CHAPTER 23

THE EARLY ROMAN EMPIRE: THE STATE AND THE ECONOMY

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I INTRODUCTION

Many scholars envision a modest increase of the GDP of the Roman empire during the first two centuries of the Principate or, for certain regions, even since the second century BC, and some of the contributors to this volume share this view.[1] Some also believe that the increase in GDP in the regions outside Italy, particularly but not only in the western ones,[2] during the first two centuries of the Principate, was primarily the outcome of an increase in population, even if a quantitative estimate of any such increase is obviously beyond our reach for most parts of the empire. For those regions where slim literary and documentary evidence exists, such as Egypt, the size of the population remains a controversial issue.[3] However, the evidence of land surveys in several parts of the empire seems to point to the spread of cultivation and settlement to new areas and the extension of cultivation in previously inhabited areas, while the diffusion of new urban centers and the enlargement of existing ones also suggest demographic growth. The Antonine Plague must have caused a marked decrease in population and consequently a decrease in GDP.[4]

There is less consensus on whether this surmised growth of GDP in the whole of the empire between the Augustan and the Antonine periods was matched by growth in per capita income. Per capita growth can be postulated, by looking at comparative evidence, for the period after the Antonine Plague as an effect of the slackening of population pressure in some areas of the empire and the resulting gain in contractual power by the peasants.[5] We can assume an increase for Egypt: the century-long process of very modest inflation that has been recognized between the Augustan and the Antonine age[6] accelerated abruptly between the 160s and 180s AD, but after that prices probably grew less than the remuneration of

[1] It is perhaps worth noting that some economists and modern economic historians, such as North 1981, are among them; Goldsmith 1984; 1987 does not believe that there was any significant growth and speaks of a "stagnant economy." He does not believe in population growth either.

[2] See, e.g., Mitchell 1993: 241 ff., on Anatolia. [3] See Chapters 3 and 26.

[4] Lo Cascio 1991b; Duncan-Jones 1996; below, Chapter 26.

[5] Lo Cascio 1991b; 1994b. [6] Duncan-Jones 1994.

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labor.[7] However, in many regions including Italy, it is not certain that population increase did not outstrip the increase in GDP in the two centuries of the so-called "High" empire.

There is even less consensus on whether the postulated increase in per capita income actually brought better living conditions to the peasant majority of the population, or meant instead a further widening of the distance between rich and poor. It is a widely held view that the majority of the population went on living at subsistence level. Nobody will dispute that distribution of income was disproportionately unequal, even if not all will agree that "elites successfully manipulated their various situations to the detriment of others (especially non elites) in order to monopolise an inordinate share of existing benefits."[8] Goldsmith has attempted some estimates: the 600 senatorial families, representing the top 0.04 percent of the whole population (put at 55 million), would have received approximately 0.6 percent of total personal income. The top 3 percent of the income recipients would have received 20–25 percent of total personal income. The big difference between the yearly salary of the ordinary legionary soldier, 1,200 sesterces (after Domitian), and the yearly salary of the imperial procurator of the lowest degree, 60,000 sesterces, is revealing. But it is interesting to observe that social inequality, measured in terms of per capita income, does not seem to have been much higher than in other pre-industrial scenarios, such as England and Wales in 1688 or at the beginning of the nineteenth century, or Victorian England.[9] And it is hard to find direct evidence of worsening conditions for the general population in the first and second centuries AD.

A closely connected issue is the impact of the state on production: what proportion of the extracted surplus went to the state, to be distributed to non-producers (soldiers, bureaucrats, recipients of the dole at Rome), and what proportion went to the land-owning elite?

Modern controversies on these issues reflect the absence or unreliability of quantitative data. Quite divergent estimates of the population of the empire have been offered, and it is possible to derive from the sparse source material quite different evaluations of the average agricultural yield of different areas. Therefore, very different assessments of the agricultural surplus and of the proportion of the population not engaged in primary production have been advanced. No consensus will be reached on such estimates; hence the possibility of quantifying change, on a macro-economic level, is out of the question. It is a truism, however, that the impossibility of getting passably reliable estimates of a phenomenon such as an increase in per capita income does not mean that the phenomenon itself did not exist, or that it was not

[7] Drexhage 1991; Duncan-Jones 1994; below, Chapter 26. [8] Storey 2000.
[9] Goldsmith 1984; 1987; Bastomsky 1990; and see now Temin 2006.

important in comparison with the performance of other pre-industrial economies.

In order to get simple orders of magnitude, it is therefore necessary to rely on possible proxies for per capita income and the size of the agricultural surplus. By far the most significant proxy for the latter is the extent of urbanization,[10] which remained unparalleled till very recent times in many if not in most of the regions once included in the Roman empire. Another very significant proxy of the level of economic activity has emerged from the study of the Greenland ice cores and lake sediments in Sweden, Switzerland, and Spain, measuring the pollution of the troposphere from smelting operations for silver, lead, and copper extraction: these activities reached a level which was not paralleled again until the Industrial Revolution. In particular, lead pollution indicates a huge volume of silver mining, and therefore of silver coinage, and copper extraction has been taken to imply a scale of production of copper coinage again without parallel until the nineteenth century, indicating a very high monetization of the economy and the widespread use of small change.[11] Imperial coins provide independent evidence of the volume of the money supply in gold, silver, and copper. Duncan-Jones has attempted a very bold estimate of the money stock at the middle of the second century AD at approximately 20 billion sesterces, a volume of coinage without parallel in the periods before and after the first two centuries of the Principate.[12]

In this chapter we will explore whether this higher level of economic activity during the first two centuries of the Principate in comparison with the preceding and following periods, and the possible modest growth then, were, at least in part, the result of the existence of a single political entity embracing the Mediterranean, or were achieved despite it. We will ask whether the ways in which the Roman imperial state was able to secure its survival, drawing as tax a proportion of the surplus and spending it chiefly on providing law and order, and defense against external threats, were conducive to growth or a hindrance to it.

A very successful interpretation of the role of the state in the Roman economy has framed scholarly discussion in the last twenty years.[13] According to the "taxes and trade" model of the Roman imperial economy, devised by Hopkins, the creation of the Roman empire vigorously promoted long distance market exchanges of staples within the Mediterranean region: the areas subject to money taxes were obliged to sell their goods, through a "whole differentiated network of converters," to the tax-consuming

[10] Wrigley 1986.

[11] Hong, Candelone, Patterson and Boutron 1994; Hong, Candelone, Patterson and Boutron 1996; Hong, Candelone, Soutif and Boutron 1996; Rosman, Crisholm, Hong, Candelone and Boutron 1997; Wilson 2002; Hopkins 2000b; Kelly n.d.

[12] Duncan-Jones 1994. [13] Hopkins 1980; 1995/6; 2000a.

regions – the regions where most of the revenues of the state were spent, Rome and the frontier regions – in order to earn back enough coins to pay them as tribute in each fiscal cycle. Also, because a substantial number of large landowners lived in Rome and Italy and spent there the rents drawn from estates that were dispersed throughout the provinces, this extraction of rents must have promoted long distance trade through this same mechanism.

Because it singles out the logical relationship between taxes/rents and trade, the model cannot generally be disproved, provided that there actually were money taxes and money rents, provided that there were tax-consuming and tax-producing regions, and provided that recipients of money rents owned estates in different regions. It is more controversial whether higher demand enabled by the spending power concentrated in the tax-consuming regions would have been satisfied in part by local production and would therefore have enhanced market exchange at the local level. And it is even more controversial whether this mechanism could have promoted economic integration within the Roman empire strong enough to justify the conclusion that "ancient Rome had an economic system that was an enormous conglomeration of interdependent markets."[14]

The cumulative burden of taxes and rents on the producers must have been tolerable, in order for them to create a stimulus to long-distance trade and more generally to market exchanges and production. Moreover the logic of the model implies that rents and taxes "were rivals for a limited surplus."[15] If the cumulative power of the big landowners who formed the ruling elite was strong enough to undermine tax increases, the survival of the imperial state as a political entity would have been endangered.

Therefore, the model is predicated upon the assumption that the amount of taxes necessary for the state to finance its expenditure must have been small to allow the extraction of private rents. Taxes must have been low and that means, in turn, that the ratio of GDP to state budget must have been high.

II THE SHARE OF THE PUBLIC SECTOR

Several estimates of both GDP and the imperial budget have been proposed in recent years, and all of them agree in putting the ratio of the budget to GDP at a few percentage points, no more than 10 percent and perhaps much less. Goldsmith puts the share of the expenditures of central and local government at 5 percent and the share of the imperial government at no more than 3 percent. He also estimates actual GDP, arrived at by calculating both expenditure and income per head at 380 sesterces and

[14] Temin 2001. [15] Hopkins 1995/6.

multiplying this by 55 million inhabitants of the empire (that is, 20,900,000 sesterces). He then calculates the expenditure of the Roman state at 600–825 million sesterces, and, "as the government did not borrow nor generally accumulate surpluses," revenues at much the same level. Hopkins follows a different path by putting the minimum subsistence needs per person/year at 250 kg. wheat equivalent, adding one quarter of gross agricultural product to be saved as seed for the following year, and multiplying the result by 60 million inhabitants. An average farm-gate price for wheat of 450 sesterces per ton[16] yields a *minimum* GDP of 9 billion sesterces, and, assuming a tax rate of 10 percent of minimum gross product, total tax revenues of 900 million sesterces. He does not venture a guess for actual GDP but thinks that it was "perhaps between a third and a half higher" than estimated minimum GDP.[17]

A different and more detailed evaluation of the imperial budget has been offered by Duncan-Jones, who takes into account not only the sparse material provided by the literary sources, as Frank had done,[18] but also further information given by epigraphic evidence. He calculates annual expenditure on different items (army cost, civilian salary-cost, handouts, building, and other costs) as 832–983 million sesterces in c. AD 150 and 1,462–1,613 million sesterces in c. AD 215. He goes on to calculate, on a much less solid basis, aggregate revenues at closely similar levels.[19] Needless to say, these seemingly precise figures cannot conceal the often extremely conjectural nature of the estimates on which they are based. What we know about the *rationarium*, which would have been published regularly by Augustus and his successors, and the *breviarium totius imperii* left by Augustus at his death, shows that state authorities kept track of the various elements of income and expenditure.[20] The existence of a consistent budgetary policy or an actual "economic policy" is more doubtful.[21] In any case, it is interesting to observe that the three estimates of the imperial budget are not so far apart. What we can confidently say is that these estimates provide a plausible *minimum* estimate of the imperial budget and that tax must have been certainly less, and probably much less, than 10 percent. But how much less? May we really conclude that the tax burden was light for the general population of the empire?

[16] 3 sesterces *per* modius: this seems to be the most vulnerable part of the model, since we cannot tell whether this represents a genuinely average price, and are unable to construct an overall mean for all the regions of the empire.

[17] Hopkins 1980 put the cost of the Roman army at 445 (+ or –50) million sesterces. For a critical comparison between the two estimates of GDP given by Goldsmith and Hopkins and of their methods, see now Temin 2006, who advances an estimate which is close to that of Hopkins.

[18] Frank 1959. [19] Duncan-Jones 1994; see also Wolters 1999.

[20] Lo Cascio 2006b.

[21] See most recently Drexhage, Konen, Ruffing 2002a: 27–57, and 2002b: 5–21.

It is certainly possible to argue for higher GDP and budget estimates. Actual GDP must have been substantially larger, not so much because of higher per capita production as because of the possibility of larger population totals. We also need to consider a further argument. As already noted, Duncan-Jones has attempted a very bold estimate of the money stock in the middle of the second century AD at around 20 billion sesterces: this is a very high estimate, according to Hopkins, since "it works out at 330HS per head of the population – equal to three times the level of minimum subsistence."[22] This level of liquidity would be excessive, given the existence of a large weakly monetized rural economy. The way in which Duncan-Jones arrives at his estimate can be questioned.[23] But it is an independent estimate, and if correct might speak in favor of a much higher estimate of GDP. On the other hand, tax income may well have been higher, since state expenditure was probably higher than suggested by existing estimates that focus on military expenditure. Thus, it is an oversimplification to take *stipendia*, *donativa*, and discharge bonuses as the only items of military expenditure, as if expenditure to supply military units had been covered entirely by deductions from pay,[24] and as if there had not been any other items of expenditure such as building material, infrastructure, and so on. Estimate of the annual cost of army salaries and *praemia* consequently need to be increased by an unquantifiable sum. Moreover, Duncan-Jones' calculations of the cost of the civilian employees and of the emperor's household are too conservative,[25] as are his estimates of other outlays.[26] Another item is simply lacking: expenditure for the urban *annona*. Even if we can assume that taxes in kind and rent in kind from the imperial domains account for the grain distributions, and made it unnecessary for the state to purchase grain, the costs of transport (paid to the *navicularii*, the shippers) had to be borne by the state.

A low state share of GDP does not automatically mean that the burden of taxation was light. Large sectors were exempt from taxation. Italy was exempt from both, but many communities in the provinces likewise did not pay poll tax, and a substantial number of them were exempt from land tax as well. Since the population of Italy was large in comparison with the population of most provincial areas[27] and a considerable amount

[22] Hopkins 1995/6 = 2002: 227n.90. [23] Lo Cascio 1997b. [24] See below.

[25] For instance, there is no reason to put the pay of the praetorian governors at 500,000 sesterces: if raised to one million sesterces, the same level as for the consular governors, expenditure increases by 10 million sesterces.

[26] For what it is worth, Frank's (1959) estimate of non-military expenditure in the first century AD was 42 percent of the whole budget, whereas Duncan-Jones 1994 puts it at 23–29 percent in 150 AD, and at 26–29 percent in 215 (cf. Goldsmith 1984; 1987 for 29–46 percent).

[27] Frier 2000 and above, Chapter 3. I would put the share of the population of Italy at an even higher level.

of provincial cities were fully or partially immune, the proportion of the imperial population as a whole which paid taxes was significantly lower than the gross total, and their tax burden must have been correspondingly heavier.

Furthermore, we have to consider the weight of local or municipal taxation, which is not clearly discernible in our sources:[28] local direct taxes are poorly attested for the Principate. But we cannot deny the importance of *vectigalia*, including the revenues from land owned by the municipalities and indirect taxes, especially local *portoria*, which went to the cities and helped fund expenditure at the local level: new data come from recent epigraphical finds in various regions of the empire. The Flavian *lex municipalis* lists various items of income, namely the farming of *vectigalia* and *ultrotributa* (taxes for the payment of services, tolls, and so on), fines and money from unidentified sources, and various items of expenditure, namely the purchase and maintenance of *servi communes*, the *aes apparitorium*, outlays for *sacra*, social occasions, and public works and their maintenance.[29] The inscription *IvEphesos* 13[30] records a series of (presumably municipal) taxes levied in many towns of the province.[31] The *Monumentum Ephesenum* explicitly attests the right granted to a city of Asia, Alexandria Troas, to levy the *portorium* for its own use, while other texts attest the existence of local duties or tolls apart from the *quadragesima Asiae*. While it is impossible to quantify the aggregate income of all the cities of the empire, it would be a mistake to neglect the additional burden of local taxation. Local taxes were competing with state demands for the extraction of surplus.

If the proposition that the tax burden was fairly low can be accepted – and it is interesting to note that a similar state of affairs can be shown to have obtained in other pre-industrial societies[32] – it was not so low to make it hard to understand why increases in expenditure and a probable drop in GDP after the 160s AD resulted in severe financial difficulties. In the first two centuries of the Principate, however, taxation enhanced market exchanges and promoted growth. Other consequences of the political unification of the empire would likewise engender growth: the diffusion of new technological devices in agricultural production, mining, and so on,[33] as well as a substantial decrease in transaction costs.

[28] But see now *Il capitolo delle entrate* 1999. [29] Lamberti 1993.

[30] Originally published by Habicht 1975. [31] Merola 2001.

[32] Goldsmith 1984; see the general remarks of Cipolla 1988, and some of the other contributions in Guarducci 1988, especially Mathias and O'Brien 1988; and some of the chapters in Bonney 1995. Hopkins' objection to estimates of Roman GDP well in excess of 9 billion sesterces – that this would mean that taxes were too low – is duly countered by comparative evidence showing that not all pre-industrial states imposed tax rates that were as high as for instance in Mughal India (for which see Bang 2002).

[33] Gunderson 1976; Greene 2000; Wilson 2002; Lo Cascio 2006d.

III SETTING THE RULES OF THE GAME

The theoretical framework of the New Institutional Economics can serve as a powerful tool for understanding the ways in which the creation of a single political entity in the Mediterranean shaped the economy of the empire and encouraged growth. The New Institutional Economics emphasizes the importance of transaction costs as a key to understanding the performance of economic systems throughout history.[34] In the case of the Roman empire, the creation of more peaceful and safer conditions translated to a marked decrease in transaction costs. The suppression of piracy in the final decades of the Republic, the diffusion of a "technology of measurement" and of common metrological systems, and above all the creation of a unitary monetary zone and of common legal rules, especially in the field of commercial law, were all quite remarkable contributing factors in this reduction of transaction costs, in so far as they reduced uncertainty and improved access to information.[35] The imperial state could define and enforce the fundamental "rules of the game," in particular exclusive property rights, not only in the Italian core but also in the provinces. The spread of the Roman notion (and practice) of private property was fostered by the increase in the number of urban communities of Roman or Latin status. On the other hand, the concepts of the New Institutional Economics can offer a partial explanation of the reasons why this growth could not be sustained and was eventually reversed.[36]

Above all, it can help understand the relationship of collaboration and competition between the emperor and the senatorial elite which can legitimately be considered one of the structural elements of the working of the empire as a polity. The constitutional change which brought about the new monarchic state curbed the elite's ability to continue to exploit the empire on the same scale as before. Conditions for provincials improved despite continuing maladministration. On the other hand, the political convulsions of the third century AD may be considered an important contributing factor in worsening economic performance.

The emperor set the rules of the game at the level of the central and provincial administration, but his actions extended in various ways to the level of the individual urban communities. Provincial governors and city governments were charged with overseeing their enforcement. The scope of imperial interventions in framing economic relationships among private actors was considerable. For instance, the imperial authority intervened to rationalize the territorial distribution of periodic markets and their temporal

[34] North 1990; 1991; 1996.

[35] This is true even if local markets were imperfect and lacked coordination.

[36] The analytical framework devised by North 1979 can be considered an implicit answer to the objections advanced by Saller 2002: 266.

sequence.[37] More generally, particular care seems to have been taken in securing not only the regular supply of foodstuffs to the cities but the regular working of the market, the *forum rerum venalium*, in each city, and local price formation.[38] A series of fragments in the *Digest*, which refer to the role that the decurions (the members of the local senate) were supposed to play in ensuring the local food supply, contain the notion that a fair price is "fair" precisely because it was set by the market, and that only speculative behavior can alter it.[39] Various interpretations of these passages have recently been advanced,[40] but regardless of how they are interpreted, a conclusion seems to emerge: that imperial intervention was aimed at "regulating" the market, in order to avoid speculative behavior, and even an artificial lowering of prices.[41] Again, the "comparative advantage in violence,"[42] which gives the state the authority to set – and the concrete possibility to enforce – the rules of the game in market transactions between private economic actors, could add considerably to the efficiency of contracting.

The creation of a single monetary area may have contributed most to the reduction in transaction costs: a centrally produced coinage circulated almost everywhere, and locally issued coins (chiefly small bronze denominations) were linked to the mainstream coinage by a common system of fixed rates of exchange.[43] Moreover, it was a serious offense, indeed a crime, to refuse to accept current coins which carried the *vultus* of the emperor and were not counterfeit.[44] Again, the enforcement of the legal value of the coins can be viewed as instrumental in reducing transaction costs. High levels of coin output and circulation from Augustus to the third century seem to have been instrumental in facilitating safe and smooth exchanges of goods at local, regional, and interregional level.

IV MONEY AND MONETARY POLICY

No one will deny that the Roman imperial economy, as all other preindustrial economies, was "dual" in nature: a sphere of monetized market exchange that dominates the record coexisted with a self-sufficient sector whose size and workings are hard to determine: what Braudel defined as the area of "material life," of the use values, as opposed to the "economic life," the market domain, or, to use another concept, the domain of Chayanov's "peasant economy." But the share of the monetized sector was proportionally much larger than in the previous and following periods, since the

[37] De Ligt 1993a; and some contributions in Lo Cascio 2000c.

[38] See for instance the famous piece of legislation concerning the production and export of oil that Hadrian gave to Athens: *IG* II^2 1100, 1916.

[39] *Dig.* 48, 12, 3; 50, 1, 8; 50, 8, 7 [5].

[40] Examined in detail by Höbenreich 1997: 178–88; see also Erdkamp 2005: 288–90.

[41] Lo Cascio 2006c. [42] North 1979: 250.

[43] Crawford 1986; Lo Cascio 1996a; 2003c. [44] [Paul.] *Sent.* 5.25.1: Lo Cascio 1986; 1996a.

use of money was not limited to the urban centers but also encompassed rural *milieux*[45] and was therefore fairly ubiquitous: already at the beginning of the Principate, Strabo considered barter or the use of bits of silver for exchange transactions as characteristics of barbarian and backward areas such as Lusitania and Dalmatia.[46] Literary, epigraphic and papyrological evidence shows to what extent monetary transactions involved all the strata of the society. And the fragments of the Roman jurists strongly suggest that the use of coinage was a fact of daily life. Goldsmith has estimated the monetization ratio at a bit less than one half of GNP at the end of the Augustan period,[47] comparable to the degree of monetization in the least developed African countries today. Moreover, the first two centuries of the empire (and perhaps even more so the third century)[48] witnessed a substantial increase in the degree of monetization.

In terms of its sheer quantity, Roman imperial coinage was quite unprecedented in the Mediterranean world. The output of the central mint was far greater than the production of any previous issuing authority.[49] The beginning of a regular issue of gold coinage under Caesar marked a significant turning point, apart from solving a very serious credit crisis that had been caused at least in part by a shortage of coin:[50] in terms of value, gold was soon to become the most important component of the money stock.[51] The coining of the *regia gaza* of the Ptolemies by Augustus marked another turning point in the monetization of the empire: in the short run, this abrupt injection of liquidity into the economic system would have provoked an abrupt rise of the price level. Several Roman historians acknowledge the relationship between the money supply on the one hand and interest rates and commodity prices on the other.[52]

The denominational system introduced under Augustus included the gold coin, the *aureus* (or *denarius aureus*), of a little over 8 grams and of very high fineness. The *aureus* was worth 25 *denarii* of silver, each of which weighed a bit under 4 grams and was made of almost pure silver, and 100 *sestertii* of *aurichalcum*, an alloy similar to brass. The *sestertius* was normally used as the unit of account. Among the smaller denominations were the *dupondius* of *aurichalcum*, worth half a *sestertius*, and the copper *as*, worth a quarter of a *sestertius*. The value of the smallest monetary unit (the copper *quadrans*) of the monetary system was 1/4 of that of the *as* and thus 1/1600 of that of the top coin (the gold *aureus*). This wide range of denominations

[45] De Ligt 1990–1; Howgego 1992 against Crawford 1970.
[46] Strabo 3.3.7; 7.5.5; see Duncan-Jones 1990: 33 f.; Harris 1993b.
[47] Goldsmith 1984: 273 f. As Goldsmith himself notices, "a much lower figure for the degree of monetization is implied in Hopkins' estimate."
[48] Rathbone 1996b. [49] Duncan-Jones 1994: part 3.
[50] Lo Cascio 1981; Howgego 1992; *contra* Verboven 1997. [51] Duncan-Jones 1994.
[52] Suet. *Aug.* 41.1; Cass. Dio 51.21.5; Oros. 6.19.19.

made every kind of market transaction viable, from the purchase of a loaf of bread to that of an estate.

Roman money was a creation of the state and the "fiscal" character of Roman coinage has been particularly emphasized.[53] That state expenditure was the primary purpose of issuing coin should not be taken to mean that the Roman authorities had no interest at all in its role as a means of exchange, or that their monetary measures must never be thought to have been designed to enhance that function.[54] It has been argued that the great stability of the monetary system up to the third century is indicative of a "monetary policy," albeit rudimentary and empirical, that sought to ensure fixed relationships between gold, silver, and copper denominations, mainly through readjustments of their intrinsic or their face value, and also to supply the economic system with adequate means of exchange.[55] It is even possible to contend that state policy sought to dissociate face value from metal value in order to justify manipulations of the weight standard or of the fineness of the coins by the issuing authority.[56]

In any case, whatever the objectives of the state, the mere existence of a state coinage had an obvious stimulating effect on market transactions. The absence of negotiable instruments should not be interpreted as a significant constraint on the scope and flexibility of the market economy. On the contrary, it may signal that state issues satisfied demand. Moreover, some credit devices did exist: one might mention auction loans[57] or the financial arrangements adopted on third-century Egyptian estates.[58] It is therefore hard to accept the thesis that a "structural" shortage of money must have been a "structural" hindrance to economic development.[59]

Even if we cannot exclude the possibility that private individuals were allowed to have metal coined by the mint, and even if the mode of exploitation of the imperial mines seems to suggest that private contractors could have received their share in newly minted coins,[60] it remains true that most of the new coinage entered circulation via public expenditure. One can even contend that, since old coins paid by the taxpayers were normally reused and coin loss was limited,[61] it was the excess of public expenditure over the income of the state that allowed newly minted coinage to be injected into the economy. To some extent, the dynamics of public expenditure and the fact that it was discretely and differently localized in the various areas of the empire determined the different degree of monetization in different times

[53] Hendy 1991; Duncan-Jones 1994. [54] Lo Cascio 1981; 1996a; Howgego 1990; 1992.
[55] Lo Cascio 1981; Beyer 1995; see also Wolters 1999; von Reden 2002b.
[56] Lo Cascio 1986; 1996a; see now Strobel 2002b and 2004. [57] Andreau 1987.
[58] Rathbone 1991; see in general some of the contributions in Lo Cascio 2003d; and now Temin 2004 and Harris 2006. Credit devices were certainly required in order to avoid the actual transfer of coin over long distances: Harris 1993b; see also Howgego 1992: 27 ff.; and De Ligt 2002.
[59] Pekáry 1980. [60] See below. [61] But cf. Duncan-Jones 1994: chs. 13–14.

and places, as was noticed by the jurist Gaius.[62] Thus, the economy of the areas close to the *limes* was heavily influenced by payments to the army, even if the number of soldiers was not particularly large compared to the population as a whole. The dynamics of the supply of coinage seem directly related to the dynamics of public expenditure: even monetary manipulations that entailed *de facto* depreciation, in so far as they allowed a higher level of public expenditure, resulted in an increase in the supply of coinage which could have had positive effects on production.[63]

V TAX AND PUBLIC EXPENDITURE

In order to account for massive output of the Roman mint, it is not enough to invoke the necessity to compensate for coin loss: rather, we have to assume structural imbalance between tax and public expenditure. This excess of expenditure over tax income was facilitated by the exploitation of a growing number of provincial mines in the first two centuries of the Principate, especially in Spain and, after Trajan, in Dacia. The specific character of this exploitation, drawing on large and small contractors,[64] was closely connected to the overall impact of the new imperial regime at different levels: on the relationship between Italy and the provinces, on the financial apparatus of the state, and on its fiscal organization. One of the most remarkable and original features of the Roman empire as a political and economic organization depended, in a sense, on the way in which the Augustan revolution was achieved, and on the ambivalence of the figure of the *princeps*.

This constitutional change involved a radical change in the relationship between Italy and the provinces. During the late Republic, provincial tribute had been ideologically construed as the direct consequence of conquest: while poll tax was the mark of personal subjection to the conquerors, the imposition of a land tax was conceived as the practical side of the control over provincial land exerted by the Roman people, as certain passages in Cicero reveal.[65] The emergence of a new actor in the political and constitutional scene in 27 BC and the readjustments that followed during the very long reign of Augustus provoked a complete change in the ways in which the empire was managed. A new treasury, the *fiscus Caesaris*, was created alongside the *aerarium populi Romani*: closely controlled by the *princeps*, it was in a sense considered his property. The government and the administration of the provinces were split: some of them were entrusted to senatorial governors (proconsuls) in keeping with republican practices, while those

[62] *Dig.* 13.4.3; Lo Cascio 1991a: 356. [63] Lo Cascio 1981. [64] See below.
[65] Cic. 2 *Verr.* 2.7: the provinces are "*quasi quaedam praedia populi Romani*"; cf. 2 *Verr.* 2.5; 3.57; 102; *Leg. agr.* 3.15.

where the presence of the Roman army was required were directly run by the emperor. These provinces were thought to be *of* the emperor just as the former were thought to be *of* the *populus Romanus*.[66] To some extent, the relationship of the *princeps* with the provinces, which were financially dependent on him and his relationship with the *fiscus*, could be envisioned in analogy to the relationship between a private person and his patrimony.[67] Public expenditure itself, and in particular some of its elements, in so far as they were funded by the imperial *fiscus*, were ideologically construed as the emperor's demonstration of *liberalitas* or *indulgentia*. Nobody, of course, would have doubted that the *fiscus*, with its revenues, was in fact something very different from the patrimony of a private person, and that the revenues of the *fiscus* were used for purposes that we would now call "public." But the notion that these revenues were always *of* the *princeps* (as a private person) was not mere juridical fiction devoid of any practical meaning. While the emperor defined the rules of the game, as we have seen above, he was also, in a sense, a player. It is true that the sheer size of his *patrimonium* and the use of its proceeds for public purposes assimilated these proceeds to a form of tax, but the *patrimonium* itself was in many ways managed as a private asset, even if the imperial *fiscus* enjoyed specific *privilegia* in its relationships with private people.

A complete reorganization of taxation took place at the beginning of the Principate. Uniform, if not universal, criteria for counting subjects and assessing their wealth were extended first of all to the *provinciae Caesaris*, the provinces under the direct control of the emperor, and later to the *provinciae populi* as well. Uniform criteria of measuring and assessing the value of agricultural land were adopted. The replacement of tax-farmers and tax-farming companies by city functionaries and the substitution, in many areas, of tribute in cash for tribute in kind are clearly connected to the introduction of regular provincial censuses.[68] We possess important evidence for the execution of the provincial census in Egypt,[69] even if these documents seem to indicate that the procedures adopted there were in many ways peculiar, depending on the peculiar relationship between the central administration of the province and the urban centers. The general features of the new system of assessing and taxing agricultural land are described in a famous fragment of a jurist of the Severan age, Ulpian, illustrating the so-called *forma censualis*.[70]

This new system must have been beneficial to the provincials for several reasons. Land tax was now related to the monetary value of estates and thus to their revenue, and therefore, though it was not progressive, it was not

[66] The testimony of the contemporary Strabo 17.3.24–5 is particularly revealing; cf. also Suet. *Aug.* 47; Cass. Dio 53.12.2; 4.

[67] Gai. *Inst.* 2.21; cf. 2.7.

[68] Lo Cascio 2000a: 177–219. See in general Neesen 1980.

[69] Bagnall and Frier 1994.

[70] *Dig.* 50.15.4.

arbitrarily fixed: at least in some provinces, it seems to have amounted to no more than 1 percent of the capital value of the land, as declared at the census (that is, certainly no more, and perhaps much less, than 10 percent of annual revenue). Moreover, since the value of the estates was expressed in monetary terms and the land tax had often come to be collected in coin, the land tax itself spurred monetization. Finally, the decline of tax-farmers and tax-farming companies must have lowered the burden of the land tax. However, these changes took a long time to unfold and were not universal. Some regional features survived, and in some parts of the empire, land tax itself continued to be collected in kind.[71] At first, tax-farmers and tax-farming continued to collect indirect taxes, and the new taxes for Roman citizens introduced by Augustus were farmed out as well.[72]

The peculiar position of the emperor also affected the way in which public expenditure was handled by the central administration and perceived by citizens and subjects. The most important recipient of public expenditure, of perhaps up to three quarters of the grand total, was always the army. Civilian salaries and "court" expenditure were another substantial charge. Other expenses were ideologically construed as emanating from the *liberalitas* of the *princeps*. Distributions of coin (*congiaria*) and of corn (*frumentationes*) to the metropolitan *plebs*, handouts to the troops (*donativa*), and more generally personal gifts of the emperor were the clearest expression of this ideology. But the involvement of the imperial financial administration in the provision of infrastructure such as roads, aqueducts, bridges, and harbors fell in the same category of *indulgentia*. In this case, imperial expenditure complemented expenditure by the municipalities and by private benefactors and was chiefly directed at big projects which could not otherwise have been funded: the construction of the two big harbors at the mouth of the Tiber or the draining of the Fucine Lake are among the most prominent examples. Maintenance was provided in part by individual taxpayers (the landowners of the areas in question), but also to a large extent by the imperial treasury.

Expenditure on public buildings in the capital was of paramount importance, and features among the *impensae* (expenses) of the first emperor recorded in the *Res gestae divi Augusti*.[73] Imperial buildings were lavish in scale and luxurious in style, and costs were tremendous.[74] Public works were important because they provided employment for the free population. Suetonius narrates a very instructive anecdote about the emperor

[71] For instance, as late as the beginning of the second century, in recently annexed regions such as Arabia (Lewis 1985–8: 132ff.; 1989: n.16; Cotton 2003).

[72] Lo Cascio 2003a.

[73] These outlays continued to be massive up to the Severan age, and rose again from Aurelian onwards: see Daguet-Gagey 1997.

[74] DeLaine 1997.

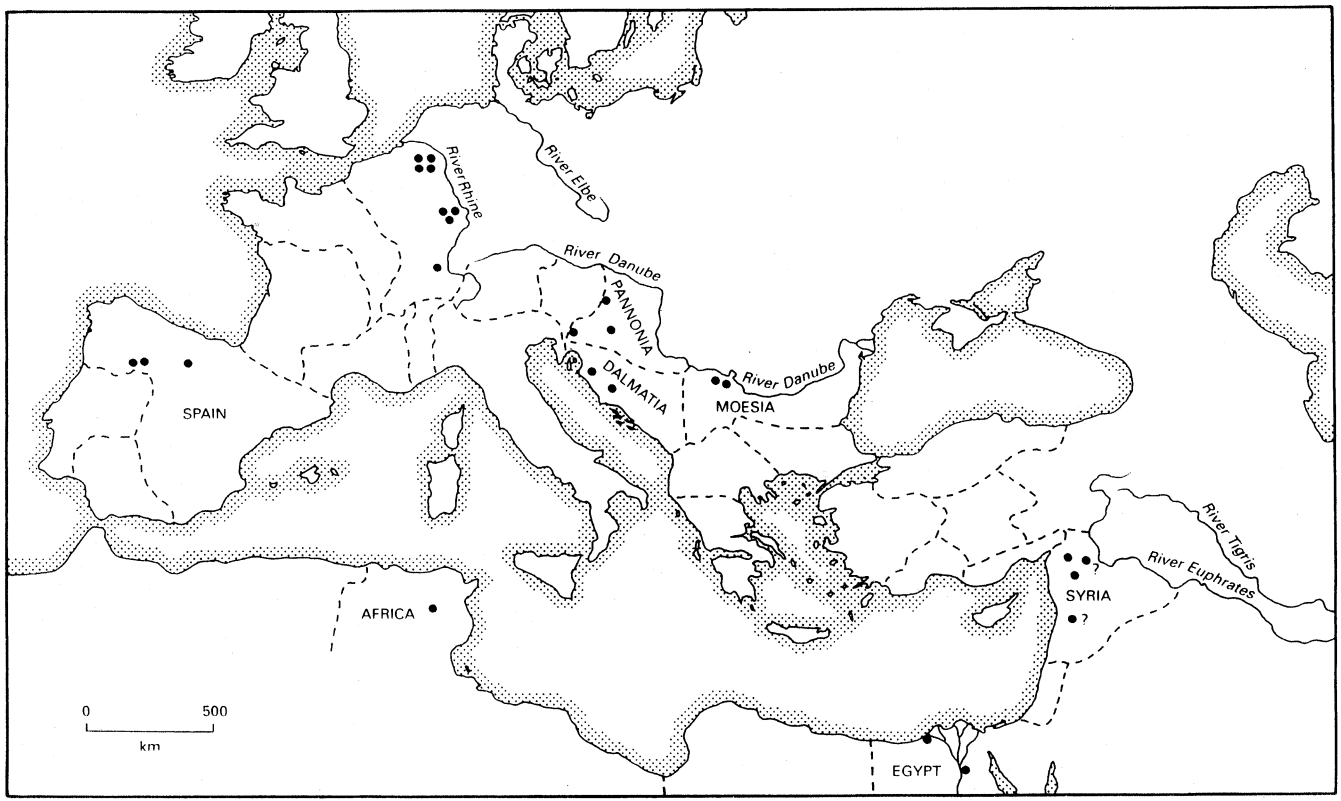
Vespasian, when he was rebuilding the Capitol: when an engineer presented the emperor with a labor-saving device to convey the columns to the hill, Vespasian rewarded the engineer but refused to make use of this invention, stating that he preferred to feed the populace of Rome.[75] The passage has been widely discussed,[76] but its most obvious explanation seems also the most acceptable: Vespasian had a clear awareness of the link between public works and urban employment. Public works thus added to the purchasing power of the *plebs urbana*.

In many towns of Italy, an original scheme of "family allowances" (*alimenta*) introduced by Nerva or Trajan disbursed additional benefits. The emperor gave perpetual loans to the landowners of the territory of a town or of the nearby districts, and the interest was distributed to male and, to a much lesser extent, female children of the same town, "*natos parentibus egestosis*," "born to poor parents," as a late epitomator puts it.[77] The monthly allowances amounted to 16 sesterces for the boys and 12 sesterces for the girls, certainly enough for their upkeep. Apart from quite a few literary and epigraphic sources, this scheme is well known from two long inscriptions from two small Italian towns, listing in detail the declared properties, their value and the portion of the loan, secured by each property.[78] These inscriptions resemble the documents that (in the provinces) would have served as the basis for the assessment of the land tax, according to the procedure described by Ulpian. The perpetual payment of the interest put a light burden on agricultural property in Italy which was immune from land tax. The purpose of the scheme has been much debated. Whereas the *alimenta* used to be understood as a subsidy for landowners, more recent work tends to view children as the intended beneficiaries of this program and the loans merely as a compulsory but efficient means of ensuring the long-term survival of this scheme. The *alimenta* undoubtedly represented a measure to support reproduction, akin to those implemented by some modern dictatorial regimes. Whatever the aims, they raised the purchasing power of the Italian families involved.

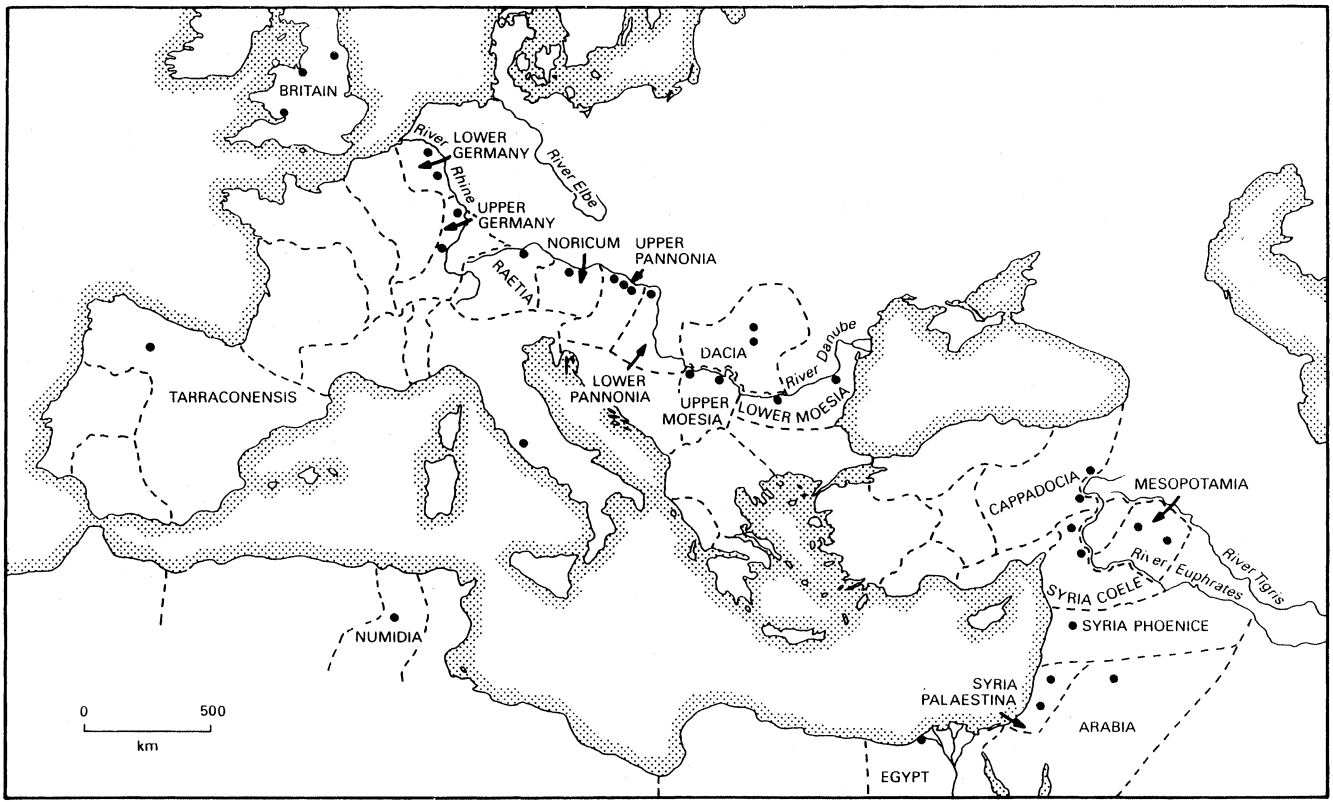
VI MILITARY EXPENDITURE AND ARMY SUPPLY

Relative to the whole population of the empire, the Roman army, at some 300,000–400,000 men, was comparatively small. Thanks to the length of service, only a tiny proportion of all the adult males joined the legions, the auxiliary and naval forces, and the units in Rome. Service in the praetorian cohorts and the legions required citizen status, and soldiers were initially recruited from the population of Italy and of the more Romanized provinces

[75] Suet. *Vesp*. 18. [76] Brunt 1980, with references.
[77] *Epit. de Caes*. 12.4. [78] *CIL* IX 1455; *CIL* XI 1147.



Map 23.1 (a) The disposition of the legions in AD 14 (b) The disposition of the legions in AD 200
Source: B. Campbell, *War and Society in Imperial Rome 31BC–AD284*. London and New York, 2002: 19–20



Map 23.1(b) (*cont.*)

of the west. The auxiliary forces were staffed with provincials from peripheral and recently annexed provinces: they were "native" or "colonial" troops recruited from among the subject peoples. Soldiers enjoyed a relatively high standard of living. As client states were transformed into provinces, the troops moved towards the frontier of the empire. This exacerbated the contrast between the inner and more urbanized areas of the empire and the frontier regions. The troops were no longer an army of occupation, except in a few unstable or exposed areas: once wars of conquest had subsided, it became their duty to defend the border against low-intensity threats. In these conditions, even if the number of soldiers was small and units were often under-strength, the presence of the army precipitated economic transformation and growth.[79]

Soldiers were often accompanied by a number of slaves and servants, while officers kept entire *familiae* of freedmen and slaves. Numerous civilians, chiefly traders and contractors, contributed to the necessities of daily life in the camps and the civilian settlements nearby. Some specific functions are recorded on the wooden tablets found at the fort of Vindolanda on the northern frontier of Roman Britain:[80] the *balniator*, who took care of the baths, the *cervesarius*, the beer-brewer, and the *uector* and the *iumentarius*, carriers using carts or pack animals. Furthermore, many soldiers, at the end of their service, settled in the same areas in which they had served, and they had at their disposal a rather substantial sum of money, the discharge-bonus of 12,000 sesterces, which they could use to set up a farm or to start a trade.

Army demand greatly affected economic life in militarized areas.[81] The soldiers had to be provided with food, fodder (for the enormous number of pack animals and horses), and firewood, and these items represented, as in other pre-modern armies, the bulk (in terms of weight) of supply. Requirements and rations have been ingeniously calculated from modern and comparative data and from ancient evidence. Each soldier received a basic ration of two *sestarii* of grain (850g.) per day; but his diet included also meat, cheese, vegetables, olive oil, sour wine, and salt. Even if some of the grain and other basic foodstuffs arrived in the form of imperial tax or rent revenue,[82] most of these items normally came from areas in the vicinity of the camps and forts. The presence of the army therefore impelled the enlargement of the cultivated area and the introduction of innovations in agricultural and breeding techniques. It has been observed

[79] One normally neglected aspect is illustrated by Haynes 2002.

[80] Bowman and Thomas 1983; 1994; 2003; Bowman 1994; Birley 2002.

[81] See in general Wierschowski 1984; Kissel 1995; Junkelmann 1997; Roth 1998; and also Roth 2000. See below, Chapter 27.

[82] Erdkamp 2002b: 60 n. 32, who quotes Fink n. 91 (a papyrus from Dura with the reference to grain "*ex praediis fiscalibus*").

that in the frontier zone, the army served as a powerful agent of discontinuity in agricultural exploitation: palaeobotanical investigations document the introduction of new plants and the importation of seeds, and the Vindolanda tablets show that poultry and pigs were locally bred and beer was locally produced. It was only where the local agrarian economy was unable to provide sufficient resources (as probably happened in the regions close to the border in Britain), that external sources were required. For climatic reasons, items such as olive oil always had to be imported from the Mediterranean.[83] Thus, army demand increased the volume of exchange between the core regions of the empire and the border areas: the most prominent example is Baetican oil, which found its way to the frontier area of Germany and Britain. The same was true of some manufactured goods: Vindolanda received clothes from Gaul and other goods from Londinium. The accounts and the letters from Vindolanda and the papyrological evidence from Egypt reflect the extremely large and varied range of the goods that were consumed not just by officers and their families but also by ordinary soldiers.[84] The latter might even have access to luxury goods from beyond the empire such as pepper.

Consumption levels must have been related to pay scales. From Augustus onwards, an ordinary legionary was paid 225 denarii (or 900 *sestertii*) per year, while specialists received one and a half times as much (*sesquiplicarii*), or double (*duplicarii*) or triple pay (*triplicarii*). The soldiers of the praetorian cohorts in Rome and legionary cavalrymen also earned higher wages. Pay levels for auxiliary soldiers are uncertain and controversial: they may have received 5/6 of the legionary pay or the same as the legionary soldiers.[85] Domitian raised basic pay to 300 *denarii* (1,200 *sestertii*), and it seems likely that auxiliary stipends were raised accordingly. Military pay subsequently remained stable for more than a century until further increases occurred at the end of the second and the early third centuries. These later raises more than counterbalanced the rise of the level of prices and improved soldiers' living standards. Non-commissioned officers received a higher or much higher pay. Centurions and decurions, the commanders of the *centuriae* of foot soldiers and of the cavalry *decuriae* of the legions and of the auxiliary contingents, received salaries equivalent to several tens of times the basic pay. The salaries of officers drawn from the two top orders of Roman society, the *ordo senatorius* and the *ordo equester*, were higher still: in the second century, a *legatus legionis*, the commander of a legion, received 200,000 sesterces. It has been calculated that officers' pay absorbed perhaps 20 percent of the total cost of a legion.[86] Expenses for food and clothing were deducted from

[83] Even if olives were grown "further north than they normally are in modern times": Harris 2000: 718.

[84] Bowman and Thomas 2003.

[85] Now Speidel 1992, with references; but see Alston 1994.

[86] See in general Le Bohec 1994.

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soldiers' pay.[87] Moreover, a substantial proportion of the remaining pay was deposited in individual accounts administered by their units. This system of deductions and savings reduced the physical presence of coin required in and around the camps.

Were military supply demands met by market mechanisms? Two radically opposed views have been advanced. Thus, the army is thought to have been directly supplied through the redistribution of the proceeds of tax in kind and rents collected on public or imperial properties in faraway regions. Grain and other foodstuffs were carried by the *navicularii*, shippers, private businessmen, who transported them on a contractual basis for the imperial administration. Compulsory purchases at fixed prices or requisitions provided the supplementary quota to satisfy the needs.[88] Alternatively, the army supply is thought to have relied on the market and sustained by the purchasing power of the soldiers (irrespective of whether the actual purchases were arranged by the military administration).[89] However, the archaeological evidence, which has been taken to prove that there was a centralized and direct management of the supply to the military detachments can be read in different ways. While it does document specific supply lines, as in the case of Baetican oil, it cannot establish the existence of some kind of "administered trade." It is neither possible nor legitimate to infer from the presence in the camps of Germany and Britain of vessels (the Dressel 20 amphoras) that carried the Baetican oil the existence of direct flows of fiscal oil from specific production areas in Baetica to specific military sites: after all, there is no evidence that tribute in oil was ever collected in Baetica. The distribution of Dressel 20 amphoras may thus be interpreted as evidence of commercial flows towards areas with strong demand for oil.[90] The evidence of the Egyptian papyri, other documents from Tripolitania,[91] and the Vindolanda tablets reveals the operation of market mechanisms for the supply of officers and ordinary soldiers, even if they are not always easy to reconstruct in detail and depended on local circumstances.[92] There is no reason to believe in a centralized administration of military supplies under the supervision of the office of the *praefectus annonae* in Rome.[93] Conversely, the Vindolanda tablets suggest that the procurement of supplies was managed at the level of the single unit, and that soldiers and veterans were sometimes involved as individual economic actors.[94]

[87] Fink 1971: nn. 68 and 69.

[88] Remesal Rodríguez 1986; 2002a; 2002b; Carreras Monfort 2002; Erdkamp 2002b; Whittaker 1994; but, for a more balanced view, cf. Whittaker 2002 (repr. in Whittaker 2004).

[89] Wierschowski 1984; 2001; and 2002; but see also Tchernia 2002.

[90] Tchernia 2002. [91] Marichal 1992.

[92] On the economy of the frontier areas, see in general Whittaker 1994; 2004; and Savino 1999.

[93] Remesal Rodríguez 1986; 2002a; 2002b. [94] *Tab. Vind.* II 343.

VII THE *ANNONA CIVICA*

Since the Republican period, the Roman authorities had intervened in the food supply of the capital, a city whose population had come to surpass that of every other urban center in the Mediterranean.[95] Rome's demographic growth was correlated to the extension of political control over sources of grain that were accessible by river or sea, such as south Etruria, Umbria, and Campania, and later Sicily, Sardinia, and Africa, and finally Egypt. By contrast, the conquest of the Po Valley did not have a remarkable effect on the food supply of Rome: due to high transportation costs, the capital did not normally import foodstuffs from northern Italy. The *aediles* had long been supervising the retail trade in grain to curb speculation. The prevention of famines or shortages was the main goal. More intrusive efforts were made during the Gracchan period. A new law provided for subsidized grain, and large granaries began to be built in Rome and Ostia. These storage facilities helped counterbalance the vagaries of the supply caused by climatic variation. Subsequent *leges frumentariae* intervened to adjust various features of the distribution system by changing the grain price, the number and the identity of the recipients of subsidized grain, or the size of the allocations, until in 58 BC a bill established that grain would be distributed free of charge to all the adult male citizens who were present in Rome. Under Caesar's dictatorship, this privilege was limited to adult male citizens who were regularly domiciled in Rome. Augustus established a *numerus clausus*, a closed number of recipients, and it seems that from then on the privilege was in fact hereditary.[96]

Beyond the grain dole, the state was also concerned about the food supply in general. The *cura annonae* and the exceptional powers given to Pompey in the 50s BC anticipated the more thorough and stable reorganization of the grain supply by Augustus. Some tentative figures give an idea of the scale of the problem: on a conservative estimate,[97] during the early empire, the city of Rome consumed around 30,000,000 modii of grain (200,000 tonnes) per year, a transfer that required the service of some 800 ships with an average capacity of 250 tonnes. In addition, a much larger number of tow barges were needed to move the grain from the ports at the mouth of the Tiber to Rome. The import of other types of food added to the scale of operations.

The concentration of so many consumers in a single place posed a big challenge to a pre-industrial economy and a rudimentary administrative

[95] Rickman 1980; Lo Cascio 2000b for the population of Rome.

[96] And therefore the new immigrants to Rome were barred from it: Lo Cascio 1997a. New beneficiaries were chosen by lot.

[97] Garnsey 1983.

apparatus. The administrative structure set up by Augustus and headed by the *praefectus annonae* in Rome and with offices in the big ports of Ostia and Puteoli supervised the collection of foodstuffs, their transport, storage, and distribution and marketing.[98] Thanks to this arrangement, the city of Rome avoided the specter of other large pre-industrial towns – wild price fluctuations caused by speculation and disruptions in supply. Large provincial cities at least occasionally experienced interventions to stabilize prices and supply.[99]

Since the late Republic, taxes in kind and rents from public and later imperial properties in the provinces accounted for a substantial share of the metropolitan grain supply. This share progressively grew during the early empire, thanks to the annexation of new provinces such as Egypt and the expansion of the imperial estates that was fed by confiscations and legacies: for instance, Pliny the Elder claims that Nero confiscated the properties of six senators who owned half of Africa.[100] It is worth noticing that the *coloni* of the imperial estates in Africa handed over one-third of their crop, and comparable rates were paid by the tenants of the "public land" or "imperial land" in Egypt. Even if only part of this grain was actually shipped to Rome, taxes and rents were sufficient to support the grain dole. Moreover, additional grain was sometimes bought in the same areas where taxes in kind were levied and subsequently sold on the Roman market. State grain could be sold to mitigate price fluctuations in the open market of the other urban centers of the empire.

The *praefectus annonae* set up contracts with the *navicularii*, the shippers (who could also be the shipowners), for the transport of state grain. Shippers and private grain merchants (*negotiatores frumentarii*) were often the same people, and both groups were under the supervision of the *praefectus*,[101] as were dealers in other foodstuffs such as oil.[102] *Navicularii* who used cargo ships of a given minimum capacity to ship grain to Rome were granted specific non-economic incentives and later also coveted exemption from municipal liturgies in their communities of origin. These capacity limits and the shipwrecks of *naves onerariae* give us an idea of the common size of the ships involved in the Roman grain supply: from 10,000 *modii*, or a bit under 70 tons, under Claudius, to 50,000 (or about 340 tons) in a later period.[103] Offering to refund their losses in case of shipwreck, Claudius tried to induce the *navicularii* to sail during the winter period, but this measure proved short-lived. Public supervision also

[98] See in general Pavis d'Escurac 1976; Rickman 1980; see also Herz 1988; Sirks 1991. On the *frumentationes*, see Virlouvet 1995.

[99] See, e.g., the decree of L. Antistius Rusticus, governor of Pisidia (AD 92 or 93): *AE* 1925: 126b, on which see in particular Wiemer 1997.

[100] Plin. *NH* 18.35.

[101] Merchants were the ones who "*annonam urbis adiuvant*": *Dig.* L 6.6.3.

[102] Lo Cascio 2002b.

[103] Pavis d'Escurac 1976; Rickman 1980; Sirks 1991.

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extended to other professional groups that were involved in the grain supply, such as the *mensores frumentarii*, the measurers of the grain, the *caudicarii*, the bargees, and probably the *pistores*, the bakers in Rome and Ostia. In the third century AD, the monthly free distributions of grain gave way to the daily free distributions of bread. In addition, the *praefectura annonae* supervised the collection, transport, and distribution of olive oil: the *Mons Testaceus*, an artificial hill made up of the discarded and broken amphoras that had carried it from Baetica to Rome, testifies to the vast scale of these imports. In the Severan age, oil likewise began to be distributed free of charge.

Initially, the *navicularii*, *pistores*, and other professional groups involved in the supply of Rome had a contractual relationship with the *praefectura annonae*, and were paid for their services. Later, as early as the principate of Commodus and the Severi and possibly as a consequence of the financial difficulties following the Antonine Plague, this contractual relationship was changed to a kind of liturgy (*munus*). From now on, the *navicularii* were obliged to use part of their ships' capacity in the service of the *annona*. In due course, service for the *annona* became a hereditary obligation.

The range and nature of state intervention might be taken to suggest the food supply of the capital did not rely on market mechanisms and that we are dealing with an example of "administered trade." It is certainly true that tax and rent grain accounted for a substantial and growing share of the grain that arrived at Rome. However, private merchants and shippers were involved in this operation, and their status as private entrepreneurs remained unaffected. Oil amphoras that were shipped to Rome carried painted inscriptions with the name of the *negotiator*, or *mercator* or *diffusor olearius*, that indicated the identity of the owner of this commodity during the transportation phase. In the Severan period, these names were replaced by those of the emperors and later by that of the provincial department of the imperial *patrimonium*. This suggests that in this period, the imperial administration became directly involved in the collection and transportation of olive oil, a process that is related to the expansion of imperial property in the provinces following the extended confiscations of Septimius Severus. Yet the private names re-appeared in the reign of Severus Alexander: we may conclude that even oil originating from imperial estates in Spain was sold to private merchants both before and after the brief period of direct state involvement in the oil supply.[104] Once again, the inherent ambiguity of the role of the emperor, who acted as a private individual but also set the rules of the game, helps explain why even the expansion of imperial property did not change the market character of the imperial economy.

[104] Lo Cascio 2003b, with references.

VIII THE IMPERIAL STATE AND PRODUCTION

The expansion of imperial property is one of the most important developments of this period but should not be viewed as the result of a direct intervention in the economy or of a *dirigiste* policy. The Flavian poet Statius gives an account of the duties of the *a rationibus*, the central head administrator of the imperial finances, who was originally an imperial freedman and later on an equestrian officer.[105] This passage allows us to deduce the importance of "patrimonial" incomes and expenditures for the imperial budget. Imperial properties consisted above all of agricultural estates, both in Italy (where initially they were few in number) and in the provinces. Their number and size gradually increased during the first two centuries of the empire. Most of the mines and the quarries came to be absorbed into the imperial property. A wealth of inscriptions, papyri, and ostraca documents the pace of this expansion and concomitant changes in exploitation and labor regimes. As already noted, the imperial estates and their rents played a critical role in supplying the urban centers and the army. The imperial mines provided iron for weaponry as well as gold, silver, and copper for coinage. The imperial marble and granite quarries furnished the material for public buildings commissioned by the emperor and analogous activities by municipal administrations and private benefactors outside the capital.[106] In addition, by the Antonine period most of the brick factories around Rome had fallen into the hands of individual members of the *domus Augusta*, until a virtual imperial monopoly on brick production was established in the Severan period.[107]

In the productive sphere, the emperor assumed his usual dual role as private actor and public functionary. This ambiguity had a strong impact on the ways in which the various imperial possessions were exploited. Two features were common to all of them: the involvement of private contractors from small tenants to rich entrepreneurs, and the market-based framework of their operation. Thanks to epigraphic sources, we are reasonably well informed about the management of imperial estates in north Africa.[108] Small-scale farmers (*coloni*) cultivated plots of land as share-croppers. As long as they cultivated the land, they were entitled to perpetual and hereditary leaseholds and also enjoyed the right to occupy unused land as long as they put it under cultivation. *Coloni* paid a rent in kind, normally a third of their crop, and in addition owed a number of days of agricultural labor service to the *conductor*. The *conductor* acted as a middleman who rented an entire estate from the imperial administration for five-year periods, collected the *partes agrariae* from the *coloni*, and cultivated – through the *coloni* but perhaps also with the help of a separate labor force – part of

[105] Stat. *Silv*. 3. 3. 86–105; cf. 3. 3. 43 ff. [106] For Italy and Africa, see Jouffroy 1977; 1986.
[107] Lo Cascio 2005. [108] See in particular Kehoe 1988a.

the estate. The imperial *fiscus* collected rent from the *conductores*, probably again largely in kind. The interests of these three groups overlapped to some degree: while the *coloni* were ready to invest in their parcels and bring unused land under cultivation, the *conductores* sought to maximize their income and thus to persuade the *coloni* to cultivate their plots as intensively as possible, while the *fiscus* aimed to ensure and if possible increase food production for the metropolitan market. The interplay of these interests resulted in the expansion of cultivated land on these imperial estates. The specific measures recorded on epigraphic documents such as *lex Manciana*[109] and above all the *lex Hadriana de rudibus agris et iis qui per decem annos continuos inculti sunt*[110] indicate the impact of deliberate government policy.

In the late Republic, mines, if they were located in areas included in the *ager publicus*, had been left to be occupied by private entrepreneurs. *Societates*, companies, were involved in their exploitation, but it is debated whether they were actual companies of contractors that exploited the pits with their workforce, or companies of *publicani* that exacted the fiscal revenues of the state. Privately owned mines existed on privately held land. At the beginning of the empire, particularly during the reign of Tiberius, many mines were seized by the *fiscus*, at least in some regions such as southern Spain. In recently incorporated areas – above all northern Spain, which was to become the richest source of gold for the imperial mint – the local mines had become imperial property upon conquest and were directly exploited by the imperial administration: colossal investments, possible only for the emperor, were required to extract ore with the help of complex waterpower devices.[111] In general, state control, more sporadically exercised in the Republic when the government sometimes intervened to prohibit or limit the exploitation of mines, was now more readily achieved, at least in the case of the precious metal mines. But the systems of exploitation were diverse: direct exploitation as in northern Spain, or through *conductores*, contractors, as in the iron mines of Noricum; a mixed system, a sort of partnership between the imperial administration and private small entrepreneurs, as in the silver and copper mines of Lusitania.[112] Two important epigraphic texts from a mining district in the last of these regions, dating from the reign of the emperor Hadrian, inform us about the exploitation of the pits and some aspects of daily life in the district itself.[113] One of these texts regulates the concession to private individuals of a series of activities that were to be performed as monopolies. The other one, the *lex metallis dicta*, establishes a set of rules for the *occupatio* and cultivation of the mines in

[109] *CIL* VIII 25902. [110] *CIL* VIII 25943; *CIL* VIII 26416. [111] Wilson 2002.

[112] On the forms of exploitation of the mines, see in particular Andreau 1988; Domergue 1990; on the labor force: Andreau 1989.

[113] *FIRA* I^2: 105 and 104; see Domergue 1983; Lazzarini 2001; Mateo 2001, with references.

the district. While the interpretation of the specific rules is hotly debated, some details seem to be clear: the involvement of small entrepreneurs who occupied and then began to dig the pits, in order to reach the *venae*, the ore deposits. They could claim a *dimidia pars* of each pit they dug, but also had to buy the *dimidia pars* which was property of the imperial *fiscus* for a cash price that was related to the richness of that particular *vena*. According to a widely held view, they also had to surrender half of the ore to the fiscal administration, apart from selling the rest to the *fiscus*. In any case, whatever the system that enabled these contractors to make a profit and pay for the concession, it seems fairly certain that the extracted mineral and/or the resultant metal was to a large extent available to the imperial administration. The Transylvanian mines seem to offer a rather different picture.[114] In this district of the Roman province of Dacia, the site of very rich gold mines, some extant wooden tablets record a labor contract between the miner and the *conductor* of his *operae*, the entrepreneur.[115] In this case, the laborer received a cash salary. However, the diversity in mining regimes might merely be a function of the diversity of the surviving documents: we do not possess a *lex metallis dicta* for Dacia.

The state did not have a monopoly on metal production, and there was a free market for metals. But the imperial administration exercised indirect control, at least as far as gold and silver are concerned, and it was this indirect control that allowed the state to pursue a specific policy in the issuing of coinage. For instance, the opening of new pits in new districts always seems to have been supervised if not decided by the *fiscus*. This link between control of the exploitation of the mines and the currency policy of the emperor is very clearly attested by the passage of Statius referred to above. Moreover, the behavior of the state authorities suggests an interest in the maximization of production rather than in the reduction of the costs of labor that was provided, at least in part, by slaves, convicts, and soldiers. This is particularly evident in the scale of operations of the hydraulic devices in the Spanish mines.[116]

The forms of exploitation of quarries are less well known, even though important evidence survives in the *ostraka*, inscribed sherds, that have been found in one Egyptian district of the Oriental Desert between the Nile and the Red Sea, at Mons Claudianus.[117] In a later phase, production in the imperial quarries appears to have been organized directly by imperial procurators, but it seems that the state had previously relied on the intermediation of private entrepreneurs. As to the labor force, from the evidence from Mons Claudianus we know that it was formed essentially by two types of workers, termed the *paganoi* and the *familia*. Their status

[114] Noeske 1977.
[115] *CIL* III pp. 948 ff., IX–XI; cf. *FIRA* III 150 f.
[116] Wilson 2002.
[117] Bingen et al. 1992; 1997; Cuvigny 2000.

is obscure, although it is likely that the former category consisted of free laborers, inhabitants of Egyptian villages, who had moved to the mining district. The management of marble distribution at Rome as well as in Italy and the provinces is even less clear, notwithstanding the standardized inscriptions found on some of the blocks in the quarries themselves that seem to imply strict supervision of production but whose precise function remains uncertain.[118] It has been argued that all the marble coming from the imperial quarries was claimed by the emperor, who wanted to ensure adequate supply for the furnishing and repair of imperial buildings but could relinquish part of it to private individuals and communities. Yet that does not exclude the possibility of a "secondary diffusion" of reused material. Moreover, it is certain that some manufactured marble goods such as sarcophagi were largely marketed by the imperial workshops or by the imperial administration.

The expansion of imperial property, especially through legacies and confiscations, proceeded spasmodically during the first two centuries but reached a climax with the accession of Septimius Severus, who confiscated the properties of the followers of his opponents in the civil war, Pescennius Niger, and especially Clodius Albinus. The hugely enlarged *patrimonium* was split up and part of it, the so called *res privata*, was put under the control of a new administrative department.[119] The first obvious effect of the enlargement was to eliminate the competition of a certain number of private *rentiers* in the extraction of the productive surplus which was drawn as rent or tax, and this undoubtedly increased the income of the "state," that is, the emperor. But these confiscations also changed the role of the imperial financial administration in the economy as a whole: its interference in economic life certainly increased. Several developments must be tied together. As shown above, the quantity of commodities produced on the imperial estates and directed to supply Rome increased, and the emperor's administration at least temporarily replaced the private *negotiatores olearii*.[120] The emperor also became the unique owner of the *figlinae* around Rome.[121] The contractual relationship which tied the shippers to the administration of the *annona* was changed into a *munus*: the general economic difficulties following the Antonine Plague can explain why the number of *navicularii* who were ready voluntarily to assume the duty of transporting grain to Rome fell, and why it became necessary to resort to coercion to secure the food supply of the capital. With respect to the collection of the *portorium* and perhaps also of other indirect taxes, tax-farming was abandoned and tax-farmers and their clerical staff were replaced, at least temporarily, by the imperial procurators and the imperial *familia*.[122] However, this increased

[118] Fant 1988; 1989a; 1993; Pensabene 1989. [119] Lo Cascio 2000a: 133 ff., with references.
[120] Lo Cascio 2003b. [121] See above, 642. [122] Lo Cascio 2003.

role of the imperial property or of the imperial administration did not radically change the economic structure that had characterized the first two centuries of the Principate: market relations would continue to dominate the economy of the late empire.

IX A DYNAMIC MODEL

According to the "taxes and trade" model, the economic integration of the empire was facilitated by the existence of a unified political and fiscal organization and the concentration of the wealthiest landowners in Rome and Italy. A relatively low cumulative burden of rents and taxes for the peasant majority of the population was a necessary precondition for this outcome.[123] The Antonine Plague drastically reduced the productive basis from which the imperial state drew its financial resources. Under these circumstances, and notwithstanding the panoply of measures taken to deal with this crisis, the tax burden was bound to increase and the economic integration of the empire became increasingly dissociated from the flows of taxes and trade. The expansion of imperial property, in so far as it enabled the state directly to exploit a growing share of the resources of the empire, reduced the scope of commercial transactions.

This development shows that the "taxes and trade" model of the Roman imperial economy needs to be qualified and made more dynamic in order to maintain its undoubtedly powerful heuristic value. The interplay between taxes and trade cannot be thought to be the root cause of the increase in Mediterranean sea-borne commerce since this increase had already occurred before the sharp distinction between "tax-producing" and "tax-consuming regions" was established and taxation in cash money assumed great importance.[124] Mediterranean trade in the last two centuries BC was chiefly based on the export of wine and manufactured goods from Italy to the provinces and beyond the frontiers, especially in the west. Since Italy was exempt from land tax, the export of Italian goods to the provinces cannot be explained with reference to the "tax and trade" model.

The "taxes and trade" model assumes the existence of a structural imbalance between "tax-producing" and "tax-consuming regions." Yet this imbalance could not last indefinitely. It seems legitimate to interpret the long-term dynamics of the economic relationships between these two spheres in terms of relative prices and different "terms of trade" of different areas within the empire, and a gradual deterioration of the provincial terms of trade.[125] The existence of monetary tribute and the concentration of the

[123] See above, 621–2.

[124] Woolf 1992, for the thesis that economic integration in the Mediterranean economy peaked in this period.

[125] von Freyberg 1989.

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recipients of rents in Rome caused the influx of capital into the peninsula. This imbalance was offset by an ever increasing flow of imported provincial goods into the same area, whereas Italian exports abated. In the end, this imbalance led to stagnation in Italy and economic growth of the provinces (especially in the west), as long as efficient techniques of production spread from Italy to the less developed areas:[126] if prices were lower in the provinces, it was more profitable to produce there and to sell in cash-rich Italy.[127] In so far as this process served to undermine the erstwhile economic primacy of Italy, it was perfectly consistent with the diversification of the geographical provenance of the Roman ruling class and with the transformation of the empire itself: in economic terms, the core became less of a core while the periphery was rendered less peripheral.

[126] Gunderson 1976. [127] Lo Cascio 1991a.