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ROME AND THE POLIS: TRADITION AND CHANGE IN THE FINANCIAL ACCOUNTS OF TAUROMENION, 1ST CENTURY B.C.

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ABSTRACT

Ancient historians provide us a partial, mostly favourable to Rome, picture of the expansion during the Republic. However, not much attention has been devoted to the local economic history of the Greek cities that became part of the Roman state. Thanks to a completely new edition of the financial accounts of the Greek city-state of Tauromenion from the I century B.C., we shed new light on the intertwined process of institutional and economic change in Sicily during the I century B.C. In addition to informing us about the aggregate economic movements of the city, the Tauromenion accounts also show clear signs of Roman influence as months and magistrates were named after the Roman tradition. We find that there was no structural break in the civic accounts associated with this institutional change, but rather that the generally wealthy city of Tauromenion showed signs of financial distress in the last years before the change. The evidence suggests that rather than being an imposition of Rome, institutional change was voluntarily embraced by middle-sized cities such as Tauromenion and could be motivated by economic reasons.

Keywords: Ancient Economy, Roman Rule, Roman Sicily, Public Finance.
JEL Codes: N00, N01, N44.

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We thank the participants in the workshop in honour of Stefano Fenoaltea as they were very supportive and gave us valuable feedbacks. The present article is the result of joint efforts and we are responsible *in solido* for it. However, sections 1 and 2 should be ascribed to Filippo Battistoni whereas the Introduction, chapter 3 and the Conclusion to Marco Martinez. We deliberately avoided erudite discussions and references in the footnotes, a choice that could displease classicists should they read this paper. We preferred however to concentrate on the

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> "The reconstruction of the past from our poor stock of inherited evidence reflects the observer's feel, intuition, above all knowledge of the broader corpus of historical sources, of economic logic, of the relevant technology, institutions, and mores; it reflects, in a word, the observer's talents and experience"
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> (Fenoaltea 2019: 14).

Introduction

Between the III and I century B.C., Rome gradually imposed its rule across the Mediterranean. In the Greek-speaking world, the Roman expansion clashed with states of different nature (major kingdoms, local rulers, leagues) but the basic cell of these organizations was in most cases the city-state, free and autonomous in their internal organization even if not completely independent in wider ranging matters. Factual history writing is favoured in the ancient literary sources and it usually adopts a top-down perspective leading to a possibly overly Romano-centric picture.

Although various studies investigated in depth the relations between Rome and the Greek world describing the civic dimension (for example the work of Ferrary 2017) and how the public finance system of well documented cases such as Delos and Athens worked (Migeotte 2014) there is still much left to discuss about the impact Roman rule on the public finances of Greek cities and on the political economy aspects of the integration in the Roman sphere of medium-sized cities. We intend to tackle the issue thanks to the noteworthy evidence from the Sicilian town of Tauromenion, that, probably because of its fragmentary status, has been not widely used neither in works on the ancient economy (for example it is not mentioned in Bresson 2015) nor in research on the effects of Roman rule.

Looking at this evidence would add an important layer in understanding the economic consequences of Roman rule. In particular, it would allow us to consider macro-processes of socio-political integration into what would soon become the prosperous and vast Roman empire from the viewpoint of the poleis who bore the burden of social and institutional change, rather than from the Roman perspective. Economic and commercial aspects arguably mattered in the decision of a polis to oppose or support the Roman

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data: Notwithstanding its intrinsic limits, this effort provides a new perspective for the analysis of the material and more generally to the question of how and to what extent we can analyse very fragmentary data pertaining to societies differing from modern ones.

integration: in the I century B.C., the province of Sicily was one of the main commercial assets of Rome for the import of corn.

For this reason, we try to shed new light on the continuity and change in Greek cities under Roman rule basing our analysis on a complete re-edition of the financial accounts of the Sicilian city of Tauromenion, I century B.C. The financial accounts of Tauromenion were inscribed on stone on a monthly basis, making this an important source to observe the change within and between years.[1] Importantly, we observe an institutional change that clearly betrays Roman influence. The financial documents of Tauromenion represent a seldomly found typology: most cities had similar accounts, but they are lost for us, or had never made their way to stone. Tauromenion itself was not an extraordinary city: it was a middle-sized town, highly reliant on agriculture. Therefore, it might not be unsound to generalise its characteristics to similar cities for which we lack documentation.

In looking at the Tauromenion material, we search for economic patterns within the financial movements (i.e., by cancelling out for merely accounting movements) and we propose an approach to restore missing observations in order to reconstruct more generalisable patterns. We consider two main indicators of economic welfare from the monthly accounts of Tauromenion: a stock measure of cumulated wealth that we derive from the monthly balances of the accounts, and a flow measure of monthly difference between revenues and expenditures. We intentionally pass over the classic modernist-primitivist debate on ancient economy, nor do we consider productive here to discuss the idea of economic rationalism in the ancient world, even if we do occasionally make some statements that could have a bearing on that debate.[2]

We find that the city of Tauromenion was generally wealthy: it relied on a positive balance in all the city accounts with only two minor exceptions, and it was able to maintain moderate but stable streams of profits that, in the case of sacred accounts, gradually increased the deposit over the years. However, over the two years that preceded the institutional reforms, some trends were reversed: the sacred account could no longer count on sufficient revenues – we argue, such revenues used to consist of

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[1] Accounts of the ancient world should be understood quite differently from modern ones: they tend to be simpler, listing revenues and expenditures, sometimes organized into subcategories. Even modern scholars that have stressed the complexity of some ancient cases (Delos, Chankowski 2019) would agree that they are immensely simpler than modern ones (for an overview of modern accounting practices, see Van de Ven and Fano 2017).

For a detailed description of the Tauromenion accounts see *infra*, including a brief discussion of the presence/absence of the double-entry bookkeeping principle (n. 17).

[2] A classic overview on the primitivist-modernist debate is Finley 1973. Stefano Fenoaltea was not a stranger to the discussion – see Fenoaltea (2016).

donations – to meet monthly expenditures; the civic account also experienced unprecedented losses and the revenues obtained from selling goods on the market were halved compared to the first years of the series. In two (possibly non-consecutive) years after the institutional reforms, the balances are more stable, although marked by occasional losses. We cannot find evidence of a structural break occurring with the institutional reforms, but we do see a situation of economic distress in the city before the reforms, at least compared with the very prosperous figures of previous years. If the reforms were associated with a stronger direct rule of Rome, we would see drastic changes in the economy of Tauromenion. Rather, since the distress precedes the reform, we suggest that the city of Tauromenion decided to respond to economic challenges by strengthening its allegiance with the incumbent power of the time, Rome. Whether this was sufficient to face economic hardships we cannot tell as we miss counterfactual scenarios and statistical tests can be misleading with the data at hand. Our evidence gives us a privileged, although limited, point of view: when observed through the eyes of the local communities, the so-called Romanization looks like a far more complex and nuanced phenomenon than the monolithic impression we may get thanks to the literary sources. It may be suggested that cities, such as Tauromenion, had the option to willingly strengthen their link to the cultural and political sphere of Rome, and that a reason for this assimilation might have been economic.

Our main contributions in this paper should be seen along two major lines of scholarly research. First, we aim at bringing some new food for thought to the ongoing debate on what forms Romanization might take, adopting a bottom-up approach.[3] Second, we contribute to the broader literature trying to understand relationships between political and economic institutions of the ancient world: having as a basis a carefully revised edition of the sources we try to order and 'translate' them in a form that allows an economic/financial analysis by a larger group of scholars, putting them on par with the specialists of the ancient world.[4] By so doing we suggest a specific interpretation for Tauromenion's data, connecting the economic and the institutional spheres and giving priority to the former over the latter.

We organize the paper as follows. Section 1 provides an historical overview of Sicily and its relationship with Rome in the I century B.C.

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[3] For a general overview of the problem: Versluys (2014), Woolf (2014), and Roselaar (2015).

[4] Among others, see Bowman and Wilson (2009); De Callatay (2014); Manning (2018); Allen, Bertazzini, and Heldring (2021); Allen and Heldring (2021). Fochesato (2021) also assessed quantitatively the link between public finance and political change, and the basis of rich fiscal data from medieval and Renaissance Siena allowed a rigorous approach.

Section 2 presents the weaknesses and advantages of epigraphic sources. Section 3 describes the quantitative evidence about the economy of Tauromenion under Roman rule as can be derived from the sources. Conclusions follow.

1. Historical background

After the first Punic war Sicily became the first Roman province (241 or 227) and proved to be an asset of paramount importance for Rome (Finley 1968; during the Roman empire: Wilson 1990), since it constituted an experiment for later assimilations of foreign territories (Crawford 1990). The main role of Sicily in the Roman economy was the provision of corn, even if we ignore many aspects of how the island was administered and how taxes and corn supplies were levied (Dubouloz and Pittia 2007).

What we know of I century B.C. Sicily rests mostly on a single literary source, the orations against Verres by Cicero (70 B.C.), and on several scattered testimonies of different nature: documents, coins and archaeological remains. The Verrines are extremely rich in fiscal and financial details as well as highly problematic in their interpretation and reliability. Given the judicial context, Cicero's testimony is biased, partial and its goal is certainly not to give a clear and harmonic description of how Sicily was administered but to describe in as much detail as possible how Verres took advantage of his role of governor and which laws or procedures he bent or subverted in order to get rich. One of the most difficult issues in interpreting the data is constituted by the status held by the cities and their territories and what it meant in fiscal terms (Prag 2014: 186-199). This is a question that has a direct bearing on the administration and – closely connected with it – the economic situation of the island. The problem is twofold: it must be observed how deeply the Romans interfered with local administrations, and it can be asked how wealthy Sicilian cities were. If we ask Cicero, the Romans left a considerable degree of freedom to the cities and, before Verres started to vex them, they enjoyed great prosperity. As for the administration, every year a governor (*propraetor*) was sent to Sicily, joined by two quaestors (Cicero himself had been quaestor in 75 B.C.). The governor was ultimately responsible for making sure that Rome received its tithe and/or taxes (the actual levy was an affair of the *publicani*), administered justice (Fournier 2010) and kept order at the provincial level. Civic institutions mostly remained the same and differed from city to city (general overview in Prag 2014) according to previous traditions, even if there are several hints to the fact that the Romans were not as neutral as Cicero maintains (Ferrary 1988: 5-17).

From an archaeological point of view, we get the impression that the island was prosperous and with an extremely lively society, articulated through a stream of civic communities (Pfuntner 2019) that were blooming in II-I B.C. At a political-institutional level, two major breaks took place in the second half of the I century B.C. First, in the turmoil characterizing Caesar's last months and the aftermath of his death, Sicily fell into Sextus Pompey's hands and could join the Roman state again only after Pompey's defeat at Naulocos (36 B.C.). It is a common belief among scholars that the two later accounts from Tauromenion showing an institutional reform should be dated to this period (Manganaro 1964: 55; Wilson 1990: 35 and 357 n. 26; against: Battistoni 2011: 181), when cities in Sicily could have been enjoying Caesar's grant of *Latinitas* (46 B.C., civic status equivalent to the *ius Latii*), even if we lack detailed sources to define precisely what this status actually meant. The second breakthrough came with the Augustan reorganization of the province, probably in the twenties (Wilson 1990: 35). At that point several cities were given a different political structure and among the reformed civic orders Tauromenion became a Latin colony, a measure which sources depict as punitive since it implied the presence of Latin-speaking colonists and new institutions and was caused by the anti-augustan stance the city had had. This last change however did not affect the Tauromenion accounts that predate it by several decades. More relevant to the present analysis is the status enjoyed by Sicilian cities in Cicero's time, before the granting of *ius Latii*. According to Cicero there were five cities exempt and free from taxes (*liberae et immunes*), three subjected to a treaty (*foederatae*), a bunch whose territory was subject to the censors whereas the remaining ones, the vast majority, were the so-called *decumanae* (Prag 2014). It must be stressed that the Verrines mostly deal with fiscal aspects (of grain, especially) and a considerable confusion has arisen from applying to entire cities the definition pertaining in fact to parts of the Sicilian land. Most cities paid a tithe (*decuma*) which could be topped by two further ones, *frumentum emptum* and *imperatum*, that were however sold and not given for free to the Romans. Tauromenion, because of the treaty, was exempt from paying the *decuma* but not from selling corn so that it enjoyed a privileged status.

2. Sources

The evidence from Tauromenion on financial aspects is exceptional among the data about public and sacred finances from the ancient Greek world as it can be paralleled with just one other case, Delos.[5] Delos and

[5] There is a certain number of accounts from the Greek world but these accounts are usu-

Tauromenion however differ considerably since the economy of Delos was heavily influenced by the presence of the temple of Apollo, a major economic actor that could rely on an impressive financial liquidity, whereas Tauromenion represents the quite common typology of midsized city-state. Pending the scarcity of testimonies on the matter, a notable exception is constituted by the accounts of the managers (*phrontistai*) of units of large estates in the Egyptian Fayyum area from the 3rd century A.D., that are also reported monthly. They offer an extraordinarily detailed account of the financial movements of an agricultural estate at the time. It has been argued that their function was to inform the manager about the monetary costs of production which, combined with other information about factors such as the suitability of the land, allowed him to compare the profitability of different units and make quasi-rational decisions about which crop or unit to invest more in.[6]

We base our work on a new edition of the accounts. This process is extremely important since a general and systematic edition does not exist. Moreover, the sequence proposed in previous editions is different from the one adopted here (see below and note 4).

The accounts were carved on the walls of a still unidentified public structure (Battistoni and Campagna 2014; see below for their being memorialized lastingly as a monument and the archival original), possibly near the agora, the principal market and meeting point of the city (Campagna and La Torre 2008). Of the now lost original structure 13 blocks of different size and preservation status remain. Each block contains 2 to 12 months of accounts, usually pertaining to the same year. We have therefore records – sometimes in a very poor state of preservation – for ca. 60 months, pertaining to at least 15 different years so that we can rest assured that the original monument recorded a minimum of 182 months and we can guess that there were more.[7]

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ally confined to a specific magistracy (like the damiourgoi in Kyrene and Laronde (1987) or to a specific occasion (like the Delia festival in the sanctuary of Apollo in Delion, Attika, Brélaz, Andriomenou, and Ducrey (2007); Knoepfler (1988).

[6] See Rathbone (1991: 331-387) for a description of the accounting system and interpretations about its function.

[7] For a general overview of the material see Fantasia (1999); Migeotte (2014); Battistoni (2016). FB is currently finishing a complete edition of the blocks, starting from a new appraisal of the texts. We follow Fantasia (1999) in ordering the inscriptions in chronological order except that we consider IG 429 as the record for two different (consecutive) years rather than one. Here we outline the chronological order, with a specification of how many months are actually preserved (including fragmentary/damaged ones whose texts are partially/mostly lost; a "+" indicates that the months recorded in the block pertain to two different and consecutive years): IG 424 (2 months); IG 423 (3); (Manganaro 1964: 43-45) (3 + 5); 425 (9,5, the record continues

Besides the fact that we observe very incomplete records, one of the main challenges that we face when dealing with this source is that financial movements by themselves do not inform us about the economic reasons nor about the institutional frames behind the movements. We try to link the financial with the economic movements following internal hints: the mention of the treasurers, the occasional market sales for which we have information on the type of goods sold, and the institutional change for which see below. Table 1 provides an overview of the data-set that resulted from the re-edition of the inscriptions.

The text of both well and poorly preserved inscriptions (Figure 1) is repetitive and clearly structured: for each month there is a record of the two main posts, one of the sacred (hieromnamones) and one of the civic (tamiai) treasurers. In both cases the first entry are revenues, the second are expenditures and finally there is a running balance. The balance was an indication of whether the treasurer had realised sufficient assets to meet the expenditures that occurred in that month as for the Fayyum estate of 3rd century A.D. Egypt in, rather than measuring the accounting profit or loss made in each month (Rathbone 1991: 374). Indeed, the value of the balance was carried forward to the account for the next month.[8] We can suppose that the monthly balance was of external significance, even if they are presented in a very abbreviated form. After the aforementioned posts comes that of the *sitophylakes*, literally 'warden of the corn'. Both cash and in-kind goods were administered (beans and millet). At the end of each month, the *sitōnia*, funds for buying corn, were recorded. These funds are better understood formally, considering the statutory munificence (evergetism) typical of the ancient society, and practically, as a reserve of money for the city to use if the need arises. We will see how the overall sum of *sitōnia* funds remained virtually unchanged over time, although in the last period we can observe that this stability masked money movements such as loans, whose supposed interest rates however do not appear to increase the total amount of the *sitōnia* account over time.[9]

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on the next block, they are the only two blocks that join together); 426 (0,5 + 7); 427 (6); 430 (2 + 2); 428 (1 + 2); 429 (4 + 3); IGSI 13 (12); (Manganaro 1964: 55-56) (2). The last two blocks (Manganaro 1988: 156-157) are too fragmentary to be included in the present analysis, but we can be sure that they belong to the older blocks' group rather than to the recent blocks' one.

[8] The monetary units are talents / litrai (1/120), which were substituted by nomoi / litrai (1/40; 3 nomoi = 1 talent) at a later date, see infra. We ignore the exact value of the Sicilian talents so that our considerations must remain relative and not absolute.

[9] The one and only alleged mention of 'interest' (gr.: tokos) IGSI p. 116; 127, is actually a wrong reading of the text.

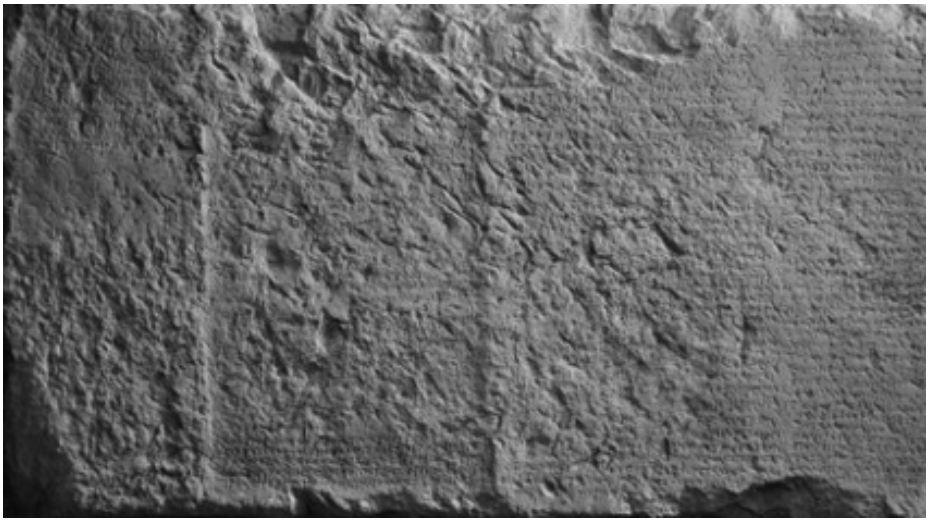
Tab. 1. *Extract from the data-set obtained from Tauromenian inscriptions. The full data-set is available upon request*

Edition	N Inscription	N Year	Month	t	Season	Account	Type	Litrai	Talents	Nomoi	Total (in litrai)	Notes
IG 424	1	A	*Artemitios*	1	Spring	*tamiai*	Balance					
IG 423	2	B	*Heloreios*	15	Spring	*hieromnamones*	Revenues	X	1,08X		129,600	X assumed to be 5
Manganaro 1964, 43-45	3	3	*Eukleios*	36	Winter	Market	Revenues	0	25,168		3,020,160	
Manganaro 1964, 43-45	3	3	*Eukleios*	36	Winter	Market	Revenues	0	44,460		5,335,200	sale of stones and wood
IGSI 13	10	14	*Iounios*	159	Summer	*tamiai*	Revenues	31		7,751	31,0071	
IGSI 13	10	14	*Iounios*	159	Summer	*tamiai*	Expenditures	38		8,757	350,318	
IGSI 13	10	14	*Iounios*	159	Summer	*tamiai*	Balance	20		2,567	102,700	
IGSI 13	10	14	*Iounios*	159	Summer	*Sitonia panta*	Balance	30		108,624	4,344,990	of which 68,424n30l by the preceding *duoviri*; 40,000n in the treasure

Fig. 1. *Extract from the set of financial inscriptions of Tauromenion considered in this study.*

(*a*)

(*b*)



Notes: (*a*) IG 423; (*b*) IG 426.
Sources: Courtesy of Parco Archeologico di Giardini Naxos – Taormina. Image F. Battistoni (snapshot of a RTI file).

The accounts mostly do not provide information about the reason for financial movements. Yet, we can imagine the main reasons behind them in our account on the basis of the more detailed accounts of Delos.[10] In Delos, the most frequent revenues in the civic accounts were due to property taxes, customs duties, property rents, and selling confiscated assets.[11] The expenditures mostly covered subsidies for the organisation of public events and for the remuneration of public works' personnel, to buy (but also sell) grain and other goods at a lower price than the market one, contributions to stage feasts jointly with the sacred account, wages to public employees, loans. In the sacred accounts of Delos, probably the equivalent to Tauromenian *hieromnamones*, more was spent for feasts, sacrifices and to remunerate the employees working in the sacred properties. While the civic account received rents and administered civic properties, the sacred did the same with sacred properties. This rather obvious difference has an important implication for our analysis: we expect the movements of the two accounts to be rather independent to one another in the sense that they have to do with different objects and rarely interacted. Because of its nature and scope, the sacred account had tended to accumulate a reserve.[12] So if we see similar aggregate movements in the two accounts over time, this signals overall structural changes more than specific changes in the content of each account.

Table 1 shows how we organised the information contained in the inscriptions in the form of a data-set. The 'Inscription' column indicates the sequence of each inscribed stone; The 'Month' indicates the month, whose name changed over time from traditional Greek ones (e.g., Eukleios) to calques from Latin (e.g., Aprilios).[13] The column 't' is a monthly progressive number that gives a chronology of the data contained in the inscrip-

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[10] For a general overview of Delos documents: Vial (1984) and Migeotte (2014: 586-684). Important considerations on economic aspects are in Reger (1994).

[11] Delos had very limited, almost insignificant, natural resources, a handicap for which the importance of the sanctuary and the commercial activities of the harbour made up. Tauromenion on the contrary could count on a prosperous agriculture (especially corn and the famous wine), on livestock and on other naturalia (e.g., stones and wood).

[12] We have several highly interesting documents that testify to the occasional interaction between civic and sacred finances and they invariably show that cities could borrow money from temples but not the other way around, so that temples could act as a sort of reserve banks for the cities that controlled them. A classic example is Locris (Del Monaco 2013 (texts); Costabile 1992), whereas Argos is a recently discovered one, still awaiting full publication (Kritzas 2006). On the separation/contact between civic and sacred that was of paramount importance in the ancient Greek world, see Papazarkadas (2011) and Rousset (2013; 2015).

[13] Greek calendars had lunar months so that, to keep the pace of the solar year, an extra month was added to the year every 2/3 years. See Hannah (2005: 42-70). We find an instance of this in IG 429 sx: the last month of the summer, *Apellaios*, is duplicated, that is the normal *Apellaios* is followed by *Apellaios deuteros* (lit.: *Apellaios* the second).

tions. We also indicate any specification about the movements provided in the sources or the assumptions that we made in imputing unreadable data.

Two blocks do not fit in this frame. They can be dated to a later period, not too far removed in time, as it is proved by paleographic and linguistic aspects and by institutional changes: months are named after the Latin ones so that the traditional names are abandoned and there appear to be two new magistrates, the *duo andres*, at least linguistically related to the Latin *duoviri*. The unit of measure for money becomes the *nomoi* and litrai, obliterating the previous talents.[14] This change is however a formal more than a substantial one, since a talent equals exactly 3 nomoi and even in the 11 older blocks there are several amounts of money that are better explained as being originally calculated in nomoi. From a financial point of view the main differences are the disappearance of the sacred treasurers – possibly now a tacit part of the civic ones –, of the grain wardens, and the merging of the grain funds into just one post.[15]

One of the most interesting aspects of the epigraphic evidence from Tauromenion is the politico-historical background against which it is to be placed. As mentioned above, the Tauromenitan accounts can be broadly dated to the I century B.C. (not later than the Augustan reorganization of Sicily, ca. 20 B.C.) and they constitute the direct local perspective specular to its interpretation by a Roman, i.e., Cicero. Any changes that were to be ascertained between the two groups of documents (11 older vs 2 newer) could therefore be indicative of what the assimilation to Rome, a political phenomenon, represented for a polis from a financial and possibly economic point of view.

A more specific question concerns when, and why, the accounts were carved into a wall. The texts do not give us any specific hint to the circumstances under which they were presented in a monumental form. Nonetheless the process itself is extremely important since it gave a stunning publicity and visibility to the texts at a time when society had a strong feeling of civic participation and individual consciousness about the management of common spaces. It is important to stress that the inscribed version was not the actual medium used to keep track of the civic and sacred financ-

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[14] A practical change, possibly important when looking at financial aspects, is constituted by how numbers were expressed. In the first period, following a local (Sicilian) tradition, numbers were written in ascending order (unit-decade-hundred…) whereas in the following period the more common descending order (… hundred-decade-unit) is adopted. Another change that can be seen in view of an opening towards the exterior is a minor adjustment in the way personal names were given: in the older accounts there is an abbreviation of very local nature (widely attested in Sicily, seldom elsewhere), it disappears after the reform.

[15] Civic control of sacred assets could be interpreted in a Roman sense, since a major difference between Rome and the poleis was the public management of *sacra* (e.g., the Aerarium Saturni).

es. There were archives in which documents were kept on papyrus or on wooden tablets (cheaper and easier to use and store than stones), so that what we have in Tauromenion was the last step of a longer process.[16]

3. Tradition and change in Tauromenion as seen from the financial accounts

Before describing and interpreting the movements of the city accounts we would like to provide a graphical overview of the source and of the methods we use to analyse it, leaving technical details to the Appendix. Table 2 provides an overview of the sources we use and the corresponding years of observation.

Tab. 2. *List of stones with corresponding years and an indication about whether they were analyzed here. Only the years that are consecutive within a source are consecutive in general*

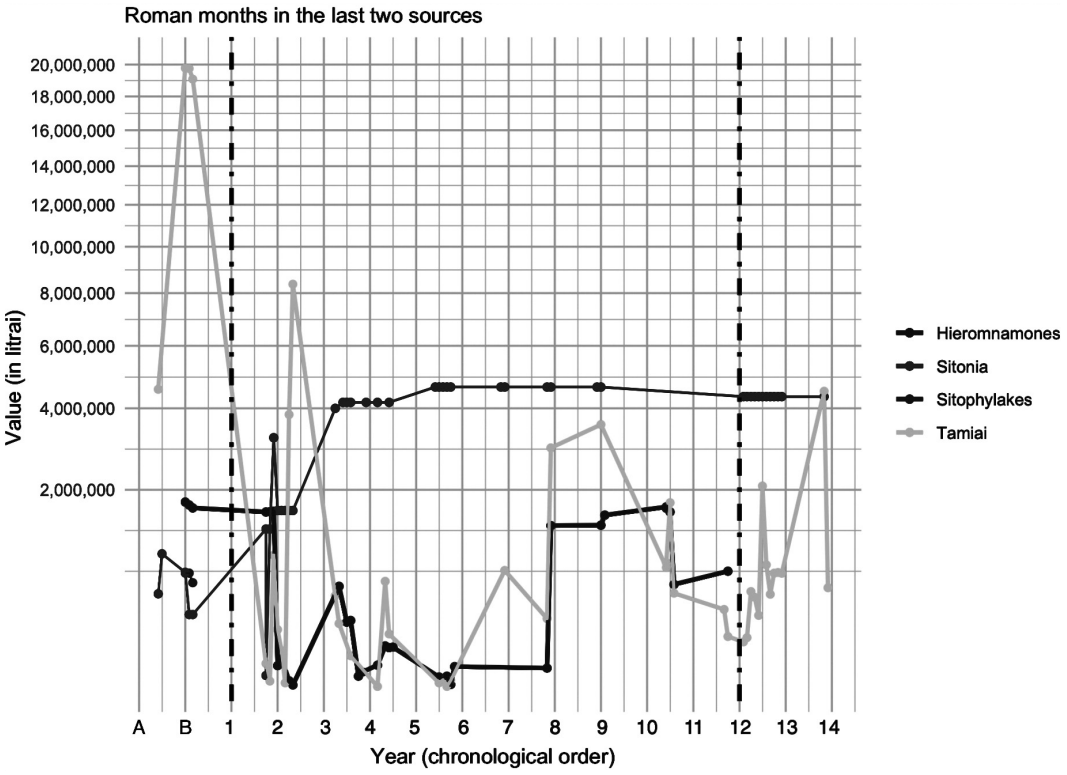
Edition	N Inscription	N Year	Analysed	Period
IG 424	1	A	No	I
IG 423	2	B	No	I
Manganaro 1964, 43-45	3	1	Yes	II
–	–	2	Yes	II
IG 425	4	3	Yes	II
IG 426	5	4	Yes	II
IG 427	6	5	Yes	II
IG 430	7	6	Yes	II
–	–	7	Yes	II
IG 428	8	8	Yes	II
–	–	9	Yes	II

[16] The process generates two issues: *a*) absences could depend on 'rhetorical' choice and not on an actual lack of what we do not read; *b*) the material we have might not be enough to speak about economic rationalism. Looking at the records on stone from Delos, Chankowski (2013) suggests that they were indeed composed in light of economic rationalism.

IG 429	9	10	Yes	II
–	–	11	Yes	II
IGSI 13	10	12	Yes	III
Manganaro 1964, 55-56	11	13	Yes	III

Figure 2 shows the values of the preserved balances of the four accounts of the city of Tauromenion.

Fig. 2. *Monthly balance of the accounts of Tauromenion, in chronological order.*



Sources: IG 424, IG 423, Manganaro (1964: 43-45), IG 425, IG 426, IG 427, IG 430, IG 428, IG 429, IGSI 13 (*ibid.*: 55-56). The inscriptions n. 3 (*ibid.*: 43-45), n. 7 (IG 430), n. 8 (IG 428), and n. 9 (IG 429) span over two years, for a total of 15 years in 11 inscriptions. Each point represents a monthly value recorded in the inscriptions. The y-axis is in square root scale. Figure 2 also includes IG 424 and IG 423.

It is quite evident how the balance of the *sitōnia* accounts remained stable over time, consistent with the fact that it was a reserve, and with the exception of the first three documents that witness its active use. Given the size of the deposit, it is quite surprising to see how unchanged the amounts remained. However, especially in the later accounts we observe that just part of the fund was kept in a deposit: the rest was given out in the form of loans to private subjects or as funds administered by individual public magistrates. The striking stability of the *sitōnia* account, together with very scarce information about its internal movements makes this fund less interesting than the other accounts to study here, as we look for changes over time. Another account that we do not analyse in detail is the account of the grain wardens, the *sitophylakes*, because we can observe its movements very rarely. So we are left with the accounts of civic (*tamiai*) and sacred (*hieromnamones*) treasurers. We see how the movements of the balances of the two accounts are similar. Given how unrelated their objects of expenditures and revenues were, we can suppose that the common movements track general economic movements. We distinguish three periods based on their accounting and institutional features, I, II, and III. The first period – on the left of the first vertical bar in Figure 2 – has a different accounting method than the one adopted in later years: it reports the revenues, the expenditures, and the difference as the resulting balance of revenues minus expenses. In the second and third period we observe an accounting change where the balance becomes a stock, rather than a flow measure – see the sources section and below for more details. This new way of computing balances is a more efficient way to present the data: before, the balance could be easily computed (revenues-expenditures), while now it tells something new. In the third period – on the right of the second vertical bar in Figure 2 – the already mentioned institutional reforms are in place. We exclude period I from the analysis because it has a different way of computing balances. Although such a broad picture is useful to compare the magnitude of the balance of the different account, this still leaves us ill-equipped to understand economic patterns of change in Tauromenion.

We propose an imputation procedure for the missing observations in the monthly series of the civic and sacred accounts. We treat each block as a different unit, as we have no way of knowing how many years passed between one year and the other except when they are recorded on the same stone. We then try to use as much information as possible to impute the missing observations: we use not only the known values of the series of interest in the considered source, but also the value of other series that might predict the movements of the series of interest. For instance, the movements of the revenues of the sacred account might be associated

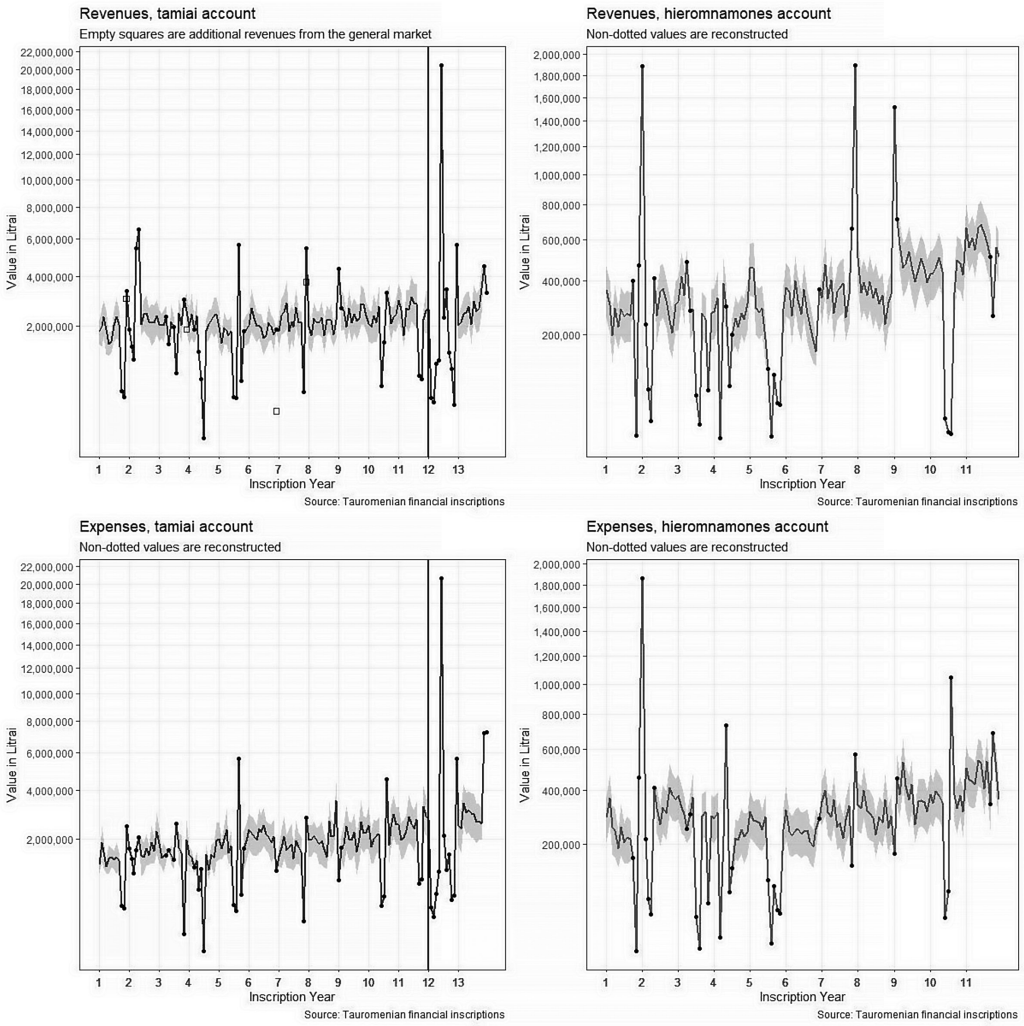
with the movements of the revenues of the civic account and vice-versa: the sacred account could have lent amounts to the civic one, moreover there can be omitted factors leading the co-movements of both accounts (e.g., a festival sponsored thanks to both civic and religious funds). We run the chosen imputation method – predictive mean matching, introduced by Rubin (1986) and Little (1988) – a hundred times to get an estimate of the imprecision and to improve the stability of the results. Lastly, we test whether there was a structural break in the series around the time of the institutional reform. The imputed data should be read with caution, and consequently we interpret the results by paying most attention to the real data.

Looking at the series of revenues and expenditures of the civic and sacred accounts, we can group the data in three periods (Figure 3): the period ranging from year 1 to year 5, with an especially high concentration of observations between year 1 and 2; the period between year 6 and year 11, with relatively few observations; and the period after the reform institutional, of which the first year is preserved almost entirely, whereas the second preserves information only for two months.

Both the *tamiai* and the *hieromnamones* accounts were used very actively: the values of the revenues and expenses changed markedly from a month to the next, and each month had at least some expenditures and some revenues. As it is normal, the sacred account was less central in the day-to-day administration of Tauromenion than the civic one: the movements of the *tamiai* account were of an order of 10 times larger than the movements of the *hieromnamones*, even though the reserves of the two accounts were not very different (Figure 3). A very evident feature in both accounts is that when large revenues occur (e.g., in the fifth month of the *tamiai* account in the year 12, or in the *hieromnamones* account at the beginning of the second year), they are balanced by an expenditure of roughly equal size. Such movements tend to coincide with the beginning the year in the *hieromnamones* and with months in the middle of the year for the *tamiai* account. Given that the charge for the accounts passed from a group of treasurers to their successors on an annual basis, these large movements were probably accounting operations that shifted credits and assets of the previous financial year to the next by registering them as expenditures (as if they were temporarily lost) and as new revenues contextually.[17] The revenue part can be explained with the handover of the account, with related revenues, from treasurers to

[17] This interpretation, if right, would remind of a double entry book-keeping system. On the topic in antiquity, see at least De Ste Croix (1956) and Williams (1978).

Fig. 3. *Revenues and expenses in civic and sacred series of Tauromenian financial inscriptions.*



Note: The values reported in the sources have a black dot. The values of the general market revenues are computed separately and represented as square dots in the *tamiai* account balance. The vertical line marks the beginning of the use of latin names for months. The y-axis is in square root scale. The values not provided in the source have been reconstructed through a predictive mean matching imputation procedure run 100 times. The reported line is the mean of the 100 values, and the grey area reports the maximum and minimum of these values for each month. A talent corresponds to 120 litrai and a nomos corresponds to 40 litrai. The years 1 to 2 (Manganaro 1964: 43-45), 3 to 4 (IG 425 and IG 426), 6 to 7 (IG 430), 8 to 9 (IG 428), 10 to 11 (IG 429) are contiguous.

treasurers; the expenditure part has to do with the fact that the treasurer of the previous year temporarily kept the money. During the year the money was actually paid back to the treasurer then in charge. This explanation is consistent with the fact that, in the two older accounts, records of relevant sums defined as "in the hand of the previous treasurer" were recorded.

For this reason, it might be more instructive to look at the difference between revenues and expenditures rather than at the two series separately to obtain a flow-measure of the monthly economic movements of the civic and sacred accounts of Tauromenion: by subtracting the expenditures from the revenues we cancel out the effects of contemporaneous charges and revenues that occurred in the accounts, most probably with the appointment of a new treasurer. The second important indicator of the economic welfare of Tauromenion besides the difference between the revenues and expenditures are the monthly balances of the accounts. While the difference between expenditures and revenues gives us a flow measure, the balance gives us a stock measure of the wealth of Tauromenion: balances were accumulated over time, thus measuring the assets net of liabilities that could be converted into cash in each month, although not immediately (i.e., credits or in-kind assets). In the balance of the *tamiai* account we separately include the revenues that the city earned by selling goods such as wood, livestock, and stones. The revenues from the market were accounted separately, but in our opinion, they should also be included in the balance because they contributed to the financial assets of the city quite substantially, reaching levels as high as 8 million litrai (67,000 talents).[18] We get a rather clear picture: the city of Tauromenion met the monthly expenses very well (Figure 4). Temporary losses were soon balanced out by more revenues in the upcoming months (e.g., in the year 3). This seems not to be the case in the after-reform period (III): negative amounts are not balanced by positive ones, and the last two months of the series show marked losses. We cannot say whether these losses were matched by revenues in later periods.

The sacred account met monthly expenses and accumulated deposits much more than the civic account starting from year 4 (Figure 4). Just before the end of the year, the sacred account records a considerable income.

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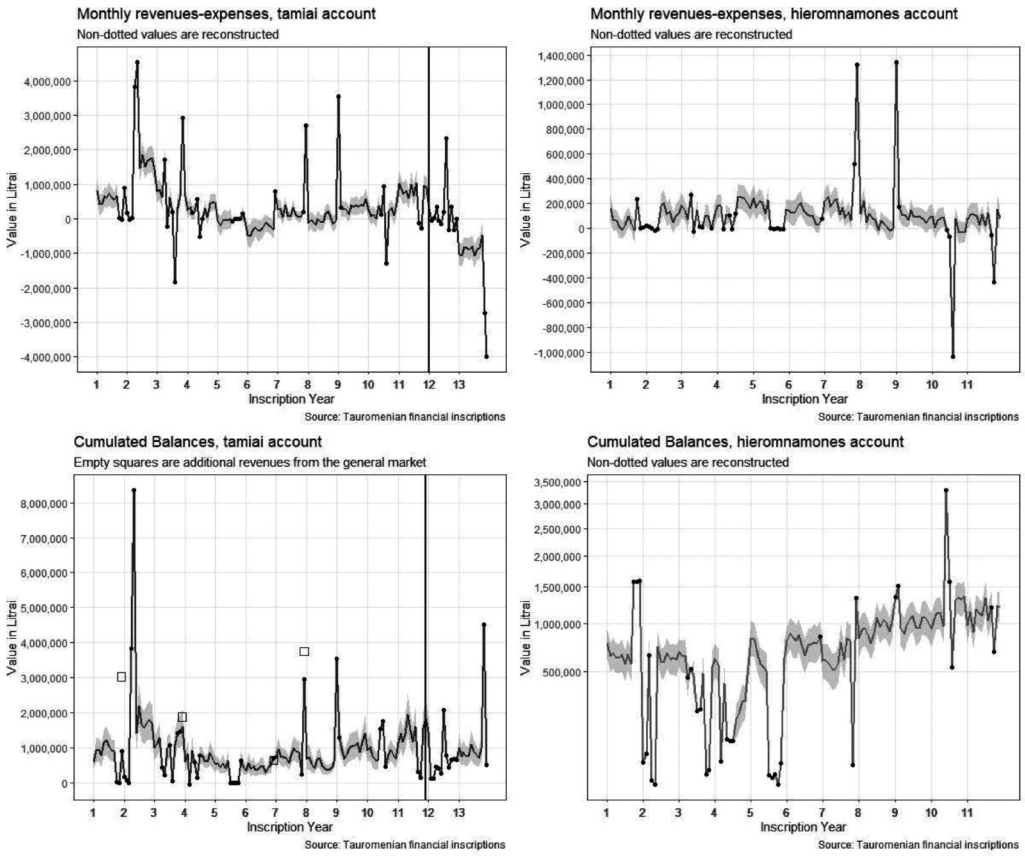
[18] We look only at the revenues received from the exchange 'market' (*agora dia pōlematōn*), excluding the revenues derived from selling livestock (*agora zōopolis*), wood and stones (*xylos* and *edrikos*). The reason is that in later periods only the exchange market is mentioned. Even if the other goods (livestock, wood and stones) could be part of it (that is, the difference is just in the grouping and not in the actual exchanges), we think that excluding these from the market revenues gives a more consistent picture over time.

Fig. 4. *Flow and stock measures of wealth in Tauromenion, by account (civic and sacred).*



Note: The values reported in the sources have a black dot. The values of the general market revenues are computed separately and represented as square dots in the *tamiai* account balance. The y-axis is in square root scale. The vertical line marks the beginning of the use of latin names for months. The values not provided in the source have been reconstructed through a predictive mean matching imputation procedure run 100 times. The reported line is the mean of the 100 values, and the grey area reports the maximum and minimum of these values for each month. A talent corresponds to 120 litrai and a nomos corresponds to 40 litrai. The years 1 to 2 (Manganaro 1964: 43-45), 3 to 4 (IG 425 and IG 426), 6 to 7 (IG 430), 8 to 9 (IG 428), 10 to 11 (IG 429) are contiguous.

In particular, it benefited from more than one million litrai of repeated profits at the end of the years 8 and 9. We explain this movement with donations from privates: the amounts were even (e.g., 10,000 talents dedicated to Zeus), making it unlikely that they derived from rents. The years 10 and 11 kept witnessing expenditures but no longer revenues, possibly

because the flows of donations stopped. The corresponding losses inverted the constantly increasing balance observed so far in the *hieromnamones* and not in the *tamiai*. It is less likely that the *hieromnamones* cashed revenues accrued from renting sacred properties (including agricultural fields), whereas sacred feasts or large-scale building maintenance works might explain the expenditures. And given that the months of the losses are not stable over time and correspond to different seasons of the year it is less likely that the *hieromnamones* cashed revenues accrued from renting sacred properties (including agricultural fields), whereas sacred feasts or large-scale building maintenance works might explain the expenditures.

Later the sacred post was suppressed, so we cannot compare the evolution before and after this period; given that its deposits were probably incorporated in the civic accounts, the conclusions we draw regarding them apply to the sacred accounts as well. Looking at the second economic indicator more in detail, that of running balances, we see how the *tamiai* balances reached levels in year 13 as high as eight million litrai. This very high level coincides with the beginning of the fourth month of the year and at the end of the previous year the city earned large amounts of money by selling goods in the market, so that it is possible to suppose that these earnings entered in the *tamiai* account with some delay.

The value of goods sold in the exchange market decreased considerably in the later years of the period II, but overall, we see a city with sound finances. The fact that the balances were not accumulated does not necessarily signal that the city was not able to meet its obligations: the net worth was re-invested, as attested by the large movements of both revenues and expenditures. In the years just before the reform, and especially in the years 9 to 11, the balances of both civic and sacred accounts fluctuated but reached a rather low level in the last month. This fact, combined with the decrease that we observe gives us some hints about moderate, but present, economic challenges that the city was facing.[19]

In period III we initially see a quite low balance, but it increases over year 12. For year 13, we observe a very high value of 4 million litrai, but in the last month, the balance left is of about 500,000 litrai only.

When looking at the difference between revenues and expenses, this decrease looks much more marked than it actually is: the decrease was accompanied by a rise in the profits in the period for which we are missing records – otherwise we could not have a balance of 4 million litrai in year 13

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[19] The creation of a third fund for the purchase of grain, first attested in year 5, may be indicative in this sense. Such operations are in fact linked to moments of financial crisis within the community.

starting from a balance of less than 300,000 litrai at the end of the year 12. This suggests that the economy of Tauromenion was not affected by the institutional reforms in an extremely negative way. Yet the marked decrease in the profits of the *tamiai* account in the final part of the last year is quite suspect, as it was unprecedented in the remaining accounts.

Tab. 3. *Results of the Chow 1960 structural break test at the point when Latin names for months were used for the first time*

Series	Test	F-test	p-value
tamiai, D (Revenues-Expenditures)	Chow-test	–18.376	1
tamiai, Balance	Chow-test	–15.196	1

Note: Three lags (a quarter) were used.

To look more formally at possible effects connected with the reform, we test whether there was a structural break in the *tamiai* series in period III. We prefer not to use more sophisticated methods in this context given the remarkable data availability constraints.[20] The presence of such a break would be a clear sign of an external factor changing radically the economic structure of Tauromenion. Looking at the documents, the most obvious external factor might be a stronger Roman influence. Given that we know when this break happened in our series, we can use a Chow test comparing the null hypothesis of time- invariant parameters throughout the sample period against the possibility of a change in the parameter values at the date of the institutional change. We use this test on the balance series (stock measure) and on the revenues minus expenditures (flow measure) in the *tamiai* account, with values regressed over values lagged by up to three months. For both series we cannot reject the null hypothesis of time-invariant parameters: the change in the period III is not associated with a change in the economy of Tauromenion. The relationship could

[20] The lack of sufficient data does not allow us to decompose seasonality from the trend in a stable manner. This would have allowed us to study structural shifts in the trend component, or to compare more formally the pre-reform and post-reform trends in a pre-post difference setting. Other empirical exercises such as difference- in-difference strategies are not feasible in this context as the institutional reform is arguably endogenous rather than imposed from the outside (i.e., from Rome). Also, we are left with a very scattered series for Tauromenion and with no way to construct series for similar cities who did not change calendar and institutions in the same period.

have gone the other way around: the city decided to make political and institutional changes to cope with economic challenges that we observed in the two years of period II.

Conclusion

In this article we presented the results of a systematic appraisal of the monthly financial accounts of I century B.C. Tauromenion, with a particular emphasis on the accounts managed by civic and religious treasurers (*tamiai* and *hieromnamones*, respectively). The accounts of Tauromenion have not received much attention from ancient economic historians. However, they are an extraordinary source to understand the relationship between Roman rule and traditional Greek city-states from an unconventionally bottom-up perspective: the accounts of the last two inscriptions show clear signs of Roman-oriented reforms.

We find that the city of Tauromenion was generally wealthy at the time as it was almost always able to meet the monthly expenditures. However, in the two years before the reforms, some signs of financial distress appeared in both sacred and civic accounts. Differently from what we could expect if the reform was a top-down imposition from Rome, we do not find remarkable signs of economic booms or downturns after the reform. This evidence suggests that the institutional reform was a way for the Greek city-state of Tauromenion to strengthen its ties with the Roman sphere, possibly to obtain economic advantages in order to overcome increasingly serious financial struggles.

Appendix

This Appendix outlines the main assumptions we followed to build the data-set used in the analyses of the paper. For further details the codes and procedures are available upon request. The first set of assumptions deals with the entry of information from the original source, and the second set of assumptions deals with the methods to impute the missing data for columns not reported in the inscribed stones.

The sources we use are quite well-preserved, but this does not avoid that some entries are difficult to read. Luckily for us, the Tauromenion evidence lacks numeral abbreviations, meaning that it spells out the amounts in words rather than using symbols. This allows us to reconstruct the overall number even if some words are difficult to read. Moreover, we can often read the numbers of a higher order (e.g. the hundreds) even though we

cannot read those of lower order (e.g. the units). In these cases, we assign the number '5' to the one that we miss, as it is the most likely number. For instance, 22XX will appear as 2,255 in our data. We create an indicator that flags which values are imputed in this fashion. When imputing values for which we were not sure whether the value was made of two or three digits, we assumed it to be of two digits to be more conservative.

The values are provided in talents, nomoi and litrai. The litrai is the smallest unit available. A talent corresponds to 120 litrai, and a nomos to 40 litrai. We convert all the units to the litrai. In Tauromenion the years begin with the spring, between February and March with the month of *Artemitios*, and end with the end of the month of *Eukleios* between January and February. In the period with roman names the accounts end later, in April, and begin again in May. The months follow a consistent structure across sources, so we do not assume much here. The two most recent inscriptions date to the period 42-36 a.C (Fantasia 1999), but besides that, it is impossible for us to locate the exact year for the different accounts. However, thanks to the work of Manganaro 1964 we can order the sources chronologically. Because we do not know the exact number of years that passed from a series to another, we assume that each series is distanced by the previous one by one year. This is just to standardize the distances among series given the lack of knowledge we have, but we can also interpret the yearly distance among series as a longer distance. To complete the series to look at the correlation among different accounts, we have to assign values to the months with no information. We thus follow a naïve and a statistical approach.

The naïve approach is useful to illustrate the data imputation conceptually. Suppose we are interested in imputing the missing values in the monthly entries of the *tamiai* (civic treasury). The naïve imputation calculates the simple average (or the median) of the values for which we have information and then assigns this mean value to the missing points. Because we can specify the frequency of the series as we know that it is monthly, the mean is computed month by month. The advantage of this method is that it leaves unchanged the mean of the values in the series after the imputation. The main disadvantage is that as many observations will be concentrated around the mean, the process will appear to be more precise than it is, as there will be few variation. This drawback is partly mitigated by the fact that we compute means at the monthly level, but we still prefer to look at the results of another method.

The statistical approach to imputation we adopt is predictive mean matching. The idea of this procedure is to use auxiliary variables that predict the unobserved movements of our variable of interest. Suppose that we are again interested in the movements of the revenues of the *tamiai*

account. The movements of the revenues of the *hieromnamones* account might be correlated with the movements of *tamiai*. The procedure starts by estimating the mean value of the entries in the *tamiai* account and finding a set of coefficients $b^{\leftarrow}$ relating each known element of the *hieromnamones* (the predictor) with each known element of the *tamiai*. Then it finds a new set of coefficients $b^{\leftarrow}$ that are randomly drawn from posterior predictive distribution of known coefficients $b^{\wedge}$. Each $b^{\leftarrow}$ is then used to calculate predicted values for the missing *tamiai* monthly entries (see Rubin 1986 and Little 1988). We run the imputation a hundred times in order to improve the stability of the results. Every time the imputed values are different, and this allows us to quantify the level of imprecision in the imputation.

Another difference with the naïve procedure is that we impute values by archival source: we do not know how many years have passed between years from different archival sources. Not doing so and considering all the values as a single series would lead to biased estimates: suppose we have a missing value in the last month of a year, and the following month in the series for which we have data is a January but from the next archival source. If many years have passed, the simple imputation of the December data as an interpolation between the one of November and January of the next archival source would be biased.

Abbreviations

IG: Kaibel G. 1890, *Inscriptiones Graecae. XIV. Inscriptiones Italiae at Siciliae*, Berlin: Reimer.

IGSI: Arangio-Ruiz V. and Olivieri A. 1925, *Inscriptiones Graecae Siciliae et infimae Italiae ad ius pertinentes*, Milano: Hoepli.

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