nature. For aggregate credits, nuclear-family coefficients were significant in almost all markets. Namely, across the industrial board, Florentine brothers, fathers and sons who were partners in different companies were likely to induce their companies to give commercial credits to each

independence, these triadic interdependencies are not scrutinized directly but rather are in the background as controls.

⁷⁹ The method used to control for unobserved heterogeneity, suggested to us by Brian Uzzi, was the cluster option within the logit regression procedure of Stata, applied to company ID.

⁸⁰ Before dichotomizing commercial credit to fit the logit regression framework, we experimented with negative-binomial regression on integer numbers of commercial credits. This alternative procedure experienced numerous convergence difficulties. More importantly, it did not permit the simple decomposition into subtypes that we desired on substantive grounds. In the end, we intentionally opted for methodological simplicity and uniformity, thereby placing all comparisons on the same statistical footing. In our dataset we also coded the monetary florin value of credits. While certainly this is valuable information, we leave the statistical analysis of that to the future, in order to concentrate here instead on the topological issue of “who trades with whom.”

⁸¹ Reciprocal ties can also include multiple ties, but here we strictly enforce the distinction, by classifying multiple reciprocal ties as “reciprocal”, in order to disentangle coefficients.

other. Consistent with our understanding of the normative obligations of sons and brothers (Alberti [1433] 1971), these nuclear-family-based commercial credits were primarily⁸² in the form of reciprocal credits, rather than in the forms of multiple-asymmetric or transactional credits.

Beyond the nuclear family itself, however, kinship effects on credit were spotty. Patrilineage was important to the social foundations of commercial credit among bankers and merchant-bankers. In this core of the Florentine economy, where high-status *popolani* families reigned supreme, traditional patrilineage exerted a strong and consistent pull on partners in companies, through all versions of commercial credit. But outside of the core banking and merchant-banking sector, patrilineage had no such effect.⁸³ The conjuncture of these two findings implies a collective threshold effect: the causal influence of patrilineage on commercial credit was contingent on the prevalence of many *popolani* patrilineages in the sector in question.

Furthermore, the structuring effects on commercial credits of cross-company intermarriage among partners, while existent, were episodic and unpatterned, both for nuclear in-laws and for *parentado*. This is in sharp contrast with the powerfully consistent influence that marriage exerted on partnership itself. Even though marriage was a social relationship that permeated the industrial logic of company formation in Renaissance Florence (Padgett and McLean 2006, pp. 1510-21), that did not spill over routinely into the market logic of economic exchange among those same companies. A rough analogy across network logics developed during the Renaissance that “marriage is to company as friendship is to credit.” This kept these two economic roles distinct.

Effects of neighborhood on credit were similarly concentrated in pattern. Extending the logic of patrilineage, *gonfalone* exerted a strong structuring effect on commercial credit in all the markets in which bankers and merchant-bankers were involved – namely, among merchant-bankers themselves, between merchant-bankers and wool manufacturers, and between merchant-bankers and silk manufacturers. These neighborhood effects were particularly pronounced among relational credits, although merchant-bankers also gave transactional credits disproportionately to other merchant-bankers in their own *gonfalone*. No markets outside of where bankers were involved showed any *gonfalone* effects. Also no statistical effects of quarter on credit, in any market, were found.⁸⁴ Overall the causal effects on credit of the “traditional” variables of patrilineage and neighborhood were perhaps surprisingly the strongest in the most “modern” capitalistic sectors of the economy – bankers and merchant-bankers.

Social-class effects on commercial credit are easy to summarize: Upper-class membership among *popolani* and magnates had no marginal effect anywhere on

⁸² Nuclear-family coefficients were also significant for multiple credits among bankers, and for transactional credits among silk manufacturers.

⁸³ With one exception: patrilineage also flopped over into significance for reciprocal credits between merchant-bankers and wool manufacturers. This exception supports our threshold interpretation, since wool also had a high percentage of *popolani* businessmen.

⁸⁴ Actually one barely significant coefficient was found (for transactional credits between merchant-bankers and silk), but because that was isolated without reinforcement from other quarter coefficients, we ignore it.

commercial credit, net of other variables with which they were correlated, like patrilineage. Indeed only a few lower-class effects in transactional credits within *ritagliatori* or cloth retailer markets were found at all. Similar to marriage, social class was powerful in its structuring effect on partnership itself – both in the demographics of partners and in partnership choices of those partners – especially in domestic banking, but that constitutive social-class influence on company formation did not spill over into the market logic of exchange among those companies.

Our findings for the “traditional” social-context variables of kinship and neighborhood can be assembled together through the image of segmentary opposition⁸⁵ (Evans-Pritchard 1940). Like other geographically concentrated patrilineage systems, traditional Florentine social structure ideally⁸⁶ was a hierarchy in the natural-science sense of a “Chinese-box” nesting of sets in supersets (Simon 1969, Pattee 1973). In particular, nuclear families were contained within patrilineages, which were contained within neighborhoods.⁸⁷ Nuclear families were the starting nodules, pervasive in their statistical effects in all industries. In and of themselves, nuclear families did not provide much network reach into the economy at large, but they offered a deeply felt linguistic model of fictive-kinship potentially extensible beyond themselves if mobilized by other forces. The second layer outward was patrilineage. Patrilineage was a powerful social force linking through credit those banks and merchant banks in which upper-class patrilineages themselves were overrepresented in partnership. The third layer outward was neighborhood in the sense of *gonfalone*. We interpret *gonfalone* statistical effects on credit as like clientage. Given that patrilineage itself was geographically so tightly constrained within the urban ecology of *gonfaloni* and *palazzi*, it is easy to understand how close neighbors could come to be interpreted as quasi-kin or fictive kin, especially if they were subordinate dependents (Klapisch-Zuber 1985). Neighborhood-based relational credits between merchant-bankers and textile manufacturers are especially simple to understand as socially analogous to patron-client relations. This nested hierarchy represents the “traditional” side of social structure in Renaissance Florence, in the specific sense that these were historical continuities from medieval times.

Far from dismissing such traditional social foundations as impeding economic progress, we find that the social-exchange principles so crucial to the micro-construction of Florentine commercial credit would have been unreliable, indeed almost inconceivable, without segmentary-oppositional kinship and neighborhood as their regulatory contexts. In the most advanced core of the Florentine economy especially,

⁸⁵ Evans-Pritchard (1940) emphasized that patrilineage kinship systems organized this way produce fluid factional politics, with conflict aggregating to varying levels of alliance, depending upon exactly who the initiating conflict partners are. This prediction fits the case of medieval, but not Renaissance, Florence well (Raveggi et al 1978). In Renaissance Florence other institutional and network systems were layered into this traditional base, thereby producing more complicated hybrid political dynamics than just factions.

⁸⁶ Actual life of course was messier than this or any simplified ideal.

⁸⁷ In 1351, 72% of the tax households of *popolani* patrilineages lived within the same *gonfalone*. By 1480 this had risen to 79%. In 1351, 63% of households in new-men and new-new-men patrilineages and in families never admitted to Priorate lived within the same *gonfalone*. By 1480 this had risen to the same 77% level of geographical concentration as the *popolani*. (Padgett 2006) [All these calculations exclude tiny solo-household patrilineages.]

commercial credit started with traditional kinship models of social exchange, but then loosened and broadened the application of these through fictive kinship and *amicizia*. Traditionalist kinship and neighborhood foundations in this sense were necessary (but not sufficient) for Florentine capitalism.

Kinship and neighborhood alone, however, are obviously not enough. In ensemble, segmentary-oppositional kinship systems provide strong network foundations for social closure and trust, but a weak foundation for long-distance cooperation (Granovetter 1973, Burt 2005). In Florence like elsewhere else other network methods also had to be found for transcending the close-minded cliquishness associated with traditional systems, if system-wide economic liquidity was ever to happen.

In the Florentine case we will find these newer network methods ultimately to have been partnership systems and republicanism, but here we will highlight that such organizational inventions did not develop in a social-network vacuum. Social-class endogamy and marriage were the network lattices upon which partnership systems and post-Ciampi republicanism grew. Actually the emergence of partnership systems and post-Ciampi republicanism, on the one hand, and the refunctioned social networks of social class and marriage, on the other, developed a catalytic feedback with each other, nourishing each others' reproduction. Post-Ciampi Florentine businessmen and politicians reconfigured the meaning of social class from a political-cohort superset of patrilineages to a more abstract concept of status and honor – something like “service to the city and the state” (cf. Rabil 1991).⁸⁸ Social mobility was more possible in this abstracted version, but it was also tightly controllable through office holding (Najemy 1982), partnership systems, and marriage. Baron (1966) has emphasized the civic-humanist ideological side of this development. These organizational and cognitive extensions of traditionalism through abstracted social class enabled banks themselves as partnership networks to cross-cut segmentary social foundations. As paradoxical as this might sound to contemporary sociological ears, in the economic core of the Florentine economy the “weak economic ties” of commercial credit were embedded in the “strong social ties” of kinship and neighborhood, whereas the “strong economic ties” of partnership were embedded in the “weak social ties” of marriage and social status. Social-exchange principles, grounded originally in kinship and neighborhood, thereby were extended to companies which no longer were composed entirely on those old foundations. This cross-cutting economic structure, spawned within evolving Florentine republican elites, is illustrated schematically in figure 3.

[figure 3 about here]

Commercial Credit: “Modern” social foundations

Partnership systems are given the label “modern” here because, as explained in Padgett and McLean (2006), they embodied two crucially new features of financial

⁸⁸ “Generally, by the middle of the fifteenth century, the notary no longer identified the rich and powerful by his or her parish of residence. They were simply called *cives Florentinis* (‘citizens of Florence’).” (Cohn 1980, p. 37)

capitalism – limited liability and bilateral-format double-entry bookkeeping. By breaking the older organizational form of unitary unlimited-liability companies, based on patrilineage, into a set of legally distinct partnerships and account books, linked only through senior partners, they concentrated operational control in the hands of single persons (or small number of persons) through means of close financial oversight of their more “autonomous” branch managers. The financial kingpins at the centers of partnership systems became important in the politics of the post-Ciampi republican state as well in banking in Florentine markets. Cosimo de’ Medici was one such wealthy businessman-politician (Padgett and Ansell 1993), but he was hardly the only one.

Coefficients in the appendix demonstrate how partnership systems worked in the realm of credit practice. Among the industrially heterogeneous companies linked into partnership systems, commercial-credit transfers were intense, as expected. Current accounts in bilateral-format double-entry bookkeeping were originally set up in Florence in order to manage just such intra-partnership-system transfers (Padgett and McLean 2006, p. 1539-43). Consistent with that understanding, all the significant effects on commercial credits among companies linked into partnership systems were relational in nature.⁸⁹ And mostly of course, given who set up partnership systems in the first place, these partnership-system relational credits involved banks and merchant-banks – namely, among banks and merchant-banks themselves, between such banks and those wool manufacturers linked to them, and between such banks and those silk manufacturers linked to them. Partnership systems we regard as the nucleus of the new and “modern” social-relational form, which radiated out into the Florentine economy, fusing with the kinship and neighborhood logics that were already there.

Empirical support for this “radiation outwards” idea is the additional finding that commercial credits, both reciprocal and transactional, were statistically more likely to take place not only within partnerships systems but also between them. The banks and merchant-banks at the center of these systems understood each other, both sociologically and in accounting procedure, and hence could link together through commercial credit quite easily. Quite a number of the letters we cited at the outset of this article, so drenched with traditional language, were written to and from the senior partners of these “modern” partnership systems, even though we did not say so at the time. The causal effect of partnership systems on the development of commercial credit in Florence, in other words, was non-linear. Not only did they directly increase the flow of credit and create technical tools for managing ‘internal’ transfers among their legally autonomous components, but also they indirectly increased the flow of credit among parallel systems of companies so organized. Current accounts in bilateral format facilitated this,⁹⁰ as long as underlying problems of trust were resolved through social embedding.

⁸⁹ The one exception to this statement was commercial credits between wool firms within the same partnership system. These were transactional not relational in character, because such transfers in the wool industry as a whole were transactional not relational in character.

⁹⁰ Current accounts in bilateral format can be thought of as a standardized protocol, enabling communication and interconnectivity in ways similar to the functioning of underlying communication protocols in the internet.

A secondary institutional anchor of commercial credit among core Florentine businessmen was republican office-holding. In particular, bankers and merchant bankers were more likely to extend to each other transactional credits⁹¹ if they previously had served in the highest office of Priorate or city council. Government in Renaissance Florence was republican, meaning that citizens if elected took temporary time out from their jobs (two months in the case of the Priorate) to serve in office in the state, with or without pay depending on the office. Election procedures varied over time (Najemy 1983), but since 1282 the volume of flow of citizens, of various social classes, into and out of the state was remarkable by any standards.⁹² Coefficients in the appendix demonstrate that political participation in the state by banking partners was not without consequence for the commercial credit of their companies.⁹³

The Italian word *onore* can be translated either as honor or as political office, both in Renaissance and in contemporary usage. To be elected to republican office in Florence was to be publicly honored by one's fellow citizens. Office-holding, especially office-holding in the top political office, was a collective signal and indeed a measurement⁹⁴ of the generalized reputation of the elected. In addition, it was also an indirect signal of the embeddedness of office holders in the networks that elected them. To be elected, city councilors had to be so deeply enmeshed in the social fabric of Florence, with all of the multifarious sanctions that implied, that it would have been difficult for them to escape as scofflaw debtors. The remarkable feature of the Priorate finding here is that, even after statistically controlling for these other embeddings, having held high public office still had an amplifying certification effect on one's credit.

Our final statistical results concern the correlation between commercial credit and political factions – the Mediceans versus the Albizzeans (Kent 1978, Padgett and Ansell 1993). Temporally speaking the political factions of 1430-34 cannot cause commercial credit in 1427, but the time gap is so short that “foreshadowing” entanglements are possible. The striking features of our findings are that the Medici party was bound up with the silk industry, and with merchant-banking relations with the silk industry. In contrast, the Albizzean party was bound up with merchant-banking relations with the wool industry. These particular industrial roots to the rise of the Medici have never, to

⁹¹ The comparable Priorate coefficient for reciprocal credits among bankers was similar in magnitude, but it did not reach statistical significance. But it almost did ($p = .089$). The effect of Priorate participation on reciprocal credits between bankers and wool manufacturers was statistically significant.

⁹² Padgett and Ansell (1993, p. 1261) graphs the volume of new-entrant flow into the Priorate, over time.

⁹³ While not a banker, the silk manufacturer Goro Dati's diary provides a clear illustration of this point, as it has for so many of our points: “So one may say that in 1412, according a rough estimate that I made of my losses and the interest I had to pay on account of them, I was in debt for over 3,000 florins. That same year 1412, my name was drawn to be Standard-bearer of Justice, and I served in that office. This was the beginning of my recovery.” (Brucker 1967, 139-140)

⁹⁴ Number of scrutiny votes made that measurement very precise, although these final vote totals were not released to the public. Election was only revealed when names were drawn from the pouch. Once again, Goro Dati: “Up until then I had not been sure whether my name was in the purses for that office, although I was eager that it should be both for my own honor and that of my heirs... On the very day my name was drawn for this office, only fifteen minutes before it was drawn, I had taken advantage of the reprieve granted by the new laws and finished paying off my debt to the Commune. That was a veritable inspiration from God, may His name be praised and blessed!” (Brucker 1967, p. 125)

our knowledge, been observed before, although they make sense in light of how well the silk industry and new-men *setaiuoli* were subsequently treated under the Medici (Tognetti 2002).

To generalize, we believe that partnership systems (with their bilateral current accounts) and republican elections were important for the development of commercial credit in Florence for two reasons: multiple-network interleaving and micro-interactional hybridization. Partnership systems and republican offices were certainly not “weak ties” in the Granovetter (1973) sense of casual acquaintances. But topologically similar to weak ties, these innovations were new economic and political relations that cut across and through Florence’s segmentary social structure inherited from its medieval past, without however destroying that traditional base. The fact that these newer social relations cross-cut the older cliquish social base was crucial to their economic liquidity consequences: Reinforced by office-holding certification of *onore*, partnerships systems, both within them and among them, turned the Florentine multiple-network economic ensemble into a “small world” (Milgram 1967, Watts 1999) of easy and fluid access to capital through numerous and redundant routes (Moody and White 2003). Given our previous analysis of the post-Ciampi birth of partnership systems (Padgett and McLean 2006), in our view it was ultimately the constitutional republicanism of Florence that channeled tumultuous political crises into the economically consequential generation of both of these “modern” sets of cross-cutting relations.

We agree with Granovetter (1973)⁹⁵ that bridging cliques with the same type of “strong tie” that comprises those cliques is a formula in the long run for dissolving the barriers or “structural holes” that sustain those cliques,⁹⁶ both for topological and for normative-contradiction reasons. Therefore, it is crucial for the dynamic reproduction of any hybridization of traditional with modern that newer networks be distinct types of networks, not isomorphic in topology with older segmentary kinship. We showed above through business letters that “modern” and “traditional” were fused at the level of micro-interactional practice in Renaissance Florence. At the macro level of network topology being discussed here, however, historically layered organizing principles were kept cross-sectionally distinct through embedding partnership systems in marriage and social class, which cross-cut segmentary kinship and neighborhood. To put the same point another way, differentiation of networks into distinct types of tie is important to the stable reproduction of hybrid ensembles, because this keeps multiple social logics in synergistic tension rather than permitting one to implode into the other (cf. White 1992, pp. 87-89). We would generalize further that failure to enforce cross-cut among multiple networks is one reason for why social embeddedness often degenerates into pits of corruption, quite different from the outcome here, Florentine clientage and favoritism notwithstanding. The two senses of “close ties” – friendship and social distance – have to be separated for corruption to be kept in abeyance in social-exchange systems. This separation inhibits

⁹⁵ Thereby slightly disagreeing with Burt (1992), who has updated his position (Burt 2005).

⁹⁶ Unless, that is, there are deep macro-structural forces sustaining those barriers, as in Padgett and Ansell (1993).

social closure and encourages the open air of gossip, which jumps across networks to cover and to discipline all in the economy.⁹⁷

In Florence, this topological network cross-cut, so crucial for solving the simultaneous economic problems of localized trust and global liquidity, was produced not economy wide but more specifically within elites. In commercial credit the simultaneous yet statistically independent coexistence of traditional with modern logics of social embeddedness was observed only in the core banking and merchant-banking sectors. These bankers and merchant bankers were mostly *popolani* in social background in 1427, thereby rooting them deeply into Florentine political and social history. Through elections, these elite bankers were absorbed into the state, especially into the peak offices of Priorate, Mercanzia, and special-purpose *balie*. Political absorption folded partnership systems into the financial sinews of the state (Molho 1971, Marks 1960). Through intermarriage (Padgett and Ansell 1993, Padgett 1994, Padgett and McLean 2006), these elite *popolani* bankers also merged with even older magnate social hierarchies. The net consequence of all of these network intersections was an oligarchy of multifaceted “Renaissance men”, who arguably were public- and civic-minded republican benefactors (Baron 1966). At least they were open to the carefully monitored and controlled recruitment of new-man entrants into themselves (Najemy 1982). It is through multiple-network intersections like these that financial markets became the economic facet of evolving Renaissance Florentine elite structure.

DISCUSSION: Transposition and Abstraction

Taking traditional social content and mathematically measuring it was a distinctive Florentine style, be that style expressed in economic account books, in political elections, or in linear perspective in religious art (Baxandall 1988).⁹⁸ No doubt the background foundation for this style was the deep commercialization of Florentine society, as evidenced by the level of numeracy required of citizens to produce our data – that is, to complete their own complicated tax returns in the 1427 *catasto*.⁹⁹ But among elites, this style reached new levels of abstraction in the very period we are studying. Not just accounting but double-entry bookkeeping. Not just oligarchy but civic humanism (Baron 1966). Not just Brunelleschi’s and Masaccio’s artistic breakthroughs but Leon Battista Alberti’s description of linear perspective in the language of Euclid (Alberti [1435] 1991).

Cross-cutting multiple networks, we argue, were one topological factor contributing to this cognitive trend among Renaissance Florentine elites toward abstraction. At the egocentric level of the person or the company, cross-cutting networks

⁹⁷ Padgett (1990) analyzes a very different example of this – the U.S. Congress in the 1960s. The control and career consequences of gossip within elites are also emphasized in Faulkner (1983).

⁹⁸ In this respect, we regard our own quantitative approach to Florentine history as consistent with the Florentines’ own procedures.

⁹⁹ To remind the reader, in this article we have analyzed only the subset of Florentines’ tax returns containing company accounts. But the 1427 *catasto* itself also contained even more about personal accounts, which we have also coded.

create packages or portfolios of diversity. Egos are not just connected to multiple alters through single or redundant types of ties; they are connected to multiple types of alters through multiple types of ties, which “intersect” within the ego to construct that ego.¹⁰⁰ In the partnership-system example, the contractual relationship of partnership not only connected businessmen in the same industry, as in the past. Now it connected businessmen in heterogeneous industries¹⁰¹ -- thereby transforming the businessmen at their hubs from entrepreneurs to financiers (Padgett and McLean 2006, pp. 1535-39). Traditional nested segmentary-oppositional systems pose their own sets of cognitive challenges. But managing portfolios of relational diversity is not among them.

The cognitive problem posed by relational packages of heterogeneous alters and ties is one of establishing comparability (Espeland and Stevens 1998) – how to turn a collection into a portfolio. In accounting, organizing piles of transactions with the same people into current accounts was a crucial step in constructing structured arrays of “customers” and measuring interaction with them in terms of relational credit and profit. In painting, organizing tiles on the floor spatially in simulated three dimensions was a crucial step in clarifying narrative relations among characters on the canvass and also movement between them and the viewer. In patrilineage families, discussing and debating the complicated twists and turns of Roman history was a crucial step in teaching themselves the duties and interaction skills of family members toward each other (Alberti [1433] 1971). In each of these Florentine examples, the cognitive function of abstract space was to project heterogeneous social reality onto lower-dimensional arrays of representation that revealed projected lines of movement for oneself.

But what exactly must be made comparable with what depends upon what your networks place in front of you. For Renaissance Florentine elites, these were patrilineage, social class, international markets, and republicanism. These were the domains of action that needed to become arrayed, if Florentines were to conceptualize how to proceed. If these had been specialized and segregated, with different sets of people doing different sets of things, then the need for cognitive comparability through abstraction would have been mitigated, with deleterious consequences for cognitive innovation. But if participants in particular domains are also interconnected through non-isomorphic other domains, as in this case, then a world of multivocality is induced, where “single actions are moves in many games at once.” (Padgett & Ansell 1993). Depending upon the particular patterns of network cross-cut, ambiguity of classification may be high or low. But everyone is struggling to find bounded-rationality footings of comparability in order to enable them to think (March and Simon 1957).

In any culture, the candidate solutions to this problem of cognitive orientation are metaphorical combinations of cultural elements already there. In Florence, examples might be these: economic relations like family and friends; political relations like

¹⁰⁰ Powell (1998) and Owen-Smith and Powell (2004) discusses this in the context of biotechnology companies.

¹⁰¹ Not to mention the other marriage and political alliance relations that linked those same businessmen to even more heterogeneous alters in social classes, neighborhoods, and the state.

economic exchanges;¹⁰² family relations like little polities. As cognitive mappings such as these occur, in order to coordinate expectations between heterogeneous parties on terms they both already understand, social roles and expectations become decoupled from their original network roots and become abstracted into transposable linguistic tools or models, available for creative and exploratory relational play (Sewell 1992, McLean 2007). Not just kinship but fictive kinship. Not just specific neighbors but potential clients. As always, words ultimately have to be backed up by action. But the froth of relational generativity is transposition and recombination within existing linguistic, institutional, and behavioral “tool kits” (Swidler 1986). Abstraction emerges out of transposition. Hence the social forces that induce network transposition also induce abstraction as cognitive corollary, the particular abstraction depending on the particular transposition.

Why then was credit so powerful in Renaissance Florence? Our bottom-line answer is that credit functioned multivocally in many practical domains at once. Once network transpositions after the Ciompi revolt constructed the necessary interactional and metaphorical analogies, each domain generated positive externalities for the other, thereby creating a powerful dynamic feedback loop for the rapid reproduction and diffusion of credit.¹⁰³ As we have seen in the letters, commercial credit in Florence was interpreted not just as an economic loan. It was interpreted also as a gift between friends. Hence it not only produced profit, it also produced friends. Friends in turn produced votes for political office, which was *onore*. Honor in turn was reputation, indeed character, in the eyes of credible others. This became better economic security than cash, because it gave access to more credit should trouble arise. Because of these inter-domain functional spillovers, induced structurally by cross-cutting social networks, credit was good for business, good for sociality, and good for politics all at once. No wonder then that Florentines used it so heavily, once these feedbacks became established.

None of this implies Machiavellian conniving, although some Florentines may have engaged in that. This is just a good old-fashioned positive feedback loop, which operated independently of cognitive micro-foundations. As Florentine actors strove to understand and to use the dramatic expansion in credit they saw developing, credit became a “generalized medium of exchange,” to use Parson’s (1956) old but still useful term.¹⁰⁴ In other words, not only did actual kinship become abstracted into fictive kinship and the like, but credit thereby became a social currency for transforming people into and across these abstracted roles: business partners into friends into political allies, with partner alternatives becoming more flexible than in the past. A new and highly quantitative metric for cognitive social distance emerged to dominate the construction of social space in Renaissance Florence – namely, I am (measurably) close to you to the extent that I am indebted to you. Precise measurability was essential because the trust

¹⁰² This mapping produces patrons and clients.

¹⁰³ As mentioned in footnote 11, while the wide interconnectivity of the system provided considerable liquidity and robustness, it also created vulnerability to credit overextension and crashes. The massive fiscal strain of Florentine wars, to which the 1427 *catasto* was one response, did lead to a temporary collapse of the system in the 1430s, leading to a wave of banking and merchant-banking bankruptcies (Molho 1971).

¹⁰⁴ A more modern but related concept is “translation protocol” (cf. Hutchins 1995, Galison 1997).

upon which everything depended was fluid and fragile. Social exchange made you, but it could also destroy you – a network reality we argue that focused the mind.

What the global topology of this new credit-constructed social space really was (cf. Greene 2004, pp. 219-50), we do not hazard to guess, but we think it is a good bet that Florentines themselves thought that it was linear perspective – namely discrete social groups becoming reconfigured into quantitative gradients of status, wealth and power, receding into the poorly perceived (but possibly sacred) horizon. On the one hand, social mobility. On the other hand, exquisite sensitivity to hierarchical distinctions in honor, character, and taste.

CONCLUSION

We have examined the impressive phenomenon of Florentine commercial credit, central to international finance and trade in early modern Europe, from three perspectives: from the perspective of Florentine business letters, from the perspective of statistical analyses of *debitori* and *creditori* in the 1427 *catasto*, and from the perspective of informed speculation about Florentine social cognition. Because of its rootedness in the 1427 *catasto*, this article mostly has been cross-sectional in character, but it is the companion to another article (Padgett and McLean 2006) that was explicitly temporal, covering the events of and after the Ciompi revolt. These two articles together make the case that the development of Florentine financial capitalism, both in partnership and in credit, was profoundly influenced by tumultuous political events, as these worked their way through and were channeled by pre-existing Florentine social structure and political institutions. Especially in the core banking and merchant-banking sectors, Florentine markets co-evolved with Florentine state structure, dynamically linked through oligarchic/republican elites that spanned them both. We have touched only tangentially on art and humanism, for which Florence is justly famous, but we believe that a full account will integrate these as well into the co-evolution and transpositions of the multiple social networks that produced changing Florentine elites. While certainly not our only progenitors, western civilization remains indebted to them.

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Table 1. CENSUS OF 1427 COMPANIES/PARTNERSHIPS IN MAJOR INDUSTRIES

	High Certainty Companies			Low Certainty Companies		
	Florence	Overseas	Old	Florence	Overseas	Old
International Merchant-Banks	0	45	7	0	10	2
Pisa/Florence Merchant-Banks	0	20	1	0	1	0
Domestic Banks	53	0	10	12	0	4
Cloth Retail	32	3	5	4	1	2
Silk Production	38	8	4	11	1	1
Wool Production						
San Martino	36	5	10	2	0	0
Via Maggio	27	0	2	1	0	0
San Pancrazio	8	0	0	0	0	0
San Pier Scheraggio	9	0	1	0	0	0
Unclear Location	34	4	9	21	4	4
All Wool Firms	114	9	22	24	4	4
Cloth Dyers	18	0	3	7	0	2
Other Industries (partial)						
Fur	6	0	0	4	0	0
Gold	3	0	0	5	0	0
Linaioli	6	0	0	10	1	0
Merciai	6	1	0	5	1	1
Rigattieri	7	1	0	4	0	1
Speziali	11	0	2	1	0	0
Miscellaneous	6	1	5	6	0	1
Unknown Industry	9	9	10	110	20	15
Totals	312	94	69	203	39	33

Table 2. CAPITAL STRUCTURE OF 1427 CATASTO COMPANIES

Average Capital/Corpo Size of Companies, in florins:

	n	corpo1= <i>corpo</i> only	corpo2= corpo1 + profit + <i>sopraccorpo</i>	corpo3= corpo2 + inventory
Merchant Banks (Int'l. + Pisa)	23	5080	5751	6973
Domestic Banks	24	6375	9941	10119
Cloth Retail	21	4305	5348	7102
Silk Manufacturing	25	3568	3928	4851
Wool Manufacturing (San Martino)	30	3239	3654	4373
Wool Manufacturing (other)	24	2030	2233	2517
Cloth Dyeing	8	1095	1195	1595

Average Leverage = Σ_i (total debt) / Σ_i (capital):

	n	corpo1= <i>corpo</i> only	corpo2= corpo1 + profit + <i>sopraccorpo</i>	corpo3= corpo2 + inventory
Merchant Banks (Int'l. + Pisa)	12	5.42	4.98	3.62
Domestic Banks	14	4.93	3.29	3.20
Cloth Retail	14	2.20	1.66	1.15
Silk Manufacturing	19	0.94	0.86	0.66
Wool Manufacturing (San Martino)	23	1.17	1.04	0.84
Wool Manufacturing (other)	16	0.54	0.48	0.41
Cloth Dyeing	7	2.27	2.03	1.44

Table 3. **VOLUME OF CREDITS: RELATIONS VS. TRANSACTIONS**(a) Reciprocal Credits:

creditor companies:	Banks	debtor companies: All Other Companies	Total
Banks	427/953 = .448	117/749 = .156	544/1702 = .320
All Other Companies	115/662 = .174	232/1959 = .118	347/2621 = .132
Total	542/1615 = .336	349/2708 = .129	891/4323 = .206

(b) Multiple Credits:

creditor companies:	Banks	debtor companies: All Other Companies	Total
Banks	474/953 = .497	169/749 = .226	643/1702 = .378
All Other Companies	160/662 = .242	400/1959 = .204	560/2621 = .214
Total	634/1615 = .393	569/2708 = .210	1203/4323 = .278

(c) Relational Credits:

creditor companies:	Banks	debtor companies: All Other Companies	Total
Banks	601/953 = .631	234/749 = .312	835/1702 = .491
All Other Companies	230/662 = .347	562/1959 = .287	792/2621 = .302
Total	831/1615 = .514	796/2708 = .294	1627/4323 = .376

N.B.: (c) is the union of (a) and (b).

“Banks” equals {Int’l. m-b, Pisa/Flor. m-b, and Domestic Banks}.

“All Other Companies” equals {Cloth Retail, Silk Producers, Wool producers:
both San Martino and other conventi, and Dyers}.

Table 4. **SUBSTANTIVE CONTENT OF CREDITS** (when known)I. Among Banks:

Relational Credits:	Transactional Credits:	Specialization of Credits: (when two contents known)
70 Accounts	17 Accounts	51 Different categories
17 Banking activities	16 Banking activities	21 Similar: Accounts
19 Merchandise	6 Merchandise	45 Similar: Other categories
19 Cloth	6 Cloth	
16 Raw materials	3 Raw materials	
5 Other	4 Other	

II. Between Banks and Others:

Relational Credits:	Transactional Credits:	Specialization of Credits: (when two contents known)
17 Accounts	10 Accounts	5 Different categories
8 Banking activities	27 Banking activities	7 Similar: Accounts
3 Merchandise	4 Merchandise	19 Similar: Other categories
45 Cloth	38 Cloth	
28 Raw materials	52 Raw materials	
0 Other	3 Other	

III. Among Others:

Relational Credits:	Transactional Credits:	Specialization of Credits: (when two contents known)
0 Accounts	2 Accounts	0 Different categories
3 Banking activities	4 Banking activities	0 Similar: Accounts
0 Merchandise	1 Merchandise	2 Similar: Other categories
15 Cloth	34 Cloth	
1 Raw materials	14 Raw materials	
0 Other	4 Other	

N.B.: "Banks" = International merchant-banks, Pisa/Florence merchant-banks, and Domestic Banks

"Others" = Cloth Retailers, Silk Producers, Wool Producers: San Martino, Wool Producers: Other conventi, and Cloth Dyers

"Specialization" = contents in similar or different categories, when two contents known.

Table 5. **SOCIAL-CLASS COMPOSITION OF 1427 PARTNERSHIPS**

number:	M-B, Intl.	M-B, F/Pisa	Dom. Banks	Wool, S.M.	Wool, Other	Silk	Cloth Retail	Cloth Dyers	Total
Magnates	22	5	15	1	7	6	8	0	64
Popolani	33	15	62	49	46	23	21	4	253
New Men	1	1	11	10	24	19	15	4	85
New-New Men	5	3	10	9	20	11	15	3	76
Not Admitted	<u>16</u>	<u>17</u>	<u>13</u>	<u>14</u>	<u>31</u>	<u>23</u>	<u>14</u>	<u>16</u>	<u>144</u>
Total	77	41	111	83	128	82	73	27	622

percentage:	Merchant- banks	Wool	Silk	Cloth Retail	Cloth Dyers	Total
Magnates + Popolani	.664	.488	.354	.397	.148	.510
New Men + N.N.Men	.135	.299	.366	.411	.259	.259
Not Admitted	.201	.213	.280	.192	.593	.232

Definition of social classes, according to political cohort:

- 1) "Magnates" are those families legally excluded from membership in the Priorate in 1293-95 (see Lansing 1991).
- 2) "Popolani" are those families who first entered the Priorate between 1282 (birth of republic) and 1342.
- 3) "New Men" are those families who first entered the Priorate between 1343 (Duke of Athens) and 1377.
- 4) "New-new Men" are those families who first entered the Priorate between 1378 (Ciompi revolt) and 1427.
- 5) "Not Admitted" are those families who had never entered the Priorate by 1427 (date of *catasto*).

Table 6. **PREDICTING PARTNERSHIP: Logit Regressions**

Dependent variable = partnership dyad (dichotomous),
out of 'universe' of all active businessmen in each industry

Independent variables:	International Merch.-bkrs.	Domestic Bankers	Wool Manufacts.	Silk Manufacts.	Textile Retailers
<u>Kinship:</u>					
Nuclear family	3.485 ^{***}	3.808 ^{***}	5.707 ^{***}	4.268 ^{***}	3.225 ^{***}
Patrilineage (excl. nucl.)	1.310 ^{**}	2.233 ^{***}	3.271 ^{***}	3.902 ^{***}	3.247 ^{***}
In-law (nuclear-family level)	3.341 ^{***}	---	---	3.035 [*]	---
Parentado (excl. nucl. in-law)	1.463 ^{***}	1.381 [*]	1.841 [*]	3.438 ^{**}	---
<u>Neighborhood:</u>					
Same gonfalone	-.221	1.064 ^{**}	.308	.898 [*]	.936
Same quarter (excl. gonf.)	.681 ^{**}	.305	.452 [*]	.377	.425
<u>Social class:</u>					
Among Popolani & Mag.	.222	1.037 ^{***}	-.069	-.261	.397
Among New-men and NNM	.979	1.265 ^{***}	-.311	.563	-.815 [*]
Among families not admitted	.465	1.550 ^{**}	-.287	.818 [*]	-.622
<u>Political Offices (0/1/2):</u>					
Priorate: past	-.423	-.215	.174	-.315	.318
Buonumini: past	.254	.081	-.098	.041	-.138
Gonfalonieri: past	.158	.026	.167	.503 [*]	-.042
Guild consuls: past	.830 ^{**}	.010	-.358 [*]	-.254	-.621 [*]
Mercanzia: past	-.140	.003	.083	.390	-.360
<u>Political Factions:</u>					
Mediceans	-.778 [*]	-.409	-.106	---	.897
Albizeans	---	---	---	.265	---
Constant:	-4.708 ^{***}	-5.641 ^{***}	-5.248 ^{***}	-4.957 ^{***}	-4.148 ^{***}
# observations (dyads)	7,260	12,430	23,996	6,640	5,256
# non-zero observations	148	148	216	98	102
Log pseudo-likelihood	-619.2	-640.7	-947.3	-417.4	-449.3
Wald chi ²	350.6	392.0	566.3	342.1	131.7
Number of variables	15	14	14	15	13
Prob > chi ²	.0000	.0000	.0000	.0000	.0000
Pseudo R ²	.143	.202	.231	.182	.107

N.B.: Cluster option used in Stata in order to control for unobserved heterogeneity in persons (i.e., in the variable of person ID).

Figure 1. **Pajek picture of Commercial Credit in 1427 Florence** (using Kamada-Kawai layout algorithm):

Color code:

Green = International merchant-banks (including Pisa)

Red = Domestic banks

Blue = Silk manufacturing companies

Brown = Cloth retail companies

Bright Yellow = Wool manufacturing companies, high quality (i.e., San Martino)

Burnt Yellow = Wool manufacturing companies, low quality (i.e., all other)

White = Dyers

Gray = Miscellaneous other

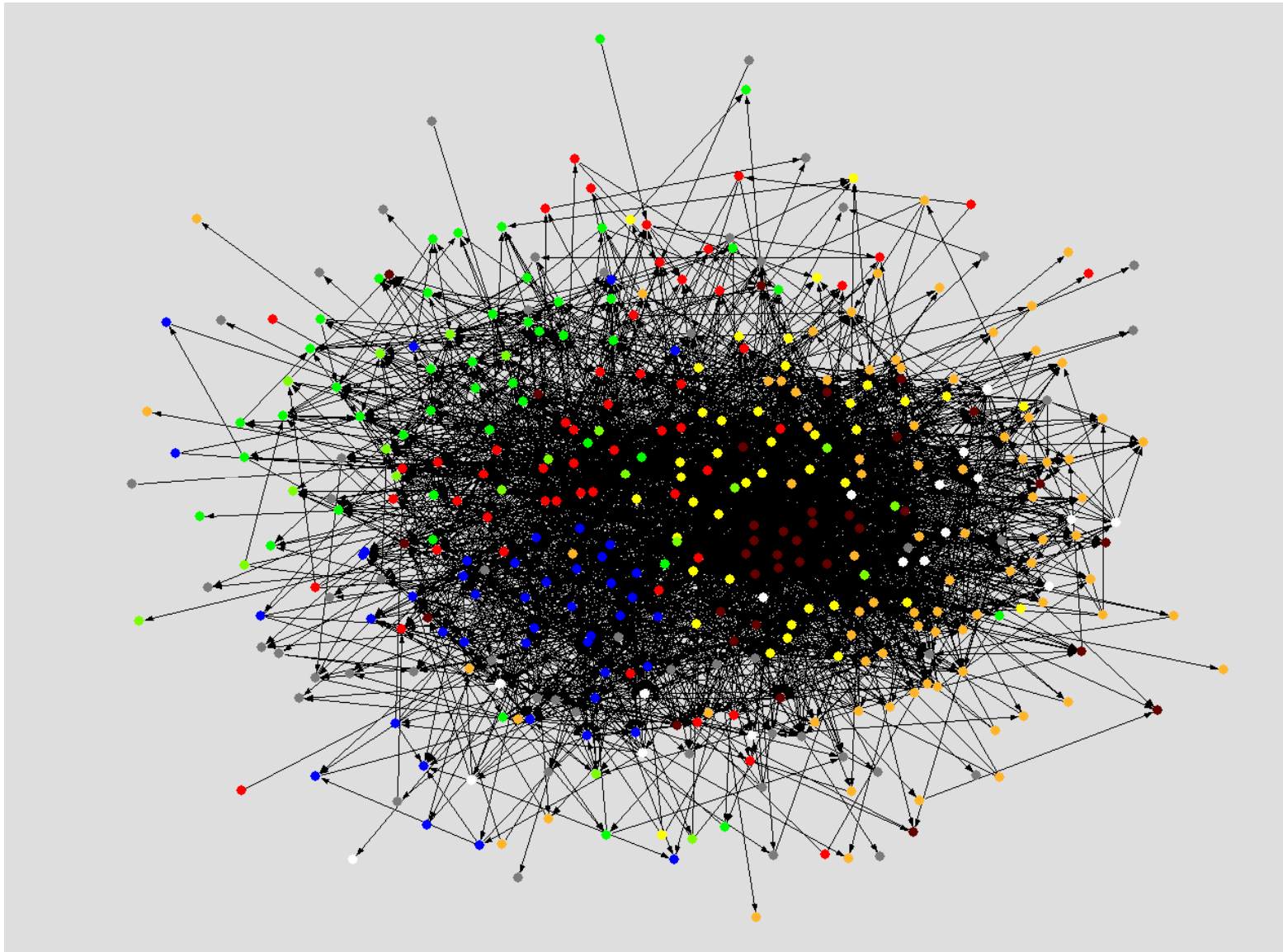
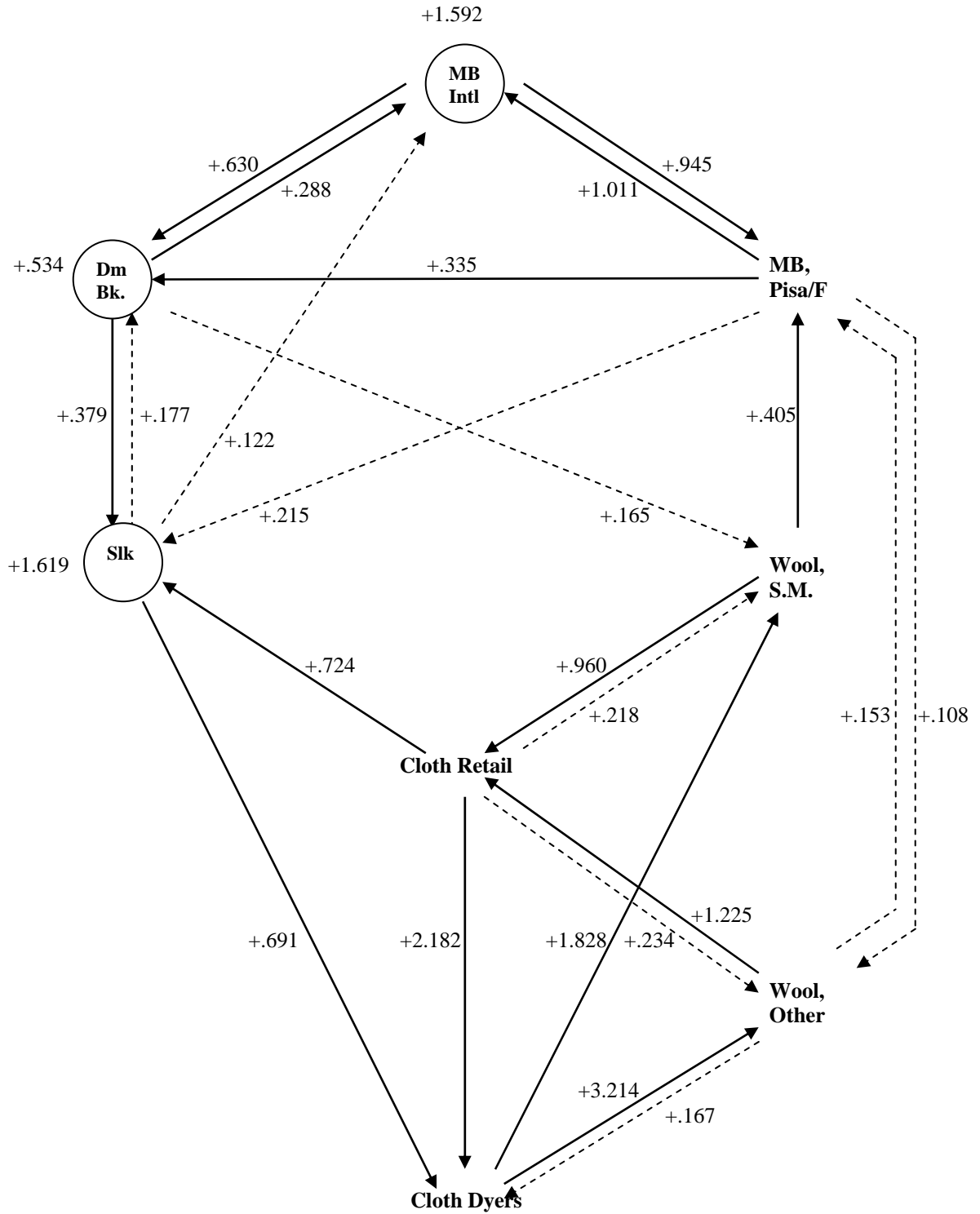
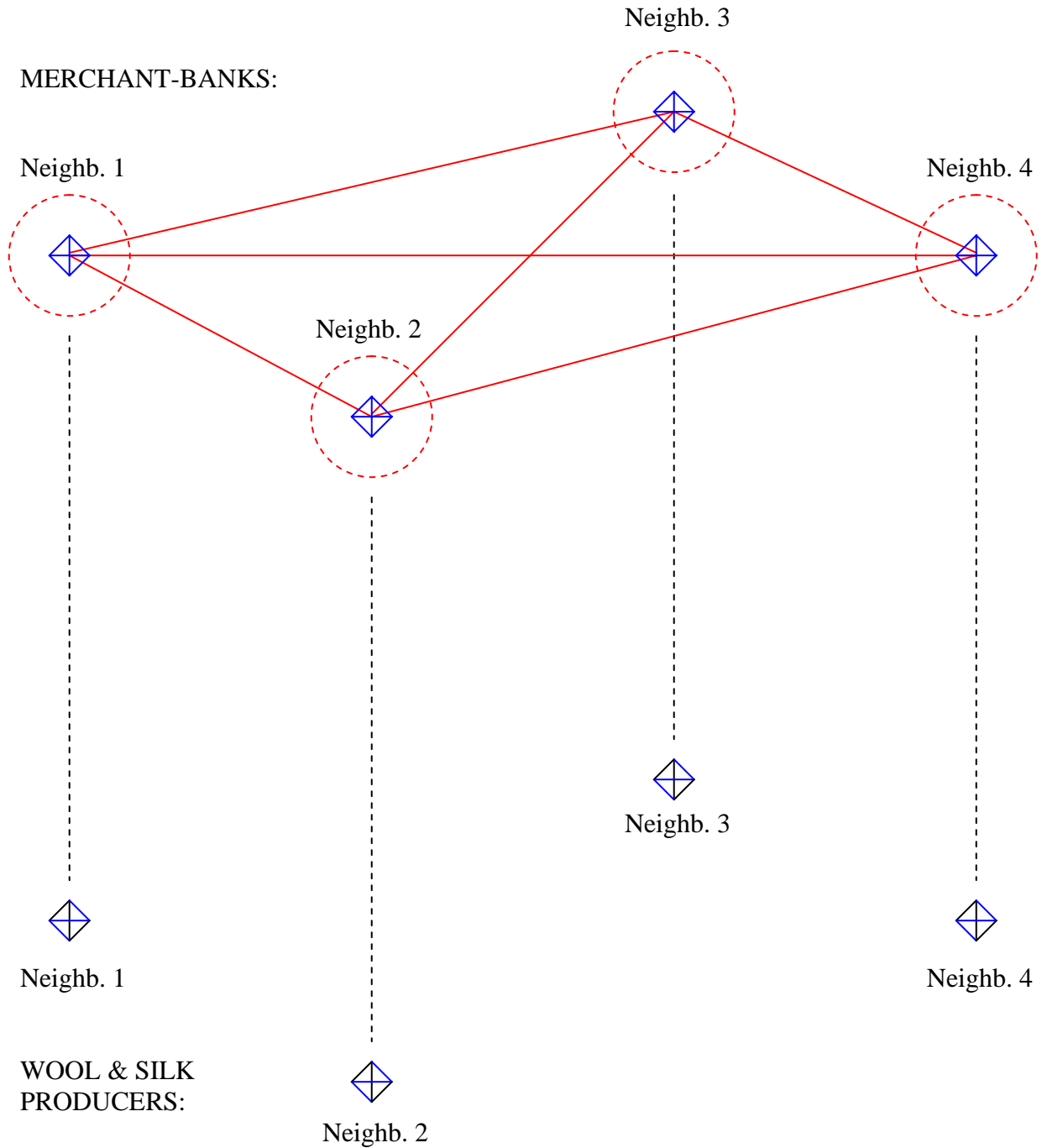


Figure 2. **INPUT-OUTPUT VOLUME OF CREDITS BETWEEN INDUSTRIES:**
 shown if $[(\text{Observed Credits} - \text{Expected Credits}) / (\text{Expected Credits})] > .10$



N.B.: $[(O-E) / E]$ controls for raw volume of credit effects. Dotted lines show weaker ratios.

Figure 3. Visual Summary of statistically significant Social-Embeddedness Coefficients



Color codes:

- | | | | |
|---|--|-----------|--|
| — | Partnership (any social class) | - - - - - | Credit (any social class) |
| — | Partnership (popolani + magnates) | - - - - - | Credit (popolani + magnate, plus any social class) |
| — | Partnership (new men + new-new men, and no admits) | | |

Appendix: PREDICTING COMMERCIAL CREDIT: Logit Regressions

As explained in the text, four logit-regressions were run for each market sector: one for all credits (dichotomized), one for reciprocal credits, one for multiple asymmetric credits, and one for single asymmetric (i.e., “transactional”) credits. The unit of analysis in all regressions was the dyad – namely, all pairs of companies active in the market sector in question, coded as a “one” if a directed credit of the specified type was actually observed between the pair of companies, and coded “zero” otherwise. In all regressions, we controlled for unobserved heterogeneity of companies, through the cluster option in Stata applied to company ID.

Social-embeddedness independent variables are listed in the tables. There were described in footnotes in the text. Tabular format for reporting logit-regression results is unorthodox. Instead of reporting each regression vertically in a column, as is traditional, we report by independent-variable clusters. We do this so that markets are laid out side by side for comparative inspection, thereby coordinating this appendix more closely with our discussion in the text.

We do not report here our final control-variable set of market-interface dummies, because these were distinctive to each market and hence were inconvenient to report within our format. Anyone who prefers to inspect the full results in traditional format can find that in a second appendix included in a longer version of this article posted on Padgett’s web page: www.home.uchicago.edu/~jpadgett.

KINSHIP EFFECTS ON COMMERCIAL CREDIT:**A. Nuclear Family** (excl. same partner):

	All credits (dichot.)	<u>Relational</u>		<u>Transactional</u> Single credits
		Reciprocal	Multiple (asym.)	
Between Merchant-banking & Silk mfct. companies	8.929**	15.818***	9.008	.935
Among Merchant-banking companies	2.761***	3.451***	4.420***	-1.200
Between Merchant-banking & Wool mfct. companies	3.516**	6.045***	-32.906***	1.475
Among Wool manufacturers	3.012*	----	----	1.623
Between Ritagliatori & Wool manufacturers	4.474	9.056**	[dropped]	.145
Among Ritagliatori	4.057	----	----	2.624
Between Ritagliatori & Silk manufacturers	[dropped]	----	----	[dropped]
Among Silk manufacturers	5.734**	----	----	5.674**

B. Patrilineal Family (excl. nuclear family):

	All credits = (dichot.)	<u>Relational</u>		<u>Transactional</u> Single credits
		Reciprocal +	Multiple (asym.)	+
Between Merchant-banking & Silk mfct. companies	.158	.277	1.809	-.842
Among Merchant-banking companies	1.688***	1.862**	1.704*	1.164*
Between Merchant-banking & Wool mfct. companies	.519	3.027**	-6.468	.350
Among Wool manufacturers	1.919	----	----	1.357
Between Ritagliatori & Wool manufacturers	1.944	[dropped]	[dropped]	2.376
Among Ritagliatori	.327	----	----	1.310
Between Ritagliatori & Silk manufacturers	[dropped]	----	----	[dropped]
Among Silk manufacturers	[dropped]	----	----	[dropped]

KINSHIP EFFECTS:**C. Inlaws** (nuclear-family inlaws):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	6.780^{***}		[dropped]	[dropped]		4.502[*]
Among Merchant-banking companies	2.187		2.752	5.741[*]		-.240
Between Merchant-banking & Wool mfct. companies	2.260		-6.158	-9.501 [*]		2.556
Among Wool manufacturers	3.318		----	----		2.705
Between Ritagliatori & Wool manufacturers	[dropped]		[dropped]	[dropped]		[dropped]
Among Ritagliatori	5.791[*]		----	----		[dropped]
Between Ritagliatori & Silk manufacturers	3.388		----	----		4.083[*]
Among Silk manufacturers	[dropped]		----	----		[dropped]

D. Parentado (extended-family inlaws):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-.959		-5.809	[dropped]		1.382
Among Merchant-banking companies	.258		-.480	.917		.136
Between Merchant-banking & Wool mfct. companies	.252		3.626^{**}	3.942^{**}		-.880
Among Wool manufacturers	-.724		----	----		-.172
Between Ritagliatori & Wool manufacturers	-16.146		[dropped]	3.753		[dropped]
Among Ritagliatori	2.223		----	----		-1.594
Between Ritagliatori & Silk manufacturers	[dropped]		----	----		[dropped]
Among Silk manufacturers	[dropped]		----	----		[dropped]

NEIGHBORHOOD EFFECTS:**A. Gonfalone:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.702*		1.628**	1.681		-.066
Among Merchant-banking companies	1.141***		1.307***	.672		.946***
Between Merchant-banking & Wool mfct. companies	.509*		.592	1.347*		.400
Among Wool manufacturers	-.205		----	----		-.307
Between Ritagliatori & Wool manufacturers	-.017		-3.137*	-.154		.295
Among Ritagliatori	1.203		----	----		.276
Between Ritagliatori & Silk manufacturers	-1.099		----	----		-1.126
Among Silk manufacturers	.069		----	----		-.185

B. Quarter (excl. gonfalone):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.261		-2.461***	.452		.523*
Among Merchant-banking companies	.080		-.109	-.741		.213
Between Merchant-banking & Wool mfct. companies	.239		.573	-.695		.183
Among Wool manufacturers	.197		----	----		.237
Between Ritagliatori & Wool manufacturers	.302		.198	-.627		.243
Among Ritagliatori	.254		----	----		.177
Between Ritagliatori & Silk manufacturers	-.631		----	----		-.571
Among Silk manufacturers	-.597		----	----		-.418

SOCIAL-CLASS EFFECTS:**A. Among Popolani & Magnates:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	-.023		.248	-.199		-.160
Among Merchant-banking companies	.056		.023	.224		.079
Between Merchant-banking & Wool mfct. companies	-.163		-.675*	-.265		-.146
Among Wool manufacturers	-.044		----	----		-.202
Between Ritagliatori & Wool manufacturers	.091		.658	-.616		-.001
Among Ritagliatori	.316		----	----		.548
Between Ritagliatori & Silk manufacturers	-.051		----	----		-.372
Among Silk manufacturers	-.614		----	----		-.289

B. Among New men & New-new men:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.424		-.844	1.666		.447
Among Merchant-banking companies	.085		-.016	-.483		.069
Between Merchant-banking & Wool mfct. companies	.076		-.543	-1.503		.286
Among Wool manufacturers	-.092		----	----		-.208
Between Ritagliatori & Wool manufacturers	.159		.021	.198		.533**
Among Ritagliatori	.799		----	----		1.365**
Between Ritagliatori & Silk manufacturers	.494		----	----		.504
Among Silk manufacturers	-.186		----	----		-.269

SOCIAL-CLASS EFFECTS:**C. Among families never admitted to Priorate:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	.420		.231	-1.469		.377
Among Merchant-banking companies	-.358		-.404	.204		-.629
Between Merchant-banking & Wool mfct. companies	.275		1.140*	-1.673		.121
Among Wool manufacturers	.367		----	----		.245
Between Ritagliatori & Wool manufacturers	.084		-.635	-.131		-.180
Among Ritagliatori	-.797		----	----		-.632
Between Ritagliatori & Silk manufacturers	1.386*		----	----		1.657**
Among Silk manufacturers	-.881		----	----		-.666

PARTNERSHIP-SYSTEM EFFECTS:**A. Within Partnership Systems** (same partner):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	4.827		-7.456*	8.617*		4.482
Among Merchant-banking companies	6.377***		7.268***	1.867		-1.549
Between Merchant-banking & Wool mfct. companies	6.523*		8.888*	14.532**		2.081
Among Wool manufacturers	13.694***		----	----		10.136*
Between Ritagliatori & Wool manufacturers	-1.146		[dropped]	[dropped]		4.041
Among Ritagliatori	15.859*		----	----		.239
Between Ritagliatori & Silk manufacturers	[dropped]		----	----		[dropped]
Among Silk manufacturers	[dropped]		----	----		[dropped]

B. Between Partnership Systems:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	.167		.412	.286		.161
Among Merchant-banking companies	.281**		.521*	-.395		.448***
Between Merchant-banking & Wool mfct. companies	.120		.101	.182		.148
Among Wool manufacturers	-.255		----	----		-.389
Between Ritagliatori & Wool manufacturers	.181		-.119	.309		.089
Among Ritagliatori	.395		----	----		.279
Between Ritagliatori & Silk manufacturers	-.008		----	----		.405
Among Silk manufacturers	[dropped]		----	----		[dropped]

POLITICAL-OFFICE EFFECTS:**A. Priorate** (% first: pre-1427):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	-.118		.837	-4.702**		-.212
Among Merchant-banking companies	1.185***		1.170	-.866		1.328**
Between Merchant-banking & Wool mfct. companies	.518		1.545*	.361		.442
Among Wool manufacturers	.462		----	----		.468
Between Ritagliatori & Wool manufacturers	-.034		-.581	1.331		.102
Among Ritagliatori	-.119		----	----		-.612
Between Ritagliatori & Silk manufacturers	.366		----	----		.760
Among Silk manufacturers	.458		----	----		1.033

B. Buonumini (% first: pre-1427):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	-.068		1.928**	2.041		-.815
Among Merchant-banking companies	-.702*		.374	-.887		-1.249**
Between Merchant-banking & Wool mfct. companies	-.924**		.476	-.175		-1.248***
Among Wool manufacturers	.038		----	----		.235
Between Ritagliatori & Wool manufacturers	-.146		-.604	-1.117		-.272
Among Ritagliatori	-.063		----	----		-.050
Between Ritagliatori & Silk manufacturers	-.384		----	----		-.424
Among Silk manufacturers	-.422		----	----		-.501

POLITICAL-OFFICE EFFECTS:**C. Gonfalonieri** (% first: pre-1427):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-.003		-1.578*	1.329		.725
Among Merchant-banking companies	-.348		-1.245	.903		.153
Between Merchant-banking & Wool mfct. companies	.014		-1.003	.168		.222
Among Wool manufacturers	-.351		----	----		.000
Between Ritagliatori & Wool manufacturers	.304		.750	-.028		.607*
Among Ritagliatori	.210		----	----		.755
Between Ritagliatori & Silk manufacturers	.589		----	----		.864
Among Silk manufacturers	.696		----	----		.628

D. Guild consuls (% first: pre-1427):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	.508		-1.269	.022		.646
Among Merchant-banking companies	.280		.143	1.997*		.046
Between Merchant-banking & Wool mfct. companies	.238		-1.819**	-1.139		.605
Among Wool manufacturers	-.578		----	----		-1.059**
Between Ritagliatori & Wool manufacturers	.026		-.742	.501		.150
Among Ritagliatori	.649		----	----		.817
Between Ritagliatori & Silk manufacturers	-.418		----	----		-.610
Among Silk manufacturers	-.385		----	----		-.683

POLITICAL-OFFICE EFFECTS:**E. Mercanzia** (% first: pre-1427):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-.546		-.757	3.336		-.504
Among Merchant-banking companies	-.069		-.145	1.149		-.043
Between Merchant-banking & Wool mfct. companies	.506		1.805	-.090		.227
Among Wool manufacturers	-.853		----	----		-.947
Between Ritagliatori & Wool manufacturers	.023		3.594**	-.315		-.593
Among Ritagliatori	-.941		----	----		-3.499
Between Ritagliatori & Silk manufacturers	-2.257*		----	----		-4.657**
Among Silk manufacturers	-1.976**		----	----		-1.881**

POLITICAL-FACTION EFFECTS:**A. Mediceans (1430-33):**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	3.087*		-4.771	8.897**		3.391**
Among Merchant-banking companies	.532		1.874**	-4.312		.085
Between Merchant-banking & Wool mfct. companies	.139		1.746	1.799		-.432
Among Wool manufacturers	.479		----	----		-.385
Between Ritagliatori & Wool manufacturers	-.448		-3.057	-7.638		.221
Among Ritagliatori	-2.672		----	----		1.043
Between Ritagliatori & Silk manufacturers	1.293		----	----		3.375
Among Silk manufacturers	13.069*		----	----		17.242**

B. Albizeans (1434):

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-.233		[dropped]	3.540		.269
Among Merchant-banking companies	.698		2.928***	-3.423		-2.498
Between Merchant-banking & Wool mfct. companies	2.066*		[dropped]	-5.757		2.534**
Among Wool manufacturers	[dropped]		----	----		[dropped]
Between Ritagliatori & Wool manufacturers	[dropped]		[dropped]	[dropped]		[dropped]
Among Ritagliatori	[dropped]		----	----		[dropped]
Between Ritagliatori & Silk manufacturers	[dropped]		----	----		[dropped]
Among Silk manufacturers	1.348		----	----		2.010

CONTROL VARIABLES: RANDOM BASELINE**A. Expected credits, based on company sizes alone**

	All credits (dichot.)	=	<u>Relational</u> Reciprocal + Multiple		+	<u>Transactional</u> Single credits
				(asym.)		
Between Merchant-banking & Silk mfct. companies	5.768 ^{***}		3.206 ^{***}	6.777 ^{***}		3.875 ^{***}
Among Merchant-banking companies	3.291 ^{***}		2.181 ^{**}	1.996 ^{**}		1.186 ^{***}
Between Merchant-banking & Wool mfct. companies	7.270 ^{***}		2.510 ^{***}	4.577 ^{***}		4.125 ^{***}
Among Wool manufacturers	9.126 ^{***}		----	----		7.217 ^{***}
Between Ritagliatori & Wool manufacturers	4.876 ^{***}		1.819 ^{***}	3.699 ^{***}		1.567 ^{***}
Among Ritagliatori	7.308 ^{**}		----	----		6.816 [*]
Between Ritagliatori & Silk manufacturers	7.542 ^{***}		----	----		6.041 ^{***}
Among Silk manufacturers	7.812 ^{***}		----	----		6.780 ^{***}

CONTROL VARIABLES: ACCOUNTS CODED DIRECTLY VERSUS INDIRECTLY**A. Creditor bilanci seen**

	All credits (dichot.)	=	<u>Relational</u> Reciprocal + Multiple (asym.)		+	<u>Transactional</u> Single credits
Between Merchant-banking & Silk mfct. companies	.539**		.320	-.049		.820***
Among Merchant-banking companies	.386**		.561*	.190		.383*
Between Merchant-banking & Wool mfct. companies	.629***		1.086**	.962*		.618***
Among Wool manufacturers	.816**		----	----		.750*
Between Ritagliatori & Wool manufacturers	.237		1.133*	.577		.305*
Among Ritagliatori	1.815*		----	----		1.771*
Between Ritagliatori & Silk manufacturers	1.415**		----	----		1.535**
Among Silk manufacturers	.837*		----	----		.701

B. Debtor bilanci seen

	All credits (dichot.)	=	<u>Relational</u> Reciprocal + Multiple (asym.)		+	<u>Transactional</u> Single credits
Between Merchant-banking & Silk mfct. companies	.230		.467	-.688		.366
Among Merchant-banking companies	.475**		.458	.633		.609***
Between Merchant-banking & Wool mfct. companies	.445***		1.147**	-.073		.552***
Among Wool manufacturers	.463*		----	----		.389
Between Ritagliatori & Wool manufacturers	-.028		.996*	-.217		-.034
Among Ritagliatori	.558		----	----		.587
Between Ritagliatori & Silk manufacturers	-.106		----	----		-.046
Among Silk manufacturers	.270		----	----		.148

CONTROL VARIABLES: PARTNERS' WEALTH**A. Sum total of Creditor company's partners' taxable wealth**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-1.91e-6		8.18e-6	-2.72e-6		-2.60e-6
Among Merchant-banking companies	1.67e-6		1.97e-6	2.34e-6		2.21e-6
Between Merchant-banking & Wool mfct. companies	1.32e-6		-5.39e-6	3.85e-6		3.58e-6
Among Wool manufacturers	0.74e-6		----	----		1.53e-6
Between Ritagliatori & Wool manufacturers	-3.23e-6		11.8e-6	-4.44e-6		-6.56e-6
Among Ritagliatori	-0.47e-6		----	----		17.8e-6
Between Ritagliatori & Silk manufacturers	9.70e-6		----	----		3.05e-6
Among Silk manufacturers	-9.11e-6		----	----		-13.1e-6

B. Sum total of Debtor company's partners' taxable wealth

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	-6.27e-6		1.79e-6	-19.4e-6 ^{**}		-4.84e-6
Among Merchant-banking companies	0.31e-6		-0.07e-6	-4.30e-6		1.39e-6
Between Merchant-banking & Wool mfct. companies	-1.00e-6		3.31e-6	7.12e-6		-1.10e-6
Among Wool manufacturers	-0.01e-6		----	----		1.17e-6
Between Ritagliatori & Wool manufacturers	0.11e-6		9.58e-6	-21.1e-6		-1.86e-6
Among Ritagliatori	-21.8e-6		----	----		-7.63e-6
Between Ritagliatori & Silk manufacturers	14.4e-6		----	----		7.85e-6
Among Silk manufacturers	-13.0e-6		----	----		-26.3e-6 [*]

CONTROL VARIABLES: TRIADIC EFFECTS**A. Number of Transitive triads:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.154**		.080	.074		.228***
Among Merchant-banking companies	.095*		-.023	.177*		.128**
Between Merchant-banking & Wool mfct. companies	.082**		-.047	.113		.120***
Among Wool manufacturers	.095		----	----		.049
Between Ritagliatori & Wool manufacturers	.028		-.143	.101		.084
Among Ritagliatori	.061		----	----		.056
Between Ritagliatori & Silk manufacturers	.038		----	----		.155
Among Silk manufacturers	-.188*		----	----		-.179

B. Number of Cyclic triads:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.095		.278***	-.176		.029
Among Merchant-banking companies	.028		.112**	-.039		-.031
Between Merchant-banking & Wool mfct. companies	-.027		.025	-.264		-.024
Among Wool manufacturers	.046		----	----		-.039
Between Ritagliatori & Wool manufacturers	.033		.227**	-.044		-.081
Among Ritagliatori	.050		----	----		.029
Between Ritagliatori & Silk manufacturers	.084		----	----		.112
Among Silk manufacturers	-.025		----	----		-.028

CONTROL VARIABLES: TRIADIC EFFECTS**C. Number of In triads:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.137**		.040	-.206		.182***
Among Merchant-banking companies	.078***		.105**	-.094		.082***
Between Merchant-banking & Wool mfct. companies	.039*		.099***	.119*		.028
Among Wool manufacturers	.197*		----	----		.186*
Between Ritagliatori & Wool manufacturers	.085**		.106*	-.066		.118**
Among Ritagliatori	.030		----	----		.038
Between Ritagliatori & Silk manufacturers	.127*		----	----		.016
Among Silk manufacturers	.083		----	----		.078

D. Number of Out triads:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	+ Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.045		.169*	.104		-.012
Among Merchant-banking companies	.052*		.021	.164**		.078*
Between Merchant-banking & Wool mfct. companies	.097**		.153*	.080		.124***
Among Wool manufacturers	.056*		----	----		.078**
Between Ritagliatori & Wool manufacturers	.111*		-.016	-.060		.160***
Among Ritagliatori	-.194		----	----		-.294
Between Ritagliatori & Silk manufacturers	-.213*		----	----		-.270**
Among Silk manufacturers	.117		----	----		.159

GOODNESS-OF-FIT STATISTICS:**A. Pseudo R²**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	.316		.299	.442		.241
Among Merchant-banking companies	.241		.267	.262		.118
Between Merchant-banking & Wool mfct. companies	.365		.284	.453		.244
Among Wool manufacturers	.247		----	----		.185
Between Ritagliatori & Wool manufacturers	.377		.222	.422		.232
Among Ritagliatori	.315		----	----		.245
Between Ritagliatori & Silk manufacturers	.314		----	----		.271
Among Silk manufacturers	.271		----	----		.236

B. Log likelihood:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u>
			Reciprocal	Multiple (asym.)		Single credits
Between Merchant-banking & Silk mfct. companies	-1087.1		-295.4	-111.7		-.943.6
Among Merchant-banking companies	-1969.8		-833.1	-319.9		-1445.4
Between Merchant-banking & Wool mfct. companies	-2489.7		-487.3	-282.3		-2465.4
Among Wool manufacturers	-812.9		----	----		-.791.3
Between Ritagliatori & Wool manufacturers	-1545.5		-301.2	-330.1		-1571.2
Among Ritagliatori	-166.8		----	----		-159.0
Between Ritagliatori & Silk manufacturers	-363.0		----	----		-308.3
Among Silk manufacturers	-379.8		----	----		-368.7

NUMBER OF OBSERVATIONS:**A. Total number of dyads:**

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	10,620		10,620	10,620		10,620
Among Merchant-banking companies	13,806		13,806	13,806		13,806
Between Merchant-banking & Wool mfct. companies	37,288		37,288	37,288		37,288
Among Wool manufacturers	15,004		15,004	15,004		15,004
Between Ritagliatori & Wool manufacturers	8,608		8,608	8,608		8,608
Among Ritagliatori	1,190		1,190	1,190		1,190
Between Ritagliatori & Silk manufacturers	3,150		3,150	3,150		3,150
Among Silk manufacturers	1,980		1,980	1,980		1,980

B. Number of non-zero observations:

	All credits (dichot.)	=	<u>Relational</u>		+	<u>Transactional</u> Single credits
			Reciprocal	+ Multiple (asym.)		
Between Merchant-banking & Silk mfct. companies	365		70	29		266
Among Merchant-banking companies	642		222	68		352
Between Merchant-banking & Wool mfct. companies	815		98	71		646
Among Wool manufacturers	204		14	11		179
Between Ritagliatori & Wool manufacturers	722		66	106		550
Among Ritagliatori	62		8	3		51
Between Ritagliatori & Silk manufacturers	126		26	6		94
Among Silk manufacturers	146		8	7		131