Institutions, Trade, and Growth: The Ancient Greek Case of Proxenia

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Recent scholarship contends that ancient Mediterranean economies grew intensively. An explanation is that Smithian growth was spurred by reductions in transaction costs and increased trade flows. This paper argues that an ancient Greek institution, *proxenia*, was among the key innovations that allowed such growth in the period 500–0 BCE. *Proxenia* entailed a Greek city-state declaring a foreigner to be its "public friend," a status that conferred both duties and privileges. The functions performed by "public friends" could facilitate economic transactions between communities. Accordingly, network and regression analyses establish a strong relationship between *proxenia* grants and trade intensity.

Did any society achieve sustained intensive economic growth before the Industrial Revolution? The answer to this question appears to be affirmative, as scholars have gathered rich evidence that suggests protracted periods of growth in the first millennium BCE. A necessary complement to these measurement efforts is a careful investigation of the causes of such a notable shift in the economic fortunes of antiquity. Were institutional developments, technological progress, or climatic factors driving Smithian growth?

This paper makes the case that ancient Greek *proxenia* was able to reduce transaction costs and foster market integration over a span of at least five centuries (500–0 BCE). *Proxenia*, Anglicized as proxeny, was a public and highly honorific relationship between a Greek city-state (*polis*) and an individual, called *proxenos* or "public friend," who was a citizen of another *polis*. On one hand, a city would bestow upon the honored individual significant social status and often several material benefits; on the other hand, a *proxenos* was expected to act in the granting city's

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I thank editors Dan Bogart and Bishnupriya Gupta, together with four anonymous referees, for their generous guidance and constructive criticism. I thank Guido Alfani, Maristella Botticini, Leah Boustan, Federica Carugati, Timothy Guinnane, Sheilagh Ogilvie, and participants at the 2021 SIOE Conference, 2021 EHA Annual Meeting and Graduate Economic History Workshops at Oxford and LSE for valuable comments and suggestions.

interest and, in particular, to facilitate interactions between visitors from the affiliated city and his own native community. Arguably, the functions performed by recipients of *proxenia* would be especially valuable to those engaged in trade for easing access to important markets.

Rather exceptionally for the remote historical context, relations of *proxenia* are well documented, and more than four thousand beneficiaries can be identified. Since the award of proxeny was an important public act, a large number of grants were inscribed and have since been excavated and digitized. In particular, Mack (2022) has carefully constructed a dataset of all attested proxeny relations and used it to explore a network approach to studying *proxenia*. My article is indebted to this contribution and to Mack's (2015) extensive monography on the institution. Building on these recent developments, the present paper quantitatively investigates the relationship between *proxenia* and ancient economic performance. To do this, I propose novel proxies for trade intensity at the city level and gather additional data on relevant *polis* characteristics.

The argument that *proxenia* fostered ancient trade produces three implications that can be tested empirically. First, if access to proxeny relations was able to reduce transaction costs in the receiving community, then cities where many *proxenoi* are appointed should also display greater commercial activity. Second, the link between proxeny and trade should be even stronger when we focus on beneficiaries who are themselves involved in trade *lato sensu*, because they are either more able or specifically appointed to facilitate economic transactions. Third, proxeny grants should lead to higher levels of trade than there otherwise would have been. While at its core this is a causal question, this article will not make definitive causal claims, leaving the final determination to the reader.

Robust network and regression analyses provide support for all three hypotheses. The empirical investigation exploits several designs, including cross-sections, dyadic regressions, panel evidence, and gravity equations. Overall, results show a robust link between proxeny and commercial activity. Cities that garner the most influence in the web of proxeny relations are also systematically more active trading centers. Whenever trade-involved *proxenoi* are appointed, this pattern is much heightened. Further, it appears that cities of all sizes and levels of importance target commercial hubs, reinforcing a hierarchy of prominent and interconnected cores on top of a sparse network periphery. Lastly, there is evidence that trade attestations follow proxeny grants, and observed trade patterns suggest a role for proxeny on top of the standard implications of gravity models. Considering these results in light of our knowledge of

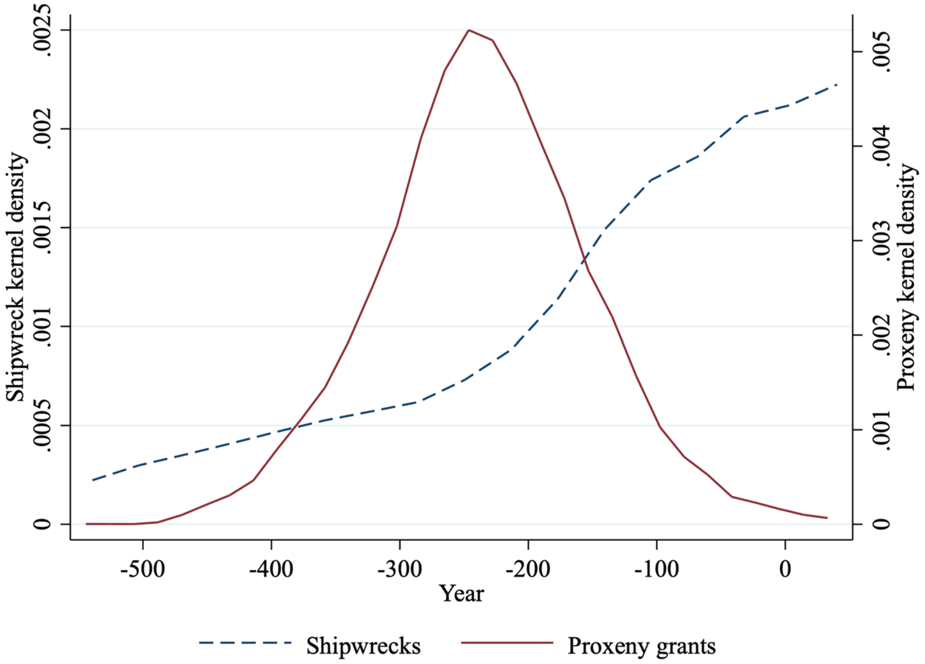

FIGURE 1
TEMPORAL DISTRIBUTION OF PROXENY ATTESTATIONS AND SHIPWRECKS

Notes: Density estimates use 50-year bins and the Epanechnikov kernel function.
Sources: Author's dataset based on PNAW and Strauss's (2013) shipwreck database.

proxeny's institutional context and theoretical understanding of the role of transaction costs in determining trade levels, a causal link between proxeny and economic performance appears likely, if not compelling.

To illustrate *proxenia*'s relevance to ancient trade, Figure 1 plots the temporal distribution of proxeny grants and shipwrecks in the period of interest, as captured by kernel densities. Whenever observations are dated with an approximate range, I use the midpoint (e.g., 125 BCE for a 100–150 BCE range). Shipwrecks reported here are restricted to the area of diffusion of this institution, thus excluding non-Mediterranean and Western Mediterranean observations. Lastly, notice that Figure 1 understates proxeny's early diffusion since the practice of inscribing grants developed only gradually. However, the general co-occurrence of an inflection point in trade expansion and grants of *proxenia* is unmistakable.

A large body of work in the economics literature has emphasized the importance of institutional development for economic performance. Since North's (1990) seminal contribution, many empirical works have sought to test this proposition in particular settings.[1] More narrowly, institutional economics has recognized that trade depends on transaction costs, whose reduction is an important precondition for market expansion (North 1991; Greif 1992). For instance, focusing on Europe's commercial revolution (eleventh–fourteenth centuries CE), Greif (1993, 2006) shows how merchant coalitions and a community responsibility system based on local and partial courts could improve contractual enforcement, thus supporting more efficient levels of trade.

In the ancient context, Bresson (2016) and Ober (2015) also emphasize increased institutional sophistication in ancient Greece as a key driver of commercial expansion. An array of innovations that reduced transaction costs and positively affected trade have been proposed, including the *polis* as a political structure (Ober 2015), the Athenian legal system (Fleck and Hanssen 2012), sailing technology (Bakker et al. 2021), the eradication of piracy (Temin 2013), and Roman conquest and political integration (Temin 2013; Harper 2017). Environmental endowments are also thought to have impacted trade as well as political development (Adamson 2021).

Recent scholarship contends that ancient Mediterranean economies achieved a prolonged period of intensive economic growth.[2] Evidence from Greece (Ober 2015; Bresson 2016), Rome (Temin 2013; Harper 2017;Terpstra 2020), and the whole basin (Scheidel 2007; Manning 2018; Terpstra 2019; De Callataÿ 2005) points strongly in the direction of intensive growth taking place in the first millennium BCE, up to the peak of the early Roman Empire (circa 150 CE). The literature suggests models of Smithian growth (Temin 2013; Ober 2015; Erdkamp 2016; Terpstra 2019), whose reliance on market integration and commercial expansion make proxeny a particularly interesting innovation to consider. Complementary sources of growth could also be at play (Terpstra 2020).

This paper contributes to both economic historical and institutional literature by making the case that *proxenia* was an important institutional development that helped reduce transaction costs and foster trade. On the one hand, showing how proxeny could work as a welfare-enhancing institution and providing corroborating evidence that it did speaks to the large body of work on the importance of institutions for economic performance. On the other hand, this paper's argument provides a specific and well-documented example of trade-fostering innovations that are key to ancient Smithian growth more broadly.

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[1] A comprehensive review is outside the scope of this paper, but notable examples abound (Acemoglu, Johnson, and Robinson 2001, 2002; La Porta, Lopez-de-Silanes, and Shleifer 2008).

[2] Prolonged Smithian growth is not necessarily inconsistent with the Malthusian model. Temin (2013) argues that repeated increases in productivity from market integration, combined with the slow pace of Malthusian forces, could keep income per capita high for long periods of time. Dutta et al. (2018) rationalize modest intensive growth in ancient times in a two-sector Malthusian model, where food consumption is subject to a Malthusian constraint but a second good that does not affect population dynamics is introduced.

The paper is structured as follows. First, I present how *proxenia* works. Then, I discuss how it could reduce transaction costs. Next, I describe sources and datasets. Lastly, I perform regression analyses and conclude.

A PRIMER ON *PROXENIA*

The institution of *proxenia* developed in Archaic times, seventh to sixth centuries BCE, by extending private "ritualized friendships" to whole cities (Walbank 1978; Engen 2010). *Xenia* (ritualized friendship) bound two individuals from different communities in an institutionalized relationship of mutual hospitality and benefaction, whose origins date back to Homer's time. *Proxenia* generalized this amicable bond to all the citizens of the affiliated *polis*—a natural consequence of proxeny being granted collectively by a whole city rather than an individual. Fittingly, the word *proxenos* derives from the prefix *pro*, which can mean "on behalf of," and the word *xenos*, meaning "foreigner" or "guest-friend"—a *proxenos* thus being someone who acts on behalf of a foreigner or institutionalized friend (Wallace 1970).

Fully matured by 500 BCE (Wallace 1970), proxeny spread to the entire Greek world and slowly declined only after the expansion of Rome in the area. Relations of *proxenia* are attested from the Black Sea to the Western Mediterranean and included grants to non-Greek individuals (Phoenicians, for instance). The latest attestation for proxeny dates to circa 200 CE, a span of about eight centuries since the earliest one around 600 BCE.[3] However, the 500–0 BCE time interval is thought to correspond to its most consistent and meaningful institutional functioning: before this period, proxeny was still in its infancy as norms informing it gradually settled down, while the first century CE saw it grow hollow. The gradual marginalization of proxeny correlates with the rise of Rome's imperial power: Roman citizenship became the sought-after status that granted social standing and privileges, and the expansion of Roman jurisdiction reduced the scope for proxeny services to be useful (Mack 2015).

Beneficiaries of proxeny were foreigners who resided in their native community. Though there were exceptions to the latter rule, beneficiaries were never citizens of the *polis* that named them public friends. Moreover, *proxenoi* were consistently male (Mack 2015).

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[3] Respectively, *Inscriptiones Graecae* IX 1 866 and *Novye epigraficheskie pamiatniki Khersonesa* II 114.

A "public friend" was expected to show continued benevolence towards the granting *polis* and act to her benefit (Wallace 1970; Walbank 1978; Burke 1992). Consider the following excerpt from a decree inscribed in Delos, seat of an important panhellenic sanctuary:

> *"The Boulè and the People decreed: Telemnestos, son of Aristides, proposed: since Jason, son of Theogeiton, of Arados continues to be a good man towards the temple and the people of Delos, and as he is held in the highest esteem for his devotion to the gods, having always been helpful both publicly to the city and privately to those citizens who appealed to him for whatever one might request of him, and since he zealously assisted those citizens who approached him when they would happen to be in need, since he continues, with both words and deeds, to be good to the temple and the people of Delos: ..."*[4]

This language, repeated with formulaic variations in many decrees, gives a generic but compelling description of what a *proxenos* was expected to do, which is aid citizens of the granting city, regardless of the official or private nature of their affairs in his community, with "words and deeds."

In general, the grant of proxeny rewarded past actions of the honorand, which had benefited the granting city. Awarding *proxenia* acknowledged a *polis*' gratitude toward the recipient, who must have performed some useful services that benefited the *polis*' citizens. The general requirement that beneficiaries have already demonstrated their usefulness to the granting city can be seen as an effective screening mechanism—prominent individuals who could easily provide access to and influence over their native community could earn the city's gratitude more easily, reasonably expecting to be awarded *proxenia* in return, and would face lower costs for providing proxeny services thereafter.

The grant of *proxenia* required an articulated approval process that ensured tight control over the selection of beneficiaries. Decrees were typically sponsored by a citizen who was likely to know the honorand personally. Then, proposals were voted upon by the city's popular assembly (*demos*), comprising all citizens, and/or approved by executive bodies (like *boule* or *ephoroi*). A strict granting procedure further ensured that *proxenoi* actually possessed the ability to keep benefiting the city.

Together with the status of *proxenos*, a highly prized distinction in itself, Greek cities often granted further privileges to their "public

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[4] IG XII 5 528. The translation from Greek is mine. I thank Elisa Antonella Polignano and Marco Santini for their helpful comments and amendments. The inscription is fragmentary, but the decree has been recognized as an award of proxeny (Mack 2015).

TABLE 1
DESCRIPTION OF ANCILLARY PROVISIONS

Honor or Privilege	Description
All else clause	Residual clause granting all other honors and privileges typically awarded to local *proxenoi*
Asylia	Immunity from seizure of one's person and property
Ateleia	Tax exemption, either total or for some specified duties
Crown	A honorific and valuable gift
Eisodos	Right to address the *polis*' political bodies
Enktesis	Right to real estate ownership in the city's territory
Epimeleia	A generic instruction to city officials to take care of the honorand
Epinomia	Right to pasture herds in the city's territory
Euergesia	Honorific status of benefactor
Hereditary grant	Disposition attributing honors and privileges also to the honorand's offspring
Isoteleia	Tax status equal to that of citizen
Politeia	Citizenship
Port license	Right to freely enter and exit the city's port
Prodikia	Right to access local legal institutions preferentially
Proedria	Preferential seats at spectacles, agonies or festivals
Promanteia	In Delphi, the right to access the oracle preferentially
Theorodokia	Appointment as *theorodokos*, honorific host of delegations announcing festivals or games

Source: Adapted from http://proxenies.csad.ox.ac.uk/terms.

friends." These additional grants, which henceforth I term "ancillary provisions," included meaningful economic benefits like tax exemptions and protection from expropriation, but also more symbolic honors like preferential seats at the theater. Table 1 describes the most common ancillary provisions.

Arguably, the valuable and location-specific ancillary provisions granted with proxeny ensured the recipient was well incentivized to perform his functions. These privileges were enjoyed over time and only applied to precisely localized interactions: to enjoy tax exemptions or theater seats in the granting *polis*, the *proxenos* must have visited the city often, allowing for frequent monitoring of his actions. The principal-agent problem was not particularly severe: *proxenoi* could not "run away with the money," since they received no one-time transfer, but rather a stream of utility that depended on interacting with the granting *polis*.

Further, if a *proxenos* shirked or misbehaved, his status could be revoked, and all the benefits would be lost.[5]

Moreover, different bundles of ancillary provisions arguably reflect different incentives to which individual *proxenoi* responded. Awarding proxeny and its ancillary provisions was costly, and thus a *polis* would have tried to grant them efficiently. Part of these costs were economic, as tax privileges (*ateleia, isoteleia*) produced revenue losses and real property rights (*enktesis*) weakened the citizenry's tight control on land ownership (since only the *polis*' citizens could own land in the city's territory). Risk of diluting proxeny's honorific value as a competitively sought-after status would also have constrained the number of *proxenoi* and the ancillary provisions granted to them. Further, grants of proxeny entailed significant expenditures of political capital since competing interests had to coalesce and provide enough support for the proposed decree to pass. Given this allocation problem, if a *polis* chose to reward a *proxenos* with economic benefits, rather than more honorific privileges, these must have been actually valuable to him or otherwise would not be effective incentives.

INSTITUTIONAL ANALYSIS OF *PROXENIA*

This section discusses the scope of proxeny's economic role and formalizes this article's argument.

To start, one must recognize how nuanced and flexible *proxenia* was as an institution. First, while it relied on a surprisingly consistent set of norms and expectations, rules concerning the appointment and functions of "public friends" were not formally codified, nor were there any binding contracts that beneficiaries would sign. Proxeny lived in an intermediate space between private and public order institutions: it was personal to the extent that one individual would be granted this status due to his particular benefactions and would perform his role of "facilitator" for the sake of his own reputation and material benefit; but proxeny was impersonal in that a *proxenos*' help would be provided to all citizens of the granting *polis* for their mere origin, regardless of any personal relationship with the "public friend" (at least in theory). Second, we know that *proxenoi* could be appointed as a consequence of very different services and that beneficiaries had varied occupations (like merchants, judges, generals);

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[5] Given that our sources are inscriptions, it is inherently more difficult to find evidence of nullified proxeny decrees because the original epigraph would have been destroyed. Nonetheless, Mack (2015) does mention some evidence of repudiated proxeny grants, so this was indeed a possibility.

similarly, *poleis* might name “public friends” for different reasons, a function of the specific challenges faced and individuals available. Third, proxeny was greatly diffused, both across time and space and in terms of volume. Lastly, while its public dimension is well documented, *proxenia*’s private, menial work—arguably the most important aspect for our purposes—is much less directly attested.

Overall then, there must have been sizable heterogeneity in the importance of economic and non-economic motivations behind proxeny’s working and diffusion. However, my purpose in this paper is to uncover any systematic relationship between this institution and economic activity—an “on average” characterization that is bound to mask historical specificities.

Perhaps unsurprisingly, given proxeny’s nuances and longevity, scholars are not yet unanimous on the role that it played in the ancient economy, if any. Early contributions posited that *proxenoi* were part of a state trade policy (Hasebroek 1933; Ziebarh 1933), but their hypothetical functions appear exaggerated. Some have suggested a link between proxeny and commerce; confidence and specificity vary (Walbank 1978; Burke 1992). On the basis that early Athenian grants of proxeny did not honor trade-involved individuals, Engen (2010) doubts such a systematic link. Marek (1984) has downplayed *proxenoi*’s economic involvement, on the basis that—when decrees mention the honorand’s occupation or specific services, which is rare—*proxenoi* are rarely identified as merchants. Mack (2022) notes how centrality in the proxeny network correlates with territory size, the latter being a proxy for economic resources. Woolmer (2015) discusses proxeny, together with *asylia* (see Table 1) and other privileges, as tools that *poleis* could use to attract merchants to their markets, a point shared by others (Walbank 1978; Burke 1992; Reger 2007). Terpstra (2019) argues that proxeny grants could have helped foreign traders operate in Greek markets.

I argue that *proxenia*’s main economic effect was to reduce transaction costs for the granting *polis*’ citizens—an efficient institution proposition in the tradition of North and Thomas (1973). There are several ways in which *proxenoi* may have proven useful for economic interactions. First, they could guarantee visitors’ identities and vouch for them (Mack 2015).[6] Establishing identity was difficult in the technological environment of antiquity, but critical for many economic and social interactions. Second, *proxenoi* could help visitors access and influence local institutions (Mack

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[6] The attestation of identity was possible either because the *proxenos* personally knew the visitors or because he recognized a seal or a token.

2015), courts in particular, which would be critical to protecting oneself from arbitrary harm and settling disputes. As a citizen of his community, a *proxenos* could mobilize the legal rights and influence that a visitor would lack. Third, "public friends" could also share information on local conditions and introduce a visitor to trusted networks of knowledge and business. Lastly, Terpstra (2019) proposes that *proxenoi* could act as conveyers of an intercommunity enforcement mechanism: as he was often in contact with both the granting city and his community, a "public friend" could reduce information asymmetries.

To appreciate the scope for *proxenoi* to reduce risk and lower transaction costs, it is worth reviewing the broader institutional context in which proxeny operated. First of all, there never was a "Greek Law": each city-state had its own legal code and jurisdiction, even for the first few centuries of Roman rule (Bresson 2016). While local codes shared common features and principles, there was still appreciable legal heterogeneity across *poleis*, especially in the degree to which non-citizens were entitled to access local courts and the disadvantage at which they would do so. In the mid-fourth century BCE, Athens introduced a reform of contract enforcement rules for long-distance trade (Ober 2015): for large-scale "commercial cases" (*dikai emporikai*), provided that the contract had been agreed in Athens or concerned a shipment directed to Athens, new rules put citizens and foreigners on equal footing to access litigation and settle contractual disputes—the only basis for adjudication being whether the contract had been violated, regardless of the parties' citizenship. As this was regarded as a rather exceptional development, the implication is that for the vast majority of contracts, jurisdictions, and centuries, citizens and foreigners would *not* litigate on a level playing field. Overall, ancient Greece, though featuring the institutional context of self-governed communities studied by Greif (2006), did not develop a comparable community responsibility system. The mediation of a *proxenos* was potentially important for ensuring fairer court adjudications.

Further, other legal features, like the right to reprisals, *sulan*, made the economic environment risky. The archaic principle was that if one had been harmed by citizens of another *polis* who could not be brought to justice (for instance, because they had left), then any citizen of the offenders' *polis* could be held accountable for the injury caused, with either their person or their assets (Woolmer 2015; Bresson 2016). While in later periods this right was not exercised by individuals directly, but had to be officially recognized by their city, it was still operational and a source of considerable risk. Not coincidentally, one of the most valuable ancillary provisions that could be bestowed on *proxenoi* was *asylia* (see Table 1), or immunity from such a reprisal.

Lastly, there was arguably no close substitute for the services provided by *proxenoi*, particularly when it came to visitors' private business. The most that one could obtain in terms of favorable legal status in another city was citizenship itself (see *politeia* and *isopoliteia*, Table 1). However, grants of citizenship were rare and often made on the tacit assumption that the beneficiary would not actually move to the granting *polis* (Mack 2015); also, while offering full rights, citizenship was no substitute for the material help and influence that a friendly *proxenos* could mobilize. While we have evidence of maritime loans being available for long-distance trade, their interest rates were extremely high, and there was little to no private insurance (Bresson 2016). Guild-like associations are seldom attested and, in any case, appear to have had nothing close to the monopoly power and autonomous jurisdiction often enjoyed in medieval Europe (Bresson 2016). Quite naturally, the closest substitute for *proxenia* was Archaic *xenia*, a personal ritualized friendship between two individuals of different communities. Yet, *xenia* was typically limited to elite families, and was only a personal relationship, whereas *proxenia* extended the help of a "public friend" to all the citizens of the granting *polis* and made it possible to have a larger number of locations covered at the same time.

Further, it is useful to contrast *proxenia* with other historical institutional arrangements, focusing on the medieval Europe of the Commercial Revolution. Consider English denization: royal grants that bestow on beneficiaries the same rights as the king's liegemen, including real property rights and protection against arbitrary abuses of power (Lambert and Ormrod 2015). Differently from *proxenia* though, denization was closer to naturalization and mostly concerned aliens who had permanently moved to England. Alien guilds, the object of a broader debate on the efficiency of institutions (Greif, Milgrom, and Weingast 1994; Ogilvie 2019, 2011), can be thought to provide some of the support and legal access that *proxenia* offered. However, alien guilds were closed clubs that worked only for their members and were mostly concerned with commercial matters, whereas proxeny offered more unconditional and broader support to all citizens of the granting *polis* and did not rely on small-scale commercial diaspora, but rather on befriending influential locals. Lastly, while providing visitors with clearer rules and timely settlements, German "guest law" (*Gästerecht*) and "guest courts" (*Gastgerichte*) formalized the legal position of foreigners as fundamentally disadvantageous in both economic freedoms and access to contractual enforcement (Schultze

1908; De ruysscher et al. 2021)—hurdles that *proxenia* was there to ease.

The previous discussion makes it clear that there was ample room for transaction costs to be reduced, and that *proxenia* was well-suited to do so. Thus, this paper contends that *proxenia* fostered trade and contributed to the broader secular process of ancient Smithian growth. This argument relies on three assumptions. First, the functions performed by *proxenoi* did indeed reduce transaction costs for the granting *polis*' citizens when they interacted with the *proxenos*' community. Second, *proxenia* worked as a welfare-enhancing, rather than a rent-seeking, institution. Third, *poleis* recognized proxeny's potential to further their economic interests—that is, reductions in economic transaction costs were intentionally sought and not accidental.

All three assumptions are not directly testable, but they are credible and grounded in the facts discussed so far. Firstly, given the uncertain economic environment and foreigners' unfavorable legal standing, help from an influential individual with full rights and local clout would definitely ease interactions between visitors and locals. As for *proxenoi* themselves, we have discussed how *proxenia*'s institutional mechanics made sure that selected beneficiaries were both able and willing to perform their actions. Secondly, contrary to medieval European guilds, which Ogilvie (2011, 2019) has argued were not in fact welfare-enhancing institutions, *proxenoi* lacked any legal or contractual standing to exact fees for their services or monopolize and divert trade flows. The extent to which *proxenia* may not have been efficient *stricto sensu* has to do with the other, non-economic motivations that may have warranted a proxeny decree, like aiding religious pilgrimage or enhancing diplomatic influence—which does not subtract from the institution's economic significance. Moreover, while I use active terms to describe how *poleis* awarded proxeny, this does not imply an active trade policy. It is enough that within each *polis* economic interests of enough individuals coalesced and reached sufficient mass to get the desired proxeny decrees approved.

Critically, the proposed argument and its underlying assumptions produce three implications that can be tested empirically.

First, if proxeny did indeed ease economic transactions, then it should follow that cities where many *proxenoi* are appointed also display greater commercial activity—namely, proxeny grants and trade intensity correlate. This statement is agnostic about causal direction: it is consistent with both more proxeny grants leading to increased trade volume and high commercial intensity incentivizing the appointment of more *proxenoi*. Notice also that the focus is on the *proxenos*' community, rather than on granting cities since the reduction in transaction costs would occur in the former. For instance, Athens being a major commercial center would correlate with many other cities naming *proxenoi* in Athens so that their citizens could have an easier time trading there.

Second, the link between proxeny and trade should be even stronger when we focus on decrees that grant significant economic benefits as ancillary provisions. As argued before, awarding costly economic privileges signals that the beneficiaries would have materially benefited from them, and thus it is likely that these individuals were themselves involved in trade *lato sensu*. Whenever this was the case, we would expect commercial intensity to follow proxeny even more closely. This is consistent with both "merchant *proxenoi*" having a comparative advantage in easing economic transactions and the appointment of trade-involved "public friends" being more likely when a *polis* was particularly motivated by economic interests.

Third, proxeny grants should lead to higher levels of trade than there otherwise would have been. While this is a fundamentally causal question, the context and data at hand make it difficult to reach a definitive causal claim. However, one can make progress by investigating the timing of increases in proxeny and trade, and relating observed trade patterns to simple predictions from gravity models. By putting together the proposed analysis of this institution, our theoretical understanding of the role played by transaction costs in determining trade levels (North 1991; Greif 1992), and the empirical evidence presented next, a causal link from proxeny to commercial activity appears compelling.

PRIMARY SOURCES

Our main source of information for studying *proxenia* is the large body of inscriptions attesting to either proxeny decrees or lists of *proxenoi*. Such rich direct evidence is a somewhat rare occurrence in ancient history and allows for systematic quantitative analysis, rather than relying on individual case studies or secondary sources.

Inscription practices varied both locally and over time. First, while a few *poleis* are thought to have inscribed virtually all their proxeny decrees, the majority selectively chose which decrees to record in stone, the inscription itself amounting to an additional honor. Second, some cities preferred to inscribe at least some of their decrees in bronze, especially in Magna Graecia (Mack 2015). Third, a number of *poleis* decided to inscribe a list or catalog of their *proxenoi* rather than individual decrees; these lists provide little to no information about the reasons for the decree or ancillary provisions granted with it, but offer a much fuller picture of a city's web of proxeny relations. Fourth, the practice of inscribing proxeny decrees did not develop immediately (Wallace 1970), and thus epigraphic attestations underestimate *proxenia*'s early diffusion.

Inscriptions inevitably induce selection bias since not all decrees or catalogs were inscribed. However, because inscribing was itself a form of honorific reward, the direction of bias is not too worrying: inscribed decrees are clearly the most important ones. Otherwise, one can restate this article's findings as applying to the upper tier of proxeny relations, those that ancient cities decided to emphasize most. Mere time attrition induces more selection bias as not all inscriptions survived or have been excavated. Clearly, the remote historical context at hand implies that only part of the original universe of inscribed decrees and lists of *proxenoi* is observable now. This is particularly true for bronze inscriptions, which were both less durable and more likely to be repurposed.

However, we can take a few steps to mitigate selection bias. First, the inclusion of lists of *proxenoi* provides a broader cross-section of a city's proxeny relations, mitigating the likely under-representation of less significant decrees. Second, one can include more sources, like literary attestations, funerary monuments, and other documented mentions of *proxenoi*. Third, by analyzing all available evidence rather than particular case studies,[7] we minimize the risk of making incorrect generalizations.

Mack (2022) makes several reassuring points on the potential impact of selection bias. First, on the basis of recent developments in Social Network Analysis (SNA) with incomplete data, he notes that the highly skewed distribution of grants, particularly in terms of receiving cities, is highly unlikely to be biased by the selection of surviving material: the hierarchy of centrality in the proxeny network is so striking that it cannot be a product of random losses of evidence. Second, when one compares overall granting patterns with the records from those cities that are known to have inscribed virtually all their proxeny decrees, one finds a similar hierarchy.

Moreover, we can consider more robust information by focusing on a *proxenos*'s native community rather than on the granting *polis*. To see this point, consider all the "public friends" of Athenian origins—that is, those Athenians who were appointed by other *poleis* to assist their citizens when they visited Athens. Information about Athenian *proxenoi* is stored in the several dozen cities that appointed them. If one of these cities was destroyed or not excavated, we would lose one data point, but most other relations would still be observed, and inferences on the broader group of *proxenoi* of Athenian origin would not be severely affected. Whereas, if we focused on the grants made by each city, we would be much more susceptible to the quality of the information stored in it; in this case, we could end up observing zero *proxenoi* appointed by a destroyed or non-excavated site.

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[7] For instance, Engen (2010), Walbank (1978), and Burke (1992) all focus on Athens.

A comprehensive digitized collection of all Greek inscriptions is maintained online by the Packard Humanities Institute (PHI). While the epigraphic *corpus* is not available as a dataset, the website can be scraped to retrieve valuable information from systematic searches of digitized Greek texts. I use this approach to code several variables, as described in the next section.

DATASETS

My analysis of proxeny is based on two main datasets: one collects all attested individual *proxenoi* and is used to compute network statistics; the other gathers Greek *poleis*' characteristics used for city-level regressions.[8]

The dataset of individual *proxenoi* largely relies on the *Proxeny Networks of the Ancient World* database, curated by Mack (2022).[9] Beyond decrees and catalogs of *proxenoi*, PNAW includes attestations from literary sources, funerary inscriptions, and more. PNAW provides information on the name and native community of a *proxenos*, granting city, approximate dates, list of ancillary provisions, and PLEIADES links for geo-referencing. I cross-checked PNAW entries with word searches in PHI's collection and Engen's (2010) catalog, confirming universal coverage of attested proxeny relations. I complemented PNAW with standardized dates and additional decree information coded from PHI (awards of *proedria* and "port license").

Importantly, I disaggregate observations at the individual level whenever several recipients that are not directly related (like brothers or father-son) are recorded together. The rationale is twofold. On one hand, *proxenia* was not a group affair but a family matter, in that over 70 percent of grants contained a hereditary clause extending this status to the beneficiary's offspring; on the other hand, the decision to grant proxeny to several individuals in the same community is important information as it suggests that demand for proxeny services was high enough to warrant multiple grants. Further, notice that this decision affects SNA results only through the weights assigned to proxeny links.[10]

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[8] The data and code used in the analysis are available at Creanza (2022).

[9] Available online at http://proxenies.csad.ox.ac.uk/.

The resulting dataset has 4,048 observations, widely distributed across time and space. Virtually all attestations are (approximately) dated, and around 74 percent are suitable for network analysis, namely both the *proxenos*' and the granting community are known. About 73 percent of observations are based on proxeny decrees, 24 percent on lists of *proxenoi,* and the rest on other sources.

The structure of proxeny relations can be intuitively represented as a directed network. A network is a set of dyadic relations between nodes (or vertexes), where connections are represented by links (or edges). *Proxenia* has a natural direction: cities that grant it are source nodes, while sites where a *proxenos* is appointed are target nodes; each *polis* can be both. Thus, one distinguishes between indegree (the number of links that extend to a given node) from outdegree (the number of links that originate from a given node). Mack (2022) offers a detailed discussion of the benefits and limitations of this approach and provides comprehensive descriptive statistics on the resulting network of proxeny relations.

The dataset on individual *proxenoi* allows us to map the network of proxeny relations and compute SNA statistics. In particular, I make use of weighted eigenvector centrality (or eigencentrality) of target nodes. Eigencentrality takes into account the quality of a node's connections as well as their number: incoming links originating from central nodes count more than indegree from peripheral vertexes (Newman 2008). For exemplification, Figures 2 and 3, respectively, depict Athens' network of *proxenoi* and the distribution of eigencentrality for the whole sample.

Assigning weights to network edges enables us to include information on repeated proxeny links. It was common for *poleis* to name several *proxenoi* from the same city at once or over time. In what follows, I capture this by assigning three types of weights to edges linking two nodes: frequency weights, square-rooted frequency weights, and no weights. The concavity of the square root allows us to mitigate the influence of the few cities that inscribed most of their decrees, while not entirely discarding information on repeated links. However, these centers are mechanically downweighed by eigencentrality, as they turn out to be rather peripheral in the network. Thus, my default option will be to use frequency weights.

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[10] The analysis is robust to different weighting schemes, including unweighted statistics. Moreover, I have produced an alternative dataset where proxeny grants are not disaggregated, recomputed centrality measures, and correlated them with my preferred specification: the average correlation across 20 different measures was 97.7 percent.

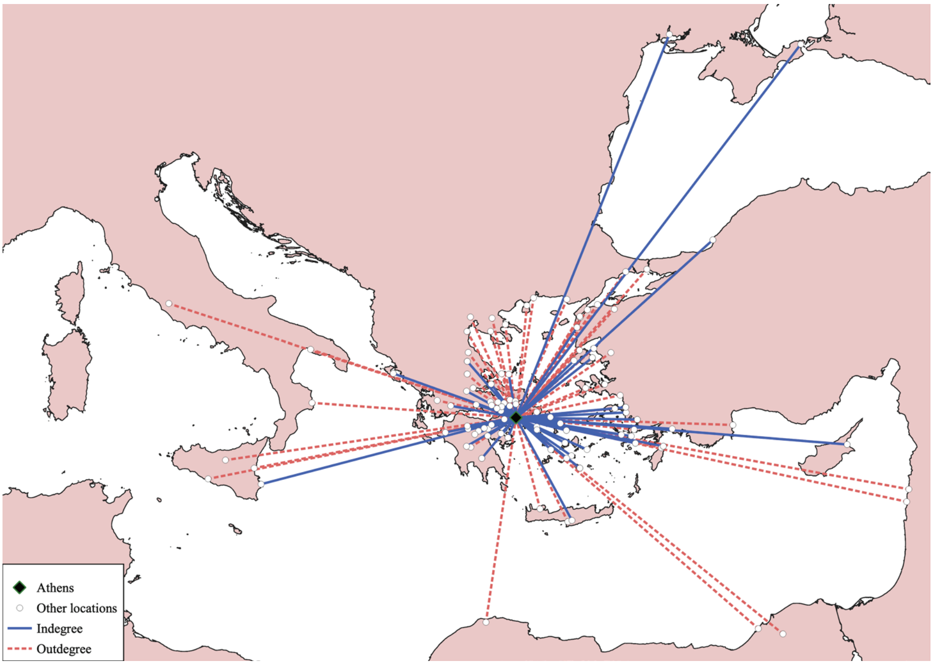

FIGURE 2
ATHEN'S PROXENY NETWORK

Source: Author's dataset based on PNAW.

The dataset of Greek cities is built starting from the *Inventory of Archaic and Classical Poleis* (IACP) by Hansen and Nielsen (2004), conveniently coded in Stanford's POLIS database.[11] POLIS covers 1,035 ancient Greek cities and dependent settlements that were founded before 323 BCE, thus excluding non-Greek and new Hellenistic-era sites. Of the 441 cities for which I compute network statistics, 360 can be matched to POLIS. The dataset contains several city characteristics, of which I use: elevation, presence of walls, number of colonies, earliest coinage, degree of urbanization (*polisity*), degree of "Greekness" (*hellenicity*), number of Olympic victors, territory size, founder, Delian League membership, and an index of fame.

The *Fame index* is coded as the number of columns of text in IACP, measured by one-eighth of a column, and reflects how much is known about a location. Though imperfect, the *Fame index* can be understood as a proxy of city prominence in ancient times, since IACP records notable features, historical events, ancient references, and archeological findings (like theaters, infrastructure, or goods) related to each location. Cultural

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[11] Available online at https://polis.stanford.edu.

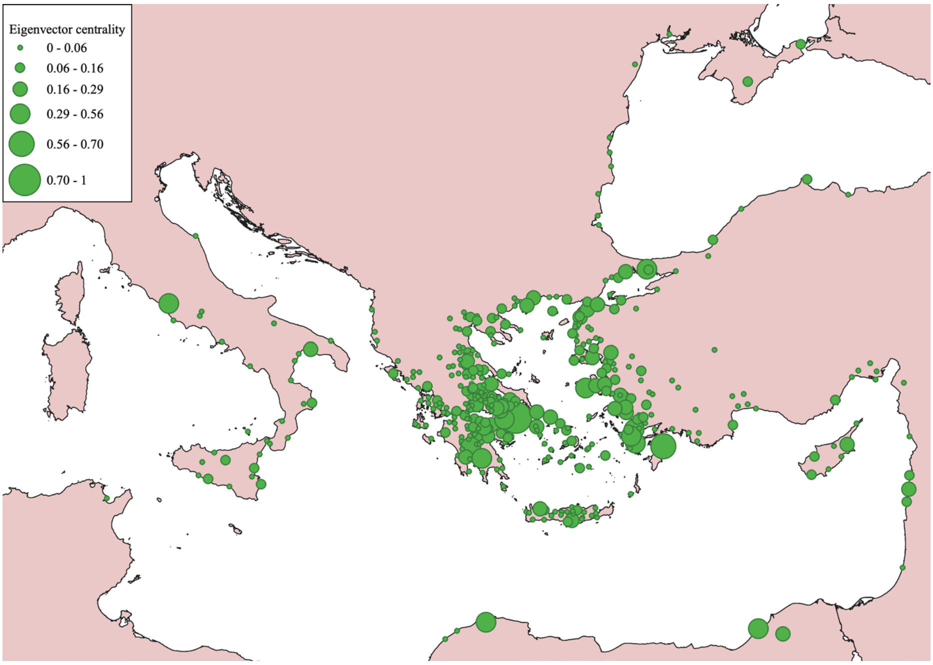

FIGURE 3
WEIGHTED EIGENCENTRALITY IN THE PROXENY NETWORK

Source: Author’s dataset based on PNAW.

and religious centers, military powers, seats of philosophical or medical academies, important markets, and so forth are all covered more extensively in IACP. Therefore, this fame proxy is an important control to include in any regression that seeks to explain city-level proxeny relations since it correlates with many factors that would make a site attractive for appointing a *proxenos*.

I complement POLIS with additional city characteristics, namely presence of a panhellenic sanctuary, dialect spoken, side taken in the Peloponnesian war, distance from the coast, and percentage of land in a 0.25°-radius buffer around the city (about 27 km). Geographic features are computed using the cities’ coordinates in IACP and a detailed vector map of the Mediterranean coastline. The list of panhellenic sanctuaries is derived from Dillon (2013). Dialects are obtained by overlaying a digitized map of Greek dialects from Woodard (2008) with georeferenced cities in the dataset; when no match was found, I used information in IACP to assign to colonies the dialect of their most recent mother city.

Most importantly, I propose four original city-level proxies of trade intensity. The first proxy, *Cargos*, is coded from Strauss’s (2013) shipwreck database and complemented with information in Parker (1992), counting the number of wrecked cargos that either departed from, headed to, or contained goods manufactured in a given city. Next, *Phoenicians* and *Trade mentions* are coded from text searches in PHI's digitized *corpus*.[12] The former counts the number of Phoenicians attested in a location, as this Levantine people specialized in long-distance trade and were known for establishing merchant enclaves in foreign cities when they could not found their own colonies (López-Ruiz and Doak 2019). Thus, more attestations of Phoenician people are likely to correlate with greater trade intensity in a given location. The *Trade mentions* proxy counts the attestations of trade-related vocabulary, like cargo, commerce, or merchant, which one expects to be more frequent where more commercial exchanges take place. One might worry that *Phoenicians* and *Trade mentions* simply reflect different epigraphic practices or be biased by greater excavation efforts; therefore, I normalize them by the general level of epigraphic activity.[13]

These three proxies are imperfect, but one can combine the information they contain and obtain a more precise measure of trade intensity. Intuitively, when all three measures point in the same direction (at the extrema, sizable or absent trade activity), then the underlying true value of commercial intensity is likely to be high, whereas when only one measure suggests large trade activity, we might be less confident. Therefore, I propose a fourth proxy, *Trade index*, defined as the sum of *Phoenicians*, *Trade mentions,* and *Cargos* after each is normalized by its maximum. Other alternatives were considered, but led to nearly identical results.[14] I prefer this definition as it is the most intuitive: if a city has the most number of Phoenicians, trade vocabulary, and cargos in a given period, it receives a score of three; if it has zero attestations of all proxies, the score is zero; all other cases fall in between.

Notice that I code trade proxies conservatively, only considering dated observations and restricting the sample to the proxeny's period of interest, 500–0 BCE. Whenever I focus the analysis on a smaller time interval, all trade proxies are recoded to only include contemporaneous observations. One could argue for including observations from a broader

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[12] Search keywords are reported in the Online Appendix, Table A1.

[13] By scraping PHI, I can reconstruct the total number of epigraphs in 88 small regions. Mapping these into IACP, I obtain 52 small regions, each containing an average of 20 locations. To get a more granular approximation, I interact regional inscription counts with city-level *Fame index*, control for size, and take its square root.

[14] For instance, the correlation in the full sample between the preferred *Trade index* and a simple sum of the three underlying proxies is 0.95; the correlation between *Trade index* and the first principal component of *Phoenicians*, *Trade mentions,* and *Cargos* is 0.97.

TABLE 2
TRADE PROXIES—TOP 10 LOCATIONS

	Phoenicians		Trade Mentions		Cargos		Trade Index	
Rank	City	Value	City	Value	City	Value	City	Value
1	Athens	2.54	Athens	3.22	Rhodes	34	Athens	2.74
2	Delos	2.36	Delos	1.85	Athens	25	Rhodes	1.63
3	Cos	1.81	Tomis	0.97	Corinth	19	Delos	1.56
4	Rhodes	1.51	Cos	0.83	Chios	19	Cos	1.41
5	Lindos	1.09	Olbia	0.68	Cos	15	Corinth	0.70
6	Samos	0.79	Odessos	0.40	Massalia	9	Chios	0.56
7	Kaunos	0.69	Thespiai	0.38	Thasos	7	Samos	0.46
8	Istros	0.56	Kyparissos	0.32	Knidos	7	Lindos	0.43
9	Delphi	0.42	Cyrene	0.32	Samos	5	Tomis	0.30
10	Oropos	0.38	Salamis	0.27	Herakleia	5	Kaunos	0.27

Source: Author's datasets based on PNAW, PHI, Strauss (2013), and Parker (1992).

time range or even undated, but ancient, evidence. If trade patterns were broadly persistent over this period of time, less conservative proxies would be richer and more accurate. However, I prefer to present results where trade measures only include dated observations strictly over the period of interest, to minimize the risk of spurious correlations. In the Online Appendix, Table A2 details the number of positive trade attestations found and how they are narrowed down to be used in regression analysis.

Table 2 shows the most commercially active locations according to my trade proxies. The five cities that are found at the top of the *Trade index* ranking are Athens, Rhodes, Delos, Cos, and Corinth—which, reassuringly, are all well-known ancient centers for commerce. Delos, however, will be omitted from the analysis whenever this collapses the whole 500–0 BCE period. After the Third Macedonian War, in 166 BCE, Rome made Delos a free port, placed it under Athenian administration, and displaced its population (Gettel 2018). Only then did Delos become an important trade center (Reger 1994). This late growth is captured by trade proxies, but is missed by proxeny eigencentrality since the island ceased to be an independent *polis* where the appointment of a *proxenos* would be meaningful (Delians relocated to Achaea). Indeed, all proxeny grants from and to Delos stopped by 166 BCE. Therefore, I prefer to include the 166–0 BCE period in the analysis while excluding Delos to consider the largest possible sample. For robustness, I also replicate results for three different time periods—Classical (500–323 BCE), Hellenistic (323–166 BCE), and Roman (166–0 BCE)—which include Delos and make no qualitative difference. Considering the 500–166 BCE period alone, again including Delos, also made no difference.

The spatial distribution of the main regressors of interest, *Trade index* and *Fame*, is depicted in Figures A1 and A2 in the Online Appendix where descriptive sample statistics are also reported in Tables A3 and A4.

FIRST EMPIRICAL TEST: PROXENY CENTRALITY AND COMMERCE

The first implication of my argument on proxeny's role in the ancient economy is that, if proxeny did indeed foster trade, then cities where many *proxenoi* are appointed should display greater commercial activity. In SNA terms, attractiveness in the web of proxeny relations is well captured by the eigenvector centrality of target nodes.

However, several other factors may have warranted grants of *proxenia*: it is important to account for city characteristics that may otherwise explain prominence in the proxeny network. I do this by considering the POLIS proxy for prominence, *Fame index*, a city's number of colonies, number of Olympic victors, status as a panhellenic sanctuary, and level of "Greekness"—all measures suggestive of non-economic influence. Next, it is important to control for a city's scale of economic activity, which I proxy with level of urbanization, century of earliest coinage, and territory size, which is viewed by ancient historians as an indicator of economic complexity (Mack 2022). Further, the inclusion of dialect fixed effects proxies for cultural variation and may capture differential diffusion or practice of proxeny among different subgroups of Greeks. Additional controls such as geographical features and the presence of walls are meant to further clean estimates from omitted variable bias and improve precision, but they are less key to interpretation.

Therefore, I test my first implication with the following specification:

$$y_i = \alpha + \beta Trade_i + \gamma Fame_i + \theta X_i + \delta_i + \pi_i + \varepsilon_i \qquad (1)$$

where i indexes the *polis*, y_i is a measure of centrality in the proxeny network, $Trade_i$ is one of four measures of trade intensity, $Fame_i$ is the prominence index from POLIS, X_i is a vector of controls (distance from coast, elevation, distance*elevation, index of urbanization, index of "Greekness," presence of walls, number of colonies, Olympic victors, territory size, presence of panhellenic sanctuary, earliest coinage), δ_i is a dialect fixed effect (FE), and π_i is a geographic region FE. Standard errors are clustered at the regional level.[15] I normalize variables so that the estimates of interest can be interpreted as beta coefficients, namely the change in the outcome, expressed in terms of standard deviations, when the regressor increases by 1 standard deviation.

Regression results support the first implication of my argument—*ceteris paribus*, cities where greater intensity of trade is attested also garner greater centrality in the proxeny network. Table 3 reports the results: Columns (1) to (4) test each trade proxy without additional FE or controlling for size, while Columns (5) to (8) show the full specification; all columns include the other controls outlined previously. Notice how the relationship between network centrality and trade is robust to all trade proxies and more comprehensive specifications. I omit size in the first four columns as this information is not available for a substantial number of cities, but as shown in Columns (5) to (8), results are very consistent even though the sample shrinks. The coefficient on *Fame* being strongly significant confirms that non-economic considerations were indeed important in structuring proxeny relations. The bottom line of this analysis is given by Column (8) of Table 3: proxeny eigencentrality increases by around 0.3 standard deviations when *Trade index* rises by 1 standard deviation.

These findings prove robust to several alternative specifications. Regression tables are in the Online Appendix, but described here. First, changing weighting scheme leads to the same qualitative results (see Table A5). However, when frequency weights are square-rooted (Columns (5)–(8)) and especially when eigencentrality is not weighted at all (Columns (1)–(4)), trade coefficients lose some magnitude to *Fame*. Conversely, when one runs Equation (1) with simple indegree as the outcome, the magnitude of trade coefficients is increased (see Table A6). This pattern likely reflects the importance of trade interests in persistent proxeny relations. Repeated grants of proxeny, may well be indicative of a strong and durable interest in accessing a given market, whereas *una tantum* links may reflect more idiosyncratic motivations. Thus, reducing information on repeated links (as done in Table A5) understates the relevance of trade. Excluding the ten cities with the highest values of *Trade index* also left results qualitatively unchanged, mitigating outlier concerns (see Table A7).

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[15] I define 10 macro-regions, but using IACP 46 smaller regions did not change results. Especially after Kelly's (2020) critique, economists are aware of potential spatial bias. To address this concern, I used a Spatial Autoregressive Model and IACP coordinates to construct a spatial matrix with each observation's distance from other observations. I then fitted fully controlled regressions (as in Table 3, Column (8)) and performed the Moran test, which checks whether the regression residuals display spatial autocorrelation. The Moran test did not reject the null hypothesis of spatially i.i.d. errors.

TABLE 3
REGRESSION RESULTS FOR WEIGHTED EIGENCENTRALITY

	Dependent Variable: Weighted Eigencentrality							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Phoenicians	0.275*** (0.079)				0.247*** (0.076)			
Trade mentions		0.271*** (0.077)				0.266*** (0.075)		
Cargos			0.241*** (0.030)				0.225*** (0.022)	
Trade index				0.327*** (0.065)				0.306*** (0.060)
Fame index	0.252** (0.091)	0.246** (0.077)	0.226*** (0.068)	0.202*** (0.059)	0.320** (0.104)	0.299*** (0.075)	0.299*** (0.069)	0.262*** (0.055)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size	No	No	No	No	Yes	Yes	Yes	Yes
Dialect and Region FEs	No	No	No	No	Yes	Yes	Yes	Yes
Observations	352	352	352	352	312	312	312	312
R^2	0.57	0.57	0.58	0.63	0.63	0.65	0.65	0.69

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.
Notes: Standard errors are clustered at the regional level. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage.
Source: Author's dataset based on PNAW and POLIS.

Importantly, the strong association between proxeny network centrality and trade intensity is also robust over time. Table 4 reports the estimated beta coefficients for *Trade index* and *Fame index* in three different historical periods: Classical (Column (1)), Hellenistic (Column (2)), and Roman (Column (3)).[16] While the magnitude of the coefficients changes over time, the main point is unaffected: appointment of *proxenoi* and trade intensity are strongly linked. *Proxenia*'s economic significance seems to have been strongest in the Hellenistic period (323–166 BCE), which also saw the greatest number of grants (see Figure 1).

A limitation of the analysis done so far is that it does not allow us to control for the characteristics of the source nodes—the granting *poleis* that give a target node its centrality. Bearing in mind that in proxeny's case, information on outdegree is less reliable than indegree, this problem can be addressed by performing a dyadic regression that, for each possible (ordered) pair of nodes, explains whether a link from one node to the other

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[16] Eigencentrality measures used in these regressions consider links established in a 30-year window before and after the start and end dates. This is meant to capture the long-lasting nature of proxeny relations.

TABLE 4
DIACHRONIC REGRESSION RESULTS FOR WEIGHTED EIGENCENTRALITY

Dependent Variable: Weighted Eigencentrality	500–323 BCE (1)	323–166 BCE (2)	166–0 BCE (3)
Trade index	0.142*** (0.027)	0.308*** (0.045)	0.134** (0.055)
Fame index	0.230*** (0.035)	0.185*** (0.056)	0.192** (0.072)
Controls	Yes	Yes	Yes
Dialect and Region FEs	Yes	Yes	Yes
Observations	184	332	203
R^2	0.50	0.63	0.37

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.
Notes: Standard errors are clustered at the regional level. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage.
Source: Author's dataset based on PNAW and POLIS.

exists with the characteristics of both. By so doing, we can hope to uncover whether there are systematic differences in how *poleis* awarded proxeny.

The specification for the dyadic regression is the following:

$$\begin{aligned} y_{ij} &= \alpha + \varphi G_{ij} + \beta Trade_i + \gamma Fame_i + \theta X_i + \delta_i + \pi_i \\ &\quad + \tilde{\beta} Trade_j + \tilde{\gamma} Fame_j + \tilde{\theta} X_j + \delta_j + \pi_j + \varepsilon_{ij} \end{aligned} \tag{2}$$

where i indexes the target node (the *proxenos*' city), j indexes the source node (granting city), and y_{ij} is a binary outcome, equal to 1 if a proxeny link from j to i exists and 0 otherwise; G_{ij} is a set of dyad-specific controls aimed at capturing how close two cities were; G_{ij} includes aerial distance from j to i, indicators for being in the same region, speaking the same dialect, i being a colony of j and vice versa, being on the same side of the Peloponnesian war (pro-Athens, pro-Sparta, or neutral) and both being members of the Delian league. The other regressors are as before, but now include the source's characteristics too. Standard errors are clustered by sources' regions.

Since the outcome is binary, Equation (2) can be interpreted as a Linear Probability Model. Thus, after multiplying the outcome by 100 and normalizing the regressors, we can read the estimated coefficients as the percentage-point change in the probability that a proxeny link between i and j exists when the regressor increases by a standard deviation.

The construction of a dyadic sample calls for a few considerations. Firstly, notice that since we have a directed network, we distinguish between a link from *i* to *j* and one from *j* to *i*. Thus, outcomes are not necessarily symmetric; it could be $y_{ij} \neq y_{ji}$, and even if these are equal, weights might differ. Consistently with previous analysis, I use simple frequency weights for repeated links. Secondly, a dyadic regression requires us to consider all possible (ordered) pairs of nodes, and thus we must define the universe of possible pairs. Given the sparse nature of the proxeny network, I consider pairs of all cities where at least one proxeny attestation is found as either source or target, which results in a sample size of 137,270.

Table 5 reports the estimates, where (T) indicates the coefficients of the target node and (S) indicates those of the source. Columns (1) to (4) illustrate a benchmark similar to previous results that explains the existence of a proxeny link only with the target node's characteristics, while Columns (5) to (8) estimate the full dyadic equation. Then, the results in Column (8) indicate that 1 standard deviation increase in the target's *Trade index* increases the probability of the target receiving a proxeny link by 1.7 percentage points. For comparison, the weighted mean of the rescaled dependent variable is 1.6, which can be interpreted as the unconditional probability of a link from *j* to *i* existing (in percentage points). The benchmark on targets' characteristics in Columns (1) to (4) confirms previously observed patterns and coefficients are robust to the full dyadic specification in Columns (5) to (8).

Dyadic regression results show insignificant systematic differences in *proxenia* granting patterns by trade activity. The *t*-statistics on sources' trade proxies in Columns (5) to (8) are relatively high, but still shy of the critical 5-percent threshold. This suggests that, while some difference is detected, more commercially active *poleis* are not significantly more (or less) likely to appoint *proxenoi* than peripheral cities. At the same time, more prominent trade hubs certainly attract more proxeny grants. This difference has an intuitive characterization: every city has access to *proxenia,* and they mostly use it to ease access to centers of economic and non-economic power (rather than minor nodes), reinforcing a hierarchy of prominent and interconnected cores on top of a large and sparse network periphery. The *Fame index*, instead, does suggest that more famous cities may be more active granters of *proxenia*, likely reflecting idiosyncratic practices by important religious centers that are well known (Mack 2015; Terpstra 2019). Though not reported, using square-rooted weights, not controlling for territory size, excluding regional and dialectal fixed effects, and clustering at the dialectal, rather than regional, level, all left results qualitatively unchanged.

TABLE 5
DYADIC REGRESSION RESULTS FOR PROXENY LINK

	Dependent Variable: Proxeny Link							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Phoenicians (T)	1.42*** (0.30)				1.35*** (0.31)			
Phoenicians (S)					0.79 (0.59)			
Trade mentions (T)		1.42*** (0.35)				1.27*** (0.36)		
Trade mentions (S)						0.21 (0.26)		
Cargos (T)			1.45*** (0.37)				1.39*** (0.35)	
Cargos (S)							–0.22 (0.42)	
Trade index (T)				1.81*** (0.38)				1.70*** (0.36)
Trade index (S)								0.33 (0.36)
Fame index (T)	0.96*** (0.28)	0.96*** (0.29)	0.85** (0.26)	0.69** (0.22)	0.97*** (0.27)	1.01*** (0.29)	0.86*** (0.26)	0.73*** (0.22)
Fame index (S)					3.99** (1.56)	4.21** (1.77)	4.36** (1.81)	4.12** (1.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialect and Region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	118,677	118,677	118,677	118,677	105,671	105,671	105,671	105,671
R^2	0.09	0.09	0.09	0.10	0.23	0.23	0.23	0.23

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.

Notes: (T) indicates the coefficient of the target node, (S) indicates that of the source. Standard errors are clustered at the regional level of the source. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage, dyadic distance, same dialect, same region, colony of, colonized by, same side in Peloponnesian war, Delian league ally, size.
Source: Author's dataset based on PNAW and POLIS.

SECOND EMPIRICAL TEST: PROXENY AND ECONOMIC MOTIVATION

The second implication of this article's argument that proxeny fostered trade is that the link between *proxenia* and commercial activity should be even stronger when we focus on decrees that granted significant economic benefits as ancillary provisions. As already argued, it is likely that these individuals were themselves involved in trade *lato sensu* and thus either more able or specifically appointed to ease economic transactions.

TABLE 6
DISTRIBUTION OF ANCILLARY PROVISIONS ACROSS PROXENY DECREES

Economic		Honorific		Not Classified	
Provision	Fraction	Provision	Fraction	Provision	Fraction
Port license	0.052	*Euergesia*	0.392	Crown	0.088
Enktesis	0.297	*Eisodos*	0.116	*Politeia*	0.207
Ateleia	0.350	*Theorodokia*	0.037	*Epimeleia*	0.019
Isoteleia	0.068	*Promanteia*	0.231	—	—
Asylia	0.486	*Proedria*	0.310	—	—
Prodikia	0.223	—	—	—	—
Epinomia	0.025	—	—	—	—
Any	0.672	Any	0.682	Any	0.271

Note: See Table 1 for a definition of each ancillary provision.
Source: Author's dataset based on PNAW.

In order to test this implication, I construct a proxy for economic incentives, EP for short, that exploits the distribution of ancillary provisions across decrees in the *proxenoi* dataset. Notice that I do not consider lists of *proxenoi* or other non-decree sources as they tend not to provide information on ancillary provisions. Table 6 shows my classification of provisions as economic, honorific, or neither in nature and the fraction of decrees that attest to each and any of them. I do not classify citizenship grants (*polieteia*), gifts of golden crowns, or generic indications that one will be taken care of by city officials (*epimeleia*), since neither economic nor honorific value seemed overwhelming. In particular, crowns would be valuable and sellable, but were also considered highly prestigious and gifted rarely; citizenship gave great rights, but was also often granted under the assumption that one would not make use of it and possibly meant as an exceptional honorific distinction (Mack 2015).

Table 7 reports the several definitions of EP that I employed and the fraction of decrees that would be classified as economically motivated according to each (namely, fraction of decrees for which EP=1). The first three versions of the proxy are defined to take value 1 when any economic benefit is awarded (and 0 otherwise), and they differ in what they consider economic or not. The fourth version of the proxy takes value 1 when a decree awards relatively more economic benefits than honorific provisions (and 0 otherwise), assigning value 1 to ties. The exclusion of real property rights is explored, as some scholars have hypothesized that they were granted under the assumption that the right was not being used, like for citizenship (Mack 2015). The exclusion of *prodikia* is considered a robustness check.

TABLE 7
DEFINITIONS OF ECONOMIC PROXY (EP)

Definition	Description	Fraction of Decrees
1	EP=1 if any economic provision is awarded	0.672
2	Same as above but exclude real property rights (*enktesis*, *epinomia*)	0.595
3	Same as above but also exclude *prodikia*	0.586
4	EP=1 if the *share* of economic provisions is higher than that of honorific provisions	0.676

Source: Author's dataset based on PNAW.

To test the second implication empirically, I split the sample of proxeny relations according to the first EP definition and re-estimate Equation (1) in the two resulting subsamples. Notice that I re-compute network measures independently in the two subsamples and perform the same analysis as before. Sample size is reduced both because I only consider decree-based observations and because several cities only had proxeny relations of one type (EP=1 or 0).

Regression results support the second implication of my argument—trade intensity is a stronger predictor of indegree centrality when we condition on *proxenoi* being involved in broadly defined trade. Table 8 reports the estimated coefficients, where Columns (1) to (4) test each trade proxy in the subsample where trade involvement is likely (EP=1), while Columns (5) to (8) do the same for the other subsample (EP=0). The results are consistent with our expectations: in the first subsample, the coefficients on *Fame* capturing generic prominence become insignificant and lose nearly all magnitude, while trade proxies gain both. Conversely, in the second subsample, trade proxies are roughly halved in magnitude but still significant and positive, which suggests that even when economic motivation was not paramount, more *proxenoi* are appointed in important trade centers; moreover, the prominence index recovers its magnitude and significance. The results for EP=0 are in line with the view that being personally involved in trade is not strictly necessary for *proxenoi* to be able to perform their functions and ease economic transactions as well as other interactions—though, of course, personal involvement can help.

These results also prove robust to several checks. Detailed regression tables are in the Online Appendix, but described here; for the sake of conciseness, tables only report *Trade index*. First, the analysis is qualitatively unaffected by considering the alternative definitions of EP (see Table A8). Second, results are robust to different weighting schemes (see

TABLE 8
REGRESSION RESULTS FOR WEIGHTED EIGENCENTRALITY, EP SUBSAMPLES

	Dependent Variable: Weighted Eigencentrality							
	Subsample: EP=1				Subsample: EP=0			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Phoenicians	0.220*** (0.066)				0.115** (0.036)			
Trade mentions		0.226*** (0.055)				0.159*** (0.032)		
Cargos			0.163*** (0.041)				0.104* (0.048)	
Trade index				0.247*** (0.046)				0.144*** (0.023)
Fame index	0.061 (0.068)	0.039 (0.051)	0.059 (0.080)	0.018 (0.042)	0.302*** (0.074)	0.292*** (0.065)	0.288*** (0.066)	0.274*** (0.059)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialect and Region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235	235	235	235	167	167	167	167
R^2	0.55	0.56	0.53	0.59	0.47	0.48	0.48	0.49

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.

Notes: Standard errors are clustered at the regional level. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage, size.

Source: Author's dataset based on PNAW and POLIS.

Table A9, Columns (1), (2), (4), and (5)). Third, restricting to the pre-Roman period, 500–166 BCE, and including Delos gives similar findings (see Table A9, Columns (3) and (6)).

We can further test the hypothesis by restricting the analysis to cities that are observed in both the EP=1 and EP=0 samples and performing seemingly unrelated regressions (SUR). Table 9 reports SUR results comparable to those noted previously, but includes a formal test of whether the coefficients in the two subsamples are the same. To ease reading, the table is re-arranged so that columns with the same trade proxy are paired and the equality test is reported between each pair. First, notice how the estimated coefficients are very close to those reported in Table 8, despite the significant reduction in sample size. Second, we reject the null of equal coefficients in the two subsamples, formalizing the observation that proxeny is strikingly more related to trade when we condition on *proxenoi* being involved in trade *lato sensu*. The only exception is *Cargos*, whose coefficients follow the general pattern but have no statistical significance.

TABLE 9
SEEMINGLY UNRELATED REGRESSIONS BY EP STATUS

	Dependent Variable: Weighted Eigencentrality							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Subsample:	EP=1	EP=0	EP=1	EP=0	EP=1	EP=0	EP=1	EP=0
Phoenicians	0.227***	0.121***						
	(0.043)	(0.041)						
Trade mentions			0.284***	0.150***				
			(0.050)	(0.047)				
Cargos					0.146***	0.121***		
					(0.035)	(0.031)		
Trade index							0.241***	0.154***
							(0.040)	(0.038)
Fame index	0.024	0.356***	0.025	0.357***	0.036	0.335***	–0.009	0.323***
	(0.077)	(0.073)	(0.075)	(0.072)	(0.080)	(0.071)	(0.076)	(0.072)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialect and Region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	127	127	127	127	127	127	127	127
R^2	0.57	0.50	0.58	0.50	0.54	0.52	0.59	0.52
Trade coef. χ^2	3.84		4.48		0.34		2.76	
Trade coef. p-v	0.050**		0.034**		0.562		0.097*	
Fame coef. χ^2	11.7		11.88		9.15		11.35	
Fame coef. p-v	0.001***		0.001***		0.002***		0.001***	

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.

Notes: Standard errors are clustered at the regional level. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage.
Source: Author's dataset based on PNAW and POLIS.

By analogy with the previous section, Table A10 in the Online Appendix illustrates the results of estimating dyadic Equation (2) in the two EP subsamples. Columns (1) to (4) test the four proxies of trade intensity in the subsample of economically motivated *proxenoi* (EP=1), while Columns (5) to (8) do this in the other subsample (EP=0). As for the full sample, the dyadic specification confirms the main results on trade proxies.

The most interesting additional finding is that, when *proxenoi* do not receive economic incentives (EP=0), grants are somewhat more likely to originate from prominent trade centers, though not all trade proxies are equally in agreement. This result can be explained by the differential value that ancillary provisions had based on the city that awarded them—economic benefits, particularly, were much more valuable when given in commercial hubs. Thus, while peripheral cities were unlikely to adequately incentivize *proxenoi* unless they granted significant economic incentives, richer and more desirable *poleis* would have been more selective in their grants of meaningful economic benefits and more able to motivate *proxenoi* with relatively fewer or cheaper privileges.

THIRD EMPIRICAL TEST: GRAVITY AND PANEL EVIDENCE

The third implication of my argument is that the appointment of a *proxenos* should result in more commercial activity taking place, especially in the target city. While this is fundamentally a causal question, the data at our disposal and the remote historical context do not allow for convincing IV strategies or quasi-experiments. Without making definitive causal claims, one can still make some progress by investigating local trade intensity over time and the implications of standard gravity equations.

Consider the following panel regression equation:

$$Trade_{it} = a_i + \tau_t + \beta ProxenyDegree_{is} + \theta X_{it} + \varepsilon_{it} \tag{3}$$

where i indexes the *polis* and t indexes time periods, $Trade_{it}$ is the number of trade attestations in city i and period t, a_i are city FEs, τ_t are time FEs, $ProxenyDegree_{is}$ is the measure of indegree, outdegree, or total degree in period s, and X_{it} is a vector of controls (time FE interacted with *Fame index*, with earliest coinage or with territory size class). Standard errors are clustered at each *polis*. Notice that, given the paucity of data, I aggregate proxeny links and trade counts in 12 50-year bins ranging from 550 BCE to 50 CE. Table 10 reports beta coefficients.

The specification in Equation (3) allows me to control for a number of sources of variation. City FE capture time-invariant *polis*-specific determinants of trade intensity and ensures that we estimate the parameter of interest, β, only through temporal variation within each city. Period FE allow for a flexible general trend in commercial activity, which is particularly important since this period saw a diffused increase in trade flows (see Figure 1). The other controls allow for differential time trends depending on a city's prominence and scale of economic activity.

Panel regression results in Table 10 suggest that, consistent with my hypothesis, the establishment of proxeny links targeting a city leads to greater trade intensity there in the following 50-year period. Consider Columns (1) to (3), which test the association between the trade outcome in t and proxeny indegree at time $t - 1$, t, and $t + 1$. Lagged indegree is strongly predictive of subsequent trade attestations, both in terms of magnitude and significance. We also have reason to believe that contemporaneous and future indegree may be significantly linked to trade, and

TABLE 10

PANEL REGRESSION ESTIMATES FOR TRADE ATTESTATIONS

	Dependent Variable: Trade (t)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Indegree (t – 1)	0.127***			0.115***	0.126***	0.143***	
	(0.040)			(0.041)	(0.043)	(0.041)	
Indegree (t)		0.029*		–0.037	–0.036		
		(0.017)		(0.030)	(0.029)		
Indegree (t + 1)			0.103	0.082	0.089		
			(0.070)	(0.059)	(0.059)		
Outdegree (t – 1)						0.077	
						(0.050)	
Degree (t – 1)							0.107
							(0.067)
City and Time FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time x Fame FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time x Coinage FE	No	No	No	N	Yes	Yes	Yes
Time x Size FE	No	No	No	N	Yes	Yes	Yes
Observations	3,949	3,949	3,949	3,590	3,200	3,520	3,520
R^2	0.19	0.16	0.18	0.19	0.23	0.25	0.23
Number of *poleis*	359	359	359	359	320	320	320

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.
Note: Standard errors are clustered at each *polis*.
Source: Author's dataset based on PNAW and POLIS.

there is some indication of this. But when we test all three variables jointly in Columns (4) and (5), lagged indegree is the largest and only significant coefficient. This pattern suggests that proxeny's effect developed over a period of time, consistently with *proxenoi* being expected to benefit the granting city for a long time and *proxenia* being often extended to their offspring.

Further, the dynamics of proxeny suggested in Table 10 speak to the question of whether proxeny might have been a rent-seeking, rather than welfare-enhancing, institution. If one were concerned that *proxenoi* had ways to capture the benefits of increased commercial exchange, it is reassuring that trade follows proxeny grants, rather than the opposite: the indegree lag is bigger than the lead, and only the former is significant. Whereas, we would expect a small and insignificant lag and a large and significant lead (or contemporaneous value) if the rent-capturing story were true. One possible explanation for why the lead coefficient, though insignificant, is not negligible is the long time window considered: a positive feedback loop from increased trade to more demand for proxeny services is likely to operate on a longer time scale than rent-seeking and be compatible with an efficient view of *proxenia*, while also pushing up the indegree lead in the medium run. Indeed, Table A11 in the Online Appendix shows that, using 25-year bins, the coefficient on the lead indegree is not only insignificant but also very close to zero, while all other results are qualitatively unchanged—though less precisely estimated.

Lastly, Columns (6) and (7) in Table 10 investigate the potential role of outdegree and total degree, finding non-negligible coefficients but imprecise estimates compared to indegree. While one might expect that trade intensity would increase in source nodes too, the highly asymmetric nature of proxeny and poorer information on outdegree make it hard to detect such effects with the available data.

An alternative way to explore proxeny's ability to increase trade volumes is to exploit the implications of standard gravity equations. The gravity model of trade has been highly influential in international economics since being first introduced by Isard (1954) and is now a staple of empirical literature (Head and Mayer 2014). In its simplest form, a gravity equation states that:

$$V_{ij} = c\frac{Y_i Y_j}{d_{ij}} \tag{4}$$

where V_{ij} is bilateral trade flow between country i and country j, c is a constant, Y_i and Y_j are each country's size (typically GDP), and d_{ij} is bilateral distance. Intuitively, this equation says that trade between i and j should be proportional to the product of their economic sizes and inversely proportional to their distance; d_{ij} is often generalized to a more generic concept of resistance: all reasons making it costly to trade between i and j. For our purposes, two considerations are in order. First, if it had an effect on trade, *proxenia* operated through a reduction in the resistance term, making it easier to trade in i if city j had appointed a *proxenos* there. Second, summing across all origin locations j, Equation (4) implies that:

$$V_i = cY_i \sum_j \frac{Y_j}{d_{ij}} \tag{5}$$

where V_i is total trade flowing to location i.

While we do not observe bilateral trade flows, we do have proxies for the total volume of commercial activity in a location. This gives us some room to test proxeny's ability to foster trade. Consider the following expression:

$$A_i = cY_i \sum_j a_{ij} \frac{Y_j}{d_{ij}} \tag{6}$$

where I allow factor a_{ij} to improve trade accessibility between i and j. Call A_i, the quantity defined in Equation (6), *Trade access mediated by* a_{ij}. I then compute several of these measures, considering different bilateral relationships that may ease trade flows and using IACP estimates of territory size as proxies for economic scale Y. First, let a_{ij} be the number of proxeny grants originating in j and targeting i, that is, along the direction where we expect proxeny to make the biggest difference for economic transactions. Second, let a_{ij} be an indicator equal to 1 whenever i and j speak the same dialect. Third, let a_{ij} be an indicator equal to 1 whenever i and j were on the same side of the Peloponnesian war. Last, let a_{ij} be an indicator equal to 1 whenever i is a colony of j or vice versa.

For our purposes, simple aerial distance between two cities is an inadequate measure of trade resistance since transportation and transshipment costs vary dramatically across land, sea, roads, and waterways. Thus, the results I present here use additional geographical characteristics to approximate the actual distance across markets. In particular, I define d_{ij} as the sum of dyadic aerial distance between i and j and each city's interaction between distance from the coast and percentage of landmass in the local territory—that is

$$d_{ij} = DyadicDistance_{ij} + DistanceToCoast_i * LandPercentage_i \\ + DistanceToCoast_j * LandPercentage_j .$$

For robustness, I consider several d_{ij}, including aerial distance interacted with the sum of land percentages in both cities, aerial distance interacted with distance from the coast and land percentage only for the granting city j (as this is the community that would benefit the most from reduced transaction costs), aerial distance only interacted with the granting city's land percentage, and more. Since results were all qualitatively similar, Table A12 in the Online Appendix reports results for the latter definition of d_{ij}, as this is the most different from the one in Table 11.

Thus, another test of my third hypothesis is to run the following regression:

$$Trade_i = \alpha + \beta Access_i + \gamma Fame_i + \theta X_i + \delta_i + \pi_i + \varepsilon_i \qquad (7)$$

where $Trade_i$ is a proxy for trade intensity, $Access_i$ are trade access measures as defined earlier, $Fame_i$ is the prominence index from POLIS, X_i is a vector of controls, δ_i is a dialect FE, and π_i is a geographic region FE. Standard errors are clustered at the regional level. Table 11 reports results using my preferred definition of d_{ij}.

Regression results support the third implication of my argument—*ceteris paribus*, trade access through the appointment of *proxenoi*

Table 11
GRAVITY REGRESSION RESULTS FOR TRADE ATTESTATIONS

	Dependent Variable: Trade index				
	(1)	(2)	(3)	(4)	(5)
Trade access	0.074 (0.228)	–0.162 (0.159)	–0.150 (0.312)	–0.347 (0.435)	–0.149 (0.376)
Trade access via proxeny		1.119*** (0.238)		1.107*** (0.241)	0.801*** (0.195)
Trade access via dialect			–0.322 (0.441)	0.065 (0.488)	–0.043 (0.341)
Trade access via alliance			0.603 (0.512)	0.149 (0.439)	0.043 (0.362)
Trade access via colony			–0.256 (0.196)	–0.047 (0.070)	–0.012 (0.063)
Proxeny EC					0.552*** (0.150)
Fame index	0.439* (0.236)	0.262 (0.162)	0.418* (0.207)	0.257 (0.155)	0.099 (0.110)
Controls	Yes	Yes	Yes	Yes	Yes
Dialect and Region FEs	Yes	Yes	Yes	Yes	Yes
Observations	323	323	323	323	303
R^2	0.41	0.62	0.43	0.62	0.66

* = Significant at the 10 percent level.
** = Significant at the 5 percent level.
*** = Significant at the 1 percent level.
Notes: Standard errors are clustered at the regional level. Controls: distance from coast, elevation, distance*elevation, polisity, hellenicity, walls, colonies, panhellenic sanctuary, Olympic victors, earliest coinage.
Source: Author's dataset based on PNAW and POLIS.

significantly contributes to observed commercial activity. Column (5) shows the fully specified regressions for *Trade index*: market access eased by proxeny relations correlates with greater trade activity. Columns (1) to (4) show the contribution of different regressors to the results and suggest that trade access alone, unmediated by proxeny, is not a successful predictor of commercial activity. One possible reason for this is that my proxy for economic scale, territory size, is imprecise, whereas proxeny relations are observed much more reliably. Table 11 also suggests that there is an independent role of proxeny on trade on top of its action through eased access to trade, as evidenced by the reduction in the trade access coefficient after proxeny eigencentrality is included (Column (5)). *Fame index*, on the contrary, is largely unrelated to the outcome. Table A13 in the Online Appendix shows that the results also hold when regressing each trade proxy individually.

CONCLUSION

Regression analyses have shown a strong and robust link between the appointment of *proxenoi* in a given location and trade intensity there. Quantity and quality of a node's connections, as captured by eigencentrality, increased with commercial activity. Not only did most cities systematically target trade hubs, but these central nodes were also targeting each other for eased market access, as one would expect in a general process of market integration. Moreover, when beneficiaries of proxeny are likely to have been involved in trade themselves, trade intensity becomes the dominant factor for explaining network centrality—as one would expect if reducing trade transaction costs were the main motivation behind a grant. Critically, there is also evidence that commercial activity increased more in locations that received more proxeny relations, consistently with *proxenoi* being effective in easing transactions and fostering trade.

Overall, the results presented in this paper support the contention that *proxenia* helped ancient Greek *poleis* reduce economic transaction costs and thus fostered trade. This finding stresses the importance of considering institutional developments in explaining ancient economic performance. It also corroborates ancient intensive growth under a Smithian mechanism, as it provides clear evidence of how market expansion could take place.

REFERENCES

Acemoglu, Daron, Simon Johnson, and James A. Robinson. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91, no. 5 (2001): 1369–401.

———. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Quarterly Journal of Economics* 117, no. 4 (2002): 1231–94.

Adamson, Jordan. "Trade and the Rise of Ancient Greek City-States." Unpublished manuscript, 2021.

Bakker, Jan D., Stephan Maurer, Jörn-Steffen Pischke, and Ferdinand Rauch. "Of Mice and Merchants: Connectedness and the Location of Economic Activity in the Iron Age." *Review of Economics and Statistics* 103, no. 4 (2021): 625–65.

Bresson, Alain. *Making of the Ancient Greek Economy: Institutions, Markets, and Growth in the City-States.* Princeton: Princeton University Press, 2016.

Burke, Edmund. "The Economy of Athens in the Classical Era: Some Adjustments to the Primitivist Model." *TAPA* 122 (1992): 199–226.

Creanza, Pier Paolo. "Institutions, Trade, and Growth: The Ancient Greek Case of Proxenia." Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2022-12-11. https://doi.org/10.3886/E183503V2

De Callataÿ, François. “The Graeco-Roman Economy in the Super Long-Run: Lead, Copper, and Shipwrecks.” *Journal of Roman Archaeology* 18 (2005): 361–72.

De ruysscher, Dave, Albrecht Cordes, Serge Dauchy, Stefania Gialdroni, and Heikki Pihlajamäki. *Commerce, Citizenship, and Identity in Legal History.* Leiden, The Netherlands: Brill | Nijhoff, 2021.

Dillon, Matthew. *Pilgrims and Pilgrimage in Ancient Greece.* London and New York: Routledge, 2013.

Dutta, Rohan, David K. Levine, Nicholas W. Papageorge, and Lemin Wu. “Entertaining Malthus: Bread, Circuses, and Economic Growth.” *Economic Inquiry* 56, no. 1 (2018): 358–80.

Engen, Darel T. *Honor and Profit: Athenian Trade Policy and the Economy and Society of Greece, 415–307 B.C.E.* Ann Arbor, MI: University of Michigan Press, 2010.

Erdkamp, Paul. “Economic Growth in the Roman Mediterranean World: An Early Good-Bye to Malthus?” *Explorations in Economic History* 60 (2016): 1–20.

Fleck, Robert K., and F. Andrew Hanssen. “On the Benefits and Costs of Legal Expertise: Adjudication in Ancient Athens.” *Review of Law & Economics* 8, no. 2 (2012): 367–99.

Gettel, Eliza. “Recognizing the Delians Displaced after 167/6 BCE.” *Humanities* 7, no. 4 (2018): https://doi.org/10.3390/h7040091.

Greif, Avner. “Institutions and International Trade: Lessons from the Commercial Revolution.” *American Economic Review* 82, no. 2 (1992): 128–33.

———. “Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders’ Coalition.” *American Economic Review* 83, no. 3 (1993): 525–48.

———. “History Lessons: The Birth of Impersonal Exchange: The Community Responsibility System and Impartial Justice.” *Journal of Economic Perspectives* 20, no. 2 (2006): 221–36.

Greif, Avner, Paul Milgrom, and Barry R. Weingast. “Coordination, Commitment, and Enforcement: The Case of the Merchant Guild.” *Journal of Political Economy* 102, no. 4 (1994): 745–76.

Hansen, Herman M., and Thomas H. Nielsen. *An Inventory of Archaic and Classical Poleis.* Oxford: Oxford University Press, 2004.

Harper, Kyle. *The Fate of Rome: Climate, Disease, and the End of an Empire.* Princeton: Princeton University Press, 2017.

Hasebroek, Johannes. *Trade and Politics in Ancient Greece.* Chicago Ridge, IL: Ares Publishers, Inc., 1933.

Head, Keith, and Thierry Mayer. “Chapter 3. Gravity Equations: Workhorse,Toolkit, and Cookbook.” In *Handbook of International Economics,* edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff, 131–95. Amsterdam, Netherlands: Elsevier, 2014.

Isard, Walter. “Location Theory and Trade Theory: Short-Run Analysis.” *Quarterly Journal of Economics* 68, no. 2 (1954): 305–20.

Kelly, Morgan. “Understanding Persistence.” CEPR Discussion Paper No. DP15246, Washington, DC, 2020.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. “The Economic Consequences of Legal Origins.” *Journal of Economic Literature* 46, no. 2 (2008): 285–332.

Lambert, Bart, and W. Mark Ormrod. “Friendly Foreigners: International Warfare, Resident Aliens and the Early History of Denization in England, C.1250—c.1400.” *English Historical Review* 130, no. 542 (2015): 1–24.

López-Ruiz, C., and Brian R. Doak. *The Oxford Handbook of the Phoenician and Punic Mediterranean.* Oxford: Oxford University Press, 2019.

Mack, William. *Proxeny and Polis Institutional Networks in the Ancient Greek World.* Oxford: Oxford University Press, 2015.

———. “‘Where are the *Proxenoi*?’ Social Network Analysis, Connectivity and the Greek *Poleis*.” *Past & Present* 257, no. 1 (2022): 11–54.

Manning, Joseph G. *The Open Sea: The Economic Life of the Ancient Mediterranean World from the Iron Age to the Rise of Rome.* Princeton: Princeton University Press, 2018.

Marek, Christian. *Die Proxenie.* Frankfurt am Main/Bern/New York: Peter Lang, 1984.

Newman, M. E. J. “Mathematics of Networks.” In *The New Palgrave Encyclopedia of Economics,* edited by Lawrence E. Blume and Ssteven N. Durlauf. Basingstoke: Palgrave Macmillan, 2008.

North, Douglass C. *Institutions, Institutional Change and Economic Performance.* New York: Cambridge University Press, 1990.

———. “Institutions.” *Journal of Economic Perspectives* 5, no. 1 (1991): 97–112.

North, Douglass C., and Robert Thomas. *The Rise of the Western World: A New Economic History.* Cambridge, UK: Cambridge University Press, 1973.

Ober, Josiah. *The Rise and Fall of Classical Greece.* Princeton: Princeton University Press, 2015.

Ogilvie, Sheilagh. *Institutions and European Trade: Merchant Guilds, 1000–1800.* Cambridge: Cambridge University Press, 2011.

———. *The European Guilds: An Economic Analysis.* Princeton: Princeton University Press, 2019.

Parker, A. J. *Ancient Shipwrecks of the Mediterranean and the Roman Provinces.* Oxford: BAR, 1992.

Reger, Gary. *Regionalism and Change in the Economy of Independent Delos.* Berkeley, CA: University of California Press, 1994.

———. “Hellenistic Greece and Western Asia Minor.” In *The Cambridge Economic History of the Greco-Roman World,* edited by Walter Scheidel, Ian Morris, and Richard P. Saller, 460–84. Cambridge: Cambridge University Press, 2007.

Scheidel, Walter. “Demography.” In *The Cambridge Economic History of the Greco-Roman World,* edited by Richard P. Saller, Ian Morris, and Walter Scheidel, 38–86. Cambridge: Cambridge University Press, 2007.

Schultze, Alfred. “Über Gästerecht Und Gastgerichte in Den Deutschen Städten Des Mittelalters.” *Historische Zeitschrift*no 101 (1908): 473–526.

Strauss, Julia. *Shipwrecks Database. Version 1.0.*2013.

Temin, Peter. *The Roman Market Economy.* Princeton: Princeton University Press, 2013.

Terpstra, Taco. *Trade in the Ancient Mediterranean: Private Order and Public Institutions.* Princeton: Princeton University Press, 2019.

———. “Roman Technological Progress in Comparative Context: The Roman Empire, Medieval Europe and Imperial China.” *Explorations in Economic History* 75 (2020): 101300.

Walbank, Michael B. *Athenian Proxenies of the Fifth Century B.C.* Toronto and Sarasota, FL: Samuel Stevens, 1978.

Wallace, M. B. “Early Greek Proxenoi.” *Phoenix* 24, no. 3 (1970): 189–208.

Woodard, Roger D. “Greek Dialects.” In *The Ancient Languages of Europe,* edited by Roger D. Woodard, 50–72. Cambridge: Cambridge University Press, 2008.

Woolmer, Mark. “Forging Links between Regions: Trade Policy in Classical Athens.” In *The Ancient Greek Economy: Markets, Households and City-State,* edited by Edward M. Harris, David M. Lewis, and Mark Woolmer, 66–89. Cambridge: Cambridge University Press, 2015.

Ziebarh, Erich. “Neue Beitrage Zum Griechischen Seehanel.” *Klio* 26, no. 26 (1933): doi.org/10.1524/klio.1933.26.26.231.