

BRIGITTA IZING-GOMBOS

University of Szeged

Hispania and its Economy with Special Regard to the Kalendarium Vegetianum

The Iberian Peninsula was considered an extremely important territory for the Roman Empire in every aspect; it was a significant strategic area in terms of both natural resources and defence. By the 2nd century BC, the provinces of Hispania Citerior and Hispania Ulterior were organised in a part of the Iberian Peninsula, where they were stationed primarily for military purposes. Subsequently, the economic potential of the area was exploited. During the Augustan period, the administrative system was transformed by several reforms. The new system took into account the experiences of the past two centuries, and when establishing new territorial units, an important aspect was how to transform from a military, economic, and/or social system into a new administrative one. This paper seeks to answer the question of how the establishment of the renewed administration was related to the previous political situation, and I will examine the impact of all this on the economic exploitation of the area. In the latter case, I pay special attention to the impact of Hispania's two main economic sectors, mining and trade, on the monetary economy of the region and the empire. When analysing the empire's revenues, it is inevitable to examine the types of taxes and their amounts, as well as the analysis of local and long-distance economic relations, such as the examination of trading associations and monetary institutions.

Keywords: Hispania, Roman administration, mining, trade, taxation

To understand the economy of the Roman Empire and Hispania's economic systems, it is also worth examining its political systems. Until 27 BC, the Roman Republic was based on political elements such as the magistracy system and various leadership positions. This includ-

ed consul, praetor, quaestor etc. Although positions could be obtained through elections, due to the free structure of the political system, it is encoded in the system that certain social groups and people acquire excessive power over others through manipulation.¹ This was no different from the empire's approach. As political power was fundamentally determined by wealth and family background, individuals who were not exceptionally skilled in politics seized power. With the rise of Augustus, the political system changed, leading to greater economic stability.² Although the empire as a new institution did not mean that people with the right skills exercised power, it could minimise political rivalry and reduce social tension. This initially resulted in fewer rebellions and periods of civil war, which allowed a stable economic mechanism to be developed in the first two centuries.³

The economy of the Roman Empire was not directed from above; trade was determined by free competition, which encouraged individual provinces to exploit their natural resources and develop product-specific export policies.⁴ However, this free competition sometimes became too one-sided, leading to imperial interventions.⁵ A good example is the decree of Emperor Domitian, who suppressed the general dissatisfaction of Italian wine producers due to excessive Gallic wine imports by prescribing the size of vineyard estates that could be established in the province of Gaul.⁶ More than 545 dated shipwrecks found on the Mediterranean coasts of present-day Italy, France, and Spain

¹ MADDISON (2005: 11–13).

² MADDISON (2005: 13–15).

³ Strab. *Geo.* 17, 3 „Augustus autem, qui urbem a bello devictam in pacem redegit, et prosperitatem omni modo auxit, ita ut pecunia ex universis provinciis ad imperium effluerit.”

⁴ There are several theories about the form of the Roman Empire's economy to his day, ranging from primitive economies to market economy schemes. See more: POLÁNYI (1976); FINLEY (1973); TEMIN (2012); ANDREAU (2015).

⁵ TEMIN (2012: 63–72).

⁶ OPDEBECK (2005: 44).

were used to model maritime trade. Shipwrecks greatly help determine the extent of trade, what import-export products were found in a given area, and the era to which they can be dated.⁷ When dating the wrecks, researchers determined that most ships sank between 200 BC and 200 AD, which could mean that maritime trade was the most intensive at this time.⁸

In 197 BC, Scipio created two provinces on the Iberian Peninsula: Hispania Ulterior in the south, with its centre in Corduba, and Hispania Citerior in the north, with its centre in Cartagena. In 183, Lusitania was conquered by the Romans.⁹ Hispania became an economically significant province in the Roman Empire. Initially, Rome was interested in the Punic Wars, but after the victorious wars, it remained in the area for strategic reasons. Over time, the area's economic potential was discovered, primarily in mining, and the economy expanded to other significant sectors. James Vicens summarized the Roman conquest of Hispania in three phases: the military bases established for the early military expansion, which remained permanently in the region after the Punic Wars and the Lusitanian and Celto-Iberian Wars; Phase 2, the era of colonization, which he defined from Caesar to the early imperial period.¹⁰ This was the period of the transformation of military bases into municipia, the establishment of a political and administrative system on the Italian model, and the integration of the territory into the empire, one of the most important events of which was recorded by Pliny. Pliny also wrote that the inhabitants of Hispania were provided with the *ius Latii* by Vespasian around 73.¹¹ Phase three, the third and final segment of the transformation of the whole peninsula into an actual and perma-

⁷ HOPKINS (1980: 105).

⁸ HOPKINS (1980: 106).

⁹ Liv. *Auc.* 28, 1.1–9

¹⁰ VICENS (2016: 58–64).

¹¹ Plin. *Nh* 3, 30; ILLÉS (2016: 9–11).

ment province, can be dated to the imperial period, and the process took place during the reign of Vespasian.¹²

Rome's interest was in the extraction of essential raw materials – especially metals – which created the conditions for the founding of the city of Italica, which had a population of approximately 3,000 in the second century BC. The city was suitable for military control of the northern Lusitanian population and also played an administrative role, thus supervising the mines of Aznalcóllar.¹³

During Romanisation, Baetica also became an important trading centre, from which imported goods such as oil, wine, and garum were transported to all parts of the empire.¹⁴ The lively trade between Rome and Hispania could be proven by an inscription found in Baetica by a fishmonger, which reads:

Neptuno Aug(usto) / sacrum / L(ucius) Iunius
 Puteolanus / VIvir Augustalis / in municipio Suelitano / d(edit)
 d(edicavit) primus
 et perpetuus / omnibus honoribus quos / libertini gerere potuerunt
 / honoratus
 epulo dato d(e) s(ua) p(ecunia) d(onum) d(edit)¹⁵

Experts assume that Iunius Puteolanus was a freed slave who migrated from Puteoli to Baetica, taking advantage of his right to free movement. This assumption cannot be proven, but it is undoubtedly true that amphorae marked with his name were found in a praetorian camp in Rome, where garum associated with Hispania was kept. Therefore, it is

¹² MADDISON (2007: 21–22).

¹³ ANDREOTTI (2018: 165).

¹⁴ PEACOCK (1974: 232).

¹⁵ CIL II 1944.

no coincidence that a text addressing Neptune has survived.¹⁶ Puteolanus is also linked to the city by his trade relationship with Umbricius Scaurus, who had a business in Puteoli.¹⁷ The sources also mention two Umbricius Scaurus, a father and son.¹⁸ Since few sources are available, it is difficult to determine with whom Scaurus Puteolanus may have done business. This relationship is important because the Scaurus family had one of the most significant garum trades in Puteoli.¹⁹ The younger Scaurus had not only economic but also political power, as he held the position of duovir in the city, which was the most important position of the city leaders.²⁰ It is an interesting coincidence that a freed slave who emigrated from the city of a successful family involved in the garum trade migrated to one of the largest fish sauce-producing regions of the empire and settled there. The sources connect him to this family. Unfortunately, this cannot be proven due to a lack of sources. However, it is an interesting assumption that Puteolanus and Scaurus knew each other before their move to Hispania.

Thanks to mining, a significant amount of precious metal flowed into Italy, which laid the foundation for the stability of the empire's monetary situation.²¹ The Italian population played an important role in the mines, an excellent example of which is the Italian settlements like Sierra Morena at the end of the second century BC and the beginning of the first. The precious metal mines of Hispania greatly impacted the empire's economic situation, as evidenced by the fact that the precious

¹⁶ HALEY (1990: 73).

¹⁷ JONES (2006: 226).

¹⁸ Scaurus mentioned in a prestigious inscription of Pompeii: CIL 10.1024. A Vmbricio A F Men / Scavro / Ii Vir I D / Hvic Decvriones Locvm Monvm / Et Hs In Fvnere Et Statvam Eqvstr / In Foro Ponendam Censvervnt. / Scavrvs Pater Filio.

¹⁹ JONES (2006: 226–228).

²⁰ BEARD (2008: 188).

²¹ MADDISON (2007: 22).

metals extracted greatly influenced the economic presence of money.²² We cannot know for sure how the mines were legally connected to the public administration system, and researchers have developed two theories for this; according to one, the publicans were given the right to mine as subcontractors, while according to the other theory, the mining rights may have been given to local companies. However, it is certain that the forced conscription imposed in the wake of the Marcomannic Wars of the second century caused the mines in Hispania and Dacia to close due to a labour shortage, resulting in a severe economic recession throughout the empire.²³ The labour shortage, as in the mines of Dacia, was solved in Hispania by using slaves.²⁴

The extent of revenues from mines can only be guessed at in the absence of sources, making it difficult to determine the exact types of revenue. If we examine the economic life of the Roman provinces at the micro-level, economic actors such as businessmen, merchants, *argentarii*, or bankers are present. My main goal was to uncover evidence of their existence in Hispania. However, first, let me present the monetary situation of Hispania during the period under discussion with the help of the available sources. Since 171 AD, it has paid a crop tax, which amounted to 5% of the grain harvest, in addition to other contributions.²⁵ The price of grain in Hispania – as in the other provinces – fluctuated, and the praetor was interested in this because the higher the price of grain, the more money came into the treasury through taxation. I have found relatively little about banking and business activities; apart from the *Kalendarium Vegetianum*, there is no other evidence apart from two epigraphic sources. However, this region was one of the wealthiest areas in the empire. It is difficult to imagine that there were no participants in

²² ANDREOTTI (2018: 167).

²³ DUNCAN-JONES (2018: 41–72, 52).

²⁴ PARKIN, POMEROY (2007: 281–282).

²⁵ HOYO (2007: 127–130).

the banking and business sectors. Two Tarraco inscriptions indicate that an argentarius/trapezita worked in the first century AD, but the subject and form of the activity are unknown. Sources that refer to money changers have been found in Saguntum, too.²⁶ According to Suetonius, Galba, the governor of Tarraconensis, cut off the hand of a dishonest nummularius and nailed it to the counter.²⁷

We know that there was a wealthy Hispanian social class, but we know little about it.²⁸ The surviving obelisks, diadems, and jewellery undoubtedly testify to wealth, but no specific person can be linked to these artefacts. However, there are occasional records of objects, real estate, and other monetary donations given to the municipality. Some studies provide an interesting picture of the economic situation of Baetica within Hispania. In Hispania, there was a significant increase in per capita income between AD 25 and 170.²⁹ This economic growth can be directly linked to flourishing trade. By the end of this period, the living standards of the middle class, which constituted a significant minority of the population, increased significantly.³⁰

Hispania was initially a grain-producing region, but over time, this escalated, and olive trees and vineyards were kept in several places.

²⁶ CIL II 4034.

²⁷ Suet. *Gal.* 9,1 “Per octo annos uarie et inaequaliter prouinciam rexit, primo acer et uehemens et in coercendis quidem delictis uel immodicus. nam et nummulario non ex fide uersanti pecunias manus amputauit mensaeque eius adfixit. (...)”

²⁸ Tac. *Ann.* 6,19 Post quos Sex. Marius Hispaniarum ditissimus defertur incestasse filiam et saxo Tarpeio deicitur. ac ne dubium haberetur magnitudinem pecuniae malo vertisse, aerarias aurariasque eius, quamquam publicarentur, sibimet Tiberius seposuit. inritatusque suppliciiis cunctos qui carcere attinebantur accusati societatis cum Seiano necari iubet. iacuit immensa strages, omnis sexus, omnis aetas, inlustres ignobiles, dispersi aut aggerati. neque propinquus aut amicis adsistere, inlacrimare, ne visere quidem diutius dabatur (...).

²⁹ CHURCHIN (1983: 227–230).

³⁰ CHURCHIN (1983: 230–232).

Over time, it has become one of the most important olive oil and wine exporters.³¹

In the case of transport and trade, as in other places, it can be observed that the state did not provide the people, ships, etc. necessary for transport and commercial activities, but subcontractors were entrusted with conducting trade between the provinces and Rome.³² This is not an exceptional example; a similar commercial relationship can be observed in the Sulpician Archive at Puteoli. On the tablets marked TPSULP 65, 94, and 95, the parties recorded the transport of grain to Alexandria and its storage in a contract; the principal was Eunus, a slave of the Emperor Claudius.³³ Various sub-companies and companies also traded between Hispania and Rome, all in exchange for predetermined amounts. This results in a relatively large income for the entrepreneur, not to mention the opportunity to build local influence and network capital. Along with the benefits, there was also a significant risk, as evidenced by the more than 500 shipwrecks excavated so far.³⁴

The Kalendarium Vegetianum

In the case of private enterprises, it is worth paying special attention to the Kalendarium Vegetianum, which significantly changed the economic situation up to that time. To understand the principle of operation of the Kalendarium Vegetianum and its underlying causes, it is worth discussing the establishment of the institution and its mechanism. Kalendaria are institutions that deal with financial matters closely related to wealth derived from agriculture. On the one hand, it is an institution issuing credits and loans, which presumably collected interest at the be-

³¹ KEAY (1988: 70–72).

³² TERPSTRA (2011: 200–202).

³³ JONES (2006); GOMBOS (2019: 52).

³⁴ SILVER (2007: 197–198).

ginning of each month on a specific day. In this case, we can assume that it did not comply with the 12% maximum interest decree. Although individual institutions also had charitable expenditures, they primarily served to invest capital and increase wealth.³⁵ In the case of the *Kalendarium*, the capital was the income from olive oil production.³⁶ Similar calendars are known from many areas and periods of the empire.³⁷ In the latter's case, a specification can also be observed: the person leading the institution, his position of power, and thus the prerequisites for his job were also given. In addition to state institutions, we can discover private investors behind calendars. The *Kalendarium Vegetianum* was a financial institution which registered credits and agricultural properties belonging to Senator Valerius Vegetius of Baetica and his family, which he presumably acquired by inheritance.³⁸ His wealth in Hispania consisted of estates and other real estate. The *Kalendarium* also dealt with the rental of real estate of absent members of the Senate, and the capital of the institution was derived from the economic activities of Valerius Vegetius. These activities were probably agreements made through loan contracts, and the recipients of the loans could be either tenants or clients of the family. The business must have been closely linked to land ownership relations, parallel to the *annona*, especially in Baetica, one of Hispania's most important oil-growing regions.³⁹ Nothing proves this better than the amphorae containing oil found in Córdoba, on which the inscription L(uci) M(ummi) VE(egeti) is found, referring to the sen-

³⁵ FRAGMENTA Vaticana. De excusetione, 187.

³⁶ SAEZ, LOMAS (1981: 57).

³⁷ CJ.4.31.3: Imperator Alexander Severus „In ea, quae rei publicae te debere fateris, compensari ea, quae ab eadem tibi debentur, is cuius de ea re notio est iubebit, si neque ex kalendario neque ex vectigalibus neque ex frumenti vel olei publici pecunia neque tributorum neque alimentorum neque eius, quae statutis sumptibus servit, neque fideicommissi civitatis debitor sis.”

³⁸ PONS (2011: 9).

³⁹ PONS (2011: 2).

ator. On the other hand, the amphorae bear the inscription C(uratores) OL(erarii), which was used to mark products intended for the annona.⁴⁰ This clearly shows that the Kalendarium Vegetianum was a private investment project. However, it was an institution that benefited both producers and the state. On the one hand, the Kalendarium's representative often supervised annona's administrative work in addition to the interest collections at the beginning of the month – that is, whether the pre-determined quantity was actually harvested. However, in the case of a deficit, the interest received by the Kalendarium was used to finance the tax deficit, possible transport costs, etc.⁴¹ The Kalendarium was transferred from the senator's private property, as was the case with other Kalendariuma, to the imperial private part separated from the fiscus by Augustus, the Patrimonium Caesaris, in 160 AD.⁴² Based on the currently available sources, no record or evidence speaks of the confiscation or expropriation of Baetica for the benefit of the emperor from this period, so in the case of the Kalendarium, a bequest is most likely.⁴³ After all the senator's property was transferred to the fiscus, the management of the Kalendarium Vegetianum came under the jurisdiction of the procurator, so it was his responsibility to settle the interest on the loans granted by the empire to the tenants, collect the rents, and control the services expected from them. It can be assumed that a rental system was in place for the properties belonging to the fiscus, grouped under the name Kalendarium Vegetianum, during the period from Marcus Aurelius to the reign of Septimius Severus.⁴⁴ An interesting phenomenon can be observed regarding the fate of the Kalendarium during the reign of Marcus Aurelius, but especially during the reign of Septimius Severus.

⁴⁰ PONS (2011: 12).

⁴¹ MILLET (2009: 141–145).

⁴² MILLET (2009: 143); CIL 11.3003.

⁴³ SOLER (2020: 145).

⁴⁴ HALEY (2003: 129).

As a member of the Punic Septimii family, which was rich in local connections, Septimius Severus was educated in Greco-Roman culture, law, and economic theory. At the beginning of his career, he was known as a rather average politician who never held a serious leadership position in the military. He first commanded Legio IV Scythica in Syria but did not govern any province where legionary troops were stationed until 191, when he was given Pannonia Superior.⁴⁵ After striving for power, he continued to rely on the army as an emperor, and his political actions were characterised by terror, confiscations, imprisonments, and executions. Owing to his political activities, the empire avoided an economic crisis. His system differed from previous ones, but this is not surprising because during his reign, the empire was again hit by civil war after 124 years. Accordingly, he shaped his methods of governance. He strengthened his relationship with the army, which resulted in alienation from the Senate, preservation of traditional Roman jurisdiction, protection of provincial interests, and reform of the military.⁴⁶ With all this, he accumulated enough strength and financial resources to build a “family business”. When Septimius Severus defeated Clodius Albinus in 197, he increased his own and his family’s wealth.⁴⁷ He did this, among other things, through the institution of the *Kalendarium Vegetianum*. One proof of this is the seals discovered on amphorae in Gaul and Hispania. According to some assumptions, the AAA (i.e. the three Augusti) must have been Septimius Severus and his sons.⁴⁸ In addition to the amphorae markings that may prove that Septimius Severus and his sons obtained valuable Hispanic lands through various auctions, we can observe a previously unseen form of their connection to commercial life, behind

⁴⁵ SMITH (1972: 484–485).

⁴⁶ SMITH (1972: 484–486).

⁴⁷ SOLER (2020: 143).

⁴⁸ To see the full tituli picti: https://www.researchgate.net/figure/Stamp-over-Dressel-20-amphora-that-belonged-to-Septimius-Severus-and-his-sons_fig3_273256834.

which lies a more complex administrative process.⁴⁹ Septimius Severus' predecessor, Marcus Aurelius, implemented a centralization reform that resulted in the quasi-formation of a financial department with the establishment of the *ratio privata* office. Septimius Severus took advantage of this by placing the profits obtained from economic activity, which had previously been reserved for private individuals, in this institution of the *Kalendarium Vegetianum*, i.e., the right to transport or deliver goods on behalf of the state, and passing all this on to his sons. This was favourable for the empire, as an honest and direct commercial relationship was established between the two areas without the need for an intermediate institution. At the same time, this paralysed economic activity by preventing merchants from benefiting from the social and economic privileges granted to those working for the state. Presumably, the emperor and his immediate family enjoyed all these social and economic benefits.⁵⁰ Septimius and his sons also performed the functions of mercator, diffusers, and negotiators, who had previously worked to collect *annona*. It is interesting to question whether Septimius Severus and his sons, as private individuals, received what the state had previously paid for these positions, as this would explain how Septimius Severus made his sons wealthy.⁵¹ This activity allowed the development of actual trade by transporting goods for the state. The measure certainly reformed the previous institution, breaking the foundations of the Roman economic system regarding the relationship between individuals and the state's interests. The profit obtained by the emperor served the state's interests since it represented an effective saving, given that the wealth of the *ratio privata* was also used to maintain the state's coffers. Simultaneously, this significantly restricted the market, which was based on relatively free principles

⁴⁹ BLÁZQUEZ (1996: 83–87).

⁵⁰ RODRIGUEZ (1996: 211–213).

⁵¹ *Historia Augusta, Vita Severi* 12.

until then, as it prevented them from continuing to benefit from the social and economic privileges granted for the management of the *annona*. However, it is not known whether this was true for all empire products for which *annona* was paid. We do not know whether this measure was a direct consequence of the confiscations against Albinus' followers or whether it resulted from a premeditated government decision.⁵²

Summary

It is clear that, as in most provinces, the exploitative intent of the state can be detected in Hispania. The systematically built urban infrastructure, proper use of natural resources, outsourcing of the transportation of products, establishment of the necessary taxes, dues, or revenues, and the method of their collection are all the results of state interest and state strategy to use the income of Hispania. The wealth of the province in natural resources is well proven by extensive mining, the production of agricultural commodities, and their large-scale transportation to Rome, as evidenced by contemporary records, tax forms, legislation, and maritime archaeological research. We can find examples of microeconomic activities, such as the sources about the fish sauce trader L. Iunius Puteolanus, from which we can assume that people interested in other areas of the empire settled in the peninsula due to better living conditions and the lively commercial life, so that they could later get involved in production and trade themselves. A good example of private financial activities that can also be linked to microeconomics is *Kalendarium Vegetianum*. This was an economic institution that registered agricultural land and recorded the loans issued on it so that debtors could use it for agricultural investments or for commercial purposes. All this first belonged to the senator Valerius Vegetius, and later the institution was so successful that Marcus Aurelius

⁵² MARTÍNEZ (1996: 213).

and Septimius Severus also acquired it by transforming the bureaucracy. Overall, therefore, in the case of Hispania, the development of economic life can be observed at both the state and private levels, with the intent of maximising the exploitation of the opportunities offered by the Peninsula.

Bibliography

- ANDREOTTI 2018 A. ANDREOTTI: *Romanization, Identity and Socio-Cultural Interaction in the South of the Iberian Peninsula between the 4th and 1st centuries BCE*. Leiden 2018.
- BEARD 2008 M. BEARD: *The Fires of Vesuvius: Pompeii Lost and Found*. New York 2008.
- BLÁZQUEZ 1996 J. M. BLÁZQUEZ: *La Historia Augusta e Hispania. Algunos aspectos a la luz de la arqueología*. *Historiae Augustae Colloquium Barcinonense* 1 (1996) 81–95.
- CHURCHIN 1982 L. CHURCHIN: *Jobs in Roman Spain*. *Florilegium* 4 (1982) 32–62.
- CHURCHIN 1983 L. CHURCHIN: *Personal Wealth in Roman Spain*, *Zeitschrift für Alte Geschichte* 32.2 (1983) 227–244.
- DUNCAN-JONES 2018 R. DUNCAN-JONES: *The Antonine Plague revisited*. *Arctos* 52 (2018) 41–72.
- GOMBOS 2019 B. GOMBOS: *Alkatrész a gépezetben - A bankárok római gazdaságban betöltött szerepe az 1–2. században*. *Ókor* 2 (2019) 46–55.
- HALEY 1990 E. HALEY: *The Fish Sauce Trader L. Iunius Puteolanus*. *Zeitschrift für Papyrologie und Epigraphik*. 80 (1990) 72–78.
- HALEY 2003 E. HALEY: *Baetica Felix – people and prosperity in southern Spain from Caesar to Septimius Severus*. Texas 2003.
- HOPKINS 1980 J. HOPKINS: *Taxes and Trade in the Roman Empire*. *The Journal of Roman Studies*. 80 (1980) 101–125.
- HOYO 2007 T. HOYO: *Vectigal incertum. Economía de guerra y fiscalidad republicana en el occidente romano: su impacto histórico en el territorio*. Oxford 2007.
- JONES 2006 D. JONES: *The Bankers of Puteoli: Finance, Trade and Industry in the Roman World*. London 2006.
- KEAY 1988 S.J. KEAY: *Roman Spain*. London 1988.
- MADDISON 2007 A. MADDISON: *Contrours of the world economy*, Oxford 2007.
- MILLET 2009 P. MILLET: *Epigrafía anfórica de la Bética. Nuevas formas de análisis*. Barcelona 2009.

- OPDEBEECK 2005 J. OPDEBEECK: *Shipwrecks and Amphorae*, Phd Thesis. Southampton 2005.
- PONS 2011 M. PONS: *Granada, la ciudad de los Valerii Vegetii*. *Itálica: revista de arqueología clásica de Andalucía*. 1 (2011) 105–119.
- PARKIN–POMEROY 2007 T. PARKIN: A. Pomeroy: *Roman Social History: resources book*. New York 2007.
- PEACOCK 1974 D.P.S. PEACOCK: *Amphora and the Baetican fish industry*. *The Antiquaries Journal* 54 (1974) 232–243.
- RODRIGUEZ 1996 R. RODRIGUEZ: *Mummius Secundinus. El Kalendarium Vegetianum Y Las Confiscaciones De Severo En La Bética*. *Gerión Revista de Historia Antigua*. 14 (1996) 195–221.
- SAEZ–LOMAS 1981 P. SAEZ – F. J. LOMAS: *El Kalendarium Vegetianum, la Annona y el comercio del aceite*. *Mélanges de la Casa de Velázquez*. 17 (1981) 55–84.
- SILVER 2007 M. SILVER: *Roman economic growth and living standards: perceptions versus evidence*. *Ancient Society* 37 (2007) 191–252.
- SMITH 1972 R.E. SMITH: *The Army Reforms of Septimius Severus*. *Zeitschrift für Alte Geschichte* 3 (1972) 481–500.
- SOLER 2020 J.M. SOLER: *La provincia romana de la Bética en época de los Severos (193–235 d. C.)*, Phd Thesis. Sevilla 2020.
- TEMIN 2012 P. TEMIN: *The Roman Market Economy*. Princeton 2012.
- TERPSTRA 2011 T. TERPSTRA: *Trade in the Roman Empire: A Study of the Institutional Framework*, Phd Thesis. New York 2011.