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State revenue and expenditure in the Han and Roman empires

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Abstract: Comparative analysis of the sources of income of the Han and Roman imperial states and of the ways in which these polities allocated state revenue reveals both similarities and differences. While it seems likely that the governments of both empires managed to capture a similar share of GDP, the Han state may have more heavily relied on direct taxation of agrarian output and people. By contrast, the mature Roman empire derived a large share of its income from domains and levies that concentrated on mining and trade. Collection of taxes on production probably fell far short of nominal rates. Han officialdom consistently absorbed more public spending than its Roman counterpart, whereas Roman rulers allocated a larger share of state revenue to agents drawn from the upper ruling class and to the military. This discrepancy was a function of different paths of state formation and may arguably have had long-term consequences beyond the fall of both empires.

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“Follow the money,
always follow the money.”
(Deep Throat)¹

Skeletons of empire

Anybody who wants to understand the scale of state power and the nature of state-society relations would do well to follow this advice. As Rudolf Goldscheid memorably put it, in Josef Schumpeter’s translation, “the budget is the skeleton of the state stripped of all misleading ideologies.”² Like all states past and present, ancient empires were sustained by their ability to extract resources that could be used to enforce their claims on people and territory and reward their agents and allies. The state’s share in total output serves as index of its effective power, just as information about the sources of revenue and the way it was spent reveal the bargaining processes that mediated relations between rulers and ruled and helps us identify the winners and losers of state formation.

Given the Han and Roman empires’ success in controlling a large share of the world’s population for hundreds of years, their ‘fiscal skeletons’ are of obvious interest. In the absence of solid statistics, any attempt at comparative analysis inevitably involves more conjecture than many historians will feel comfortable with. Yet I hope to show that even allowing for large margins of uncertainty, meaningful patterns do emerge. In as much as this exercise promises to shed light, however dimly, on the inner workings of these vast and precociously ambitious organizations, it is a challenge from which we simply must not shy away.

The study of imperial resource management (I deliberately avoid the term ‘budget’ to steer clear of potentially anachronistic notions of modern accounting and fiscal planning) may be approached by focusing either on income or on expenditure. In practice, the general poverty of the historical record forces us to draw on data and estimates from both sides of the equation in order to gain a better sense of fiscal balances. I proceed in three steps: after establishing the approximate scale of government finances in both systems I ask if and how they differ in terms of the distribution of revenue sources and spending targets and finally consider possible implications and long-term consequences.³

Han revenue

Evidence for state revenue is concentrated near the end of the Western Han period. The census for the year 2 CE reports a total population of either 57.7 or 59.6 million people who lived in 12.2 or 12.4 million households and cultivated an area of 827 million *mou* or 381,000km².⁴ The best fiscal data for this period come from a cache of documents discovered in 1993 in Yinwan that provide detailed information about the administration of Donghai

¹ That there is no actual record of this quote prior to the 1976 movie version of “All the President’s Men” (see W. Safire, *New York Times* August 3, 1997) does not detract from its validity for historians.

² Schumpeter 1954 [1918]: 100, from Goldscheid 1917.

³ I concentrate on orders of magnitude and distributional issues, in part to provide a basis for broader discussion of the underlying fiscal regimes, which are the subject of several contributions by Mark Lewis, Kent Gang Deng, James Tan, and Gilles Bransbourg and myself in Monson and Scheidel, eds. forthcoming.

⁴ Bielenstein 1987: 13-14.

Commandery (in Shandong) around 15 BCE. One of these texts puts the total population of the commandery at around 1.4 million people in 266,000 households. This compares somewhat awkwardly with tallies of 1.56 million and 358,000 households in the census of 2 CE: however, while the discrepancy concerning households seems troubling, the more important population figures are broadly similar. The total amount of cultivated land in the commandery is given as about 31 million *mou* or 14,300km², approximately one hectare per person or roughly 1.5 times the per capita mean reported for the empire as a whole in the census of 2 CE. Government revenue for the year stood at 266.6 million cash and 506,600 *shi* of grain, of which 145.8 million cash and 412,600 *shi* had already been spent.⁵

Given that Donghai Commandery accounted for approximately one-fortieth of the imperial population⁶ and that it may be considered a reasonable ‘average’ province in the sense that it was neither located in the metropolitan region or the in the highly developed old core of the Great Plain nor particularly peripheral, and therefore perhaps not entirely unrepresentative in terms of its overall economic development, extrapolation from the reported tallies implies annual imperial revenues of about 10.7 billion cash and 20.3 million *shi* of grain. Priced at 50-75 cash/*shi*=*hu*, this would yield a grand total of approximately 12 billion cash.⁷

While this is undoubtedly an exceedingly crude extrapolation, it happens to match a total of 12.3 billion cash in state revenue reported in the *Xinlun*.⁸ According to this source, from the late Western Han period onward more than 4 billion cash were annually collected in taxes, half of which was spent on the salaries of civil servants and half of which was set aside for emergencies. In addition, the lesser treasury is said to have generated an income of 8.3 billion cash to be used for the maintenance of the court and the emperors’ gifts and rewards. Yet although this match might seem superficially appealing, it has often been noted that the notion that the lesser treasury enjoyed twice as much income as the ministry of agriculture is highly dubious: after all, the latter received all major taxes as well as monopoly revenue and was responsible for paying officials and the military whereas the former primarily sustained the imperial court. One solution has been to reduce the intake of the lesser treasury to 1.3 billion cash by emending the text.⁹ It is hard to see how the lesser treasury, which derived income in the first instance from imperial domains and the mint, could have taken in over 8 billion cash per year when the mint was credited with issuing 230 million cash per year, an output that could not have meaningfully contributed to ten-figure profits.¹⁰ The poll tax on children, also allocated to the lesser treasury, could not have yielded more than 200 million cash per year. And although domain income may have been considerable we must wonder about its effective catchment area. Even so, as we will see below, while textual emendation would reduce lesser treasury income to a superficially more plausible level, it does not help explain the absence of military spending from this account and fails to generate a credible overall state revenue total that is compatible with the Yinwan records.

⁵ Loewe 2004: 60.

⁶ The four possible permutations yields ratios (empire : commandery) of 37, 38.3, 41.2, and 42.4 to 1.

⁷ For grain prices, see Scheidel 2009c: 200-1 n.292.

⁸ In Pokora 1975: 49.

⁹ Nishijima 1986: 594; and cf. Pokora 1975: 59. The amount of 8.3 billion oddly reappears in a passage in the *Hanshu* according to which financial reserves under Yuandi (49-33 BCE) amounted to 4 billion for the ministry of agriculture, 2.5 billion for the superintendent of waterways and parks, and 1.8 billion in the lesser treasury (Nishijima 1986: 594), for a total of 8.3 billion cash. The 4 billion in savings echo the 4 billion in annual income of the same ministry. One wonders what to make of this.

¹⁰ Scheidel 2009c: 187-99, for Han coin output and quality.

Alternative conjectures are possible but similarly shaky. If we were to assume that the reference to the over 4 billion cash in taxes available for salaries and savings were to those revenues that reached the central government, this tally might be taken to reflect the surplus that was remitted from the provinces net of local expenditure. In that scenario, the 120 million cash that had not been spent in Donghai would have been available for transfer to the center, schematically implying total revenue of under 5 billion cash and consistent with the more than claimed 4 billion in tax revenue, if only on the assumption that the Donghai tallies did not include income of the lesser treasury. Then again, we cannot be sure whether the 55 percent of cash revenue and 81 percent of grain revenue that had been spent had been expended locally or whether they included remittances to the central authorities, and thus whether the savings were earmarked for transfers or represented genuine savings.¹¹

The only thing that is reasonably clear from the Yinwan documents is that overall state revenue in the late Western Han period must have been considerably more than 4 billion or 5.3 billion cash unless we assume that Donghai's per capita contribution to state coffers was up to three times the imperial average or that the records had been massively falsified to impress superiors.¹² The fact that the only way to reconcile these data with the *Xinlun* is by accepting a predominance of the lesser treasury not only in overall state income but also more specifically in revenue from the Shandong region calls for skepticism, as does the schematic division of tax income into one-half civilian salaries and one-half savings and especially the absence of military spending, which must have been considerable at any time. The most sensible solution might be to ignore the *Xinlun* passage as irremediably flawed and rely instead on extrapolation from the Yinwan data.

In theory, it should be possible to check the latter against an estimate of probable income based on reported tax rates. In practice, however, this approach is fraught with difficulties, especially since nominal tax rates cannot simply be taken to reflect effective tax rates: the latter might fall short of the former by a wide margin. Bearing this in mind, we proceed with a deceptively simple question: in the late Western Han period, how much tax revenue would close to 60 million subjects have generated in a given year? Liabilities concerning the poll tax are relatively easy to estimate.¹³ Near the end of the Western Han period, the annual poll tax would have stood at somewhere from 80 to 120 cash for each adult aged 15 to 56. In an ancient society, some 55 to 60 percent of the population would have fallen in this age range. Consequently, some 34 million adult taxpayers would have owed between 2.7 and 4.1 billion cash, disregarding higher rates for merchants and slaves who would not have made up more than a small fraction of the population. Children aged 7 to 15 owed 23 cash per year, for a total of 200 million or so. Total liabilities would have been in excess of 3 billion and probably between 4 and 5 billion cash.¹⁴

¹¹ Cf. a reported breakdown of Tang revenues in the mid-eighth century CE, according to which two-thirds of cash revenues and seven-eighths of grain revenues were expended in the provinces (Twitchett 1963: 156; see below, n.***). The Yinwan data would allow a broadly comparable reconstruction.

¹² For the possibility of higher-than-average state income in Donghai, see below, ***.

¹³ For this and the following taxes, see Nishijima 1986: 595-601. See also Lewis forthcoming.

¹⁴ Loewe 2010: 318-9 reports a recently discovered tally in official documents for what looks like Dongyang county in Jiangsu, which refers to poll tax registration of almost precisely 20,000 individuals (and some 2,000 exemptions) in a population of some 41,000 people. The implied percentages of 49 to 54 percent (depending on whether exemptions are part of the tally or separate) are consistent with the relative share of those aged 15 to 56 in a population with a very low life expectancy at birth (say, 20 years with modest growth, or somewhat higher life

The expected income from the land tax of one-thirtieth of the harvest depends on average yields. If we treat the aggregate output of the 827 *mou* of cultivated land as equivalent to grain fields and assume an average yield of 1.5 *hu* per *mou* (or 650 liters per hectare) and local prices of 50 to 75 cash per *hu*, we obtain a tax share of approximately 40 million *hu* or 2 to 3 billion in cash.

If property taxes had still existed in this period, they would have had the potential to add greatly to this tally. Instituted under Wudi to fund his massive campaigns against the Xiongnu, a rate of perhaps 1.2 percent on all property and higher rates for merchants could easily have translated to several billion cash per year. For instance, if a hypothetical farming family of five owned land, housing, and equipment worth 20,000 cash, the asset of the working population alone would have been sufficient to bring in close to 3 billion cash. Elevated upper-class liabilities would have added considerably to this burden. However, as Mark Lewis has pointed out, there is no evidence for the survival of this tax after Wudi and it may therefore be best to assume that it was no longer current.¹⁵ In any case, the reported tax rates would have represented a very heavy burden: 1.2 percent of assets would have equaled a much higher share of the harvest than one-thirtieth, and a rate of 5 percent for the rich would have approached likely total returns on investment on capital. Such rates seem effectively unsustainable in the long term and were in any case unnecessary once Wudi's war efforts had ceased.

Commutation taxes, which may have been important as conscription declined in the late Western Han period, can be expected to have contributed further revenue. Adult men may have paid 3 cash per year, for an annual total of a mere 50 million, but actual levies may have been much higher. Each year, some 500,000 men were theoretically liable to serve in the army for one year, and the buy-out fee may have been as high as 300 cash per month. Revenue from this source may have reached hundreds of millions.

Other sources of revenue are even more difficult to quantify. The annual gold offerings of fiefholders appear to have been comparatively modest. We have no idea of the scale of income from the salt and iron monopolies, although given their prominence in the record it may well have been considerable, as would have been revenue derived from imperial estates.¹⁶

Very broadly speaking, these estimates point to projected state revenue of the order of maybe 7 to 10 billion cash per year, or significantly more only if some forms of property taxes were still on the books. This result, however tenuous, is very roughly compatible with the Yinwan data, especially as the hypothetical total of 12 billion extrapolated from the latter might well be too high.¹⁷ This, in turn, would suggest relatively high rates of taxpayer compliance, in

expectancy if adult mortality was higher than in standard models), implying a high degree of taxpayer capture at least within the registered population.

¹⁵ Lewis forthcoming.

¹⁶ Nishijima 1986: 602-7. On the institution, e.g., Wagner 2001. Precious metal mining was far less significant in ancient China than in the Roman empire: Golas 1999: 109-36; Scheidel 2009c: 179-80.

¹⁷ Since Donghai reportedly accounted for one-fourth of all Han subjects but one-twenty-seventh of all cultivated land, extrapolated overall state revenue should perhaps be put at closer to 27 times than to 40 times the commandery tally, for a total of closer to 8 billion than to 12 billion cash, or more if domain income was concentrated in the Guanzhong region. Moreover, income from the salt monopoly may have been disproportionately important, as Shandong has long been established as a center of the industry and Donghai bordered on the sea. If, as in later periods of Chinese history (cf., e.g., Huang 1974: 193 for Ming), wholesalers obtained salt directly from the salt fields, considerable income could have accrued to the commandery. 3 of the 34 known salt agencies of the empire were located in Donghai, in addition to 2 of 48 iron agencies (Loewe 2004: 64-70). (In later periods, however, the northern coast of Shandong was more important: cf. Chiang 1975: 94 fig.1).

that actual revenue was not merely a modest fraction of expected revenue but relatively close to projected liabilities.

The main alternative to this reading is to assume that monopoly and domain income was much more important than direct taxes and thereby offset massive underperformance regarding the latter.¹⁸ At least as far as monopoly income is concerned, this does not seem plausible given the (admittedly short-lived) experiment with abolishing the monopolies from 44 to 41 BCE. At the same time, domain income remains impervious to computation. Although the high quality of census registration in the late Western Han period would presumably have facilitated collection of direct taxes, it does not by itself document strong taxpayer compliance because similarly good census coverage under the Tang coincided with high rates of tax evasion.¹⁹ Even so, the notion that direct taxation, though not nearly as well supported as we might wish it to be, was the mainstay of the system is consistent with local data.²⁰ The logical corollary of relatively strong compliance raises intriguing comparative questions to which I will return at the end.

Roman revenue

In contrast to the Han empire, Roman state finances are usually approached from the expenditure side, by reconstructing the scale of overall outlays (and thus revenues) from estimates regarding their constituent elements.²¹ After exploring the potential of this perspective, I hope to show that more direct conjectures about revenue that have not previously been attempted in a systematic way likewise hold considerable promise. I focus on the first two centuries of the imperial monarchy, a period of stability between the civil wars of the first century BCE and the dislocations of the third century CE.²² The best information on spending is available for the military. For the second century CE, Richard Duncan-Jones estimates army salaries of 600 million sesterces or up to 700 million including discharge bonuses in the second century CE, while Reinhard Wolters arrives at 535 million.²³ These totals need to be adjusted for two countervailing factors. On the one hand, troops may well have been significantly understrength at least in peacetime (which would have reduced actual costs); on the other, non-salary costs on items such as animals and materials, which are not included in existing estimates

¹⁸ A third option, that both direct taxes and monopolies and domains generated very high incomes, is implausible in terms of what we know about state demands, discussed below. For estimates of total state revenue of closer to 20 billion cash see however Yü 1967: 62-3 (whose calculations are worthless) and Chang 2007a: 85-6 with 355-6 n.54 (generally a maximizing account).

¹⁹ Twitchett 1967: 34.

²⁰ The notion of strong compliance meshes well with the high rate of taxpayer capture indicated in the Dongyang texts (above, n.***). Reported income in Donghai was so high that it is difficult to imagine how it could have been achieved in the face of widespread evasion of direct taxes. Thus, even with perfect compliance a population of 1.4 million would not have generated more than 100 million in poll taxes, or a bit more if higher rates for some groups are included. Land tax income is harder to estimate but at 1.5 *hu/mou*, a 3.33 percent tax would have yielded 1.6 million *hu*, or the reported 500,000 *hu* plus 50-75 million cash. But yields may have been lower: at 100 *hu* for a household of four, total tax would drop by a quarter. (For the logical implications of these figures for levels of monetization and tributary integration, see below, ***) Another 100 million cash or so in revenue from other sources would be required to reach the reported total: as noted above (n.***), salt monopoly revenues may have made a substantial contribution.

²¹ The situation for the late Roman empire is different; see below, ***.

²² For calculations concerning the Republican period, see, e.g., Frank 1933: 141, 145, 228, 230; Knapowski 1961; 1967.

²³ Duncan-Jones 1994: 33-7; Wolters 1999: 211-8, 223. Cf. also Rathbone 2007: 174 (680m as “theoretical total”).

(and would have raised costs), also need to be taken into account.²⁴ We cannot be sure to what extent these two variables would have canceled each other out. Given that the military itself engaged in production and construction, routine non-salary costs need not have amounted to more than a small fraction of salary costs. By contrast, military campaigns are known to have increased outlays and should be factored into long-term averages.

Civilian expenditure is thought to have accounted for a smaller slice of the pie. Duncan-Jones estimates 75 million sesterces for administrators' compensation, 40 to 50 million for handouts to the metropolitan population and military units, 20 to 60 million for construction, and 50 to 100 million for other items such as the imperial court, gifts and subsidies. This yields a total of between 190 and 280 million sesterces in non-military spending, compared to 265 million according to Wolters, the same order of magnitude. This results in annual expenditure totals of roughly 800 million or between 800 and 1,000 million sesterces.²⁵ This overlap between recent estimates provides a measure of comfort. However, while it would seem impossible to compute greatly different outlays for the military, state agents, and cash handouts, items such as civilian construction and discretionary spending are more difficult to quantify.

It is sometimes suggested that state investment in infrastructure was very considerable.²⁶ The critical question is: how much larger could such outlays have been? While Duncan-Jones's guesstimate of 20 to 60 million lacks a solid foundation, it would be hard to envision expenditure that was dramatically – say, by an order of magnitude – higher.²⁷ Our imagination is constrained by the observation that annual spending in the hundreds rather than tens of millions sesterces would have produced much more infrastructure than we can readily account for. Thus, at one-half of estimated military spending, 300 or 350 million sesterces spent on construction would have been enough to fund the equivalent of the gilding of the roof of the Temple of the Capitoline Triad or the construction of two major metropolitan aqueducts or several Baths of Caracalla or ten Basilicae Aemiliae or dozens of provincial theaters or aqueducts every year, or to build or replace the entire principal road network of the Roman empire once every generation.²⁸ Even with optimistic assumptions about the scale of state-sponsored provincial

²⁴ On understrength, see now Bang in press; on non-salary costs (especially related to animals), Herz 2007: 314-9. On variation between peace and campaigns, Rathbone 2007: 174-5.

²⁵ Duncan-Jones 1994: 37-46 (800 million to 1 billion); Wolters 1999: 218-223 (800 million). Frank's 1940: 51-4 guess of 1.2 to 1.5 billion under the Flavians owes too much to literal readings of rhetorical passages to bear any weight. Rathbone 2007: 175 fails to offer any support for his guess that military outlays accounted for less than half of the imperial budget.

²⁶ Wilson 2009: 81.

²⁷ Duncan-Jones 1994: 42 (up to three times the cost of gilding the Capitoline Jupiter temple by Domitian, annualized across his reign).

²⁸ Plutarch, *Publicola* 15.3 (temple); Pliny the Elder, *Natural History* 36.122 (aqueducts; cf. Frontinus, *On Aqueducts* 7.4); DeLaine 1997: 219-20 (baths); Plutarch, *Caesar* 29.3 and Appian, *Civil Wars* 2.26 (basilica); Pliny the Younger, *Letters* 10.39.1; Philostratus, *Lives of the Sophists* 2.548 (provinces); Duncan-Jones 1982: 124-5 (roads). This survey expands on my comments in Scheidel 2009b: 62 n.67. Thornton and Thornton 1989: 135-9 compute imperial construction projects under the Julio-Claudians as 57,506 work units, or 4.3 times those for the two aqueducts that cost 350 million, for a total of 1.5 billion sesterces or 16 million per year. Even allowing for the extraordinary shakiness of the whole exercise, and expanding massively to account for pricey building materials for some types of structures, this provides at least a sense of likely order of magnitude. They also (141-4) estimate that the draining of the Fucine Lake, a major project under Claudius, could not have engaged more than 3,000 workers at a time rather than the 30,000 claimed by Suetonius, *Claudius* 20.1 (a classic symbolic figure: Scheidel 1996). If we reckon very generously with a daily wage of 6 sesterces and 300 annual work days and allow for other expenses equivalent to labor costs, this project might have cost 10 million sesterces per year. The entire *alimenta* scheme in Italy could not have cost more than a few 100 million even if coverage was complete; its establishment appears to

construction projects – which would have had to absorb most of this spending – this seems far too generous to be plausible.²⁹ A related outlay, disaster relief, is very sporadically attested at the level of 4 to 10 million sesterces per event, but only the capital itself could expect to command much higher subsidies.³⁰

Gifts to the ruler's entourage may have been quite substantial: Nero's gifts were said to average more than 150 million per year, but outlays on that scale – even if not rhetorically inflated – counted as exceptional and some recirculation of such benefactions occurred (see below).³¹ Long-term mean annual spending on gifts would therefore most likely have remained in the eight-figure range. The grain dole in the city of Rome is often excluded from calculations of state spending but was certainly part of it. At 60 *modii* of grain (c.400kg) per year for perhaps 200,000 recipients, the state would have furnished 12 million *modii* per year. Value at source may have been in the low tens of millions but by the time the grain was distributed in the capital its value might have risen into high eight figures.³² This makes it difficult to price this item but if we take account of transportation and storage costs, which also had to be borne by the state, an effective annual cost of well in excess of 50 million sesterces seems plausible. In the third century CE, provisions of oil, wine and meat were added and grain was replaced by bread, raising costs further.

Games and the imperial court also made demands on public resources, but neither of them must be overrated. State grants to the organizers of major games in the capital ran in the hundreds of thousands rather than millions; satirical references to the cost of games, for what they are worth, fall in the same range; and the same is true of high-end gladiatorial shows in the provinces. The highest tally reported for a single occasion, 2 million sesterces, is ascribed to Hadrian before he became emperor. Military forces were involved in the capture of exotic animals, helping contain net cost. Most of the games in the empire were underwritten by local elites, and even in Rome itself senior office-holders were expected to contribute at what was perceived to be considerable personal expense.³³ Extravaganzas such as Trajan's 123-day shows in 107 CE were the exception, not the norm. It therefore seems unlikely that all state-sponsored public entertainment generated costs of more than in the low eight figures per year.

have been spread out over a number of years and the payout was less generous than in some private schemes (Duncan-Jones 1982: 302-3, 317-8).

²⁹ That said, a comprehensive survey of imperial building activity in the provinces would be of great help in addressing this question (cf. now also Dey 2011: 830). While the most detailed study, Boatwright 2002, does document expansive investment under Hadrian, we are left wondering how typical this was. More importantly, even this rich evidence is perfectly compatible with my estimates. Her list of "architectural and architectural donations" to provincial cities (109-11) refers to some 70 projects ranging from aqueducts to tombs. If we rather generously assigned an average net cost (to the treasury) of 3 million sesterces to each of them – with some costing more and others, such as tombs, (much?) less – and furthermore guessed that only one-tenth of actual projects are actually known (a guess that would logically predict donations to over 600 cities or one-third of all cities in the empire!), we would end up with a grand total of maybe 2.5 or 3 billion sesterces including grander projects in Rome and Athens and a number of new city foundations, or 120 to 140 million per reign-year, consistent with my upper-end estimate of 100 to 150 million sesterces per year for construction (see below). For the nature of public building in the third century CE, see now Rambaldi 2009, with Dey 2011 (showing an emphasis on fortifications, but without any evidence for how these projects were funded – state involvement cannot automatically be construed as full state funding). MacMullen 1959 draws attention to the contribution of military labor to imperial construction projects, which would have reduced net expenses.

³⁰ Duncan-Jones 1994: 18.

³¹ Duncan-Jones 1994: 43; for gifts in general, see Millar 1977: 135-9, and cf. 491-506.

³² Rickman 1980: 120-97; Scheidel 2010: 444.

³³ Talbert 1984: 59-63; Hopkins and Beard 2005: 91.

The costs of running the court may well have been considerable but any conjectures must be advanced in the context of our estimates for other types of discretionary spending, and should therefore also be put in the tens rather than hundreds of millions.

All in all, a conservative estimate might envision less than 600 million sesterces in annual military spending, 120 million in salaries and handouts, and perhaps 250 million in all other combined expenses, for a total of a little under 1 billion. A high-end guesstimate would assign 700 million to the military, 200 million to salaries, handouts, and the dole, 100 or 150 million to construction, and another 100 or 150 million to other discretionary spending, for a total of 1.1 or 1.2 billion sesterces.

This reconstruction is reinforced by consideration of the savings supposedly realized by emperors who did not engage in massive building projects in the capital: both Tiberius and Antoninus Pius are credited with saving around 100 million per year.³⁴ If this was the margin of savings for rulers who neither engaged in expensive military operations nor in massive metropolitan building projects, it is difficult to see how civilian discretionary spending, and resultant spending flexibility, could have been vastly greater than posited in the above estimates. It also deserves notice that the costs associated with rebuilding of Rome after the fire of 65 CE triggered coin debasement, another indicator of limited slack in the system. All this suggests that income did not normally greatly exceed expenditure, which means that my estimate of expenditure of around a billion sesterces per year may serve as a rough proxy of aggregate revenue, at least for the period of relative stability up to the late second century CE.³⁵

This, in turn, allows us to explore the distribution of state revenue, especially the balance between direct taxes or tribute (on assets and persons) and other sources of income.³⁶ Collection regimes were heterogeneous, and some communities enjoyed immunity from tribute, most notably Italy as a whole. For various provinces, direct taxes in the form of tribute are reported at levels from one-seventh to one-fifth of farm output, in kind or in cash and assessed based on the size and type of land. An annual tax of one percent of assessed value is reported for Syria and Cilicia, which assuming at a net yield on capital of 5 to 6 percent would equal a tax of one-sixth to one-fifth on net income. Lower rates in the form of tithes are known for various areas in the late Republican period, although their continuation under the monarchy is uncertain.³⁷ It is only in Egypt that we have more precise information. Tax on private grain land seems to have been

³⁴ Suetonius, *Caligula* 37.3; Dio 74.8.3. I hasten to add that these figures in both cases derive from a total of 2.7 billion, a highly stylized (= 3x3x300 million, Scheidel 1996), but here I am merely interested in orders of magnitude.

³⁵ This estimate is likewise very broadly consistent with what little we can say about Roman state revenue in the sixth century CE: prior to the conquests of Justinian, total income from an area which four centuries earlier may have contained a little over one-third of the imperial population (Scheidel 2007b: 48) may have been of the order of 5 million *solidi* or 1.3 million tons of wheat equivalent (conjectured from the data in Jones 1964: 463-4, using official gold/grain commutation rates), close to one-half of a second-century CE revenue total of <1 to 1.2 billion sesterces or 2.5 to 3 million tons of wheat equivalent. Assuming somewhat higher economic development in the eastern Mediterranean and fairly inflexible effective (as opposed to nominal) tax rates, this apparent (if admittedly very shaky) convergence provides a measure of comfort.

³⁶ For taxes in the early monarchy, see, e.g., Neesen 1980, with Brunt 1981; Rathbone 1996. On the later empire, Jones 1964: 411-69; Bransbourg 2010.

³⁷ Hyginus 205L, with Neesen 1980: 44-8; Duncan-Jones 1990: 187-90.

around one-eighth or one-tenth of output but higher (30 to 40 percent) for public land. Poll taxes varied considerably depending on location and status.³⁸

In the most general terms, these nominal liabilities translate to very large overall revenue. Even if agrarian production is put at not more than half of GDP, a 10 percent tax rate would yield at least three-quarters of a billion sesterces, or 60 to 80 percent of total state expenditure.³⁹ Overall rates of 15 or 20 percent would yield correspondingly more. The contrast to land taxes in China, at one-thirtieth of output as noted above, is striking.

The notion that direct taxation did in fact generate revenue on this scale conflicts with the great importance of other sources of state income. Indirect taxes include internal tolls (*portoria*, at rates of 2, 2.5, and 5 percent) and border tolls (of 25 percent in the East), as well as a more obscure toll for the city of Rome itself.⁴⁰ The fiscal contribution of the internal tolls was probably relatively modest: for domestic *portoria* to generate 100 million sesterces in revenue, between 2 and 5 billion sesterces' worth of goods had to be traded inter-regionally every year, or 10 to 25 percent of total GDP, a high rate in an agrarian economy where much output was either consumed domestically or traded locally. The import toll held greater promise: a single ship laden with goods from India carried cargo assessed at some 7 million sesterces including a tax of 1.4 million.⁴¹ How many ships like this would have entered the empire in a year? Our imagination is constrained in the first instance by the likely size of the markets for these luxury items. According to my own rough projection, some 30 percent of GDP may have been available as disposable income that could have been used to acquire goods such as these, creating a potential market of up to 6 billion sesterces.⁴² If one-tenth of this income had been spent on imports from Arabia and India, this demand would have supported 85 shiploads worth 7 million each; at one-quarter, over 200. This is an exceedingly crude exercise but one that shows that we cannot easily reckon with many hundreds of ships because the overall market, however substantial, was limited.⁴³

Even so, 100 ships could have produced some 140 million sesterces in revenue even before internal tolls are taken into account, and an even higher total cannot be ruled out. Overall

³⁸ Duncan-Jones 1990: 47-55 for a quick and deliberately (over)schematic survey. If, but only if, public land amounted to around one-third of all farm land, the overall tax rate would have been of the order of 20+ percent (ibid. 48). For the shift to private land in the Roman period see now Monson 2012.

³⁹ For a Roman imperial GDP size of close to 20 billion sesterces, see Scheidel and Friesen 2009: 74. The share of subsistence income in GDP was probably more than 50 percent, most of which would have been agrarian output: ibid. 89. My calculation in the text is based on a GDP of 18 billion and a tax immunity rate of 15 percent, mostly in Italy.

⁴⁰ Duncan-Jones 1990: 194-5; and De Laet 1949: 345-50 for the *octroi* of Rome.

⁴¹ E.g., Rathbone 2001 (on *P. Vindob.* G 40822).

⁴² Scheidel and Friesen 2009: 89. On the market for these goods, see most recently McLaughlin 2010: 141-55.

⁴³ Modern speculations tend to range from high to extravagant. Rathbone 2001: 48-9 thinks the value of the Indian Ocean trade could have reached 1.4 billion sesterces while McLaughlin 2010: 164 estimates trade at 1.2 billion and toll income at 300 million; both come close to my '25 percent scenario.' Sidebotham's 2011: 218 "probably minimum" (!) conjecture of close to 18 billion in trade volume per year equals the entire GDP of the Roman empire and highlights the need to contextualize our guesses in order to curtail fantasies. (At the opposite end of the spectrum, Young 2001: 210 misuses Pliny the Elder, *Natural History* 12.41 to conjecture toll revenue in the mere tens of millions.) If we blithely took the one attested shipload as the default, the 120 ships involved in the Indian Ocean trade mentioned by Strabo 2.5.12 would have brought in 840 million worth of imports or 14 percent of disposable income (and some 170 million in toll income not counting tax on capital outflows and minor tolls on the same imports, for which see Young 2001: 209), perhaps a more plausible guess but equally shaky given the relatively early date of his statement and most importantly our ignorance about mean load values.

toll revenue from all sources of over 100 million seems highly likely and a total of up to 200 million need not be unrealistic.

The yield of an inheritance tax of 5 percent imposed on Roman citizens is impossible to quantify due to various exemptions for relatives and other groups of beneficiaries.⁴⁴ The official version that the tax was meant to fund veteran bonuses is not particularly enlightening because we do not know how well this link worked in practice and which veterans received bonuses. Demand may have ranged from 40 to 100 million per year, and a tax yield in low eight figures is not implausible.⁴⁵

Slaves were taxed at 4 percent at sale and 5 percent at manumission.⁴⁶ If there were 7 million slaves worth 1,000 sesterces each and 5 percent of them changed hands every year, this would have yielded 14 million sesterces; at higher turnover rate and/or a (probably more realistic) higher mean price, revenue could have been in the tens of millions.⁴⁷ Manumission taxes may have yielded comparable amounts, even though informal manumission practices would have cut into revenue.⁴⁸ I leave aside assorted smaller taxes as well as ad hoc exactions such as the *aurum coronarium*, which probably had little effect on mean revenue. Remarkably, however, the state could claim to have taken in 20 or 30 million sesterces a year merely from a (high) tax on the sale of gladiators.⁴⁹ Even if taken *cum grano salis*, this claim (meant to emphasize the generosity expressed by this tax's abolition) suggests that seemingly marginal levies had the potential to add significantly to income (in this case, if true, maybe 2 percent of total state revenue).

Additional revenue accrued from mineral extraction and imperial domains. Precious metal mines in particular reportedly yielded great profit. Gold mines in northern Spain were said to produce 20,000 pounds, or 6.5 tons (equivalent to 88 million sesterces) and a mine in Bosnia produced 50 pounds per day, or 5.9 tons (80 million sesterces) per year. In the second century CE Dacia also contributed on an unknown but presumably similarly substantial scale. Silver mines in Spain, which had generated 300 pounds of silver per day (35.4 tons or 44 million sesterces) in the third century BCE, were still being exploited in the first century CE, albeit with unknown results. Just these three figures combined would produce an annual total of over 200 million sesterces.⁵⁰ Unfortunately, we cannot tell whether such tallies accurately reflect conditions under the empire and, more importantly, if they are meant to represent total output or the state's share: the latter seems plausible but is not certain.⁵¹ To this we may add lesser mines,

⁴⁴ Günther 2008: 23-94.

⁴⁵ If in the second century CE Romans represented, say, 20-25 percent of the empire's population and owned a third or half of all assets and assets were worth 10 times GDP and annual turnover was 3-4 percent and taxable legacies equaled one-quarter of all estates, liabilities would have been 25 to 50 million sesterces per year and actual yield presumably less. Despite the many "ands" required for my conjecture, this at least suggests that the tax could in principle have made a significant contribution to legionary discharge bonuses. Historians who disapprove of such numbers games may prefer to take Caracalla's interest in this tax seriously (Dio 77.9.4), for the same result.

⁴⁶ Günther 2008: 95-126, 149-54.

⁴⁷ On the number of slaves, Scheidel 2011b: 292 (10 percent of the total population?); on slave prices, Scheidel 2005.

⁴⁸ On possible manumission rates, cf. Scheidel 1997: 160-6.

⁴⁹ According to the *Senatus Consultum de pretiis gladiatoribus minuendis* of 177 CE: see most recently Carter 2003.

⁵⁰ Pliny the Elder, *Natural History* 33.67, 33.78, 33.97; Edmondson 1989: 88-9; Harl 1996: 81-2 (who misrepresents the evidence).

⁵¹ Edmondson 1989: 88 and Harl 1996: 81 consider two of these tallies to be state revenue.

marble quarries, and so forth.⁵² This means that mineral wealth alone might have covered a sizeable share of total expenditure, perhaps anywhere from a tenth to a quarter.⁵³ Domain income was a function of the size of imperial holdings, which is unknown but presumably kept expanding and arguably amounted to a multiple of the estates of the richest private individuals, which are said to have reached low nine figures. If valued at a billion or two, imperial estates could have produced 50 or 100 million sesterces in annual net revenue.⁵⁴

A final category, legacies to the emperor, may have offset gifts, and in fact may often have been intended to do so. The experience of Augustus, who claimed to have received 1.4 billion sesterces in legacies over 20 years, indicates that this was by no means a trivial source of income.⁵⁵ The incidence of confiscations fluctuated over time but at least periodically may have been of genuine fiscal significance.⁵⁶ A long-term average in the high eight figures for both categories combined seems a distinct possibility.

All this adds up to an intriguing picture. The margins of error are considerable, and in many cases enforcement problems and graft were bound to take their toll, but it seems unlikely that all these estimates are consistently wide of the mark and greatly overstate actual revenue: in particular, what appear to have been the biggest revenue streams – from import tolls, mining, and domain income – would have been relatively easy to control by the state. If we tally up these estimates we arrive at a total in the hundreds of millions. In view of the above survey, it seems difficult to me to assume a net total of much less than half a billion sesterces, and the actual figure could have been even higher.⁵⁷

At half a billion, these sources of income would have covered half or close to half of state spending. This is striking because in theory, direct taxes, had they reached the central government to the extent to which they were nominally due, would already have covered all required expenditure all by themselves. There are several ways to explain this discrepancy. (1) Overall state spending might have been higher. However, in order to make a real difference, it would have had to be dramatically higher than estimated above, which is inconsistent with what we know about outcomes.⁵⁸ (2) Indirect taxes and mining and domain income totaled only a

⁵² The gold mines of the Rio Duerno alone, not included in the above counts, are estimated to have produced 3 tons of gold (or 40 million sesterces) per year for a period of 130 years (Domergue and Hérail 1978: 278). For the organization of mining and quarrying, see now Hirt 2010. Mining yields declined in late antiquity: e.g., Edmondson 1989.

⁵³ Say, 100 million sesterces if the reported figures represent a ceiling and a 50 percent state share (as in the Roman mining ordinances of Vipasca); 250 million or more if the sources specify state revenue and empire-wide output was higher than in these samples (cf. the previous note). In this context, it merits attention that even a single lead mine could generate between 200,000 and 400,000 sesterces of revenue for the state (Pliny the Elder, *Natural History* 34.165).

⁵⁴ Duncan-Jones 1982: 132-3 (returns), 343-4 (fortunes). On domains, see Millar 1977: 175-89.

⁵⁵ Suetonius, *Augustus* 101. See Millar 1977: 153-8 for emperors' inheritances.

⁵⁶ Millar 1977: 163-74. Burgers 1993: 65 observes that the 35 senators and 321 knights reportedly executed by Claudius might well have generated revenue in excess of 800 million sesterces (or 60 million per year).

⁵⁷ Using tallies of 100 to 200 million for tolls, 25 to 50 million for estate taxes, 40 to 60 million for slave-related taxes, 100 to 250 million for mining and quarrying, 100 to 200 million for domains, 50 to 100 million for inheritances and expropriations, and disregarding minor levies, for a total of at least 400 million and possibly as much as 800 million sesterces per year. The computational mean of 600 million would allow for 20 percent loss to graft and still yield half a billion net.

⁵⁸ An annual total of 2 billion sesterces in state spending and saving would have absorbed 400 to 800 million in indirect taxes and domain income and 1.2 to 1.6 billion of direct taxes, the latter equivalent to around 15 percent of one-half of GDP. This scenario would require additional spending equivalent to that of the entire Roman army, for which there is no plausible outlet. (Provincial construction seems the only even theoretically conceivable candidate,

small fraction of the estimated amounts, which is once again incompatible with the record, the significance assigned to them by the state, and the small amount of effort required to capture most of these dues. (3) This leaves a final option, which is that only a relatively modest proportion of all direct taxes that were nominally due were actually collected or reached the central government. Amnesties such as Hadrian's celebrated remission of supposedly 900 million sesterces in back taxes may merely have been the tip of an iceberg of foregone state income resulting from concealment of taxable assets, failure to pay, and rent-seeking behavior by agents.⁵⁹

Distributional comparisons

Sources of revenue

How do Roman state finances in the second century CE compare to Han finances in the first century BCE? Roman revenue of between 1 and 1.3 billion sesterces translates to around 2.6 to 3.5 million tons of wheat equivalent whereas Han revenues of 10 to 12 billion cash equal 2.1 to 3.7 million tons of wheat equivalent.⁶⁰ Adjusted for population (putting Han China's at 60 million and Rome's at 70 million), annual per capita revenue stood at 37 to 50 kilograms in the Roman empire and 35 to 62 kilograms in the Han empire, effectively the same rates. This is not surprising given that economic development must have been very broadly similar in both environments. Although Roman GDP might well have been somewhat higher in capita terms, the Han state share of GDP was not constrained by municipal taxes as it was in the Rome world.⁶¹ In any case the margins of uncertainty are so wide that neither one of these factors would make a

for which see above, notes ***) This implies that effective income from direct taxes had to fall short of nominal rates.

⁵⁹ Dio 69.8.1 (118 CE) (though probably merely yet another symbolic figure, cf. Scheidel 1996), and see MacMullen 1987: 739-42, 749, 750, 752; Duncan-Jones 1994: 60 for further remissions and temporary tax relief throughout the empire. This meshes with documentary evidence of substantial tax arrears (MacMullen *ibid.* 740, 753). Local elites, who would have held much of the taxable wealth, appear to have been crucial in assessing assets, with unsurprising consequences for net state income. For the grand bargain between military dictatorship and local elites, see below, in the final section.

⁶⁰ Using 2.5 sesterces per *modius* or 2.6-2.7 kilograms of wheat per sestertius (Scheidel and Friesen 2009: 73-4) and 50-75 cash per *hu* or 0.21-0.31 kilograms per cash. For Roman revenue, see above, adding 100 million in savings to the high-end spending estimate to create a maximum of 1.3 billion in revenue. In the Han case, savings also have to be taken into account (see above, n. ***) but since the estimate is built from income this would not affect the overall total.

⁶¹ Cf. Morris 2010: 281 for slightly higher social development in Rome than in Han China. The Roman case resembles the more developed Song period (*ibid.* 332). My Roman state revenue estimate approximates 5 to 7 percent of GDP (coincidentally the same rate as for Hopkins's 2002 [1995/6]: 201 somewhat lower revenue and GDP estimates). Zuiderhoek 2009: 37-52 conjectures municipal income of the order of 3 percent of GDP, for a total public sector share of 8 to 10 percent (to which we would need to add a further margin for spoiled tax in kind and any revenue collected but not passed on to the central authorities, plus the value of compulsory services, for a total public sector share somewhat in excess of 10 percent). Cf. Lewis forthcoming for a guesstimate of a 10 percent tax take from Han peasant output.

real difference here. Moreover, in both cases, compulsory labor services are not included in the estimates, despite their undoubted significance.⁶²

This fundamental similarity conceals considerable differences in the distribution of both revenue and expenditure.⁶³ In the case of the Han empire the evidence does not allow us to be certain that direct taxation was of paramount importance, at least in the Western Han period before evasion by local elites undermined the system, as it did under the Eastern Han; but the general assumption appears probable. In the case of the Roman empire during the first few centuries of the monarchy, the evidence is less poor and on balance supports a model of considerable reliance on income from sources other than tribute. If this impression is indeed correct, it suggests that the Roman authorities chose the path of least resistance by focusing on revenue sources that were easily controlled: imperial domains; mines and quarries; customs dues that targeted the wealthy (who sustained demand for exotic imports and inter-regionally traded goods); and taxes that had the same effect in homing in on upper-class legacies (however constrained by traditional emphasis on close kin⁶⁴) and the market in slaves. All these arrangements had the net effect of capturing surplus at lower unit costs and with less friction than those involved in the pursuit of tribute.⁶⁵

As I argue elsewhere, this arrangement is best understood as a key element of a – tacit but no less effective – grand bargain between state rulers and local elites that gave the latter ample leeway in protecting their own interests and skimming off surplus at the local level but nevertheless generated sufficient revenue to support a bloated military, rulers' senior associates, and the metropolitan populace, the three major constituencies of the winning coalition of the Caesarean-Augustan system of ostensibly civilianized military dictatorship. It was only when income from some sources contracted just as demand for revenue rose that rulers sought to renegotiate these arrangements by putting greater pressure on fixed assets, albeit without much success in the long run.⁶⁶

⁶² Han: e.g., Nishijima 1986: 599 (corvée); Barbieri-Low 2007: 212-56 (corvée and convict labor). Rome: e.g., Millar 1984 (convict labor); Scheidel 1991: 149-53 (irregular exactions from lower classes); Drecolli 1997 (routine elite liturgies).

⁶³ I skip here the question of the monetization of tax revenue, which is not immediately germane to the present discussion. In Donghai about 90 percent of revenue was monetized (see above, and cf. Scheidel 2009c: 204 n.310). The debate concerning Rome continues (e.g., Duncan-Jones 1990: 187-98; Hopkins 2002 [1995/6]: 215-8).

⁶⁴ Champlin 1991: 103-31.

⁶⁵ Bang 2008: 214 rightly regards heavy import tolls as an example of opportunistic fiscal parasitism. Roman tax collection was probably also skewed in geographic terms, favoring the western Mediterranean. Egypt, with maybe one-tenth or less of the empire's population, can reasonably be supposed to have produced some 200 million sesterces in direct taxes (cf. Duncan-Jones 1990: 53). Plutarch's (*Pompey* 45) reference to a 70 percent increase in revenues thanks to (limited) Roman expansion in the Levant is telling. We cannot tell how much the western regions of the empire caught up over time, but Italy's immunity from tribute and the concentration of toll income in the East would have ensured massive imbalances for centuries. In view of how the empire eventually unraveled it is tempting to consider the impact of different effective tax rates relevant on the long-term prospects of the western and eastern parts of the empire, next to other features such as overall development, geography, and ecology.

⁶⁶ See Bransbourg and Scheidel in Monson and Scheidel. This is an example of a 'low-tax' or 'secure state' regime that avoids overly intrusive measures, for which see Monson and Scheidel more generally. For the later Roman empire, see Bransbourg ***.

Agency costs

What was state revenue spent on? Leading up to an overall breakdown at the end of this section, I focus first on expenditure on administrative agents and the military, the two most crucial supports of any ‘fiscal skeleton’ and the only areas that allow detailed comparison between the two empires. Formal outlays on state administration are particularly well documented for the early Eastern Han period, several generations later than the evidence for revenue discussed so far.⁶⁷ As there is no compelling reason to assume that either state income or civil service salaries differed dramatically between the first century BCE and the first century CE, for the limited purpose of the present survey data from these two periods will be used side by side. The number of salaried officials and clerks appears to have been similar in both periods: in 5 BCE, the central and provincial administration reportedly employed some 130,000 officials, compared to an estimate of 153,000 for the Eastern Han empire.⁶⁸

The most complete extant salary list, for the year 50 CE, records salary ranks corresponding to monthly compensation from 350 *hu* or 5.5 tons of unhusked grain at the very top to 8 *hu* or 125 kilograms at the very bottom of the pay scale. Total expenditure evidently depended on the relative distribution of pay ranks. A detailed breakdown refers to the staff of the commandery that included the new capital Luoyang and was therefore atypically large. 892 officials are listed, most of them at junior ranks: 262 clerks receiving 192 *hu* (3 tons, equivalent to 19,200 cash at an elevated metropolitan valuation of 100 cash per *hu*) per year, 50 accessory clerks at half as much, and 231 capable junior clerks, presumably at a similar level, plus 230 patrolmen who, if they were paid like soldiers at the frontier (a conjecture unlikely to be wide of the mark), might have received the equivalent of some 8,000 cash (or 1,250 kilograms) per year. It is hard to see how this group, which accounted for 87 percent of the overall staff, could cumulatively have earned more than 10 million cash equivalent (or 1,600 tons of grain) per year, or perhaps close to 15 million (or 2,300 tons) if higher ranks are included. If we extrapolate from these values to 130,000 or 150,000 officials overall, we obtain 350,000 to 400,000 tons of grain equivalent per year, or approximately 1.4 to 2.1 billion a cash.⁶⁹ Metropolitan officials also regularly received gifts, which, if put at 50 percent of base pay, would raise total expenses by only a few hundred million cash.

A check on this estimate is provided by the breakdown for the prefectural staff for Luoyang, comprised of 796 men. Again, most of them were of junior rank, with the highest member commanding 9.5 tons or 60,000 cash equivalent per year and probably more than 700 clerks ranked within a bracket of around 1,250 to 2,000 kilograms or 8,000 to 13,000 cash. The same rough extrapolation as before suggests 250,000 to 300,000 tons in grain equivalent, or between 1 and 1.8 billion in cash equivalent and a couple hundred million more with gifts.

At the prefectural level, heads received between 7.5 and 17 tons (or 24,000 to 81,000 cash equivalent at lower provincial grain prices), depending on the size of their counties, and

⁶⁷ For all the salary data used in the following, unless otherwise noted, see Bielenstein 1980: 125-31.

⁶⁸ Loewe 2004: 70-1. Extrapolating from staffing levels in Donghai Commandery, Loewe estimates that close to 100,000 of the 130,000 officials at the end of the late Western Han period worked outside the capital. An alternative extrapolation that takes account of population numbers suggests a slightly lower total: if that commandery housed 2.5 percent of the population, its 2,200 officials may also have accounted for a similar share of all provincial officials, for a provincial total of closer to 90,000. See also Zhao, in this volume.

⁶⁹ Using a grain valuation of 100 cash per *hu* for one-quarter of officials (see the previous note) and of 50-75 cash per *hu* for the others.

their assistants 5.5 to 9.5 tons (or 18,000 to 45,000 cash).⁷⁰ The provincial leadership consequently earned more than 16,000 tons and less than 32,000 tons (or between 50 million and 150 million) per year in the Eastern Han period (or maybe a third more under the Western Han, controlling for the greater number of prefectures and assuming constant pay, although actual pay may have been lower).

The most highly remunerated officials operated in the center. In the Western Han period, the most senior official, the Chancellor, made 720,000 cash (or 112 tons) per year, while the heads of the 100 or so commanderies made 144,000 cash (22.5 tons) per year.⁷¹ In the Eastern Han period, the Three Excellencies earned 420,000 cash (65.5 tons) per year and perhaps as much again in regular gifts, for a total of 2.5 million for the entire group. The Nine Ministers were entitled to 216,000 cash (33.5 tons) each and perhaps half as much again in gifts, for a total of 3 million. Yet even their immediate subordinates were much more junior. The ministry of agriculture, a key agency, disposed of two assistants (at 108,000 and 64,800 cash) and a staff of 164 that included 16 officials paid 36,000, 20 at 19,200, 9 at 13,200, 25 at 9,600, and no fewer than 75 apprentices, who must have received (even) lower compensation than the ranked officials. Overall, this high-powered agency cannot have absorbed much more than 2 million (310 tons) in base pay or perhaps 3 million (470 tons) including gifts. In this case, excluding the top grandees, extrapolation to 130,000 or 150,000 officials would yield a tally of around 220,000 or 260,000 tons, or 0.9 to 1.4 billion cash equivalent per year (without gifts).

These overlapping extrapolations suggest that the late Western Han state may have spent around 300,000 or at most 400,000 tons a year on officials, equivalent to anywhere from 1.2 to 2.1 billion cash. The higher end of this range reminds us of the claim in the *Xinlun* that 2 billion were spent on the salaries of officials. Whether this is a convincing reason to salvage this particular element of the text is not for me to say.

For much of the Roman empire, during the Republic and for the first three centuries of the monarchy, the civilian state administration was much smaller in size than that of the mature Han empire. Conversely, senior Roman officials were much better remunerated than their Han counterparts. In best Han fashion, Roman equestrian officials were ranked in salary classes, from the *sexagenarius* making 60,000 sesterces or 10,000 to 20,000 *modii* (67-134 tons) in wheat equivalent per year to the *trecenarius* (starting in the late second century CE) with five times as much. A *centenarius* (100,000 sesterces) would be in charge of the finances of a province, a *ducenarius* (200,000 sesterces) in charge of the finances of a major province or serving as the governor of a small province. A *sexagenarius* would oversee the collection of certain taxes, conduct censuses, or manage public works or imperial domains. In terms of function and seniority, the Han equivalent of a Roman *sexagenarius* (at around 100 tons) might be a prefect in charge of the office of salt (or iron), ranked at 600 or 1,000 *shi* (13-17 tons). A *centenarius* (100-200 tons) resembled a commandery assistant at 600 *shi* (13 tons), and a *ducenarius* (200-400 tons) was equivalent to a commandery head at 2,000 *shi* (22 tons). We can see that Roman officials received considerable multiples of the pay due to functionally comparable Han administrators. As a consequence, 136 Roman equestrian officials in 192 CE absorbed some 15.4 million sesterces per year, or 15,000 to 30,000 tons of wheat equivalent.⁷²

Members of the senatorial order who enjoyed stints as governors or legionary commanders appear to have been even more lavishly compensated: Roman notions of

⁷⁰ Bielenstein 1980: 101.

⁷¹ For the latter, see Bielenstein 1980: 93, with 125.

⁷² Duncan-Jones 1994: 37-9 (also for the following paragraph).

hierarchical differentiation called for recognition of the top order of the ruling class, and an isolated reference to 1 million sesterces (1,000-2,000 tons) for a top governorship in the early third century CE supports this intuition. We are reduced to guesswork regarding the finer points of senatorial compensation, but Duncan-Jones plausibly reckons with an annual total of 43.5 million sesterces (45,000-90,000 tons) for a mere 73 senatorial governors and generals. This implies a scenario in which 209 top officials received almost 60 million sesterces per year, which translates to 60,000-120,000 tons of wheat equivalent, corresponding to something like 15 to 40 percent of total Han spending on well over 100,000 officials. Even allowing for some margin of error in the case of Roman senators, it is clear that top officials were dramatically better compensated by the Roman emperor than by his Han counterpart. The reason for this must be sought in the political structure. In imperial Rome, generous pay reflects a long-standing legacy of aristocratic privilege and oligarchic control, deeply rooted in a time when the empire had been set up to a large extent as the personal hunting ground of a smallish set of political, military and religious leaders, and expensively maintained by the endemic insecurities of the new monarchical rulers. Han China, by contrast, rested on the Warring States tradition that had overcome the autonomy of feudal confederates and struggled to create a loyal and dependent class of officials serving the state (see Zhao, in this volume).

At the same time, there can be no doubt that overall the Roman state, at any time of the monarchical regime, spent far less in real terms on civilian administration than the mature Han state. Duncan-Jones's estimate of 75 million sesterces in civilian salary costs translates to 80,000 to 170,000 tons of wheat equivalent, compared to perhaps 300,000 tons or more in China. The 15 million his estimate allows for junior ranks could have supported 6,000 subordinates at twice the legionary base pay.⁷³ Actual numbers might have been smaller but costs higher given that companions of governors also received compensation and imperial freedmen occasionally commanded high salaries.⁷⁴ Yet while we might choose to double or triple outlay for sub-elite officials to bring the total closer to 100 million sesterces, or 100,000 to 200,000 tons of wheat equivalent, we also need to consider constraints arising from the fact that governors were accompanied by deputized soldiers, who were already covered by military budget spending, and that many subordinates were imperial slaves. Moreover, we also need to take account of the costs for Han slaves which are not included in the previous estimates but may very well have been sizeable: a claim of 100,000 or more slaves in government employ, absorbing 500 or 600 million cash (at least 100,000 tons) a year, may well be hyperbole, but at least points to substantial slave use in the public sector.⁷⁵ It is therefore unfeasible to invoke the costs of Roman imperial slaves in order to raise overall outlays closer to Han levels. In the roughest terms, Han spending on civilian administrators was probably not less than twice and possibly as much as three times as high as relevant Roman expenditure.⁷⁶

This overall picture remained unchanged in late antiquity. Detailed salary information for the later Roman empire is not available until the sixth century CE. Despite intervening sweeping

⁷³ Numbers are unknown: cf., e.g., Garnsey and Humfress 2001: 36 (2,000 imperial slaves and freedmen); Kelly 2004: 111 (up to 10,000 slaves and seconded soldiers); Alföldy 2011: 210 (10,000 for the entire imperial administration).

⁷⁴ Note the case of a freedman *proximus* in the central administration in Rome with a salary of 40,000 sesterces (*Corpus Inscriptionum Latinarum* 6.8619), and cf. the imperial slave in charge of revenue from Gaul who was endowed with 15 sub-slaves (*ibid.* 6.5197).

⁷⁵ Wilbur 1943: 174-5, 397-401, on a memorial dated to 44 BCE. The rhetorical character of the passage in question strongly suggests exaggeration. Yet, for what it is worth, the averred cost credibly approximates subsistence income.

⁷⁶ At 100,000 to 200,000 tons in Rome and 300,000 to 400,000 tons (or even more including slaves) in Han.

reorganizations, salaries of senior officials remained high. What must have been a top-paid official, the praetorian prefect of Africa, received 100 pounds of gold per year, close to 2,000 tons at the official commutation rate or maybe half in local real terms, more than the Three Excellencies of Eastern Han earned together. Salaries of governors ranged from 400 to 2,880 gold *solidi* (anywhere from 50 to 770 tons) depending on rank, well ahead of Han governors' salaries.⁷⁷

Junior pay grades are known mostly from Justinian's re-establishment of the praetorian prefecture of Africa in 534 CE. His decree lists a staff of 396 officials for the prefect's office. 70 percent of them were classified at the base pay grade of 9 *solidi* per year, equivalent to a cavalryman's pay or up to 2,400 kilograms of wheat equivalent at official commutation rates. The four most senior officials (the heads of the four *scrinia*, or bureaus) made 46 *solidi* (up to 12 tons) and the 96 others between 11.5 and 23 *solidi* (up to 3 or 6 tons) per year. This resembles the Eastern Han pay grades from accessory clerks to officials ranked at 200 *shi*, such as the assistants to heads of small prefectures. In terms of both pay levels and pay distribution, the make-up of Roman offices broadly resembles that of the Han offices described above.⁷⁸

However, it appears that this document conceals much lower pay averages overall. The 396 officials in the African prefectural office – a very high-level administrative unit – received 4,172 *solidi* per year, or 10.5 *solidi* per capita, and the staff of the corresponding ducal office (managing military affairs) averaged 15.5 *solidi*. Yet reported pay rates for other provincial staff were much lower: in several provincial offices, staff income averaged between 3.6 and 4.5 *solidi*, or around one ton, and even lower averages are attested, such as 1,000 *solidi* for 600 officials in Egypt, likewise under Justinian.⁷⁹

Given these discrepancies, it seems inadvisable to extrapolate from the prefectural data to the (earlier) empire overall. In theory, if 396 officials earned 4,172 *solidi* per year, 30,000 or 35,000 of them could have made some 316,000 to 369,000 *solidi* or 40,000 to 100,000 tons, excluding the most senior ranks. However, if actual mean base pay was lower for provincial staff, overall totals for subordinates would likewise have fallen short even of these fairly modest levels unless palatine pay levels at the imperial centers were sufficiently higher to offset this. If we rather generously add up to 200,000 *solidi* for governors and generals and as much again for top officials, we reach the equivalent of 100,000 to 200,000 tons of wheat equivalent, the same range as a generous estimate for the second century CE and high markedly less than the Han amount of 300,000 tons or more.

This may seem surprising, considering the familiar notion that 'bureaucracy' expanded in the later Roman empire. But while it did so numerically, in terms of staffing, moderate contraction of compensation at the senior level appears to have stabilized overall outlays. Exploiting the corrosion of established aristocratic privilege, the late Roman state cut compensation at the senior level whilst employing tens of thousands of junior officials at often trivial wages. Proto-bureaucratization was achieved by re-allocating resources from symbolic viceroys to lower-level agents who were disproportionately clustered in the main centers of

⁷⁷ Jones 1964: 397-8. Cf. Kelly 2004: 65 (720-1,440 *solidi* per year for governors from 535/6 CE).

⁷⁸ Jones 1964: 590-1, and cf. 598 for average pay at the 9 *solidi* level in an earlier ducal office, and 446 for commutation rates. A strong preponderance of basic pay grades (albeit without salary information) is also found in the office of the *comes sacrarum largitionum* in 384 CE, where 312 of 446 officials, or 70 percent, belonged to junior ranks: Jones 1964: 583-4.

⁷⁹ Jones 1964: 593-4. 599.

power, and by externalizing the cost of civil service by effectively requiring subjects to sustain officials through direct payment for services.⁸⁰

The Roman state thus moved from extravagant compensation at the senior level and relatively small civilian staffs to more moderate senior compensation at the provincial level and larger junior staffs whose funding was in effect largely privatized. The Han system, by contrast, had always curtailed senior incomes and instead furnished a very large number of junior officials with a living wage. As a result, wage compression was and remained much more pronounced in Han China than in Rome. In the sixth century CE, a praetorian prefect, at 100 pounds per year, would receive at least 800 times the nominal basic stipend of an entry-level official of 9 *solidi*, and several thousand times the actual stipends that are attested for this period. By contrast, a top Han official, even with gifts, would only make less than 100 times the stipend of a lowly accessory clerk.

The data gathered in Table 1 demonstrate that senior Roman officials and all members of the Roman military were better paid than their Han counterparts. Existing information enables us to compare official salaries and military stipends at least for select ranks: even allowing for significant margins of error, the observed discrepancies are consistent across different ranks and spheres of employment.⁸¹ In real terms, incomes of top officials were on average ten times higher in the Roman than in the Han empire, with smaller gaps of around five times among more junior ranks.

Table 1: Annual salaries of civilian and military personnel (expressed in metric tons of grain)⁸²

	Rome	Han	Rome multiple (Han = 1)
<i>Top officials</i>			
Chancellor (1 st c. BCE)		110 (+ gifts?)	
Three Excellencies (1 st /2 nd c. CE)		65 (?130 with gifts)	
Consular governor (e. 3 rd c. CE)	1,000-2,000		8-18
Praetorian prefect (6 th c. CE)	1,000-2,000		8-18
<i>Very senior officials</i>			
Nine Ministers (1 st /2 nd c. CE)		35 (?50 with gifts)	
Trecenarian procurator (2 nd c. CE)	335-670		7-14
Ducenarian procurator (2 nd c. CE)	225-450		5-9

⁸⁰ On proto-bureaucratization, see Eich, in this volume. For fee-paying and extortion, see Jones 1964: 399-401, 467-8, 496-9, 591, 605; Kelly 2004: 64-8. Jones 1964: 399 tellingly estimates that the purchase price of a governorship equaled twice the annual salary.

⁸¹ This despite the fact that this survey is biased in favor of Han officials because it includes gifts which may also have existed but cannot be quantified on the Roman side.

⁸² Sources: Jones 1964; Bielenstein 1980; Duncan-Jones 1994: 37-8. The gifts for the Three Excellencies and Nine Ministers are documented. A *centurio* was in charge of 80 men, whereas a company commander (*houshi*) might command some 100 to 200 men (derived from Loewe 1967: I 76). The base pay for Han infantrymen is based on a single adult man: however, family members were also allocated grain (ibid. 93-4), which complicates comparison (especially as they may also have worked for a living).

Provincial governors

Grand Administrator (1 st /2 nd c. CE)		23 (?gifts)	
Prefect of Egypt (6 th c. CE)	320-650		(<)14-28
Centenarian procurator (2 nd c. CE)	110-220		(<)5-10
Governor (5 th c. CE)	50-100		(<)2-4

Regional administrators

Prefect (1 st /2 nd c. CE)		16	
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Junior officials

Accessory clerk (1 st /2 nd c. CE)		1.5	
Scribe (6 th c. CE)	1.2-2.4		0.8-1.6

Military ranks

Company commander (1 st c. BCE)		6-11	
Centurio (2 nd c. CE)	13-27		2-2.5
Garrison infantryman (1 st c. BCE)		0.6-0.7+ (?)	
Legionary infantryman (2 nd c. CE)	1.3-2.7		(<?) 2-5

Wage multiples

Multiple of top official relative to infantryman	200-1,500	200	1-8
Multiple of top official relative to company commander	20-150	10-20	

This overview neglects two confounding variables: the role of irregular compensation and the difference between fiscal and social cost. The Han tradition conveys the impression that very senior officials were the beneficiaries of considerable imperial largesse.⁸³ Thus, a chancellor could be said to receive 10 million cash in gifts, or a Grandee Secretary who supposedly relied only on his salary and gifts was able to leave 5 million cash. Even if these are symbolic figures, they indicate gifts well beyond the standard salaries and annual supplementary allocations at the very top of the hierarchy. However, such benefits may well have been a function of close proximity to the ruler. The main question is to what extent this kind of largesse extended into the less exalted ranks of officialdom that cumulatively accounted for the bulk of pertinent state spending. When a fairly senior official ranked at 800 *shi* (ahead of most officials) received silks, cotton, clothes, wine, meat and fruit from the emperor, we must wonder whether this was part of

⁸³ Collection of data in Ch'ü 1972: 89-94.

the regular allocation (which we can at least crudely quantify) or not. In any case, for the overwhelming majority of officials such gifts would not by themselves create noteworthy wealth.

The main mechanism for providing stable supplementary income to high-ranking officials was ennoblement, which entitled beneficiaries to a hereditary claim to revenue from households that were put under their jurisdiction. Reported tallies ranged from a few hundred to 26,000 households.⁸⁴ Revenue was collected by separate state agents, and fiefholders were entitled to retain 200 cash per year and household.⁸⁵ Between 193 and 241 nobilities were said to exist near the end of the Western Han period. Assuming that the average number of households was in the low thousands, a typical noble would have received several hundred thousand cash per year. At 1,000 to 5,000 households per fief, the state would have lost between 40 million and 200 million cash per year, a small share of total state revenue as estimated above.

At the same time, an annual income even of 200,000 cash (for 1,000 households) exceeds the pay of all but the top dozen Eastern Han state officials. We may conclude that ennoblement created a class of privileged beneficiaries of state largesse not entirely unlike those members of the senatorial class in Rome who received large handouts for occasional public service. However, even in this case, income levels probably still fell short of Roman tallies: a hypothetical chancellor endowed with 10,000 households on top of his salary and gift income would have received some 500 tons of grain equivalent, less than the *base* pay of all or at least some Roman senatorial governors or the most senior late Roman officials.

References to the great wealth of Han officials do not necessarily reflect the scale of official benefits. Several top officials are credited with large fortunes denominated in the tens or even hundreds of millions cash, which put them on a par with stereotypically denominated fortunes of the wealthiest entrepreneurs. Meanwhile, fortunes at the gubernatorial level that were considered noteworthy could range from hundreds of thousands to tens of millions cash.⁸⁶ In such cases, there is no good reason to seek their source primarily in state income rather than in a mixture of existing family wealth and more importantly the unofficial financial benefits of office. The latter is echoed in reports of tremendous wealth amassed by favorites of Roman emperors.⁸⁷

This is not the place to consider the social cost of these administrative systems. One would expect that at all levels considerable income was derived from fees, gifts and bribes solicited from state subjects (and subordinate fellow officials). Whilst arguably a significant addition to the burden of the state on the economy, these practices did not directly affect state finances except in so far as they allowed the state to employ agents at low wages or in some cases even to have them purchase positions because informal income made government service attractive.⁸⁸

While rent-seeking explains the viability of low wages at subordinate levels, it is the gap between Han and Roman senior and more generally military incomes that catches the eye. As suggested earlier, high compensation for senior Roman officials owed much to a tradition of aristocratic dominance and regime vulnerability. The latter may be even more important in explaining the dramatic pay differentials between officers and privates in the Roman military, where officers functioned not only as military commanders but also as guarantors of troop

⁸⁴ Loewe 2004: 284 and n.17.

⁸⁵ Swann 1950: 431-2; Loewe 2004: 286.

⁸⁶ Ch'ü 1972: 93.

⁸⁷ Duncan-Jones 1982: 343.

⁸⁸ Repeated increases of Han junior wages (once explicitly to combat corruption) show some awareness of the problem: Bielenstein 1980: 125. Cf. also Jones 1964: 397, on the later Rome empire.

loyalty. With its lack of stable dynasties and endless usurpations, the Roman imperial monarchy faced powerful incentives for targeting military commanders with largesse. Han rulers operated in a substantively different environment where up to the late second century CE senior agents or military officers did not normally pose a comparable threat to the ruling dynasty and its court.⁸⁹

Protection costs

Detailed evidence for military spending is disproportionately concentrated in the first two centuries of the Roman imperial monarchy. In this period, my estimates suggest that the army accounted for slightly more than half of state spending. While much less is known about routine military costs in the Han empire, it is clear that soldiers and especially their officers were relatively modestly compensated. For this reason, the Han empire would have had to maintain a larger army than the Roman empire in order to match the latter's military expenditure commitments. If a Han infantryman received 3 or 3.33 *hu* of grain, some salt, and possibly a few hundred cash per month, his overall cost to the state, even allowing for equipment, could not easily have exceeded the equivalent of 10,000 cash per year.⁹⁰ Officers might have absorbed perhaps half a million cash for every 100 to 200 men, and cavalry would also have necessitated higher outlays.⁹¹ The Han empire would therefore have had to support a standing army in excess of half a million men in order to spend a little over half of state revenue of 10 to 12 billion cash on the military, or a force considerably larger than the Roman imperial army at probable second-century CE strength.

There is nothing to support this notion. Comparisons are made difficult not only by the lack of Han evidence but also by the greater numerical flexibility of the military of the Western Han period, when conscription still played an important role and effective troop strength may have waxed and waned according to demand. Following the shift to professional service under the Eastern Han dynasty, conditions may be more similar to those in the Roman empire but numbers are even scarcer. Han troop strength is most liberally recorded for the great campaigns the emperor Wudi waged against the Xiongnu. Yet while these records have prompted elaborate quantitative reconstructions of military outlays in that period, the underlying numerical claims may well be colored by a historiographical tradition that was hostile to this military effort and therefore inflated its human and financial cost.⁹²

Later but more straightforward reports of war expenses are comparatively modest. A major twelve-year war against the Western Qiang in the early second century CE cost 24 billion cash; in the 130s and 140s CE a further 8 billion was spent over a decade; and in the 160s CE 5.4 billion were budgeted (and 4.4 billion used) for a two-and-a-half year campaign.⁹³ It remains

⁸⁹ For Roman exceptionalism in terms of dynastic discontinuity and violent turnover and the contrast with Chinese dynasties throughout history, see Scheidel in progress a.

⁹⁰ Loewe 1967: I 93-4, II 69-71; 2006: 64-5; Chang 2007b: 30.

⁹¹ Conjectured from Loewe 1967: I 76, 96.

⁹² For a recent extreme example, see Chang 2007a: 85-6 (and 178-9), who estimates total annual military spending of at least 29 billion cash based on an army of 600,000 to 700,000 with a large share of expensive cavalry. For a list of reported troop strengths under Wudi, many of them seemingly stylized, see *ibid.* 164-73. The impression of extraordinary cost is reinforced by references to multi-billion cash outlays to reward troops for individual victories or to induce defection of enemy leaders (Barfield 1989: 56-7). This is an area where source criticism is badly needed.

⁹³ Yü 1967: 61; Peng 1994: 161.

unclear how figures of 1 to 2 billion cash in annual campaign expenditure for major conflicts relate to baseline levels of military spending, but if the latter had routinely greatly exceeded such special commitments it is hard to see why the latter would have seemed noteworthy or onerous.⁹⁴

For the Eastern Han period, at least, the notion of relatively moderate military expenditure is consistent with the fact that the Northern Army, charged with the defense of the capital Luoyang, is said to have consisted of 3,536 men, a far cry from the 20,000 or so troops and paramilitary units deployed at or near the city of Rome. In the same period, a major military installation north of the Yellow River housed 1,000 troops, and a recent estimate of the strength of a late Western Han garrison at the northern frontier that is well documented thanks to finds of wood strips points to a total of 2,000 troops and a comparable number of support personnel.⁹⁵

While it is true that we lack ratios to extrapolate from such records to overall military manpower, what little evidence we have is not readily compatible, for much of the Han period, with the existence of a standing army that numbered in the hundreds of thousands and even in quiet years absorbed the better part of total state revenue, as it did in the Roman empire.

Subsidies designed to avert open conflict and exert influence over foreign powers are functionally complementary to military spending and belong in the same overall category of protection costs. This is a rare instance where more information is available from the Chinese side of the comparison. Tributary arrangements were critical in attempts to purchase compliance from peripheral challengers, especially in the steppe. In the first century CE, some 450 million cash per year were earmarked for subsidies to the Xianbei, Xiongnu and others. Allowing for comparable allocations to the Wuhuan and Western Qiang, a total of perhaps three quarters of a billion cash seems possible. We lack comparable cash denominations for tributes during the Western Han period but reports point to similarly large commitments, exemplified by 7 tons of silk floss and 30,000 pieces of silk fabric given to a *shanyu* who visited the imperial court in 1 BCE, on top of regular payments.⁹⁶ It is difficult to relate such figures to regular military spending. Aggregate subsidies in the high nine figures may have been roughly comparable to the annual cost of a standing army of 100,000.

For all we can tell, subsidies played a lesser role throughout Roman history. Although they are reported from the beginning of the imperial monarchy and figures are usually missing, we gain the impression that they were not a particularly heavy burden.⁹⁷ By far the highest recorded amount is a one-time payment of 200 million sesterces to secure peace with the Parthians in 217 CE, at a time when annual military expenditure had swollen to more than a billion. Otherwise, large gifts of 100 or 200 million sesterces are limited to two instances of diplomatic relations with client kingdoms on the eastern frontier. In late antiquity, when the Roman state supposedly relied more frequently on subsidies, reported sums are comparatively modest.⁹⁸

⁹⁴ It is difficult to know what to make of the list of more than 23 million items of military equipment found among the Yinwan documents and dated to 13 BCE, including over half a million crossbows and over 11 million crossbow bolts (Barbieri-Low 2001: 2), which is too large to be a provincial depository and may refer to the huge arsenal of the capital (cf. Loewe 2004: 77-8, with references to the debate).

⁹⁵ Bielenstein 1980: 117-8; Chang 2007b: 108-118. Cf. also Loewe 2006: 63 for a mere 3,250 troops to man 1,000 kilometers of defense lines.

⁹⁶ Yü 1967: 61-4 (Eastern Han); Barfield 1989: 64-5 (Western Han).

⁹⁷ Duncan-Jones 1994: 43-5; cf. Gordon 1949.

⁹⁸ Dio 78.27.1 (217 CE); Suetonius, *Caligula* 16.3, *Nero* 30.2; Dio 63.6.5 (gifts to client kings). Later payments include 2,100 pounds of gold annually plus 6,000 paid upfront to Attila, equivalent to 8.4 and 24 million sesterces,

The available evidence suggests that subsidies accounted for a larger share of what we might somewhat anachronistically call ‘defense spending’ in the Han empire than in the Roman empire. It is tempting to combine this observation with scenarios of relatively low regular military expenditure in the Han empire and higher routine commitments to the Roman military, representing two alternative strategies of managing conflict that may have been mediated perhaps not so much by differences in the degree of military dominance in politics as by ecological conditions.⁹⁹ These differences may have persisted for much of the long-run convergence of both systems towards the professionalization and subsequent geographical and social peripherization of military service.¹⁰⁰

Overall state expenditure

Where did the money go? In the Roman case, a rough breakdown is within reach. In an ‘average’ year of the second century CE, between 600 and 700 million sesterces went to the military, or 60 to 65 percent of the total; maybe 150 million or more to the inhabitants of the city of Rome, in the form of food, handouts, construction and entertainment, or 15 percent; between 100 and 150 million to rulers, elites and administrators via court expenses, salaries and gifts, or around 15 percent; and probably less than 10 percent to the general provincial population through infrastructure spending and other benefactions. The overwhelming majority of disbursements were concentrated in two geographical areas and on something like 3 percent of the imperial population: the army (and their families) at the frontiers and the metropolitan population. What matters here are not the actual numbers, which are inevitably tentative, but that no realistic adjustment would permit the (re)allocation of more than a small fraction of state revenue to the tributary subject population.¹⁰¹

Spending on the military provided protection, arguably the main product of any premodern state; much of the remainder was lavished on privileged groups, represented by the ruling class, other imperial retainers, and the metropolitan populace. Given the low cost of the expanded administrative apparatus, there is no good reason to assume that this breakdown substantially changed in late antiquity, except for the fact that the emergence of multiple capital cities somewhat relaxed geographical constraints on disbursement.¹⁰²

The state expenses of the Han empire are simply not well enough known to allow similar calculations. However, if state officials received not more than 2 billion out of 10 or 12 billion of total revenue, and if the army did not absorb a much higher amount, a larger share of state

respectively; and 30,000 *solidi* (or some 2 million sesterces in gold equivalent) paid to the Persians in a treaty in 562 CE.

⁹⁹ State formation in the Eurasian steppe frequently depended on resource extraction from settled areas: e.g. Barfield 1989.

¹⁰⁰ Lewis 2000; Rosenstein 2009.

¹⁰¹ Even if we arbitrarily increased provincial spending by several 100 million sesterces it could never account for more than a quarter of the total, and there is no good reason to believe that it was anywhere near that level (see above, ***). In keeping with the estimates developed above, the breakdown in the text is based on low/high estimates of expenditure on the military (600/725 million including handouts), administrative compensation (75/100 million), elite gifts and court expenses (70/100 million), metropolitan construction (20/40 million), the *annona* (50/70 million), games (20/40 million), and provincial construction (80/>100 million).

¹⁰² Note that the late Roman expansion of the civil service did not curtail militarization: administrative service was a *militia* (Jones 1964: 566).

income than in the Roman empire might have been available for local spending even once domain income used to support the capital and savings are taken into account.¹⁰³

In this reconstruction, the Roman empire would appear as more aristocratically ‘top-heavy’, more detached from local affairs, more heavily militarized, and more engaged in long-distance transfers of resources than the less ‘top-heavy’, more civilianized, less fiscally integrated, and more locally entrenched Han state.

Outcomes

The two imperial systems had different backgrounds: during the phase of expansion beyond Italy, Rome had heavily relied on a two-tier system of conscripting military labor from citizens and externalizing the financial cost of war-making by drawing on provincial resources, whereas the Warring States and especially Qin, the basis of the Han system, had attempted intensive mobilization of both military and civilian labor and material resources from the general population.¹⁰⁴ But they began to converge in institutional and organizational terms once they had both achieved imperial unification and security.¹⁰⁵

Both empires made attempts to establish or maintain a broad tax base and lay claim to a wide variety of revenue sources. Yet both were, or became, essentially “low-tax regimes,” benefiting from the lack of peer competitors that could have exerted serious pressure, and eventually unable to adjust once new challenges arose.¹⁰⁶ Even so, a comparative perspective points to differences in the way in which fiscal extraction practices were anchored in society. For the first three centuries of its existence, the Roman monarchy continued Republican-era discrimination in favor of the Italian heartland, whereas the Han regime, capitalizing on established modes of surplus mobilization and constrained by less favorable logistics, made greater demands on the core population in the metropolitan regions. More generally, the Roman system maintained greater distance in terms of both extraction and distribution. The state was more detached from revenue collection: taxable assets were normally assessed by local elites and many dues collected by them, in a process that was monitored by an extremely thin governmental superstructure. A large share of state income was captured at choke points along conduits of commercial exchange, targeting above all elite spending, or derived from domains under the state’s direct control. This approach reduced the burden of direct taxation and allowed private rent to flourish at the expense of public tax. Belated attempts in late antiquity to expand

¹⁰³ In commentaries to a Tang account of state income and expenditure (Twitchett 1963: 155-6), 40 percent of tax grain went to the capital and 60 percent was spent locally or given to the army. Of textiles, half went to the capital and the other half were used for army, salaries, and local welfare. Of cash, 70 percent was used for provincial salaries and 30 percent for army pay. Alternatively, one-third of cash income and one-seventh of tax grain is said to have been absorbed by the capital. Compared to the Roman empire, this suggests greater concentration of resources in the capital and less spending on the military.

¹⁰⁴ See Tan forthcoming, on the Roman system, and Lewis forthcoming, on the roots of the Han system.

¹⁰⁵ For the overall convergence process, see Scheidel 2009a.

¹⁰⁶ For the concept, see the editors’ introduction to Monson and Scheidel, ed. forthcoming. The *Hanshu* portrayed the imposition of a land tax of one-fifteenth of yield at beginning of Han rule as a reduction of the previous Qin rate (Swann 1950: 149-50). While we do not know actual Qin rates, an abatement of earlier war-induced rates seems at least plausible. Lewis forthcoming considers greater exactions under Wudi as a short-lived analogy to previous Warring States efforts. In Rome, it was not so much regular tax rates that came down but irregular exactions of enormous proportions that ceased with the end of the civil wars (e.g., Millar 1984b; Scheidel 2007a: ***). For attempts to improve collection in late antiquity, see the literature above, n.***.

the reach of direct taxation appear to have been of limited success and increased friction. Most revenue was spent at great remove from payers, in the capital(s) and in the military frontier zones. Military demands dominated overall expenditure.

By contrast, the Han empire sought to extract revenue more broadly but at the same time transferred it less aggressively. Logistical constraints curtailed discrimination in favor of the center, and poll taxes, which targeted the general population, appear to have been much more widespread than in the Roman empire. Operating through a formal state bureaucracy, the fiscal apparatus intruded more deeply in local affairs. Whereas in the Roman world, liturgies bridged the gap between local autonomy and central power, the Han state turned locals into government employees. Although we cannot tell for sure, Han military spending may have been less dominant overall, and subsidies played a greater role. For these reasons, as well as due to logistical constraints, a larger share of revenue might have been spent (or kept) locally.¹⁰⁷ As a corollary, benefits to state agents (as opposed to cooperative but formally autonomous local elites) may have been disbursed more widely than in the much smaller and more steeply hierarchical Roman administrative apparatus.

Moving beyond these basic observations quickly leads us into the realm of conjecture. For example, we might ask whether direct taxation was as crucial to the Han system as is usually surmised,¹⁰⁸ a notion that logically presupposes relatively high rates of taxpayer compliance but may also have depended on the deployment of state officials in revenue collection. If that was indeed the case, and if much of this revenue was spent locally and in the civilian sphere (all of them big ‘ifs’), we might wonder whether all these features were interconnected. A cross-cultural survey has found broadly-based taxation to be positively correlated with bureaucratization and the provision of public goods.¹⁰⁹

This might seem like an unaccountably optimistic vision of the Han state, with its historically limited penetration of local society, presumably endemic corruption, and history of popular unrest. Then again, there is a good reason to embark on this line of inquiry. As I have noted elsewhere, the successful re-building of fiscal structures was a vital precondition for imperial unification in the post-Han period, just as its prolonged absence of comparable developments in post-Roman Europe coincided with diminished state power and political fragmentation. More remarkably, Han-style fiscal institutions appear to have survived even in

¹⁰⁷ A note of caution. The Yinwan data point to large cash income, only a small fraction of which could have been spent on local officials, and even suggests the possibility of partial monetization of land tax (see above, n.***). In the most general terms, this is consistent with the model of ‘fiscal circulation’ proposed for later periods (see Scheidel 2009c: 204 on von Glahn 2004). It also raises the possibility of large-scale cash transfers out of the region, which would not have constituted a heavy logistical burden: 100 million cash would have weighed a little over 3 tons, or just a few wagon loads worth of metal. (One of the Yinwan documents even explicitly mentions the conveyance of cash to the capital by regional officials: Loewe 2004: 74.) At the same time, long-term non-reciprocal flows of cash would simply have caused price inflation in recipient areas, which means that unless there is evidence of corresponding movement of goods it is hard to see how such practices could have been sustained or profitable unless transfers primarily resulted in centralized hoarding, a distinct possibility (see above, ***, on state savings) that would be consistent with a more primitive fiscal system. Two possible scenarios, one in which the center supplied cash that circulated mostly regionally, and one in which cash moves back and forth between center and peripheries in a cycle of minting, hoarding, and targeted disbursement, are largely identical in terms of ultimate outcomes, yet quite different from a ‘tax-and-trade’ circulation model (cf. ***).

¹⁰⁸ Lewis forthcoming regards land taxes and labor services as the backbone of the Han fiscal system and notes that tolls on commercial and urban activity were of lesser importance than in later periods.

¹⁰⁹ See Blanton and Fargher 2008: 251-3.

periods of severe dislocation throughout the extended Period of Disunion up the sixth century CE.¹¹⁰

This is where a comparative perspective on taxing and spending might be of help in addressing a much bigger historical question. By funneling resources towards high-level agents, a privileged capital city, and a military that were all far removed from local society, the Roman state weakened the nexus between taxation and spending. Local spending was sustained in the first instance by local taxation and largesse.¹¹¹ Imperial investment was limited and, more importantly, ambiguous even when it occurred. In a world of liturgical obligations, road construction was a decidedly mixed blessing, and even more popular infrastructure investments would have been mediated by the intervention of local elites, thereby separating donor from recipient. In the Han system, which could not yet rely on the great canals of later dynasties, geography impeded massive transfer of staples,¹¹² senior officials were paid less, the military was less lavishly endowed and at least in times of stability more constrained by civilian leadership, and local affairs above the village level were dealt with by formal state agents rather than self-governing urban elites.

This superficially paradoxical combination of greater cellularity and deeper state penetration may have strengthened the institution of the state at the local level. In the long term it may ultimately have been conducive to the creation of more lasting ties between state and (local elite) society. If true, this process, and its fiscal dimension, may be worthy of consideration as a further addition to the growing number of factors that are being marshaled to explain the permanent dissolution of the Roman empire and the comparatively greater resilience or perhaps rather regenerative capacity of early Chinese state institutions.¹¹³

¹¹⁰ Scheidel 2011a.

¹¹¹ Schwarz 2001; Zuiderhoek 2009, both emphasizing the importance of municipal income relative to private benefactions (euergetism). For municipal finances, cf. Burton 2004.

¹¹² A 'tax-and-trade' system akin to that of the Roman empire arose only later: cf. De Ligt 2003.

¹¹³ Scheidel in progress b.

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