

The Institutions of Roman Markets

Benito Arruñada*

In Giuseppe Dari-Mattiacci and Dennis Kehoe (eds.), *Roman Law and Economics*, vol. 2, Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.), Chapter 17, Oxford University Press, Oxford, 2020.

Abstract

The chapter analyzes the basis of the market economy in classical Rome, from the perspective of personal vs impersonal exchange and focusing on the role of the state in providing market-enabling institutions. It starts by reviewing the central conflict in all exchanges between those holding and those acquiring property rights, and how solving it requires reducing information asymmetry without endangering the security of property. Relying on a model of the social choice of institutions, the chapter identifies the demand and supply factors driving the institutional choices made by the Romans, and examines the economic circumstances that influenced these factors in the classical period of Roman law. Comparing the predictions of the model with the main solutions used by Roman law in the areas of property, business exchange, and the enforcement of personal obligations allows the chapter to propose alternative interpretations for some salient institutions that have been subject to controversy in the literature, and to conclude with an overall positive assessment of the market-enabling role of the Roman state.

Keywords: economics of ancient law, economics of ancient societies, economic analysis of Roman law, law and economics, Roman history, property rights, transaction costs, registries, impersonal exchange, new institutional economics.

JEL: D1, D23, G38, K11, K12, K14, K22, K36, L22, N13, O17, P48.

* Pompeu Fabra University and Barcelona GSE. E-mail: benito.arrunada@upf.edu. This work has benefitted from advice and comments received from Maria Brosius, Yun-chien Chang, Giuseppe Dari-Mattiacci, Damián Fernández, Stephen Hansen, François Lerouxel, Joe Manning, Fernando P. Méndez González, Thomas McGinn, Pedro Pernas, Paul du Plessis, Dominic Rathbone, José Remesal Rodríguez, Jane Rowlandson, Carlos Sánchez-Moreno Ellart, Peter Temin, Rick Verhagen, an anonymous reviewer, and participants at the Economic History Seminar of Carlos III University, the Bozen workshop on “The Institutions of Property Rights,” the Italian Society of Law and Economics, the Spanish Association of Law and Economics, and the 18th annual conference of the International Society for New Institutional Economics (Duke University). Usual disclaimers apply. It received support from the Spanish Ministry of the Economy and Competitiveness through grants ECO2014-57131-R and ECO2017-85763-R, and the Severo Ochoa Program for Centers of Excellence in R&D (SEV-2015-0563). This work is a considerably expanded and revised version of Arruñada (2016).

1. Introduction: The institutions of impersonal exchange¹

Opportunities for economic growth are greater when trade, instead of being limited to known people, is impersonal. This is so especially when “impersonal” means that contractual performance is totally independent of hard-to-observe parties’ characteristics, including not only their reputation and wealth but also their legal authority to commit strangers to the contract.² However, such fully impersonal trade requires contractual enforcement to be based on assets (i.e., to convey *in rem* rights or, in general, priority to acquirers) and this poses a conflict between those holding and those acquiring property rights. This conflict between owners and buyers is present in both property and business contexts in which owners explicitly act through contractual agents. This chapter analyzes the sophisticated institutions used in classical Rome to overcome such conflict, reducing information asymmetry without endangering property rights.

Given that property rights are the foundation of economic incentives and prosperity, one might think that, in case of conflict with acquirers, goods should always be returned to their owners unless they had granted their consent. However, such strict enforcement of property rights as rights *in rem* would increase transaction costs by worsening the information asymmetry suffered by acquirers of all sorts of rights, who would always have to gather the consent of the previous owners without even knowing who they are. Strictly enforcing property rights would therefore endanger trade. Moreover, it would also endanger specialization, because specialization is often based on having agents acting as owners’ representatives, and, with universal strict enforcement, acquirers would have reasons to doubt the legal authority of sellers.

Economic growth therefore requires this conflict between property enforcement and transaction costs to be minimized, so that both current owners and acquirers are efficiently protected. Protecting owners’ property rights encourages investment, and reducing the transaction costs faced by acquirers encourages them to trade impersonally and thus improves the allocation and specialization of resources. Owners’ consent must be preserved but enforced in a way that makes trade possible. And current owners have an interest in tackling the conflict, not only because they are potential sellers but also because, being acquirers with respect to the previous owners, they could eventually lose their title.

The nature of the problem can be clarified by considering that most economic transactions are interrelated sequentially, as most transactions legally interact with previous transactions. In the most simple sequence, with only two transactions, one or several “economic principals”—such as owners, employers, shareholders, creditors, and the like—

¹ This section summarizes the argument in Arruñada (2012:15–42) and Arruñada, Zanarone and Garoupa (2019).

² Other concepts of impersonal exchange use less stringent requirements, such as, mainly, trade in the shadow of an independent court (North 1990:34–35), but also trade with strangers, equal treatment of market participants, presence of assurance intermediaries, or posted prices available to any buyers (Arruñada 2012:15–18).

first voluntarily contract with one or several economic “agents”—possessors, employees, company directors, and managers—in an “originative” transaction. Second, the agent then contracts “subsequent” transactions with third parties.³ Understandably, it is necessary to optimize the total costs of transacting, considering both originative and subsequent transactions.

Sequential exchange is necessary to specialize the tasks of principals and agents—between landowners and farmers, employers and employees, shareholders and managers, and so on in the originative contract. But it also gives rise to substantial transaction costs, because, when third parties contract with the agent in the subsequent contract, they suffer information asymmetry regarding not only the material quality of the goods or services being transacted but also the legal effects of the previous originative contract. In particular, third parties are often unaware if they are dealing with a principal or an agent, or if the agent has sufficient title or legal power to commit the principal.

Moreover, principals face a commitment problem when trying to avoid this asymmetry because their incentives change after the third party has entered the subsequent contract. In an agency setup, before contracting, principals have an interest in third parties being convinced that agents have proper authority. However, if the business turns out badly and there are no further incentives in place, principals will be inclined to deny such authority.⁴ The typical dispute triggered by the sequential nature of transactions is one in which the principal tries to elude obligations assumed by the agent in the principal’s name, whether the agent had legal authority or not.

In principle, judges may adjudicate in such disputes in favor of the principal or the third party. I will refer to favoring the third party as enforcing “contract” rules, as opposed to the seemingly more natural “property” rules that favor the principal.⁵ The effects of these rules

³ This use of “agency” language for describing property cases may puzzle readers familiar with the legal concept of agency. However, it is convenient for generalizing the argument, encompassing all types of transactions.

⁴ This is easy to grasp in a legal agency setup as, e.g., when contemplating the relationship between a shareholder (principal), a corporate representative (agent) and a corporate lender (third party). A typical property conflict is that between a first buyer (principal), a seller (agent) and a second buyer (third party). In such a case, the commitment refers to the seller’s promise not to sell twice. Ex ante, she is interested in committing herself, in order to encourage the buyer to buy; but her incentives change after the sale. The text could therefore read: Before the originative sale contract, sellers (i.e., agents) have an interest in buyers (i.e., principals) being convinced that they will not cheat through a subsequent transaction (e.g., a second sale), but their incentives change after the first sale.

⁵ These labels parallel the legal origin of the dichotomy and should prevent confusion with related but drastically different concepts. In particular, the rules are similar but distinct from the “property” and “liability” rules defined in an influential work by Calabresi and Melamed (1972) because, instead of a taking that affects only two parties, here the rules are defined in the context of a three-party sequence of two transactions. Moreover, my analysis focuses on the role played by the parties in each transaction, disregarding that current third parties will often act as principals in a future sequence of transactions. Consequently, when good-faith third parties win a dispute over their acquisitive transaction (i.e., when they are given a property right), they do not win by virtue of a property rule, as this—by definition—would have given the good to the original owner. In such a case, the third party does not pay any monetary damages to the original owner, as in Calabresi and Melamed’s liability rule. A final difference is that Calabresi and Melamed’s property rule is weaker, referring only to the ability to force a would-be taker to bargain for a consensual transfer similar to specific performance, which thus arguably has little to do with a right *in rem* (Merrill and Smith 2001).

are clear. Take the simple case in which an agent exceeds his legal powers when selling a good to an innocent third party (i.e., a good-faith party who is uninformed about the matter in question). When applying the “property rule” that no one can transfer what he does not have, judges have the sold good returned to the previous owner, who is therefore granted a right *in rem*, and give the innocent third party a mere claim *in personam* against the agent. Conversely, judges may apply an indemnity or contract rule so that the sold good stays with the acquiring third party and the owner-principal only wins a personal claim against the agent.

The difference in the value of these legal remedies—real or personal— is substantial because the enforceability of these two types of right is often markedly different. While rights *in personam* are only valid against specific persons, *inter partes*, rights *in rem* are valid against all individuals, *erga omnes*. The latter, therefore, provide the strongest possible enforcement: without the consent of the rightholder, rights *in rem* remain unaffected. When the thing is a parcel of land, the difference in value often ranges from full value for the party being adjudicated the land, to zero value for the party being given a claim to be indemnified by an insolvent person. (Similar differences arise in business and corporate contexts, where a parallel distinction is often made, but framed in more general terms: not in terms of rights but in terms of legal priority.)

If judges apply a property rule, maximizing property enforcement, owners will feel secure with respect to future acquisitions but all potential acquirers will suffer greater information asymmetry with respect to legal title, endangering trade. Conversely, if judges apply a contract rule, minimizing information asymmetry for potential acquirers, they weaken property enforcement, making owners feel insecure, endangering investment and specialization. The choice of rule therefore involves a conflict between property enforcement and transaction costs—more generally, a conflict between the transaction costs of origination and subsequent contracts.

To overcome the conflict, expanding the set of viable contractual opportunities with minimal damage to property rights, different solutions will be appropriate, depending on the circumstances of each type of right and transaction. The legal system may directly choose to enforce some rights in a certain way or, more generally, give freedom to rightholders about which rule to apply. However, when rightholders are free to choose, the legal system must guarantee their commitment, which in some cases is automatic as a byproduct of market interactions but in others requires costly organizations such as public registers.

In general, for judges to apply property rules, which favor owners, owners must have publicized their claims or their rights, which should protect acquirers. That is, owners can opt for a property rule to make their rights stronger, but, thanks to publicity, acquirers suffer little information asymmetry. Conversely, for judges to apply contract rules, which favor acquirers, owners must have granted their consent, which should protect them. That is, when it is in the owners’ interest to reduce transaction costs, they choose a contract rule, so that acquirers’ rights are stronger, whereas owners’ rights are weaker. This weakening of property is safeguarded by the fact that it is owners—in general terms, principals—who choose e.g. the agent to whom they entrust possession or appoint as their representative, while implicitly, and simultaneously, opting for a contract rule. However, commitment to their choice is also necessary.

Smooth operation of this conditional application of rules poses varying degrees of difficulty for different transactions. The difficulty is relatively minor when the origination transaction produces verifiable facts, such as the physical possession of movable goods by a merchant or a house by a lessee, or the ordinary activity of an employee. For these cases,

judges can base their decisions on this public information, which is produced without any explicit formal intervention. What judges or legislatures have to do is only to clearly define the rules to be applied.

The difficulty is greater when the originative transaction produces less verifiable facts, making private (i.e., contractual, as opposed to institutional) solutions harder to apply. Such private solutions may even be impossible if all the information on the transaction remains hidden and its consequences are not verifiable. Consider, for example, the difficulties of using land as collateral when hidden mortgages are enforced on the basis of contractual documents (Arruñada 2003). Given the possibility of antedating mortgage deeds, judges would be basing their decisions on unreliable information, and lenders would be reluctant to contract for fear of previous mortgages emerging. In such a context, rules alone are not enough because applying them requires verifiable information on the titling-relevant elements of originative contracts. To produce such information, it is necessary to enforce only those mortgages that have been made public, usually by entering them into a public register. Something similar happens when establishing by purely private contract the existence of a corporation, distinguishing the corporation's assets from the personal assets of its shareholders (Arruñada 2010).

This analytical perspective, which focuses on contract interaction and sequential exchange, in which there are at least two transactions and three relevant parties, is necessary for improving our understanding of transaction costs in impersonal markets, and the role that institutions play to contain them. In particular, it prevents contractual problems being considered as referring to only two parties, even for situations in which the dominant conflict may well be multilateral. For instance, when considering the institutions of Roman markets, a prominent survey (Frier and Kehoe 2007:134–37) discusses the tragedy of the commons and the bilateral conflict between the owner and the potential trespasser or usurper, but sidelines the multilateral conflict, which is central for any property market, between alternative claimants and acquirers (e.g., between owner, seller and acquirer or between an owner in debt and successive creditors).

2. Institutional choice

Environmental circumstances, such as the cost and benefits of registry services and their palliatives, as well as the distribution of trading opportunities in the economy will also affect the relative value of personal and impersonal solutions. To structure the analysis, and taking land transactions as the baseline, figure 1 represents the hypothetical social decision on whether or not to build the institutions to support impersonal exchange. In essence, it assumes that more impersonal exchange requires a fixed cost F for putting in place the necessary institution, such as a land registry.⁶ If such an institution is created, individuals can then

⁶ Using discrete categories of personal and impersonal exchange is a simplification. Moreover, personal exchange also often requires institutional support which incurs fixed and variable costs, as the historical examples below will make clear. However, for the sake of simplicity, I will omit them, assuming that they are lower than those for impersonal exchange, so that the costs considered in the

choose to trade personally or impersonally. To trade impersonally, they incur an additional unit cost but their assets become more valuable. Following Arruñada and Garoupa (2005), the social value of an asset, such as, e.g., a parcel of land (represented on the vertical axis), is assumed to depend on the probability that claimants with better legal rights may appear and is thus a fraction of its value in an ideal world with no conflicting claims, represented on the horizontal axis. This fraction depends on the availability of institutions and the individual decisions to use them or not, and it is lower if the asset is traded in a more personal way—in land, it remains under private titling, or “privacy,” for short. To simplify matters, the figure represents all the assets available in the area served by a certain institution, such as a registry, that costs an amount F to put in place. Publicly titling a particular parcel of land means that, by incurring an additional unit cost (given by the intercept of the public titling line), the probability of a conflicting claim on that land being successful falls with respect to privacy. In other words, by publicly titling, the value of the asset increases by a certain percentage: with respect to the privacy line, the public titling line has a negative intercept but is steeper.

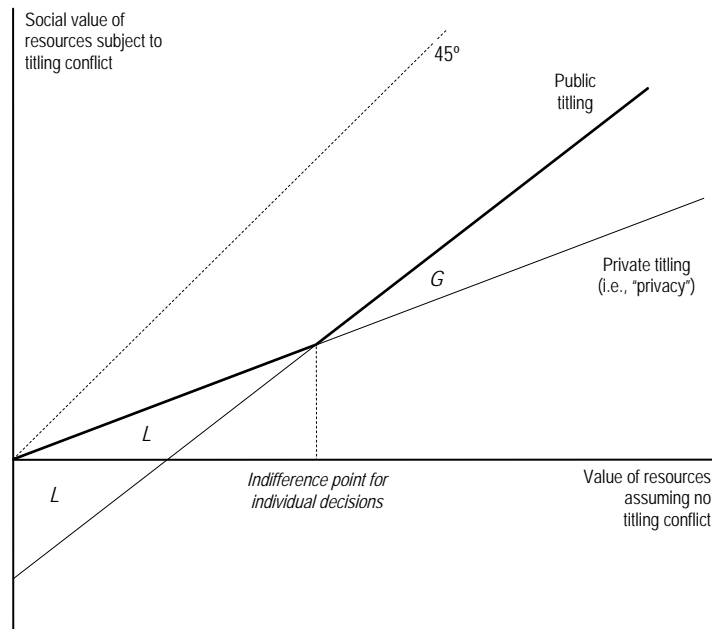
The social choice of institutions is therefore driven by the fixed and variable costs of the different institutions and the value of resources in the economy, represented in the figure by their distribution along the horizontal axis. When public titling is available, owners incur a unit per-parcel cost for publicly titling their land, given by the intercept of the public titling line. They will choose not to publicly title the less valuable parcels: those below the indifference point in the figure. Area G therefore represents the potential gain from using public titling institutions, which are only used for higher-value resources.⁷

In a given geographical or historical context, the optimality of introducing public titling hinges on the difference between the titling gains G and the fixed costs, if any, of establishing the titling system, F ; and the main determinants of these gains and costs are: (1) the statistical distribution of the resource in the economy, represented by its distribution along the horizontal axis; (2) the costs and effectiveness of public titling, given respectively by the differential fixed cost of establishing the titling system (F), the differential variable or unit costs represented by the intercept of the public titling function and its slope (which for land is equal to one, minus the probability of eviction); and (3) the cost and effectiveness of privacy, given by the variable costs represented by its intercept (assumed in the figure to be zero) and the slope of the privacy function.

analysis must be understood as the cost differences between institutions enabling relatively more or less impersonal exchange.

⁷ For a more detailed analysis, see Arruñada and Garoupa (2005:713–25). Area L is the potential loss when public titling is made mandatory, so that even low-value resources are publicly titled, resulting in overtitling of low-value land. This possibility is more theoretical than real, because, in practice, the effectiveness of mandatory titling is limited to initial allocation of titles, as shown by the recurrent failure to register second transactions after land titling efforts (Arruñada 2012:147).

Figure 1. Choice between personal and impersonal exchange to maximize social value of productive resources



Note: The figure represents how the social value of resources such as, e.g., land (*vertical axis*) is a function of their theoretical value assuming no conflicting claims (*horizontal axis*) and the availability of institutions (e.g., land registries) for public titling. Social choice of institutions is driven by these costs and the statistical distribution of the value of resources in the economy along the horizontal axis. Area *G* represents the potential gain from using institutions suitable for impersonal exchange for high-value resources, and area *L* the potential loss from using them for low-value resources (by, e.g., overtitling low-value land).
 Source: Adapted from Arruñada and Garoupa (2005:717, figure 2).

The situation in the classical period of Roman law (including the last two centuries of the Republic and up to the second half of the third century C.E.) can be hypothesized as: (1) offering considerable gains as a consequence of relatively extensive markets, so that a substantial proportion of resources lies to the right of the horizontal axis, capturing the effect of greater demand and opportunities for impersonal exchange; (2) maybe suffering high fixed and variable costs of creating (i.e., cost *F*) and operating (the line's intercept) what would be relatively ineffective (i.e., with a relatively flat line) registries; and (3) enjoying refined institutions for personal exchange (privacy), which made palliatives relatively effective by enacting rules and maximizing the use of available evidence (i.e., obtaining a steeper slope for the personal exchange line).

The rest of the chapter will address these three issues in the Roman context. Section 3 explores to what extent Roman markets would have benefitted from institutions making impersonal exchange easier. Section 4 examines the difficulties that the Romans of the West may have faced for archiving information, making registries more costly or less effective. Then, the bulk of the chapter studies the main sets of palliative solutions used for channeling different types of exchange in the areas of property (section 5), business (6) and the enforcement of personal obligations (7), making personal exchange (privacy) regimes more effective. Sections 3-4 explore the factors behind the institutional choice while sections 5-7 review their content. Section 8 concludes by examining the overall role of the Roman state with respect to the market.

Before moving ahead, some caveats are in order to clarify the boundaries of the analysis. First, the above conjectures assume that privacy was the predominant solution for the conveyancing of land during the classical period. Even though some public titling solutions were also available—in particular, public conveyances through ceremonies (*mancipatio*) and judicial intervention (*in iure cessio*)—these were not based on registries and therefore presented different costs and effectiveness (see, for a complementary discussion, Arruñada, 2015).⁸

Second, when the analysis is applied not to land but to other types of goods, it must be kept in mind that for originative transactions that produce some verifiable consequences, such as the possession of an asset or the activity of an employee, these consequences can be relied upon to ground judicial decisions on subsequent contracts with third parties. In terms of Figure 1, this means that the personal-exchange line will be—*ceteris paribus*—steeper than for those other transactions which lack verifiable consequences, such as, for instance, mortgages.

Third, from this perspective, solutions for personal and impersonal exchange are seen as substitutes: if personal exchange is made easier, impersonal exchange becomes more expensive.⁹ However, the state also builds institutions that make personal exchange more easily enforceable: e.g., if the state opens jails for putting debtors in prison, these will be a complement to personal exchange. The same holds for civil registries and other systems that facilitate the identification of individuals and therefore the enforcement of their personal obligations.

Fourth, there has been much discussion about to what extent it makes sense to use modern economic concepts when analyzing ancient economies. The above analysis assumes, and the next sections aim to show, that the basic problems that market participants faced in Roman times were *essentially* the same as those they face now: the need to efficiently overcome information asymmetries with respect to title and legal authority in order to enforce property rights and reach specialization advantages in contracting. Institutions of course adapt to the specific technological and economic circumstances at any time, but this adaptation is always governed by the same basic forces. The analysis may be new but the problems are not. The relative importance of the problems is probably different, and, in the Roman case, this is applicable, in particular, to the relative prevalence and the consequent interactions between personal and impersonal exchange. However, one should not ascribe personal exchange to nonmarket relations. Even today, most market exchange is personal to the extent it relies on information about the parties' attributes. In particular, exchange can be personal without being based on domination or power, an aspect that might be relevant for the ongoing discussion between “primitivist and/or substantivist” and “modernist and/or formalist” positions (using the labels in Scheidel 2012:7–10).

⁸ Especially in the pre-classical period, the Romans used a form of conveyance known as *mancipatio* that I will analyze in section 5.1. It was public but did not rely on registries, therefore did not incur a fixed cost F , but its effectiveness was likely limited to the local market. Roman Egypt did rely on a sophisticated system of registers, but it predated Roman conquest.

⁹ Note that my argument is about substitution between personal and impersonal exchange, both happening in the market, not between market and non-market forms of exchange, as seemingly discussed by, e.g., Temin when arguing that the Roman “economy of friends” was a complement of the formal market (Temin 2013:110–11, 148). I.e., to the extent that reputation, friendship and other social ties acted as safeguards of market exchange, they were complements of the market, but making personal exchange possible, which was a substitute of impersonal exchange.

Lastly, I will not analyze factors making all types of market exchange—both personal and impersonal—and, in particular, long-distance trade viable, such as, mainly, the effectiveness of the Roman state in providing: (1) a stable currency; (2) a tolerable tax burden and little government intervention; (3) security of property in a wide geographical area, with, e.g., little piracy in the Mediterranean; and (4) a hybrid but comprehensive judicial system which, without destroying local legal systems, covered the whole of the Empire through potential appeals to Rome. My objective is to analyze the main features of a few salient institutions from the perspective of personal-versus-impersonal exchange, in the hope of suggesting some alternative interpretations. With this in mind, I will examine some classic controversies, aiming to clarify some of their main elements.

3. Institutional demand: Opportunities for impersonal exchange in the Roman economy

With the expansion and consolidation of the Roman state during the Republic, the Roman economy developed in the direction of providing greater opportunities for impersonal exchange. In terms of Figure 1, it is therefore likely that the distribution of resources moved to the right along the horizontal axis. It is debatable, however, to what extent such movements and opportunities were limited to a few activities or even geographical areas. Let us now review and discuss some empirical indicators in this regard.

3.1. An extensive market economy

Several indicators point out that the economy of the early Roman Empire was an exchange economy to an unprecedented level, albeit with some redistribution by the state and the presence of customary systems in rural areas. It has been estimated that 7.4-19.5 percent of Italy was urbanized at that time (Wilson 2011:191). If these numbers are taken as an index of economic performance, the Roman economy performed similarly to those of the most advanced European economies in 1600-1750. This was achieved “through the combined operation of moderately stable political conditions and markets for goods, labor and capital, which allowed specialization and efficiency” (Temin 2006:134).

It has even been argued that the Roman economy was not merely a collection of independent markets but an integrated market economy: “markets for goods, labor and capital were relatively well-developed in ancient Rome, which in turn encouraged specialization and efficiency. These markets were able to work well in the environment created by public authorities who provided local public services in cities and a functional rule of law across most of the Empire.” (Temin 2006:137).

In particular, “the market for land in the Roman Empire worked approximately like the land market today” (Temin 2013:139) because land was typically held in fee simple with few impediments to land usage and sale. The market in urban real estate enjoyed not only a substantial provision of public goods but, compared with other ancient societies, much less interference from public authorities in terms of debt moratoria, rent control, mandatory

redemption and tenant protectionism (Ellickson, forthcoming:42–45). In addition, prices varied substantially and transactions were sophisticated, including mortgages and subdivisions.

Moreover, the Roman economy was not only well developed in terms of size and specialization but in the predominant role of market exchange in the allocation of all types of resources. In addition to a market for slaves that had little in common with “closed” slavery (Scheidel 2008, Temin 2013:114–38), there was an active market for the rights to sue or to inherit (Riggsby 2010:127), and money compositions were acceptable even for criminal acts (Nicholas 1962:209).

The environment for market exchange only ceased to be favorable in the later centuries of the Empire, when trade collapsed at least in some times and areas as a consequence of political instability. The market economy was seriously damaged by the third century C.E., with the collapse of frontiers and other events: the doubling in size and cost of the army; the increase in taxation; the emergence of a new more militaristic and local ruling class; and the rise of Christianity (Brown 1971). Both the market and the common culture retreated earlier in the West: e.g., market institutions remained in place in the Eastern empire in the seventh century (Brown 1971:145).

3.2. Discussion

However, the extent, integration and nature of market exchange in ancient economies, and in Rome in particular, remain controversial among historians.¹⁰ For our purposes, even if the Roman economy was a market economy, it is debatable to what extent it opened up opportunities for impersonal exchange: in terms of Figure 1, even if productive resources moved to the right along the horizontal axis, it is unclear to what extent or in which areas they did move.

Certainly, in addition to being extensive, the Roman market economy also showed signs that it might have benefitted from less personal exchange, such as substantial productive specialization and long-distance trade. There was specialization mainly in agricultural production and processing industries, with technological change and diffusion (Greene 2000). Since the second century B.C.E., provinces had specialized in producing different types of goods: e.g., Italy exported wine and oil; Egypt and North Africa, grain; Spain, wine, oil and minerals, etc. Long-distance trade in bulk commodities was prevalent (Temin 2006), and the degree of specialization achieved for bulk commodities suggests that the difficulties for impersonal exchange were overcome at least in those markets. Documentary evidence shows that at least the large estates were organized with the aim of reaching economies of scale and producing marketable surpluses (Rathbone 1991). Moreover, the city of Rome, far from being an extractive parasite, as Finley (1999) contended, specialized in producing and

¹⁰ Most ancient historians would subject claims about the integration of markets in the Roman Empire to numerous caveats. See, e.g., Erdkamp (2005) and Bransbourg (2012). Moreover, judgments on ancient economies must always be taken cautiously, given the lack of adequate evidence. See, for instance, Scheidel (2012:2–5), for a summary of the limitations for unambiguously interpreting the evidence on the Roman economy, and Scheidel and Friesen (2009) for a comparative assessment of works obtaining substantially different estimates of the mere size of the Roman economy.

exporting all sorts of services (Ellickson, forthcoming). After the First Punic War (264-241 B.C.E.), the increase in foreign population in Rome made it necessary to create a specialized magistracy, the *praetor peregrinus*, for dealing with non-Roman citizens by applying the *ius gentium* to them, with a focus on conflicts related to interregional trade (Nicholas 1962:7, Winkel 2013:3553, Brennan 2001:87–89).

Financial intermediaries and transactions were sophisticated, and bankers provided such an array of services (Andreau 1999) that it has even been suggested that “financial institutions in the early Roman Empire were better than those of eighteenth century France and Holland” (Temin 2013:189). Moreover, much borrowing was for commercial purposes,¹¹ and financial markets in different regions of the Empire were linked, most likely through financial intermediaries (Temin 2013:178–79). Credit was also abundant, so much so that indebtedness was often considered a problem (Crook 1967:171–72). Lastly, if interest rates, “perhaps the most evident quantitative dimension of the efficiency of the institutional framework” (North 1990:69), were indeed not much higher than those of today (Crook 1967:211), they would suggest low default risk and therefore effective guarantees. Despite usury regulations, it seems that market participants were able to adjust the interest rate to the risk of the loan.¹²

However, opportunities for impersonal exchange might have been limited to some markets and transactions. With respect to trade, it has been debated to what extent most production did remain local, with most long-distance trade taking place only by water, given the higher costs of transporting goods over land.¹³ Similarly, there are doubts on the nature of the exchanges. For instance, for rural land in Roman Egypt, Rowlandson (1981) considers that many of the transactions she analyzes took place between relatives. Certainly, for a land market to exist it is not necessary for most land to be transferred by purchase, as Temin points out (2013:144); however, transactions between relatives are more likely to be personal. Similarly, in the area of sureties, the effectiveness of guarantees raises the question about to what extent exchange was personal or impersonal. Some authors even give somehow contradictory accounts on this. For example, Crook claims that the abundant supply of credit to the dominant class was structured as a web of loans and personal sureties, in a circular fashion, relying on *officium*, the “mutual serviceableness between status-equals” (Crook 1967:94) but based, deep down, on the supposedly secure market for land (ibid.:170–72). This description suggests that personal credit was grounded on secured and therefore impersonal credit.

¹¹ Or even most borrowing, according to some authors (e.g., Johnston 1999:84).

¹² Rates were often regulated via usury ceilings, but they were often evaded by, e.g., lending to *peregrini* (Livius, book XXXV:7), not stating the rate in the contract, and possibly granting hidden discounts on the principals (Verboven 2003). In fact, “repeated statutes were made, for obviating all elusions, which by whatever frequent expedients repressed, were yet through wonderful devices still springing up afresh” (Tacitus, book VI). In the light of usury-avoidance practices (Koyama 2010), the prevalence in the ancient evidence of loan contracts stating the regulated and legally-enforceable maximum rate of 12 percent or no rate at all (e.g., Lerouxel 2012b), irrespective of the borrower’s default risk, suggests that the effective implicit rate—easily disguised by, e.g., discounting the loaned amount below the stated principal—was probably higher. Similarly, in the opposite direction, the Sulpicii archive also provides some basis for believing that variable interest rates below the legal limit were charged (Bransbourg 2014).

¹³ It is estimated that “the envisaged price ratio for moving a given unit of cargo over a given unit of distance is 1 (sea) to 5 (downriver)/10 (upriver) to 52 (wagon).” (Scheidel 2013:4).

4. Institutional supply: Public registries in Rome

In a context of substantial opportunities for impersonal exchange, it may come as a surprise that land registration “was quite unknown to Roman law” (Nicholas 1962:104), especially considering that Rome revitalized the land registers of Egypt and built numerous cadastres. In accordance with the analysis in section 2, there are two possible reasons: the costs of registries and the effectiveness of hybrid palliatives and purely personal-exchange solutions. First, as argued above, the supply of institutions is costly and, therefore, for a given demand, it might be inefficient to provide them even if they make some additional exchange opportunities possible.¹⁴ Second, the efficiency of registries and, in general, of all solutions for impersonal exchange depends on those for personal exchange. This section will explore some elements of the cost hypothesis while the following sections will examine Roman palliatives and, in particular, section 7 will focus on the personal-exchange hypothesis.

4.1. Constraints on property registries in the Roman West

The cost of archiving and, especially, using written documents as judicial evidence is difficult to ascertain but should not have been a serious impediment to developing property registries. It is true that Romans lacked paper and printing, and relied for recordkeeping on perishable media, such as whitewashed boards and wax tablets (Rhodes 2013). However, their reliance on wax tablets for all sorts of important documents and archiving seems to have been a choice (Meyer 2004), as they also made frequent use of papyrus imported from Egypt, especially in the East (Bagnall 2010), and more generally for the administration of the Empire (Innis 1950). The use of papyrus could have reduced the costs of registries, but sealed wooden tablets seemingly offered greater protection against fraud by tampering (Meyer 2004:2), so were harder to refute in court than other documents (Meyer 2004:219, 226). Moreover, a basic facilitating factor was probably a level of literacy that is believed to have been high not only among the upper class (Harris 1989) but also among lower-class participants in economic transactions (Haeussler 2013).

Roman archiving laws are often considered weak (Riggsby 2010:89). Similarly, “the files of the government (except perhaps the archives for census material) seem often to have been in disarray” (Eich 2013). It is even claimed that Romans suffered archiving difficulties for legislation, as the imperial office was sometimes unable to find its own legislation, which “may surprise those accustomed to think of the Romans as an administratively efficient people” (Crook 1967:32). Moreover, forgery of public documents was prevalent at least in certain periods (Moreau 1994). Even authors inclined to believe that the Roman bureaucracy was well-developed recognize that the archives were at least sometimes in a state of abandonment and negligence (Nicolet 1988:179).

¹⁴ This complements the views in some other chapters of this volume. For example, Abatino and Dari-Mattiacci (forthcoming [b]) argue that lack of proper agency institutions constrained growth; while de Ligt (forthcoming) seems to hold that institutions followed market demands, and Fleckner (forthcoming) suggests that there was not enough demand for more stable business associations. Other authors, however, hold a middle ground view (Hansmann *et al.* forthcoming).

However, different levels of the Roman government did organize extensive public archives for administrative purposes, where they kept copies of different types of documents such as laws, contracts for public works, international treaties, documents related to public lands, minutes of political bodies, imperial rescripts, and mortgage loans to provide subsidized assistance to children (Sánchez-Moreno 2013:662–64). Closer to property registries, they also operated public registries on individuals, mainly the census, which was updated every five years (Crook 1967: 46), and a birth registry, established by Augustus in 4 C.E., which served to provide evidence of status as well as family or household size. Moreover, Romans kept records of transactions in both the private and public spheres. Private recordkeeping was effective. E.g., some banks preserved contracts of third parties for which they had facilitated payment, for them or for the benefit of their clients (Temin 2013:184), and, more importantly, lenders' books were used as evidence in courts. The books of bankers were seen as "unimpeachable legal evidence [... And, with some constraints to protect sensitive financial data,] the praetor required bankers to disclose their entries as evidence on behalf of anyone to whose case they were relevant" (Crook 1967:233). This made their records a sort of partial register, acting as notaries or specialized witnesses. Similarly, the state also kept a record of transactions in the grain trade (Temin 2013:107). Therefore, registries seem to have suffered neither insurmountable nor specific technological difficulties.

Nor did the Romans lack knowledge about property registries: their conquest of Egypt (30 B.C.E.) put them in touch with a long tradition of property registration. In both Ptolemaic and Roman Egypt, public registers played an effective role in enforcement and trade of property rights in land.¹⁵ Furthermore, the Roman provincial administration of Egypt created between 68 and 72 C.E. a sophisticated "registry of acquisitions," the *bibliothèque enkteseon*, for property rights in land and slaves. It was not merely a passive recording of deeds but an active register of rights with certification of title: deeds were void unless the grantor, to prove his title, presented a certification issued by the *bibliothèque* to the scribe writing the deed, and the scribe was then required to send the deed to the *bibliothèque*. Lerouxel (2012a:648–51) shows that the introduction of the *bibliothèque* coincided with an increase in the volume of transactions. Moreover, it was created with the objective of protecting property rights and reducing private transaction costs.¹⁶ This objective is also clear from the fact that, from a merely fiscal perspective, tax authorities had an easier alternative: to define land taxes and obligations as rights *in rem*, so that they enjoy priority over all other rightholders, including innocent third parties who thought they were acquiring free of charges. In fact, this was the common solution in later centuries, at least in the West (Nicholas 1962:153, Crook 1967:246).

¹⁵ See, e.g., Manning (2003), Monson (2012) and Muhs (2015). Very different institutions for land contracting (deeds, notaries, eviction guarantees, witnesses, checks on parties' identity, formal consent of potentially affected rightholders, repeated formal protestations of title, recordation of contractual transcripts in public registries) were in place in different stages of Egyptian history and changed substantially in line with increases in the volume and value of transactions (Muhs, 2015). The effectiveness of the register to protect good-faith purchasers against fraudulent vendors (e.g., Daumas 1987:162) and the other legal functions analyzed by Manning (2003) and Muhs (2015) point towards a legal (i.e., transaction-cost-reducing) function of Egyptian registries, as does the claim that they did not contain maps (Kain and Baigent 1992:1). Applying Demsetz's (1967) argument, several factors could have made land registries more useful in Egypt: the possibly higher value per unit of land and recurrent annual flooding.

¹⁶ As analyzed by Jördens (2010) and Yiftach-Firanko (2010), according to Lerouxel (2012a:652).

4.2. Discussion

The situation is far from clear, however, and several aspects remain in doubt. First, the registration of land in the census, begun with Augustus,¹⁷ has sometimes been seen as “a system of land registration” (Crook 1967:147). However, this part of the census was probably a mere *administrative* cadastre, instead of a *property* register,¹⁸ as it was based on voluntary declaration, as cadastres usually are, given that they only create obligations, not rights (Arruñada 2012:205). The summary of the *forma censualis* reproduced in the Digest from Ulpian, a jurist writing in the third century C.E., makes clear that both the properties and their “owners” were identified in the census, but its purpose was fiscal, as most of the recorded information (on surface areas, uses, products and values) was irrelevant for titling purposes. Consequently, the information could be based merely on what the “owner” declared, without any reference to an independent review of his title claim. Moreover, the Ulpian fragment makes clear that failing to declare an ownership claim in the census did not damage the claim: “a man who claimed ownership did not declare it, it is right that his claim should remain” (D. 50.15.4.4).

This declarative nature is a common feature of cadastres everywhere because tax authorities are happy to record a claimant as owner to ensure tax collection, even if his claims are not legal. It also explains why the census was not used as proof of title but only as one more source of evidence: “the census-list, being based on individual declarations, was only evidentiary, not automatically proof” (Crook 1967:149). Of course, as in many other jurisdictions, ancient and new, after volunteering to record their claim in the cadastre, Roman claimants probably tried to use their position as taxpayers to perfect their title.¹⁹ But, given the lack of independent reviewing and purging of the information contained in the cadastres, judges did not rely on them (Ellickson, forthcoming:29, n. 65),²⁰ so property acquirers had no reason to rely on them either. In particular, even if the vast majority of the claimants recorded as owners in the cadastre were the true legal owners, acquirers could not rely on such records to reduce the information asymmetry that they suffer with respect to sellers. Therefore, it might well be the case that a variety of public registries did indeed exist for all the purposes mentioned, e.g., by Nicolet (1988:213–40), and that the authorities did have lists that allowed them to identify “owners” (in fact, claimants) to the level of legal certainty required by administrative law in matters such as tax collection or street maintenance. However, it is

¹⁷ See, however, Nicolet (1988:226–32) for possible antecedents of cadastral documents.

¹⁸ The confusion between cadastres and registries is a version of a wider confusion in historiography between administrative (mainly tax) and contractual or “economic” archives (Sánchez-Moreno 2013:660). The necessarily public element in rights *in rem* exacerbates the confusion by adding such a public element to what are *functionally private* contractual registries (Arruñada 2017, 2018).

¹⁹ Indeed, payment of the land tax seems to have been considered proof of ownership later, in the Byzantine empire (Laiou and Morrisson 2007:50). This is reminiscent of current practice in some jurisdictions: “In Illinois, for example, an adverse possessor may establish his claim merely by paying taxes on the property, at least against an owner who is familiar with real estate practice and records” (Rose 1985:80). A mention in the Digest also refers to relying on the census for settling boundary disputes in the absence of evidence on alterations (Papinian D. 10.1.11).

²⁰ Considering the reluctance of judges to grant conclusive effects to evidence produced by property registries, which has been observed in different countries and historical circumstances (Arruñada 2012:241, n. 39), the prevalence of fraud in public Roman documents (Moreau 1994) may have added another difficulty.

equally likely that such lists provided little valuable information for ascertaining legal title to property.

Second, Rome also did extensive land surveying and recording during its complex and repeated processes of land redistribution, which relied on lists of beneficiaries and land parcels at different levels (e.g., Moatti 1994). However, these were not prepared for facilitating private transactions; therefore, labeling them as land registers may be misleading (as in, e.g., Duncan-Jones 1976). Even if a double set of records with different information may have been used, relying on bronze for the maps and more perishable media for more detailed information, including the beneficiaries' names and the surface area assigned to each (Nicolet 1988:219–21), the information was not updated for property transfers, so that “to clearly establish property rights, it was necessary to perform all of a series of searches to find their origin” (Nicolet 1988:221). In addition to mapping and administrative functions, the *forma* played a legal attestation function “with the reserve, however, that not containing the transfers, it must be, in case of title conflict, completed by other means” (Moatti 1994:109).

Third, securities granted to public bodies over private land were recorded by different means (Verhagen, forthcoming:15–16). However, the purpose of this archiving might well have been merely that of enforcing the state's claims, instead of publicizing them to potential third parties. From a land titling perspective, this archiving by the state would therefore have served the same purpose as the safekeeping of contracts and property deeds by landowners and lenders, and, even if the rightholder was the state, it was in essence of a private nature. When land charges were inscribed in stone or bronze, as in the *alimenta* schemes of the Veleia and Ligure Baebiani tablets, by which the state granted loans to landowners, the returns from which were then used to maintain poor children, a publicity purpose is more likely, but the function of such publicity is also unclear. In addition to that of cautioning potential land acquirers that the land was subject to the *alimenta* charge, publicity might have had merely euergetic purposes—i.e., to show that the emperor was doing good, not only caring for children but also providing a stimulus to agriculture (Lo Cascio 2000:223–64). It is consistent with such euergetic purpose that no traces are preserved as to how such inscriptions would have been removed upon paying back the loan, an essential element for publicity to be effective with respect to potential property acquirers.

Fourth, there seems to be growing consensus that the practices of Egypt were more representative of the rest of the Roman Empire than it was thought in the past and that available evidence may be seriously biased by the type of media used (e.g., Ando 2010:179). However, this bias does not explain the lack of references to land registers in both the preserved records of contracts documenting private land transactions,²¹ and in the legal texts (until the last centuries of the Empire²²). Both absences suggest that at least in the West and

²¹ For instance, Adams (2013), Camodeca (2013), and Rotman (2013). This is in contrast to those found in Egyptian contracts (Yiftach-Firanko 2013). Private safekeeping of documents might have been prevalent even for publicly issued documents, given that “it does appear that the safest way to preserve a decision that concerned you was to take a copy of it to yourself when it was promulgated; and this is in fact how our surviving documents have mostly come down to us” (Crook 1967:33). This private safekeeping of public documents led to forgeries (Moreau 1994).

²² The involvement of public authorities in private legal transactions increased in the last centuries of the Empire, with some authorities recording private documents and issuing copies of their records which enjoyed privileges as proof (Harter-Uibopuu 2013). In 313, Constantine enacted publicity for conveyances, with a clear fiscal purpose (Honoré 1989:142–46), and in 323 he made the public registration of donations mandatory. A century later, Valentinian III (425–455) required the registration of conveyances, allegedly with little visible effect with the exception of the papyri of

during the classical period of Roman law, land registration did not play a significant role in private contracting. Considering that jurists often minimize the role of modern registries in property transactions (Arruñada 2012:114–18), therefore exaggerating their own role, which is diminished in the presence of effective registries, one may wonder if Roman jurists simply omitted mentioning the titling role played by property registries in Roman times. It seems unlikely, however, that such bias would have left no trace of registries. Modern treatises teach most property law as if private conveyancing (i.e., without registries) were still the dominant paradigm. However, all of them need to cover conveyancing “in registered land”, to use the English terminology. They tend to present a distorted view of the two modes of conveyancing but for obvious reasons they need to present both. Similarly, considering practices in medieval European cities, one may think that local courts kept written records of *in iure cessio* transactions, which might then have been used as a sort of land recordation system. But even this possibility remains unlikely because such transactions were rare (Gaius 170: II.25) and reliance on such records should have left some traces in the legal sources. Nor do the municipal registration practices observed in later centuries seem to be relevant with respect to classical Roman law, because the earlier available evidence on municipal land recordation in the West, the papyri of Ravenna, dates transactions starting in 445 C.E. (Everett 2013).

Lastly, suggestions that lack of land registration in Rome was due to an overriding preference for privacy seem unsupported. For instance, Temin argues that “there was no registration of property ownership on behalf of the state, as in Egypt and probably other provinces too. Roman law and administration operated in a quite different tradition of civil honesty compared to the prying bureaucratic registers of Hellenistic kingdoms” (2013:184). However, reluctance to publicity of transactions seems to be absent in the legal texts and commentaries (while they abound, e.g., in modern European discussions), and, perhaps most importantly, traditional Roman rules on conveyancing did require publicity, as examined in the next section. Therefore, the reason probably lay in other factors. As argued below, more effective palliatives and stricter enforcement of personal obligations possibly made registration less necessary in Italy and the West than in Egypt and the Hellenistic kingdoms.

5. Palliative solutions in property

The Roman law of property provided a variety of solutions for contracting rights *in rem*, enabling the type of asset-based impersonal exchange which is a main focus of this work. Allegedly, these solutions changed substantially over time in parallel with changes observed in the economy and, in particular, with the expansion of long-distance trade.

Ravenna, whose registration is attributed to this city being an important capital and administrative center (Everett 2000:73–76). However, it is unclear how prevalent the use of these solutions was both before or even after Constantine. Other contractual evidence on property, dated at the end of the fifth century, during the period of Vandal rule in Africa, does not mention registers (Corcoran 2013). Several factors indicate that these institutional changes had little, if any, impact on reducing transaction costs: their fiscal objective, their coincidence with the decline in market activity and their apparent failure.

5.1. Ceremonial publicity: *mancipatio*

In principle, to transfer ownership of the most valuable goods, such as land, slaves and cattle,²³ Roman law required a formal and public conveyance, either through a collusive proceeding before the court (*in iure cessio*) or through a public ceremony known as *mancipatio*. In the latter, the seller and the acquirer appeared upon the property before a person holding a scale and five witnesses. The acquirer then declared the property to be his, struck a token coin against the scales and handed it to the seller, who said nothing. This ceremony produced a public conveyance which was separate from the private contract (the two-step contracting process characteristic of property, as analyzed in Arruñada 2003). In this case, the public step served at least two major purposes. First, it triggered the start of a prescription period that can also be understood as a purging procedure. Contradictory *in rem* rights were downgraded to *in personam* status unless rightholders opposed the intended transaction either during the ceremony or within the prescription period. Second, it provided the basis for future legal procedures, as the law granted substantial procedural advantages to possessors against other claimants.

The ceremony therefore had a titling function as it publicized the conveyance, but also served to gather the consents of affected rightholders and purge conflicting claims either at once or after a certain period. In contrast to the creation of rights *in personam* by formal *stipulatio*, which did not in principle require any witnesses (Nicholas 1962:104), *mancipatio* required numerous witnesses, and this “was probably needed not so much to prove that the act had taken place as to give it publicity so that any defect of title (which in a small society would be likely to be known to the witness) could be investigated immediately” (Nicholas 1962:256).²⁴ Indeed, in such a context, witnesses often performed several functions, including, in addition to merely testifying, those of pointing out possible title clouds and granting their consent. Acquirers achieved some title protection by choosing the right witnesses: those with a good reputation (when adjudicating a case, judges considered the reliability of witnesses²⁵) and specially those who might know or even directly hold claims on the land (including, e.g., relatives and neighbors). These potential claimants, by acting as witnesses, are implicitly consenting to the transaction.²⁶ This also holds for boundary disputes, for which, in Rome, “though not a legal requirement, it was standard practice to call

²³ The separation made economic and legal sense: given their value and durability, *res Mancipi* were assets suitable for enforcing multiple rights *in rem*. For this reason, it made sense for the legal system to require publicity when transferring them. Views considering that the separation was driven by the legal requirement probably reverse the direction of causation. The inclusion of some types of movables in *res Mancipi* should not be seen as a “useless but ubiquitous complication” (Crook 1967:141), because those movables were high-value capital goods suitable for holding multiple rights on them.

²⁴ It has even been argued, in the context of documents formalized in *tabulae*, that “these *testes* or *superstites*, as they were called, were not witnesses in our sense, expected later to testify to what they had seen or read, but judges, expected to stop an act at the time of its making if the performance were flawed” (Meyer 2004:118).

²⁵ Interestingly, witnesses sealing the Campanian tablets were ordered hierarchically, starting with those of higher status (Meyer 2004:118).

²⁶ Referring to conveyances in Ptolemaic Egypt, it is said that “the seller identifies those most likely to challenge the title of the new owner as his children and siblings” and “children were present and consented to the transaction, or ceded their claim to the property” (Muhs 2015).

the neighbours to witness a conveyance by delivery. This allowed the transferee to verify that the transferor and his neighbours agreed on the boundaries, or, if they did not, to pinpoint the area/s of dispute. If the dispute was not settled at the time, the conveyance could be confined to the agreed area, or if necessary postponed” (Honoré 1989:139). Lastly, even if *mancipatio* did not in principle require delivery of possession (Buckland 1912:95–96, Gaius 170:IV.131) the transferor had a duty to deliver it (Honoré 1989:139). In most cases, if the transferee did not obtain possession publicly, it was not protected against dispossessors by possessory interdicts, this being a speedy procedure by which the judge would adjudicate on possession without looking at title, forcing possible owners to rely on a more cumbersome action, that of *vindicatio*, in which the possessor would be the defendant and would not therefore bear the burden of proof (Nicholas 1962:108–109).²⁷

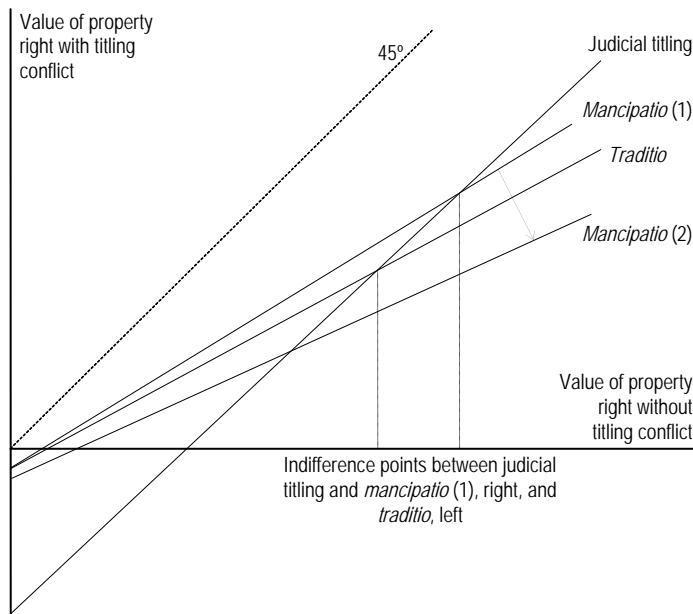
5.2. Evolution towards privacy

Conveyance by *mancipatio* therefore served for providing some degree of publicity, gathering consents and purging property rights. However, public ceremonial conveyances become less efficient with economic development.²⁸ First, their cost increases if parties move more and need to purchase from a distance. Second, they are more effective in local markets, where transactions take place between neighbors, as is common in rural societies, than in wider markets: e.g., “the six participants in the *mancipatio*, though adequate enough for a small community, could constitute no hindrance to secrecy in so vast a society as imperial Rome” (Nicholas 1962:104). Indeed, for neighbors, it is easy to notice announcements and public deals, especially for the kinds of rights common in rural societies, many of which are linked to family and household matters. This is probably less so for non-neighbors, as indicated by the longer prescription periods usually granted to those absent, apparently balancing costlier knowledge with longer time.

²⁷ It must be kept in mind that, in Rome, possession was narrowly understood to mean “not simply the holding of a thing but rather the holding of a thing in the manner of an owner, the exclusive holding of a thing” (Nicholas 1962:111). Those holding without possessing had “detention”: they were physically occupying the land but lacked relation to it (Nicholas 1962:112). This was mere *possessio naturalis* (Buckland 1912:77).

²⁸ Moreover, two other factors may be present, at least in the short term. On the one hand, there is a permanent demand for privacy by economic agents, because of reputational concerns and tax avoidance, a demand that could be uncorrelated to economic growth. As argued by Nicholas, “there was a similar struggle to achieve secret conveyancing in English law, culminating early in the seventeenth century in the recognition of the device of a bargain and sale for a term followed by a release” (1962:104, n. 3). On the other hand, conveyancers—mainly lawyers—may have an interest in privacy solutions to the extent that they increase the demand for their professional services.

Figure 2. Hypothesized evolution of titling when, after distant trade becomes more common, *mancipatio* becomes costlier and less effective and is replaced by *traditio*



Note: The figure aims to represent the historical evolution caused by the lesser efficiency of *mancipatio* with the development of markets, which led to the predominance of conveyancing through *traditio*, characteristic of classical Roman law.
Source: Adapted from Arruñada and Garoupa (2005:717–18, figures 2 and 3).

Figure 2 represents what might have been the historical evolution in Rome towards more private conveyancing. At the starting point, most land is conveyed by *mancipatio*, with some public titling for the highest-value land through the judicial procedure known as *in iure cessio*. I hypothesize that the development of a wider market for land had two effects: first, it increased the cost of holding public ceremonies, which drove the *mancipatio* line downwards; and, second, and probably more important, it made such ceremonies less effective, reducing the line's slope. With this move of the *mancipatio* line, a more private titling procedure, using increasingly private delivery and known as *traditio* (or even, in the late Empire, merely granting a written deed),²⁹ a procedure which previously was suboptimal, became individually optimal for land parcels whose value lay to the left of the new indifference point.³⁰ A testable prediction of the analysis is that the abandonment of

²⁹ Procedural law is also important here. In post-classical times, the more bureaucratic system of judicial procedure known as *cognitio extra ordinem* ends up superseding the old formulary system. After Diocletian (284–305), documents issued by a scribe started to constitute a proof superior to witness testimony (Thür 2013). However, the role of written documents—mainly, on wooden tablets—may have been underestimated in legal texts and scholarship (Meyer 2004:112–20).

³⁰ Note that, in this context, relying on *traditio* could be individually optimal even if *mancipatio* had remained more effective than deed titling in terms of title assurance. (Imagine that in the figure the *traditio* line had simply moved downwards—and, therefore, become more costly—while remaining parallel to the old one.)

mancipatio should lead to an increase in the number of judicial procedures, which would then also be used for land values between the two indifference points.

5.3. Exercise of possession as access to ownership: *usucapio*

To the extent that the exercise of possession has observable consequences, it is capable of providing the basis for titling, by having it upgraded to ownership with the lapse of time—by acquisitive prescription.³¹ In Rome, initially, undisturbed possession of land and other capital goods for only two years (one year for other movables) led to ownership by *usucapio* if acquired in good faith and based on proper cause, even if conveyed by simple *traditio* (i.e., delivery of possession) without *mancipatio*, and with the only exception of goods stolen or taken by force. Furthermore, during the late Republic the praetor enhanced the protection enjoyed by the good faith possessor on the way to *usucapio* by granting him an action that ensured he succeeded even against the formal owner (if the possessor's title was formally defective: a recipient of land by informal delivery or *traditio* instead of formal *mancipatio*) or against everyone but the owner (if the title was substantively defective because, e.g., he had bought from a non-owner). As a consequence, “the recipient of a *res Mancipi* by *traditio* was for nearly all practical purposes in the position of an owner” (Nicholas 1962:127). It is believed that, thereafter, informal delivery by *traditio* replaced formal *mancipatio*.³²

The key element for *usucapio* to work effectively as a titling procedure is that the exercise of possession provides claimants with the information they need to litigate and protect any property rights infringed by the intended transaction (e.g., Rose 1985:78–81). It therefore implicitly provides the basis to start a selective purge and acquirers need to check only if the seller has effectively been in possession for the prescription period. In this context, doubts about the information provided by possession may arise, especially if the delivery of possession is unobservable. Indeed, *traditio* was increasingly made without any visible transfer of the good. This, together with the decreasing use and limited efficacy of *mancipatio* in a vast economy, leads some authors to think that Roman publicity was ineffective (e.g., Nicholas 1962:104). However, this critique may have been unwarranted because, for existing rights to be protected under *usucapio*, possession only needs to inform affected rightholders with sufficient time for them to take action. And owners can always make their possession public if, foreseeing a possible sale, they want to convince future acquirers that they will be protected by the *usucapio* of the seller.

It is consistent with this titling view of possession that the time for *usucapio* increased when the information provided by publicity might have taken longer to process. Standard *usucapio* was part of the civil law and therefore applied only to Roman ownership: i.e., Italic land held by Roman citizens. For provincial land, longer periods were required: for *longi*

³¹ For a more extensive treatment of the titling role of possession see Arruñada (2015).

³² In fact, it has been argued that *mancipatio* was retained longer for land, at least until the fifth century, because it did not require the presence of the parties on the spot (Buckland 1912:73). However, it is likely that the *mancipatio* term appearing in later Roman documents really means only conveyance (Nicholas 1962:117). Meyer argues that formal conservatism (syntax, style, rhythmic prose) in Roman documents conveyed authority (Meyer 2004:59). Her argument might help explain why the word *mancipatio* was still used even when the title was transferred by granting a written deed.

temporis praescriptio of land, ten or twenty years when parties were or were not in the same district (Nicholas 1962:128). This makes sense because of the greater distance and time probably needed by adverse claimants to get notice. The time for *usucapio* also became longer in the last centuries of the Empire. At the time of Justinian, three years were required for *usucapio* of movables, *longi temporis praescriptio* became the only *usucapio* for land, and a *longissimi temporis praescriptio* of thirty years was introduced for good faith acquisitions even for things that had been stolen (ibid.). This lengthening of *usucapio* periods at the time of Justinian seems consistent with greater civil unrest and consequent information and purging difficulties.

5.4. Discussion

The public ceremonies of *mancipatio*, initially, and the sophisticated use of possession and *usucapio* seemingly provided an effective palliative for transfers of ownership. The limitations of such a palliative are most visible in the inability of Roman law to implement efficient real securities, which is understandable due to their abstract nature and the consequent difficulties to make them publicly known by such means. Given the lack of registers,³³ to provide lenders with real security, mortgages were instrumented on the basis of the *fiducia*.³⁴ This therefore merely reduced the default risk of the lender by creating a dispossession risk for the borrower, which helps explain why they most often resorted to personal sureties.³⁵ Alternatively, Romans could, of course, easily add real securities to their

³³ Efforts to make hypothecs public in the West came quite late: not until 472 C.E. was priority granted to hypothecs created before a public authority or before three witnesses (Nicholas 1962:153), therefore with an element of publicity.

³⁴ A *fiducia*, “like the late medieval English mortgage, was a conveyance subject to a covenant for reconveyance on payment of the debt” (Nicholas 1962:151). In *fiducia*, the owner gave ownership to the creditor by *mancipatio* or *iure in cessio*, usually including pacts for reconveyance on payment of the debt, authorizing the creditor to sell if the debt was not paid and allocating the possible surplus to the borrower (e.g., Crook 1967:244–45). There is also evidence in the Digest that at some point real securities might have been reinforced, as in old Mesopotamia and modern England (Arruñada 2012:46–47), by pledging the deed or the whole chain of deeds with the creditor (Scaevola D. 13.7.43.pr). This pledging of deeds also subjects the debtor to the creditor’s moral hazard, as he may fail to produce the deed when the debtor needs it or may even fraudulently sell, and also makes it harder to subrogate the debt and contract second mortgages. The Digest case makes this point clear, as the lender fails to produce the deed to the borrower, who is therefore unable to prove the extent of his land and cannot fully develop it.

³⁵ Personal security was very common for any substantial transaction on credit (Nicholas 1962:151). It has even been argued that Romans preferred personal rather than real securities because of status: “a wealthy Roman’s word was his bond, and security as potent as any pledge” (Johnston 1999:88). Understandably, posting a real security might even have been detrimental to personal reputation, as it might signal that the debtor’s word was not valued by potential creditors and, worse still, that he had no friends willing to back him. From this perspective, reluctance to accept publicity would have been limited to the posting of real securities, not to mere indebtedness; and such reluctance would be hard to reconcile with the above-mentioned prevalence of circular credit networks among friends.

personal obligations.³⁶ However, due to the possibility of hidden charges, the enforcement of such securities was in fact most likely based on the personal sureties offered by the borrower and his guarantors, not on the collateral value of the borrower's land.³⁷ Therefore, the presence and sophistication of real securities in surviving contracts, or their treatment in legal texts tell us little about their economic relevance.³⁸ Similarly, and whatever its effectiveness, the legal decision to impose harsher or criminal sanctions on those who hid such charges can also be seen as a sign that secrecy and fraud were hindering these transactions.

Other controversial issues are also illuminated by the titling role played by possession. For a start, analyses that consider that granting ownership by prescription based on possession and the lapse of time “makes possible the proof of ownership by depriving it of its ordinary meaning” (Nicholas 1962:156) disregard that the public nature of possession allows claimants to vindicate ownership during the prescription period. It therefore implicitly provides the basis for a judicial purge of ownership claims: ownership does not exist as a titling- (i.e., judicially-) independent reality. Similarly, seeing possession as a main element of the titling process denies claims that the importance Roman law attached to possession rather than ownership “indicates that Roman law was seriously concerned with preservation of the status quo and keeping the peace, and less so with questions of formal entitlement” (Johnston 1999:60). Possession was a tool to ascertain which claimant would be the owner. Ownership *claims* should not be confused with ownership *rights*. Lastly, when considering the role of possession in the titling process, views of a two-part land tenure system in Roman land law also seem unwarranted. It is said, for example, that “jurists and legal commentators described a complex two-part law of land tenure. There were two sets of rules, one for what has been labeled ownership and one on possession. The line between these categories is not clear, and one puzzle for modern observers is to know which set of rules was applicable in any particular case.” (Temin 2013:147). From a titling perspective, this duality makes sense not as a two-part tenure system for different land but as a two-step titling process for the

³⁶ Compare Verhagen (forthcoming), for whom “the Roman law of real security was capable of facilitating credit in a similar manner as its descendants in modern economies” and, in particular, offered “efficiency in creation” because parties could create a variety of securities very easily. However, ease of creation is, at most, a partial and doubtful advantage. Partial, because such ease *ex ante* comes at the price of, first, information asymmetry at the time of contracting (given the possibility of hidden charges and title clouds, lenders know less than borrowers about the value of the security); and, second, ineffectiveness of the guarantees *ex post* (if a prior hidden charge appears or a title risk materializes) and costly enforcement to clear title before repossession (even if hidden charges or title clouds do not surface). It is also a doubtful advantage when considering that total transaction costs may well be lower when the law reduces the variety of real rights by means of a *numerus clausus* of such rights (Heller 1999, Merrill and Smith 2000, and Hansmann and Kraakman 2002).

³⁷ Interestingly, the *alimenta* schemes mentioned above provide some indication that (at least at the time for which most evidence on these schemes is available—early second century C.E.) the collateral value of land was low, as owners had to provide a security which has been estimated at an average of 12.5 times the amount of the loan (Fernández 2013:315). Low collateral value is consistent with the conjecture that real securities were of little effect in reducing default risk.

³⁸ Verhagen (forthcoming) bases its positive assessment of Roman real securities on two facts: the Sulpicii bankers used real securities for large loans, and the extensive treatment of real securities by jurists, as well as in the Digest and the Codex. However, the Sulpicii relied on *pignus*—transferring possession to the creditor—an old form of real security. And extensive legal treatment of a given topic may well be an indication of conflict rather than low transaction costs, as shown, for instance, by the examples on *chirographa* taken from the Digest by Verhagen.

same land: possession was simply the publicizing element in the second step within the titling process ending with *usucapio*. Possession was the path to ownership, not its alternative.

6. Palliative solutions in business

Sequential exchange is prevalent in business, because using contractual agents capable of committing their principals often provides substantial specialization advantages, expanding the scope and coverage of business operations. This explains why in many situations the strict enforcement of property rights is superseded by “contract” rules granting third parties rights *in rem* or giving them priority access to the principals’ assets—i.e., making the principal liable for the agent’s contractual obligations.

6.1. The palliatives of contractual agency

However, early Roman law lacked a proper law of agency, as “the strictly personal character of the Roman obligation... made agency impossible [in the sense of creating a direct relationship between principal and third party], and the *mandatarius* alone was both liable and entitled on any contract which he made” (Nicholas 1962:189). Contracts therefore could only negatively affect their parties: what in English law is called the “privity” of contract was rigidly applied (*ibid.*:199).³⁹ This strict enforcement of what I have labeled the “property” rule made sense in a personal market with few trade opportunities but not after trade opportunities substantially increased in the second century B.C.E.⁴⁰ Consistent with this trade-expansion hypothesis, praetorian edicts introduced important changes diluting such strictness, by making principals liable and therefore protecting innocent third parties. The key innovation was to enhance the role of slaves and sons as economic agents, in two opposite directions: on the one hand, making masters and fathers liable for the acts of their slaves and sons; and, on the other hand, by limiting the masters’ and fathers’ liability to the assets assigned to the sons or slaves. I will argue that these solutions were close to modern solutions both in their function and their operation, as both were based on appearance and publicity.

First, consistent with the analysis in section 1, the principal was made liable when it was clear he had granted his consent and therefore authorized the agent. Since the second century

³⁹ Initially, the only exception were rights acquired by slaves and *filiusfamilias*, which vested in the *paterfamilias* (Nicholas 1962:199). This asymmetry in the rule (principals not liable but able to acquire rights through their sons’ and slaves’ actions) made sense because the third parties granting a right to the slave owner were themselves owners, therefore they had ultimate control of the situation and could take good care of their interests. With little potential for conflict, this solution must have facilitated some degree of exchange and specialization, as slave owners needed to be present to commit themselves on any obligation but did not need to be present to acquire rights. Indeed, we find similar asymmetries in today’s economy: banks are often allowed to modify the land registry, but only against their own interest (e.g., by filing a mortgage cancellation).

⁴⁰ According, e.g., to archeological evidence on the number of shipwrecks (Parker 1992).

B.C.E., by the remedies later referred to as *actiones adiecticiae qualitatis*, praetorian law made the *paterfamilias* liable for obligations entered by his sons or slaves, with his liability increasing with the authority he had granted or with his involvement in the businesses run by his sons and slaves (Nicholas 1962:202; Abatino *et al.* 2011:374–75). In particular, he was liable in full when he had authorized the agent, either explicitly, implicitly or by allowing similar dealings: not only when the master ordered the transaction, but also when he put the agent in charge of a business or a ship. In such cases, the scope of liability was limited to contracts made in connection with the business, and could be narrowed by giving proper notice (Crook 1967:190, Johnston 1999:103).⁴¹ Moreover, similar principles were extended outside the household when a freeman was appointed as a manager or *institor* (Nicholas 1962:203–204). And at least the *actio institoria* made it possible to commit the principal on the basis of appearance (Petrucci 2003), so it played a role similar to that of possession in property. The principal was protected only by an explicit prohibition and the rules seems to have evolved in such a way that the master was liable, and, therefore, third parties were protected, when the agent exceeded his powers through actions not explicitly forbidden and made adequately public by the master (Petrucci 2003:607–10, discussing D. 14.5.8 Paul. 1 *decret.*). Roman law was therefore considering the same basic elements of consent and publicity that we find today in business agency (Arruñada 2010).

Second, the principal could limit his liability to the part of his wealth managed by the agent (the *peculium*),⁴² therefore enjoying some degree of “asset partitioning,”⁴³ but with a complex set of legal actions that arguably resembled contemporary remedies aimed to tackle standard conflicts of interests between shareholders and company creditors, such as—in current terms (Johnson *et al.* 2000, Djankov *et al.* 2008)—the abnormal distribution of dividends and self-dealing,⁴⁴ or the “tunneling” of corporate resources to insiders.⁴⁵ In general, the rules seemingly tried to link the liability of the principal to the benefit he was obtaining from the business (Crook 1967:189). In terms of section 1, this normative linkage to benefits avoided the typical attempt by principals to get rid ex post of their own ex ante commitments (i.e., to have a property rule applied), once the business entered by their agent went against the principal’s interests.

⁴¹ “The area of competence of the agent was defined in a charter (*lex praepositionis*) or by custom or common sense; it could be restricted by posting at the workplace a written sign (*proscriptio*) in any language, or extended to specific activities by a special invitation (*iussus/-um*) addressed by the principal to third contracting parties” (Aubert 2013:3466).

⁴² The *peculium* was a separable set of resources which, even if by law it pertained to the master, was controlled by the slave and was first in line in terms of satisfying the contractual commitments made by the slave to third parties. Even if slaves’ *peculium* was more important in economic terms, “it is overwhelmingly probable that married sons living independently had such a fund” (Crook 1967:110).

⁴³ See Hansmann and Kraakman (2000), and Hansmann *et al.* (2006). Having a slave operating a business provided masters with the possibility of delegating the management of business activities and benefiting from direct agency, limited the master’s liability, provided some “entity shielding” against the master’s creditors and helped to ensure the continuity of business after changes in ownership and management. See Abatino *et al.* (2011), who find evidence of entity shielding between different businesses of the same owner.

⁴⁴ E.g., this could be behind the rule constraining the discretion of the master to pay himself to the detriment of the slave’s creditors, according to Gaius (170:IV.72).

⁴⁵ E.g., the rule making the master liable for payments made to him from the *peculium* (Gaius 170:IV.73).

6.2. Discussion

Many aspects of the Roman law of business agency are subject to alternative interpretations, however. A major question is why sons and slaves played such a prominent role as contractual agents, which suggests that they enjoyed a comparative advantage over individuals *sui iuris*, those who were “in their own power” and not, like sons and slaves, under the *patria potestas* of a *paterfamilias*. This advantage seems to have lasted at least until the early third century (Johnston 1999:106) and is supported by the occasional practice of free-born individuals becoming slaves to act as chief manager or accountant of a big household (Crook 1967:60, Ramin and Veyne 1981).

It has often been argued that the advantage was linked to failures in formal law—i.e., to the incompleteness of agency-independent labor (Nicholas 1962:203, Johnston 1999:105–106)—but the survival of this formal constraint seems unlikely, considering the adaptability shown by praetorian law. Alternatively, from the perspective of section 1, this comparative advantage may have been rooted in lower transaction costs in either their originative and/or their subsequent contracts: by easier contracting of originative agency and/or subsequent trade—i.e., by better incentives for agents and/or lower information asymmetry for third parties.

First, the incentives provided by family (i.e., household) and slave law lowered agency costs, not only by making harsher punishments available, which may be suitable in conditions of information asymmetry (Dari-Mattiacci 2013), but by judicial forbearance that implies a radical asymmetry of decision rights, as I will argue in section 7.2.1.

Second, using sons and slaves as contractual agents also reduced information asymmetry in subsequent transactions if they were easier to identify as such by third parties and, in particular, their status was not easy to modify *ex post*, thereby preventing principals from freeing themselves from their undesirable commitments. As argued in section 7.2.2, this explains the structure of the formalities which dealt with household membership.

The advantage seems more nuanced in terms of subsequent transactions with third parties: third parties may have been more reluctant to contract with *filiusfamilias* and slaves to the extent that in some circumstances they would have had access only to their *peculium*, which made recovery harder (e.g., Gaius 170:IV.74). However, for the same reason, such contracting was safer for the *paterfamilias*, suggesting the presence of a tradeoff which was arguably easy to optimize by modifying the public involvement of the principal in the business and, consequently, his liability.

There also seems to be substantial discrepancy on the prevalence of corporate entities in the Roman Empire. On the one hand, through the contract of *societas* (e.g., Riggsby 2010:13), someone selling to the partnership was selling to the individual partner with whom he was dealing with. If he was not paid, he had no recourse against other partners. In general, “legal personality was not available for private businesses” (Abatino *et al.* 2011:368). On the other hand, big tax farming companies created by *publicani* enjoyed special rules: e.g., death of a partner or litigation between partners did not dissolve the company (Crook 1967:234). It has even been claimed that there were proper companies, at least for tax farming and shipping, and that they were functionally similar to the European joint-stock companies of the sixteenth and seventeenth centuries, with their own legal identity and continuity after the death of their investors, with separation of ownership and control and with shares being traded at variable prices (Malmendier 2009).

Given that at least partnerships for tax collection and building projects were governed by special rules that included incorporation and entity shielding, the legal and judicial expertise for contracting them was available: the basic “technology” for corporate contracting had already been developed. However, in connection with the argument in section 1, corporate contracting is exceedingly costly when, in the absence of company registries, it is based purely on informal publicity (Arruñada 2010:556–58), as shown by the experience of English unincorporated companies during the Industrial Revolution (Harris 2000). Even if the company form was available to the Romans, it must have been ineffective when used without some form of public chartering. The historical record is consistent with the interpretation that, as in the modern English case and given the lack of company registries, large corporations were viable when based on the public chartering process leading to the concession grant but were hardly viable on a purely contractual basis.⁴⁶ However, in contrast with the English case, in which we observe for decades unsatisfied demand for proper incorporation, leading to the solutions analyzed by Harris (2000), there are no indications of such unsatisfied demand in Roman times.

The analysis in section 2 therefore provides a more systematic explanation as to why corporations were not used for other activities and industries. The most basic reason might have been that there was little need to use them for such activities. There was not enough demand for more stable business associations: available technology did not require the large amounts of capital and continuity that, for instance, infrastructure projects and railroads were to require at the time of the Industrial Revolution.⁴⁷ The situation would have corresponded to the one represented by Figure 1 if we interpret impersonal exchange as the corporate form of business organization and personal exchange as non-corporate organization. In the Roman context, few business opportunities lie to the right of the horizontal axis, making—even under voluntary registration, which makes the cost L irrelevant—the fixed cost of creating a company register (F) bigger than the benefits (G). Therefore, only a few large companies incorporated, relying on the publicity provided by the public calls and auctions linked to tax farming and government subcontracting.

⁴⁶ Compare Malmendier (2009), who omits any consideration of the difficulties faced by companies created on a purely contractual basis and emphasizes political considerations in the demise of the large *societas publicanorum* in the Roman Empire. They lost importance and ultimately disappeared because the state changed the way it collected taxes and produced public services, moving away from pure tax farming into more sophisticated forms of subcontracting, with greater control of subcontractors, sharing of revenues and development of the state’s bureaucracy (Gibbs 2013). It is not clear that these changes in public finance worsened the environment for the market economy, which in fact flourished during at least a couple of centuries after them; but, whatever their causes and merits, the most pressing question is why the corporate form used by tax farming did not prosper in other activities and, in particular, why this form was not used for organizing other private economic activities either before or after such changes in fiscal policy. (The existence of corporate entities in shipping, alleged by, e.g., Malmendier (2009:1089) and Temin (2013:103) on the basis of a statement attributed to Cato by Plutarch, who wrote almost two hundred years later and might have been prone to exaggeration (see, for another likely example, Ellickson, forthcoming), seems to be grounded on a weak, temporary, basis (Verboven 2002:285), even if shipping is an activity that allegedly poses relatively discontinuous and therefore simpler contractual problems.)

⁴⁷ Compare to the firm size constraint argument in Abatino and Dari-Mattiacci (forthcoming [a]).

7. Effective enforcement of personal obligations

Both economic transactions and legal systems substitute between impersonal and personal exchange. When impersonal exchange is impossible, transactions are either made relying on personal safeguards or are not made at all and become lost opportunities. In particular, the harder it is to enforce rights *in rem*, more rights will be enforced *in personam*. For example, when real securities for credit are weak, credit will tend to be more personal and transactors will rely more on personal sureties. Informal norms and formal rules might also be adapted to facilitate such substitution. If a society relies more on personal exchange, one could expect individuals' reputation to play a greater role and personal sanctions to be harsher (Arruñada 2012:50–52). This was seemingly the case in ancient Rome, where informal social norms motivated people to fulfill their personal obligations. Interestingly, both formal rules and organizationally supported institutions were also used to reinforce such informal social norms.

7.1. Informal norms and formal rules

Roman society placed great importance on personal honor and reputation, which was the basis for strong horizontal and vertical bonds that provided safeguards for all sorts of exchanges. As a consequence, fulfilling contractual obligations was a matter of personal honor (Temin 2013:12). Horizontal bonds meant that substantial mutual help was customarily provided by people equal in status, mainly under the informal institutions of *amicitia* and *officium*: respectively, the informal bond and the obligation of friendship. “Friendship (*amicitia*) gave rise to serious and substantial duties. Roman friends made claims on each other which would cause a modern ‘friend’ to break off the relationship without delay” (Schulz 1951:555).⁴⁸ Vertical bonds amounted to several layers of patronage by people of higher status, who acted as patrons for their lower-status “clients,” the *clientela*. In the early Republic the situation was close to serfdom, but survived later mainly for the relation between patron and freedman (Crook 1967:93). Moreover, informal personal ties were also important among Roman merchants for gathering information relevant for contractual enforcement. Traders often belonged to the same social groups (Temin 2006:139), were able to exchange information (Kessler and Temin 2007) and, to reduce information asymmetries, relied not only on personal ties, household members and peer monitoring but also on formal guilds and some state institutions (Temin 2013:100).

These personal bonds were based on individuals' informal reputation but were also supported in formal reputational mechanisms. Thus, losing reputation was subject to informal sanctions, but these soon acquired the formal version of *ignominia* and *infamia*, with a judicially-imposed exclusion from the legal protections enjoyed by a Roman citizen (Crook 1967:83–85). Interestingly, reputation itself was also formally protected: defaming another

⁴⁸ There are signs that informal bonds became less effective over time, as indicated by Seneca's complaint in the first century C.E. that *fides* was no longer enough and debt now needed to be formalized by means of written and sealed documents, with the seal giving increased physical protection (Meyer 2004: 156).

person was itself harshly punished with *infamia*. The role of reputation was reinforced with the *census*, which established a formal classification of individuals defining their rights and duties and including a negative mark for those who offended public morality. In this way, it provided a formal register of reputation. Lastly, the formal legal system also relied on and reinforced the informal system of social norms to the extent that the value that Roman judges granted to evidence depended to some extent on the social standing of those providing or witnessing it (Meyer 2004).

Moreover, informal social norms were reinforced by a whole array of formal rules ensuring enforcement of personal obligations by several means, which included, to mention only a few, a self-help version of debtors' prison, strict punishments and sophisticated allocations of liability. Personal enforcement or self-help initially consisted of execution of the wrongdoer by the creditor, including victims of crimes, who were entitled to a payment from the wrongdoer. Later, creditors could only privately imprison defaulting debtors but were responsible with respect to other creditors (Nicholas 1962:209–10). Judicial enforcement was also based on personal execution: the plaintiff was authorized to imprison the judgment debtor and sell his whole property (Crook 1967:82–83, Johnston 1999:108–10). After 326 B.C.E., a borrower could not pledge himself or a son as collateral for a loan (*nexum*), to become the lender's slave in case of default, but debt bondage could still result from the debtor's default (Crook 1967:173). Lastly, the law can be understood to have tried to make personal obligations effective by increasing punishments in line with asymmetric information. In particular, an early legal rule imposed double damages for eviction of *res Mancipi* (Nicholas 1962:161, n. 1), which motivated sellers not only to disclose but also to discover and purge title clouds.⁴⁹

7.2. Institutions empowering private ordering

At a more general level, social norms protecting personal exchange were also reinforced by two sets of arrangements enabling the extended *familia* to act as a legal entity: first, those allocating most decision rights to its head, the *paterfamilias*; and, second, those defining the *familia*'s legal boundaries and, therefore, who could inherit and, crucially in the context of impersonal trade, act as his contractual agent, committing the *familia*'s assets to meeting his obligations.

7.2.1. The role of judicial forbearance in enabling self-enforcement

First, concentration of property and decision rights in the *paterfamilias* (including those on slaves and *filiusfamilias*) defined an ambit of “forbearance” in which judges would not enter (using the term coined by Williamson (1991) to designate the refusal of courts to hear disputes internal to modern firms, for example, between their divisions). The refusal of

⁴⁹ It was also made a crime to mislead a creditor about prior charges (Johnston 1999:93). Verhagen emphasizes that this happened only by virtue of imperial rescript practice as from the end of the second century C.E. (forthcoming:23). This relatively late criminalization could have been a response to greater incidence of fraud caused by the slow erosion of personal bonds. This weakening of personal bonds might also have been behind the earlier growing reliance on written and sealed legal documents and the increasing physical protection of such seals, as claimed by contemporaries (Meyer 2004:156).

judges to enter into intra-*familia* disputes allowed an asymmetric allocation to the *paterfamilias* of property rights on other *familia* members.⁵⁰ This should have made it possible for *familias* to fully rely on self-enforcement in their internal transactions and to act as quasi-firms with respect to third parties.⁵¹

Several factors increased the importance of this system of self-enforcement. To begin with, it encompassed not only the *familia* stricto sensu but the wider *clientela*: “it would have been impious and unlawful for patrons and clients to litigate or testify against each other or to support each other’s enemies” (Verboven 2013). Second, judicial forbearance was enhanced by the paucity of mandatory rules about key aspects of family law, including, most prominently, substantial freedom of testation (e.g., Crook 1967:118–27), which had obvious consequences in terms of stronger incentives for sons and other possible heirs, including slaves. Third, the aforementioned reliance on self-help can also be understood as a form of judicial forbearance, to the extent that it was parties themselves who were in charge of enforcement. Fourth, this concentration of rights in the *paterfamilias* had consequences both inside and outside the *familia*. Inside, it facilitated enforcement. Outside, it helped achieving some of the “modularity” provided now by business firms (Smith 2006 and 2009). For instance, reputation was linked not only to individuals but to the whole *familia*, alleviating possible horizon problems. Lastly, it makes sense that Roman law carefully protected the *familia* against possible mistakes when the young age of the *paterfamilias* could lead him to exercise these decision rights poorly. It did so not only with the institution of guardianship, applied to children younger than 14 and women, but also with a “caretakership” which was common for minors aged between 14 and 25, probably to avoid the difficulties they would have faced for contracting, given that, otherwise, they could easily have the transaction nullified later on by alleging fraud (Crook 1967:113–18).

7.2.2. The role of formalities with respect to household membership

The importance of the *familia* as a legal entity also explains the sophisticated formalities and cautions used by Roman law to define its boundaries. All contractually relevant entries and exits of the *familia* were subject, to ceremonial formalities and, therefore, to publicity: adoption, which was commonly used to achieve succession by adopting adults who entered the *patria potestas* of their adoptive fathers; emancipation, which led to dissolution of *potestas*, and was often used as a sanction; as well as the purchase and manumission of slaves. The fact that the dominant form of marriage under the Empire was consensual and had no ceremonial requirement ties in with the argument: public notice was unnecessary because the legal status of the wife remained unchanged—that is, she remained under the *patria potestas* of her father if she was *sui iuris* and she remained independent and retained her property if she was *alieni iuris*.⁵² However, publicity was required for *manus* marriage, in

⁵⁰ About agency, it is said that “these were relations that never reached the inside of a courtroom. Their entire tone precludes contract and suit, action and liability; yet they were most effective in fulfilling the roles and needs lawyers associate with agency” (Kirschenbaum 1987:180, cited by Temin 2013:111). Indeed, they precluded contract and suit, but only inside the *familia*, in a similar fashion to modern firms.

⁵¹ Asymmetric allocation of decision rights and judicial forbearance play an important role in today’s economy (e.g., for franchising, Arruñada, Garicano, and Vázquez 2001).

⁵² Even if form-free (Nicholas 1962:80–81), marriage required a clearly manifested intention, customarily evidenced by two-step contracting (a more private engagement and a more public

which the wife was in the position of a daughter to her husband, as well as for any *mancipatio*, adoption, emancipation and manumission. All of them were ceremonial and required the presence of witnesses or some other form of publicity (Crook 1967:103–13, Nicholas 1962:71–83, Scafuro 2013, McGinn 2013). Moreover, such witnesses often played a purging function, as explained above. Some adoptions were even subject to judicial supervision and popular vote: *adrogatio*, being the adoption of a person not under the *patria potestas* of another man, often produced the merger of two *familias*, making public approval advisable, not only because it extinguished a *familia* (Nicholas 1962:77) but possibly because it may have had serious consequences for third parties, mainly creditors. Lastly, the very prevalence of adoption in Rome, by indicating the extraordinary importance of succession, indirectly supports the argument as to the legal-entity nature of the *familia*.

These requirements of publicity are understandable considering that these legal acts could potentially affect third parties: in the framework of section 1, they are originative transactions which may have serious consequences for subsequent transactions. The originative transactions were those establishing or modifying individuals' status, such as birth,⁵³ emancipation, adoption, marriage, manumission, etc. The affected subsequent transactions were those in which the status of the individuals or their children was a key condition for their legal effects. For example, marriage determined the status of children, and adoption affected the right to inherit and the power of the adopted to commit the *paterfamilias*. The consequences of slavery and manumission were similarly important, as slavery also made a form of contractual agency viable and manumission gave the right to have born-free children: freemen could marry (Crook 1967:52) and their children were free-born (see a case in Crook 1967:48–49).

7.3. Discussion

Based on this analysis of the enforcement of personal obligations, it is worth considering a possible connection between the strength of personal obligations and the convoluted development of the Roman law of agency. When enforcement of all types (by first, second or third parties) is stricter, it becomes more necessary to ensure that proper consent has been given when entering into a commitment, which may be seen as an application of the principle in principal-agent theory that establishes some degree of complementarity between the intensity of both incentives and monitoring. From this perspective, the strict enforcement of personal obligations, characteristic of Roman law, thus ties in with, first, its initial reluctance to commit an individual by the actions of others; and, second, its ulterior development of a palliative of contractual agency. This palliative was largely based on the role as agents of

wedding) and elaborate public ceremonies (Crook 1967:102–103; Arruñada 2012:238–39, n. 14; Hersch 2010).

⁵³ The birth registry was voluntary, but (as often happens with public registries) people were motivated to record to enjoy legal effects (Rowlandson 2013). The evidence can be interpreted as confirming the argument: recordation in the *kalendarium* was declarative within thirty days of birth but in principle illegitimate children (with fewer or no rights) could not be included in the *album*, which suggests some form of purge, especially considering that the *album* was publicly displayed, with both archives working respectively as a mere recording diary and as a proper register. It is consistent with this interpretation that the copies used as proof of status were produced from the *album* and were authenticated by up to seven witnesses.

sons and slaves, who provided an additional safeguard by being under the *patria potestas* of their father and master, a situation that was carefully identified and often made public by institutional solutions.⁵⁴ For a similar reason, protecting the strict enforcement of personal obligations might also have been behind the underdevelopment of the law of companies.

8. Conclusion: The extent of the Roman market economy and its institutional support

For decades, Ancient History has been divided between divergent “modernist” or “formalist” views, which commonly emphasize economic growth and market exchange, and “primitivist” or “substantivist” views, which tend to highlight constraints, power and domination.⁵⁵ My analysis of Roman institutions from the perspective of personal-versus-impersonal exchange aims to transcend two aspects of this recurrent discussion, relating to the nature and extent of the market economy in Roman times, and the market-facilitating role of the Roman state.

With respect to the nature and extent of the market, by focusing on rights *in rem*, the paradigm of truly impersonal exchange, the chapter sets a benchmark for the impersonality of market transactions, one of the dimensions of transaction costs and, therefore, the “quality” of market exchange. Using this metric, one may be tempted to frame the discussion in Ancient History in terms of personal versus impersonal exchange, considering, from a primitivist standpoint, that only impersonal markets deserve to be considered as markets. This, however, would be mistaken on both empirical and theoretical grounds. Empirically, because even today most markets and transactions remain personal or at least retain personal dimensions, even if other dimensions or attributes have been depersonalized.⁵⁶ More fundamentally, efficiency judgments must consider the fixed and variable costs of introducing and operating alternative institutions; and, even within the narrow framework of section 2, impersonal exchange is not intrinsically superior to personal exchange. Therefore, the lack of land and company registries, and the consequent reliance on palliative solutions ensuring strict enforcement of personal obligations should not necessarily be considered as a negative indicator of the extent of Roman markets or of the support given to the market by the Roman state.

With respect to this support, it has been hotly disputed if the Roman state favored the development of the market or merely pursued extractive objectives that were conducive, as an

⁵⁴ The fact that the ability to commit the principal was limited to dependents under his *potestas* also refutes the argument by Verboven (2002:260–63), according to which the strong informal ties between Roman friends made agency unnecessary. In my view, friends were less effective than sons and slaves as agents because, whatever the strength of their ties with the principal and in contrast to sons and children, their status as friends was totally informal and therefore more easily subject to misunderstanding and information asymmetry on the part of and with respect to third parties.

⁵⁵ See, e.g., for a summary account, Scheidel (2012:7–10).

⁵⁶ In reality as opposed to abstract models, impersonality is a more or less continuous attribute of transactions (Arruñada 2012:15–18) and even specific dimensions of transactions may be situated at different levels of that continuum.

unintentional byproduct, to the development of market exchange. In particular, it has been argued that Roman markets were not supported by the state and only worked in a limited manner within the informal networks of merchants and households (e.g., Bang 2008). In essence, I proposed in section 2 a simple model of the state's institutional decisions and then confirmed in the following sections that the empirical evidence on Roman institutions is broadly consistent with the model's predictions.⁵⁷ I did not discuss how the Roman state effectively provided conventional public goods which were essential for market exchange, such as security of property, a stable currency, standard weights and measures, and an interconnected judicial system, but did analyze key areas of the law in which the Roman state helped expand the market by developing institutions that enabled a wider scope of transactions. They were, if not impersonal, at least made possible by the effective enforcement of personal obligations.

These market-enabling institutions included more or less centralized solutions. Relatively decentralized solutions were based on superseding allegedly inefficient legal rules by means of judicial decisions, in a process which was to some extent similar to how modern common law is often assumed to work. The most salient case is the evolution of praetorian remedies, which filled gaps in traditional law. More centralized solutions, closer to the modern civil law tradition, were rarer and are here represented by the *bibliothèque enkteseon*, the new land and mortgage register created by the provincial administration of Egypt. This creation suggests that Roman administration was not inimical to this type of institution when it was well suited but, more widely, was interested in facilitating market transactions and limiting the market-debasing effect of the *in rem* enforcement of tax duties through tacit charges.⁵⁸

Lastly, the state contributed by supporting personal exchange within and between *familias*. In this area, the state helped the market not only by enforcing strict rules on personal obligations and not interfering with private contracting within *familias* (forbearance) but also by providing organized support for personal transactions. Roman personal exchange was not mere private ordering, as the state enacted publicity rules (e.g., on emancipation and manumission) and implemented public personal registries (e.g., the birth registry and the census) that reduced transaction costs and enhanced the enforcement of personal obligations. From this perspective and to the extent that informal social norms enforcing personal obligations were supported by such formal rules and registries, the separation between formal and informal institutions, which seems to play a major role in current discussions in Ancient history (Lerouxel 2012a:642), becomes fuzzier, while the market-enabling role of the Roman state becomes greater and more nuanced.

The picture that emerges when considering the whole set of solutions used in the classical period of Roman law is one in which, broadly speaking and relying on the framework developed in section 1, transactions are based on, first, automatic verifiability of originative contracts (e.g., publicity of possession for property and public appearance for business transactions); and, second, substantial public support for the effective enforcement of personal obligations. In particular, institutional support provided practically no organized

⁵⁷ The model assumes a benevolent decision maker, which is unreal but, under proper constraints, individual maximization should be compatible with social welfare, and judging the effectiveness of such constraints is not easier than judging overall consequences.

⁵⁸ See Lerouxel (2012a:656–57). Of course, this emphasis on enabling the market was not permanent. Especially in later centuries, the state simply gave privileged status to the treasury (Nicholas 1962:153; Crook 1967:246) without paying attention to the increase in transaction costs caused by these tacit charges in the absence of registries.

verifiability (i.e., registries of originative contracts) but did provide rules (e.g., penalties, family law), general organizational principles (judicial forbearance) and even organizations (*census*) that facilitated the enforcement of personal obligations.

9. References

- Abatino, Barbara, and Giuseppe Dari-Mattiacci. Forthcoming (a). “Agency Problems and Organizational Costs in Slave-run Business.” In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 1: Ch. 10. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.
- Abatino, Barbara, and Giuseppe Dari-Mattiacci. Forthcoming (b). “The Dual Origin of the Duty to Disclose in Roman Law .” In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 2: Ch. 22. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.
- Abatino, Barbara, Giuseppe Dari-Mattiacci, and Enrico C. Perotti. 2011. “Depersonalization of Business in Ancient Rome.” *Oxford Journal of Legal Studies* 31:365–89.
- Adams, Colin E. P. 2013. “Abinnaeus Archive.” In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:5–6. Malden, MA; Oxford: Wiley-Blackwell.
- Ando, Clifford. 2010. “The Administration of the Provinces.” In David S. Potter, ed. *A Companion to the Roman Empire*:177–92. Oxford: Wiley-Blackwell.
- Andreau, Jean. 1999. *Bankers and Business in the Roman World*. Cambridge: Cambridge University Press.
- Arruñada, Benito, and Nuno Garoupa. 2005. “The Choice of Titling System in Land.” *Journal of Law and Economics* 48:709–27.
- Arruñada, Benito, Giorgio Zanarone, and Nuno Garoupa. 2019. “Property rights in sequential exchange.” *Journal of Law, Economics, and Organization* 35:127–53.
- Arruñada, Benito, Luis Garicano, and Luis Vázquez. 2001. “Contractual Allocation of Decision Rights and Incentives: The Case of Automobile Distribution.” *Journal of Law, Economics, and Organization* 17:256–83.
- Arruñada, Benito. 2003. “Property Enforcement as Organized Consent.” *Journal of Law, Economics, and Organization* 19:401–44.
- Arruñada, Benito. 2010. “Institutional Support of the Firm: A Theory of Business Registries.” *The Journal of Legal Analysis* 2:525–76.
- Arruñada, Benito. 2012. *Institutional Foundations of Impersonal Exchange: Theory and Policy of Contractual Registries*. Chicago and London: University of Chicago Press.
- Arruñada, Benito. 2015. “The Titling Role of Possession.” In Yun-chien Chang, ed., *The Law and Economics of Possession*:207–33. Cambridge: Cambridge University Press.
- Arruñada, Benito. 2016. “How Rome Enabled Impersonal Markets.” *Explorations in Economic History* 61:68-84.
- Arruñada, Benito. 2017. “Property as Sequential Exchange: The Forgotten Limits of Private Contract.” *Journal of Institutional Economics* 13:753–83.

- Arruñada, Benito. 2018. "Evolving practice in land demarcation." *Land Use Policy* 77:661–75.
- Aubert, Jean-Jacques. 2013. "Institor." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:3466–67. Malden, MA; Oxford: Wiley-Blackwell.
- Bagnall, Roger S. 2010. *Everyday Writing in the Graeco-Roman East*. Sather Classical Lectures. Vol. 69. Berkeley: University of California Press.
- Bang, Peter F. 2008. *The Roman Bazaar: A Comparative Study of Trade and Markets in a Tributary Empire*. Cambridge: Cambridge University Press.
- Bransbourg, Gilles. 2012. "Rome and the Economic Integration of Empire." Institute for the Study of the Ancient World Papers 3. <http://dlib.nyu.edu/awdl/isaw/isaw-papers/3/> (visited July 30, 2015).
- Bransbourg, Gilles. 2014. "Les taux d'intérêt flottants des Sulpicii." In Catherine Apicella, Marie-Laurence Haack, and François Lerouxel, eds., *Les affaires de Monsieur Andreau: Économie et société du monde romain*:123–35. Bordeaux: Ausonius.
- Brennan, T. Corey. 2001. *The Praetorship in the Roman Republic (Vol. 1: Origins to 122 BC)*. Oxford: Oxford University Press.
- Brown, Peter. 1971. *The World of Late Antiquity AD 150-750*. London: Thames & Hudson. (Reprint 2006).
- Buckland, William Warwick. 1912. *Elementary Principles of the Roman Private Law*. Cambridge: Cambridge University Press.
- Calabresi, Guido, and A. Douglas Melamed. 1972. "Property Rules, Liability Rules, and Inalienability: One View of the Cathedral." *Harvard Law Review* 85:1089–128.
- Camodeca, Giuseppe. 2013. "*Tabulae Herculenses*." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:6507–509. Malden, MA; Oxford: Wiley-Blackwell.
- Corcoran, Simon. 2013. "*Tablettes Albertini*." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:6499–500. Malden, MA; Oxford: Wiley-Blackwell.
- Crook, John A. 1967. *Law and Life of Rome*. Ithaca, NY: Cornell University Press.
- Dari-Mattiacci, Giuseppe. 2013. "Slavery and Information," *The Journal of Economic History* 73:79–116.
- Daumas, François. 1987. *La civilisation de l'Égypte pharaonique*. Paris: Les Editions Arthaud (Spanish translation used: Barcelona, Óptima, 2000).
- De Ligt, Luuk. Forthcoming. "Legal Change and Economic Change During the Republic and Early Empire." In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 1: Ch. 4. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.
- Demsetz, Harold. 1967. "Toward a Theory of Property Rights." *American Economic Review* 57:347–59.
- Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2008. "The Law and Economics of Self-Dealing." *Journal of Financial Economics* 88:430–65.
- Duncan-Jones, Richard P. 1976. "Some Configurations of Landholding in the Roman Empire." In Moses I. Finley, ed., *Studies in Roman Property by the Cambridge University Research Seminar in Ancient History*:7–33. Cambridge: Cambridge University Press.

- Eich, Peter. 2013. "Administration, Roman." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:90–95. Malden, MA; Oxford: Wiley-Blackwell.
- Ellickson, Robert C. Forthcoming. "Ancient Rome: Legal Foundations of the Growth of an Indispensible City." In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 2: Ch. 15. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.
- Erdkamp, Paul. 2005. *The Grain Market in the Roman Empire: A Social, Political and Economic Study*. Cambridge: Cambridge University Press.
- Everett, Nicholas C. 2000. "Scribes and Charters in Lombard Italy." *Studi Medievali* 41:39–84.
- Everett, Nicholas C. 2013. "Ravenna Papyri." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:5739–41. Malden, MA; Oxford: Wiley-Blackwell.
- Fernández, Damián. 2013. "Alimenta Schemes." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:315–16. Malden, MA; Oxford: Wiley-Blackwell.
- Finley, Moses I. 1999. *The Ancient Economy*, Berkeley: University of California Press.
- Frier, Bruce W., and Dennis P. Kehoe. 2007. "Law and Economic Institutions." In Walter Scheidel, Ian Morris, and Richard P. Saller, eds. *The Cambridge Economic History of the Greco-Roman World*:113–43. Cambridge: Cambridge University Press.
- Gargola, Daniel J. 1995. *Lands, Laws & Gods: Magistrates & Ceremony in the Regulation of Public Lands in Republican Rome*. Chapel Hill, NC: University of North Carolina Press.
- Gibbs, Matt. 2013. "Tax Farming." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:6553–55. Malden, MA; Oxford: Wiley-Blackwell.
- Greene, Kevin. 2000. "Technical Innovation and Economic Progress in the Ancient World: M. I. Finley Re-Considered." *Economic History Review* 53:29–59.
- Haeussler, Ralph. 2013. "Literacy, Rome and Provinces." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:4104–108. Malden, MA; Oxford: Wiley-Blackwell.
- Hansmann, Henry, and Reinier Kraakman. 2000. "The Essential Role of Organizational Law." *Yale Law Journal* 110:387–440.
- Hansmann, Henry, and Reinier Kraakman. 2002. "Property, Contract, and Verification: The *Numerus Clausus* Problem and the Divisibility of Rights." *Journal of Legal Studies* 31:S373-S420.
- Hansmann, Henry, Reiner Kraakman, and Richard Squire. Forthcoming. "Incomplete Organizations: Legal Entities and Asset Partitioning in Roman Commerce." In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 1: Ch. 8. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.
- Hansmann, Henry, Reinier Kraakman, and Richard Squire. 2006. "Law and the Rise of the Firm." *Harvard Law Review* 119:1333–403.
- Harris, Ron. 2000. *Industrializing English Law: Entrepreneurship and Business Organization, 1720–1844*. Cambridge: Cambridge University Press.

- Harris, William V. 1989. *Ancient Literacy*. Cambridge: Harvard University Press.
- Harter-Uibopuu, Kaja. 2013. "Gesta." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:2908–909. Malden, MA; Oxford: Wiley-Blackwell.
- Heller, Michael A. 1999. "The Boundaries of Private Property." *Yale Law Journal* 108:1163–223.
- Hersch, Karen K. 2010. *The Roman Wedding: Ritual and Meaning in Antiquity*. Cambridge: Cambridge University Press.
- Honoré, Anthony Maurice (Tony). 1989. "Conveyances of Land and Professional Standards in the Later Empire." In Peter Goodwin Birks, ed., *New Perspectives in the Roman Law of Property: Essays for Barry Nicholas*:137–52. Oxford: Clarendon Press.
- Innis, Harold A. 1950. *Empire and Communications*. Toronto: Dundurn Press. (Reprint 2007).
- Johnson, Simon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2000. "Tunneling." *American Economic Review Papers and Proceedings* 90:22–27.
- Johnston, David. 1999. *Roman Law in Context*. Cambridge: Cambridge University Press.
- Jördens, Andrea. 2010. "Nochmals zur Bibliothek Enkteseon." In Gerhard Thür, ed. *Symposion 2009. Vorträge zur griechischen und hellenistischen Rechtsgeschichte (Seggau, 25–30 August 2009)*:277–90. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.
- Kain, Roger J. P., and Elizabeth Baigent. 1992. *The Cadastral Map in the Service of the State: A History of Property Mapping*. Chicago: University of Chicago Press.
- Kessler, David, and Peter Temin. 2007. "The Organization of the Grain Trade in the Early Roman Empire." *Economic History Review* 60:313–32.
- Kirschenbaum, Aaron. 1987. *Sons, Slaves and Freedmen in Roman Commerce*. Jerusalem: The Hebrew University Magnes Press.
- Koyama, Mark. 2010. "Evading the 'Taint of Usury': The Usury Prohibition as a Barrier to Entry." *Explorations in Economic History* 47:420–42.
- Laiou, Angeliki E., and Cécile Morrisson. 2007. *The Byzantine Economy*. Cambridge: Cambridge University Press.
- Lerouxel, François. 2012a. "The Private Credit Market, the Bibliothek Enkteseon, and Public Services in Roman Egypt." *Annales. Histoire, Sciences Sociales* 67:629–59.
- Lerouxel, François. 2012b. "Des prêts sans intérêt? Le taux d'intérêt dans le nome oxyrhynchite avant 79." *Zeitschrift für Papyrologie und Epigraphik* 181:161–172.
- Lo Cascio, Elio. 2000. "Gli alimenta, l'agricoltura italiana e l'approvvigionamento di Roma." In Elio Lo Cascio, *Il princeps e il suo impero: Studi di storia amministrativa e finanziaria romana*:223–64. Bari: Edipuglia.
- Malmendier, Ulrike. 2009. "Law and Finance 'at the Origin'." *Journal of Economic Literature* 47:1076–108.
- Manning, Joseph G. 2003. *Land and Power in Ptolemaic Egypt: The Structure of Land Tenure*. Cambridge: Cambridge University Press.
- McGinn, Thomas A. J. 2013. "Manus." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:4270–71. Malden, MA; Oxford: Wiley-Blackwell.
- Merrill, Thomas W., and Henry E. Smith. 2000. "Optimal Standardization in the Law of Property: The Numerus Clausus Principle." *Yale Law Journal* 110:1–70.

- Merrill, Thomas W., and Henry E. Smith. 2001. "What Happened to Property in Law and Economics?" *Yale Law Journal* 111:357–98.
- Meyer, Elizabeth A. 2004. *Legitimacy and Law in the Roman World: Tabulae in Roman Belief and Practice*. Cambridge: Cambridge University Press.
- Moatti, Claude. 1994. "Les archives des terres publiques à Rome (1er siècle av. -1er siècle ap. J.-C.): le cas des assignations." In Ségolène Demougin, ed., *La mémoire perdue: à la recherche des archives oubliées, publiques et privées, de la Rome antique*:103–19. Paris: Publications de la Sorbonne.
- Monson, Andrew. 2012. *From the Ptolemies to the Romans. Political and Economic Change in Egypt*. Cambridge: Cambridge University Press.
- Moreau, Philippe. 1994. "La mémoire fragile: Falsification et destruction des documents publics au 1er siècle av. J.C." In Ségolène Demougin, ed., *La mémoire perdue: à la recherche des archives oubliées, publiques et privées, de la Rome antique*:121–47. Paris: Publications de la Sorbonne.
- Muhs, Brian. 2015. "Transaction Costs and Institutional Change in Egypt in the Early First Millennium B.C.E." In Uri Yiftach-Firanko, Dennis P. Kehoe, and David M. Ratzan, eds., *Transaction Costs in the Ancient Economy*, chapter 3. Ann Arbor MI: Michigan University Press.
- Nicholas, Barry. [1962] 2010. *An Introduction to Roman Law*. Oxford: Oxford University Press.
- Nicolet, Claude. 1988. *L'inventaire du monde: Géographie et politique aux origines de l'Empire romain*. Paris: Hachette.
- North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Parker, Anthony John. 1992. *Ancient Shipwrecks of the Mediterranean and the Roman Provinces*. British Archaeological Reports International Series 580. Oxford: Tempus Reparatum.
- Petrucchi, Aldo. 2003. "Orígenes romanísticos de la buena fe objetiva en la contratación mercantil." *Anuario Mexicano de Historia del Derecho* 15:601–15.
- Ramin, Jacques, and Paul Veyne. 1981. "Droit romain et société: Les hommes libres qui passent pour esclaves et l'esclavage volontaire." *Historia* 30:472–97.
- Rathbone, Dominic. 1991. *Economic Rationalism and Rural Society in Third-Century A. D. Egypt: The Heroninos Archive and the Appianus Estate*. Cambridge: Cambridge University Press.
- Rhodes, P.J. 2013. "Documents and Archives." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:2181–84. Malden, MA; Oxford: Wiley-Blackwell.
- Riggsby, Andrew M. 2010. *Roman Law and the Legal World of the Romans*. Cambridge: Cambridge University Press.
- Rose, Carol M. 1985. "Possession as the Origin of Property." *University of Chicago Law Review* 52:73–88.
- Rotman, Youval. 2013. "Babatha." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:1004–1005. Malden, MA; Oxford: Wiley-Blackwell.

- Rowlandson, Jane. 1981. "Sales of Land in Their Social Context." In Roger S. Bagnall, Gerald Browne, Ann E. Hanson and Ludwig Koenen, eds., *Proceedings of the Sixteenth International Congress of Papyrology*:371–78. New York: Chico Scholars Press.
- Rowlandson, Jane. 2013. "Birth, Registrations of." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:1128–31. Malden, MA; Oxford: Wiley-Blackwell.
- Sánchez-Moreno Ellart, Carlos. 2013. "Archives." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:660–65. Malden, MA; Oxford: Wiley-Blackwell.
- Scafuro, Adele C. 2013. "Witnesses, Greek and Roman." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:7114–16. Malden, MA; Oxford: Wiley-Blackwell.
- Scheidel, Walter, and Steven J. Friesen. 2009. "The Size of the Economy and the Distribution of Income in the Roman Empire." *Journal of Roman Studies* 99:61–91.
- Scheidel, Walter. 2008. "The Comparative Economics of Slavery in the Greco-Roman World." In Enrico Dal Lago and Constantina Katsari, eds., *Slave Systems, Ancient and Modern*:105–26. Cambridge: Cambridge University Press.
- Scheidel, Walter. 2012. "Approaching the Roman Economy." In Walter Scheidel, ed., *The Cambridge Companion to the Roman Economy*:1–21. Cambridge: Cambridge University Press.
- Scheidel, Walter. 2013. "The Shape of the Roman World." Princeton/Stanford Working Papers in Classics. Version 1.0. April.
- Schulz, Fritz. 1951. *Classical Roman Law*. Oxford: Clarendon Press.
- Smith, Henry E. 2006. "Modularity in Contracts: Boilerplate and Information Flow." *University of Michigan Law Review* 104:1175–222.
- Smith, Henry E. 2009. "Modularity in Property, Intellectual Property, and Organizations." Harvard Law School Working Paper, September 17.
- Temin, Peter. 2006. "The Economy of the Early Roman Empire." *Journal of Economic Perspectives* 20:133–51.
- Temin, Peter. 2013. *The Roman Market Economy*. Princeton: Princeton University Press.
- Thür, Gerhard. 2013. "Proof, Legal, Greek and Roman." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:5572–74. Malden, MA; Oxford: Wiley-Blackwell.
- Verboven, Koenraad. 2002. *The Economy of Friends: Economic Aspects of Amicitia and Patronage in the Late Republic*. Brussels: Latomus.
- Verboven, Koenraad. 2003. "The Sulpicii from Puteoli and Usury in the Early Roman Empire." *Tijdschrift voor Rechtsgeschiedenis* 71:7–28.
- Verboven, Koenraad. 2013. "Clientela, Roman Republic." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:1577–82. Malden, MA; Oxford: Wiley-Blackwell.
- Verhagen, Hendrik L.E. Forthcoming. "The Security of Credit in Rome: Secured Transactions in Classical Roman Law." In Giuseppe Dari-Mattiacci, ed., *Roman Law and Economics*, vol. 2: Ch. 14. Oxford Studies in Roman Society and Law (Thomas A. J. McGinn and Paul du Plessis, eds.). Oxford: Oxford University Press.

- Williamson, Oliver E. 1991. "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives." *Administrative Sciences Quarterly* 36:269–96.
- Wilson, Andrew I. 2011. "City Sizes and Urbanization in the Roman Empire." In Alan K. Bowman, and Andrew I. Wilson, eds., *Settlement, Urbanization, and Population*, 161–95: Oxford: Oxford University Press.
- Winkel, Laurens. 2013. "Ius Gentium." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:3553–54. Malden, MA; Oxford: Wiley-Blackwell.
- Yiftach-Firanko, Uri. 2010. "Comments on Andrea Jördens." In Gerhard Thür, ed., *Symposion 2009. Vorträge zur griechischen und hellenistischen Rechtsgeschichte (Seggau, 25–30 August 2009)*:291–99. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.
- Yiftach-Firanko, Uri. 2013. "Law, Greco-Roman Egypt." In Roger S. Bagnall, Kai Brodersen, Craige B. Champion, Andrew Erskine, and Sabine R. Huebner, eds., *The Encyclopedia of Ancient History*, First Edition:3941–45. Malden, MA; Oxford: Wiley-Blackwell.

10. References to ancient sources

- Digest. The Digest of Justinian.* Rev. English language ed. by Alan Watson. Philadelphia, PA: University of Pennsylvania Press.
- Gaius. *The Institutes of Gaius.* Translation, Edward Poste. Revision, E.A. Whittuck. Oxford: Clarendon Press, 1904.
- Livius. *The History of Rome, Books 27 to 36.* Translator, Cyrus R. Edmonds. <http://www.gutenberg.org/ebooks/12582> (visited December 1, 2013).
- Tacitus. *The Reign of Tiberius, Out of the First Six Annals of Tacitus; With His Account of Germany, and the Life of Agricola.* Translator, Thomas Gordon. Editor, Arthur Galton. <http://www.gutenberg.org/ebooks/7959> (visited December 1, 2013).