Alan Bowman, Andrew Wilson (eds.), *Quantifying the Roman Economy. Methods and Problems*, Oxford: University Press, 2009. 356 pp. ISBN 978–0–19–967929–4

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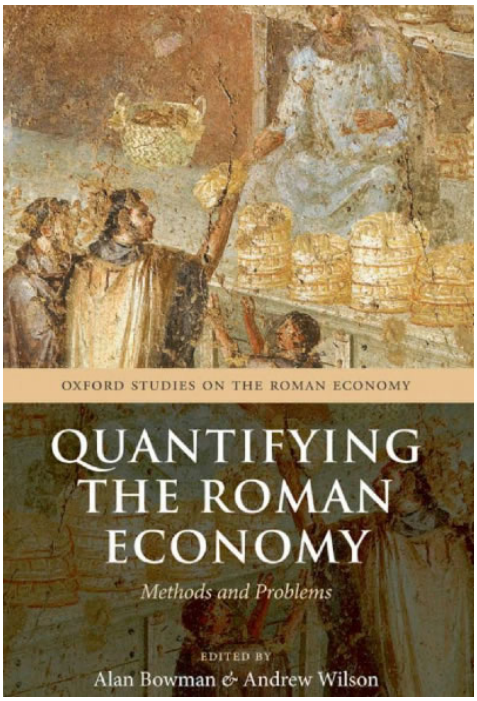

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This volume represents the debut of the monograph series '*Oxford Studies on the Roman Economy*'. Since 2009 this prestigious series have published the following volumes: A. Bowman, A. Wilson (eds.), *Settlement, Urbanization and Population* (2011); A. Bowman, A. Wilson (eds.), *The Roman Agricultural Economy: Organisation, Investment and Production* (2013); M. Flohr, *The World of the Fullo. Work, Economy and Society in Roman Italy* (2013); A. Marzano, *Harvesting the Sea. The Exploitation of Marine Resources in the Roman Mediterranean* (2013); B. Russell, *The Economics of the Roman Stone Trade* (2013); Ph. Kay, *Rome's Economic Revolution* (2014)[1]; K. Blouin, *Triangular Landscapes. Environment, Society, and the State in the Nile Delta under Roman Rule* (2014). Two more volumes are in preparation: A. Bowman, A. Wilson (eds.), *Trade, Commerce, and the State in the Roman World*; A. Bowman, A. Wilson (eds.), *Mining, Metal Supply and Coinage in the Roman Empire*[2].

There is no point on trying to use my own words to introduce this volume to the reader as it has been clearly done on the back cover of the reviewed volume. Therefore, the paragraph is reproduced at the beginning of this review: 'The volume contains a number of papers by leading Roman historians and archaeologists, discussing approaches to and methods of analysing the performance of the economy of the Mediterranean world under Roman imperial rule in the period c. 100 BC to AD 350. An introductory chapter defines the constituents and characteristics of economic integration, growth, and decline in the Roman economy, and the ways in which quantifiable and proxy data can be used to measure them. This followed by analyses of approaches to specific economic sectors: demography, urbanization and settlement patterns, the agrarian economy, patterns of trade and commerce, metal supply, and coinage. *Quantifying the Roman Economy* offers a comprehensive survey of the opportunities for advancing understanding of the economic and technological development of the Mediterranean world under Roman rule combining old and new evidence from archaeological and documentary sources.[3]'

The *Preface* (pp. V-VII) presents the main aim of the Oxford Roman Economy Project: a detailed analysis of the main aspects of Roman economy (population, urbanisation agriculture, trade, mining and coinage) within a large chronological segment (100 BC – AD 350). Apart from analysing the development of the Roman Imperial economy the project will focus also on the integration level throughout the Empire, the interactions with the regional economies and the behaviour of the 'free market'.

The *Contents* (pp. viii-x) indicate a six parts structure: urbanisation; field survey and demography; trade; coinage; prices, earnings, and standard

[1] The review of this volume will be published in the Journal of Ancient History and Archaeology 4.4, 2014.
[2] http://oxrep.classics.ox.ac.uk/oxford_studies_on_the_roman_economy/.
[3] A. Bowman, A. Wilson (eds.), Quantifying the Roman Economy. Methods and Problems, Oxford: University Press, 2009, back cover.

of living.

The very consistent introduction chapter by A. Bowman and A. Wilson – *Quantifying the Roman Economy: Integration, Growth, Decline?* (pp. 3-84) – can be considered the red thread of the entire project.

After the authors identify four fundamental elements with impact on Roman economy – a) demography and urbanisation; b) agriculture; c) trade; d) metal supply and coinage – they also draw the attention on the limits of various approaches at a large scale: the impossibility to cover all aspects and all the areas of the Empire.

Starting with the historiographical discourse the authors suggest the definition of key terms through the answers of which the research project mentioned above will offer; the methods they should be used (with their advantages and limits); the identification of patterns (pp. 7-15).

An important aspect to be analysed within the project will be the analysis of the 'integrated economy'. This aspect is going to be methodologically discussed through some key aspects (pp. 15-28): a) the economic policy; b) coinage and monetization; c) commercial institutions; d) movement and trade; e) markets; f) integration within industrial sectors.

The subchapter that present the directions of analysis on the economic growth of the Roman Empire (pp. 28-46) underlines the state of research on the available evidence (archaeology, ancient representations and literary sources).

According to A. Bowman and A. Wilson the economic growth of the Roman Empire has to be targeted from various points of views such as:

a) Extent and nature of the economic growth;

b) Trade and manufacture;

c) Intensification of investment in infrastructure and technology;

d) Division of labour;

e) Technology and development: archaeological and documentary sources – with relevant case studies;

f) Education of the workforce – if this modern matter can be found in the Roman world; g) institutional incentives and stimuli – these aspects may be the most difficult to be quantified due to the exclusive literary evidence;

h) Symptoms of growth (e.g. the raise of the urbanization level; the replace of imports with local products; the increase of consumption; the standard of living);

i) Contextualizing growth in the longue durée (e.g. the absence of the increase of the income/capita in the Roman period; the regular and homogenous increase of population in the Mediterranean basin and western countries by 1750; the idea that the increase of population and of the standard of living can be alternatives to the technological changes within the traditional agricultural societies – and all these aspects are going to be questioned).

One aspect that could not be omitted in this project is the decline of the Roman economy. The fields analysed on this matter are (pp. 46-53): trade and manufacture; b) stagnation of capital investment; c) institutional stimuli and attitudes; d) specialization of labour and education of the work force; e) urbanization, demography and settlement patterns.

Next in this subchapter are presented the areas of analysis and the reasons of selecting them (pp. 53-68): a) demography, settlement and urbanization; b) the agrarian economy; c) Production and trade; d) mining, metals and metal supply.

The 'Conclusion' (p. 69) reveals the authors' views and intentions within the launched project on Roman economy: the sine-qua-non specificity of such a project and the well-awareness that cannot cover all the aspects of the Roman economy; the hope for a clearer picture on how the Roman economy can be compared with previous and later historical periods and other cultures; the general and specific patterns of various provinces and regions of the Roman Empire during chronological segments.

It is expected that by offering new data to make possible the integration of Roman economy in the economic histories 'of the very long run'.

Elio Lo Cascio, *Urbanization as a Proxy of Demographic and Economic Growth* (pp. 87-106).

After presenting the importance of defining the terms 'urbanization', 'rate of urbanization', and the relationship agrarian-non-agrarian population, the author suggests a new model to calculate the rate of urbanization based on the Italian method to calculate the demographic development not based on the capital but on the workforce.

Using this method it is expected to be able to emphasize the effects of the demographic raise on the land productivity and workforce. Based on a complicated formula (p. 102) E. Lo Cascio suggests that, statistically, 100 agricultural workers could have produced food for themselves and 20 more individuals and based on this result the Italian peninsula was far more economic developed than most of the other Mediterranean regions.

In his '*Response to Elio Lo Cascio*' (pp. 107-112), Roger Bagnall contradicts the method and theory of Lo Cascio demonstrating that uncertainty statute of population number in the lack of clear evidence may lead to erroneous results (e.g. the case of Egypt). At the same time, R. Bagnall points out that one important element which has a strong impact on the level of urbanisation – the 'scale of change' of population number – on long run is almost missing in Lo Cascio analysis.

Willem Jongman, *Archaeology, Demography, and Roman Economic Growth* (pp. 115-126).

The author starts from the idea that the welfare resided in the safety of subsistence was the primordial goal of mankind while the standard of living knew flourishing as well as declining periods. In his opinion, W. Jongman considers that the demographic structure is a traditional and relevant indicator for the economic performance. On this line he demonstrates the pitfalls of producing statistics based on grave analyses which are commemorative items and propose the demographic statistics. His argument is that in a pre-industrial society such as Rome the prosperity was not supported by a long life expectancy.

The approach is targeting a parallelism between the Roman society and the modern ones in order to emphasize how far we can go with analogies.

On conclusion he draw the attention that we cannot talk about absolute number concerning the population in the Roman Empire but we must resume for the interpretation of standard of living to the samples of population number at certain time and places.

Elizabeth Fentress, *Peopling the Countryside: Roman Demography in the Albegna Valley and Jerba* (pp. 127-161).

Speaking about samples of population data that can offer some hints on quantifying Roman economy this work comes with to relevant case-studies. On the basis of field survey the author proposes the calculation of population in the Albegna Valley (nowadays, in Tuscany, Italy) and Jerba Island (off southeastern Tunisian coast) in the Augustan period.

The author estimate the population number in the two case-studies based on the archaeological evidence (sites, buildings, materials) and comparing with other similar cases. Her theory is supported by a rich illustration of maps, plans and statistics. The comparative method allows the scholar to identify general and specific patterns that were caused by a series of factors (e.g. the location on the field – harbour; epidemics) in different periods.

One important conclusion of this work is the model villas versus villages: the number of villas increased and declined at the same time with the urbanisation process while the villages are always active.

Using the work of L. Fentress and other cases of field survey, David Mattingly wrote a theoretical study – *Peopling Ancient Landscapes: Potential and Problems* (pp. 163-174) – of which the leitmotif is: how far can we go with the interpretation on a large scale for something that can be locally identified on the field? On this line the scholar proposes three categories of archaeological facts: i) known knowns; ii) known unknowns; iii) unknown unknowns.

Although at the very first sight it may sounds like 'The Life of Brian', with the People's Front of Judea, the Judean People's Front, the Judean Popular People's Front, the Campaign for a Free Galilee and the Popular Front of Judea, each of these categories is clearly established according to the level of knowledge on various sites and artefacts.

The work is then focused on the problems raised by the random surveys that can influenced the relevance of results. The author identifies six of such issues: 1) numbers and how they are generated; 2) random sampling; 3) the recoverability of rare upper-echelon sites in random samples; 4) the possibility of missing farms; 5) site interpretation in the ploughzone; 6) evidence of absence and absence of evidence.

The conclusion of this article, which can also be considered as the motto for many archaeological enterprises and field surveys is clearly summarised by the author few pages in advance: 'Random sampling in itself is not the complete answer and there are other decisions relating to the design of the sample and the field methodology that can materially affect the reliability of the results.' (p. 167).

Alan Bowman, *Quantifying Egyptian Agriculture* (pp. 177-204)

Based on a strong papyrological evidence and joined by the archaeological sources the author proposes four 'headings' that may help to quantify the agrarian activities in Roman Egypt: a) quantity and distribution of land; b) crop production and consumption; c) animal power and transport; d) wages, costs, and prices.

The detailed analysis of these aspects allow the scholar to presents both, the advantages and limits, of a cognition in detail of a particular situation at a province level. However, A. Bowman points out the fundamental danger considering one model as applicable to the entire Roman Empire or any other province.

In his '*Response to Alan Bowman*' (pp. 205-209), Roger Bagnall considers that also the use of other sources may offer the possibility to create a new model of agrarian Roman Egypt opened to new contribution instead of a model that must remained only to the level of questions without answers. Among those sources R. Bagnall mentions the 19th century maps of Egypt before the construction of the Aswan dams and barrages elsewhere; the new information from papyri, and raises more questions on details about the agricultural life in Roman Egypt.

Andrew Wilson, *Approaches to Quantifying Roman Trade* (pp. 213-249)

In author's opinion the attempt to quantify the trade in the Roman Empire is fundamental to understand the urbanisation process, the scale of economic development, and the opportunities of investment.

A. Wilson discusses the key elements for this purpose: the role of long-distance trade in supplying the urban centres of the Roman Empire by developing the markets and enabling specialization and division of labour.

The work provide extremely useful examples when the combination of various aspects revealed by the archaeological evidence for a possible quantifying of trade: the marble – material sources for the Roman luxurious infrastructure: architecture, sculpture, sarcophagi; the shipwrecks – their number by centuries together with the kind and the size of cargo can be considered as an indicator for merchandise; the pottery – as a merchandise an indicator for volume and contents.

These aspects will provide very important results when combined with proper statistics and comparative methods.

However, in the conclusion of this work the author emphasizes the fact that despite this large archaeological evidence and statistic approaches the notion of 'trade' must be regarded as sub-specie levels: what merchandises were traded; between which regions the trade took place and in which periods. The attempts to make large comparison in time and space indicate that there are whole to understand the entire phenomenon.

The huge amount of data collected, interpreted and presented by A. Wilson have allowed the raised of new discussion.

Michael Fulford, *Approaches to Quantifying Roman Trade: Response* (pp. 250-258).

After summarizing A. Wilson's ideas in the above mentioned important work the author suggests the 'quantifying of Roman trade' taking into account also the consumer point of view. The source for such an approach is the archaeological evidence provided by the sites. In this case the sites are regarded as the place that have requested

the merchandises. M. Fulford also points out the possibility that the maritime and long-distance trade can have different meaning. For instance, the author comes with the fact that the wine amphorae of the type Dressel 1 are mainly distributed in the inland Gaul and Iberian Peninsula, while other wines are distributed along the coasts. Practically such an analysis may reveal the importance of settlement hierarchy with further implications such as 'reciprocity, redistribution, and marketing'.

Another comment to A. Wilson's presented work comes from William Harris, *A Comment on Andrew Wilson: 'Approaches to Quantifying Roman Trade'* (pp. 259-265).

In the first part are mentioned the merits of A. Wilson's work on the analysis of the shipwrecks and suggest to consider for further analysis the maritime safety. The reason to take into account also this element is the development of maritime safety which could have influenced the shipwrecks' number and quotes a series of publications on this topic.

After emphasizing the importance of Wilson's aims, W. Harris mentions adjacent aspects that may help for more achievements: 'the full range of important traded commodities'; the patterns of urban sites that relied on imports (e.g. Pompeii, Herculanum).

Regarding the investments the scholar raise the question whether the Romans had a regular mentality in this field and if so, whether they carried on their investments in our modern terms.

The economic growth is discussed through the limits of literary and material sources, and the demographic element. In all cases the evidence have just a relative or scarce statute and he suggests the use of models (e.g. Greene-Hitchner and Malthusian models on the diffusion of productive technology). According to W. Harris the material evidence is a precious indicator for economic growth if one will 'concentrate on the *causes* of economic growth in known historical societies.'

The last part of his comment re-open the discussion the re-definition of 'urban centre' following the fact that the archaeology demonstrated that the urban territory and, implicitly, the consumption model extended beyond the city walls.

The work by Matthew Ponting, *Roman Silver Coinage: Mint, Metallurgy, and Production* (pp. 259-265) opens the section of this volume dedicated to '*Coinage*'.

The first part of this study is dedicated to the development of analytic methods regarding the silver contents in coins as a source for studying the Roman monetary economy, certainly, presenting both advantages and limits of these methods.

An important aspect that M. Ponting emphasizes is the coin surface analyse which has suffered an artificial enrichment process with silver while the kern can have a very low silver contents. The use of techniques such as atomic absorption spectroscopy (AAS), inductively-coupled plasma atomic emission spectrometry (ICP-AES), and the lead isotope analysis allows not only the identification of the silver contents but also if the coins were issued in the same technique or the same workshop. A first historical conclusion applying these techniques was to establish that the silver coin debasement started before the reign of Nero. The presence of metals like gold and bismuth in the silver coins may allow the identification of metal provenance (e.g. Hispania). On the same line, the more the silver was debased and other metals (e.g. nickel) were added one can identify the mints that issued denarii (e.g. Septimius Severus denarii issued in Rome separated from those minted in the East). The same methods have allowed to identify the source (Hispania) for the denarii of Augustus. Tracing the metal elements signature and based on the similarities of the lead isotopes an unexpected results shows that denarii of Augustus, Tiberius and Nero contained lead from…Britain!

Bruce Hitchner, *Coinage and Metal Supply* (pp. 281-286)

The author add to the metallographic manipulation of coinage other aspects that the coinage can reveal on the economic approach: the regularization of the production volume of coinage; state loans, debt cancellations, tax remissions. All these elements have influenced the quantity of metal and coinage in the Roman Empire. The literary sources are well collected and fully supports this theory.

Christopher Howgego, *Some Numismatic Approaches to Quantifying the Roman Economy* (pp. 287-295)

Using an antagonism path the author magisterially presents the reasons why the metallographic analysis of the Roman coinage (the project lead by M. Ponting and K. Butcher) is the most important approach in order to quantify the Roman economy:

a) the Roman monetary was a complex one that involved both imperial coins and regional/local ones up to the 4th century;

b) the coin-die analysis is very relative in the absence of sources and exhaustive studies;

c) the quantification is based on large extrapolations of few samples that also produce high margin of error;

d) analysing the Fisher's equation (MV = PT) the author clearly define it as a 'truism';

e) on the same line, the limits of this equation comes from the fact that it was issued for the monetized economies of modern societies applicability and this lead to the mistake done by scholars to considers the GDP as the equivalent of PT – which includes also the non-monetized economy, and, not to omit that the monetization has fluctuated in time.

f) when analysing the 'money' (M) there is no distinction between credit-money versus coined-money;

g) the velocity of money (V) is practically an unknown variable

The author's opinion on Fisher's equation is that this formula is extremely unstable to be applied to the Roman period.

Therefore, Ch. Howgego comes with an excellent approach in which he demonstrates the necessity that two other aspects should be taken into account for the progress of quantifying Roman economy:

A) Analyse of patterns of circulation.

To what level did money circulate within the Empire and beyond the frontiers and how long did last this movement. This will raised questions whether the Mediterranean is a natural units for analysis and whether the temperate Europe

shares the same patterns or not. For certain the answer to such questions can unveil many aspects that have influenced the development of the Roman economy.

B) Metal analysis

The scholar brings to attention an aspect that we always knew about it but no many or none of us has thought on analysing it: what the Romans – as coin users – thought on the content and the weight of coinage. And, again, Ch. Howgego demonstrates, fully persuasively, how this aspect can be identified:

The silver fineness measured by superficially neutron activation;

The weight by weighing large quantities of coins in good state of preservation (e.g. hoards).

In his opinion the Ponting & Buthcher project offer four key topics for the economic history of the Roman Empire:

1) The coinage debasement is 'arguably as good indicator... of the fiscal inadequacy of the Roman Empire';

2) How strong were price changes influenced by monetary changes, and other reasons;

3) The unity or diversity of the Roman imperial economy may be noticed by mapping the parallelism between the monetary changes at the scale of the Roman Empire and the regions which choose their own way (e.g. the Nero's monetary reform concerned the whole Empire but was it coordinated with the reforms in Crete Cappadocia, etc.;

4) The level of influence of internal economy on the coinage and the external pressure upon monetary behaviour

Dominic Rathbone, *Earning and Costs: Living Standards and the Roman Economy (First to Third Centuries AD)* (pp. 300-326)

This work presents the importance of a large evidence for prices and salaries that may lead to:

1) to figure out the levels of prices and salaries in the Roman Empire in different periods;

2) to point out the regional variables and by chronological sequences for prices and salaries by individuals and institutions;

Once one can analyse these aspects it will be able to answer questions such as: a) to what level can we discuss about a market and an integrated labour force? b) what were the standards of living and the differences between them?; c) which were the significant changes upon the market integration and the standard of living?

At the same time, the author admits that the evidence available at the moment is far for being enough to answer all these questions.

On this line, D. Rathbone presents the limits that narrow the quality of evidence but also the hypotheses that can be developed starting from this evidence:

a) the metrology of ancient units – presents the variety of units and the impact upon the fluctuations of prices and salaries;

b) the wheat prices – it shows the data paucity and he gives some examples that may offer some hints on the fluctuation of wheat price;

c) military salaries – this element is important because of the evidence that have survived on one side and the spread of the army throughout the Empire. The author present the information on military payments and explained the limits of research on them;

d) state civilian employees – based on case studies the scholar considers that these employees received huge salaries and this was the reason why the Roman elite was seeking to get these positions;

e) private employees – the evidence shows that the specialists were better paid and the presence of investments in the employee's training. These aspects lead to the hypothesis of a larger free market for prices than the wheat price. Such hypothesis leads to another one on the existence of regional variables regarding the standard of living;

f) the Price Edict of Diocletian raises the question on how real were the maximal prices and how useful are they for historian. A comparative analysis with other sources revealed potential pitfalls for historian as the prices in the Edict reflects a situation from the eastern Roman coasts. At the same time, some salaries are related to prices but other products are very variable in prices (e.g. myrrh, ivory).

All the above mentioned aspects allowed the author to reach conclusions of high importance for the understanding of Roman economy mechanisms. The Price Edict does not reflect a historical reality. The Roman state and elite believed in a homogenous market and tried to maintain this illusion (e.g. 'keeping the official silver to gold weight ratio of the coinage at 12:1'). The existence of regional fluctuations of salaries (e.g. doubled salaries in the most developed areas). The documentation of a period of economic stability in Egypt (AD 80-160; AD 190-274) which D. Rathbone considers as possible to be a larger pattern based on the constant level of military payments. The rise of prices at the end of the 2nd and 3rd centuries reduced the purchasing power of silver and gold. Practically, in this case, the purpose of the Price Edict of Diocletian and his monetary reform sought to recover this purchasing power of gold. But all these measures had effects only on short term due to the increase of discrepancy between the 'gold-rich' elite and a 'cash-poor' peasantry.

Robert C. Allen, *How Prosperous were the Romans?: Evidence from Diocletian's Price Edict (AD 301)* (pp. 327-345)

This study focuses on an aspect that concerns us, all (sic!): prosperity, which can run from extreme poverty to fabulous wealth.

Following the trend of many other studies in this volume R.C. Allen presents his opinions and approaches, with advantages and limits of methods.

Regarding the calculation of the Gross Domestic Product (GDP) by the number of population the scholar considers this aspect problematic due to the quality of evidence for the Roman period. On the same line, to establish the living standard using the 'skeletal evidence' (the better nourished individuals during childhood and puberty are taller adults) is limited by the reliability on the archaeological evidence following the data sampling.

An interesting approach undertaken by the author is the comparative analyse of purchasing power of a labourer from the Roman Empire and his counterpart from other places and periods (e.g. Qin dynasty in China, the Moghuls and the Raj in India). This research can allow us to judge Roman economic performance within a broader context.

Such an approach is possible by using previous researches and the available analogies.

The main sources was the Price Edict of Diocletian where the wage/day for a year and the costs to support a family by the labourer were analysed.

To be able to compare with other societies and periods the scholar converted the wage in grams of silver/day. Following this method the results show that in the Roman Empire the wage was smaller than in early modern Europe and Asia. Then the analyses went further with more interesting observations: in all societies the welfare ratio indicates that the labourer could cover the daily meal costs but not all the common goods; unlike the Romans the modern societies are bigger consumers and the products are more expensive from the technological point of view. The costs for daily living in Rome were much smaller than other societies.

At the end of this work, it is presented the method known as the 'bare bones diet' (the costs for basic meal) which mathematically indicates that the Roman labourer could even had some profit to spend on 'luxuries'.

Walter Scheidel, *New Ways of Studying Incomes in the Roman Economy* (pp. 346-352)

Based on D. Rathbone's work and some of his previous studies W. Scheidel discusses three ways to extend the research on costs and wages from the Roman Empire beyond the data limits: a) to identify the determinants of real incomes; b) the use of data proxy for real incomes; c) the potential of cross-cultural comparison.

In the first case the authors emphasizes the strong influence of demography on the real wages. Owing to some papyri from Egypt W. Scheidel creates a matrix that 'mediated real income at the end of Republic and a reversal' in the Imperial times. Certainly, the authors also presents the limits of this method.

In regard to figure out the real incomes (b) the high slave prices are considered indicators for high wages and the other way round. Again, the limits of this approach are mentioned.

The cross-cultural comparison is used to prove the aspects revealed by this method. At the first sight, the high positioned officials in the Roman Empire were six times better paid than their counterparts in China of the Han dynasty during the 1st century AD. However, an overall analysis demonstrates that, in fact, both Roman and Han bureaucracies earn the same: a smaller but better paid officials in the Roman Empire versus more officials but less paid in China. No matter the case, a well-known and extremely actual conclusion in both cases the bureaucratic officials were extremely costly.

The volume ends with a useful index of keywords and geographic places (pp. 353-356).

At the end, it can be affirmed that, for certain, the present volume can be considered a turning point, the foundation for the future research and understanding of the complexity of economy not only of the Roman Empire but of any other society.