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## The comparative economics of slavery in the Greco-Roman world

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**Abstract:** A comparative perspective improves our understanding of the critical determinants of the large-scale use of slave labor in different sectors of historical economies, including classical Greece and the Italian heartland of the Roman empire. This paper argues that the success of chattel slavery was a function of the specific configuration of several critical variables: the character of certain kinds of economic activity, the incentive system, the normative value system of a society, and the nature of commitments required of the free population. High real wages and low slave prices precipitated the expansion of slavery in classical Greece and Republican Rome, while later periods of Roman history may have witnessed either a high-equilibrium level of slavery or its gradual erosion in the context of lower wages and higher prices.

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## Introduction

Genuine ‘slave economies’ – in which slave labor permeated all sectors of the economy and played a central role in economic output outside the sphere of family labor – were rare in history.<sup>1</sup> Classical Greece and the core of the Roman Empire are among the most notable cases. This raises important questions: how did the Greeks and Romans come to join this exclusive club, and how did the circumstances that determined the development and structure of their regimes of slave labor compare to those that shaped other slave-rich systems? This paper has two goals. The first one is to improve our understanding of the critical determinants of the large-scale use of slave labor in different sectors of historical economies. This calls for a comparative approach that extends beyond classical antiquity. I hope to show that by adjusting and fusing several existing explanatory models, and by considering a previously unappreciated factor, it is possible to make some significant progress toward the creation of a cross-culturally valid matrix of conditions that situates the experience of ancient slave economies within a broader context. In brief, I argue that the success of chattel slavery is a function of the specific configuration of several critical variables: the character of certain kinds of economic activity, the incentive system, the normative value system of a society, and the nature of commitments required of the free population. My second objective is to explain differences in the relative prevalence of chattel slavery in different periods and parts of the ancient Mediterranean world with the help of data on prices and wages, a body of evidence that has never been fully exploited in this context and which again allows some genuine progress. I argue that high real wages and low slave prices precipitated the expansion of slavery in classical Greece and Republican Rome, while later periods of Roman history may have witnessed either a high-equilibrium level of slavery or its gradual erosion in the context of lower wages and higher prices.

Whereas slavery as an institution used to be truly ubiquitous in world history, the use of large numbers of (often male) slaves for productive purposes was not.<sup>2</sup> In most settings, at least insofar as the demographic and occupational structures of slaveholding are at all perceptible, slaves were often female and/or employed in the service sector. American slavery provides an obvious counterpoint, with its emphasis on slave labor in agricultural production, and a comparatively minor role in manufacturing and services. Where does Greek and Roman slavery fit in on this spectrum?

Unfortunately, even the most basic properties of the classical slave economies remain obscure. The number or proportion of slaves in a particular ancient state or in particular sectors of their economies is invariably unknown. The widespread notion that slaves accounted for approximately one-third of the population of classical Athens and Roman Italy is devoid of any evidentiary foundation and owes much to the corresponding share of slaves in the population of the Old South in the 1860 census.<sup>3</sup> The only usable quantitative evidence, gleaned from the census returns of Roman Egypt in the first three centuries AD, yields different percentages for different parts of the country, from 7% in one city in Upper Egypt to

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<sup>1</sup> I use ‘slave economies’ as the specifically economic correlate of the familiar term ‘slave societies’ (as opposed to the much more common ‘slave-owning societies’ or ‘societies with slaves’ which permitted slave-ownership but did not depend on it); for definitions and discussion, see Turley (2000), 4-5, 62-100. The conventional canon includes Greece and Rome in antiquity, and the United States, Brazil, and the Caribbean from the fifteenth to the nineteenth centuries: e.g., Hopkins (1978), 100-01; Finley (1998), 298. Dutch South Africa and the Sokoto caliphate (in nineteenth-century Nigeria) surely belong in the same category, with late medieval Korea as another candidate. For the somewhat more inclusive concept of ‘large-scale slave systems’, compare Patterson (1982), 353-64.

<sup>2</sup> For general surveys, see Patterson (1982); Finkelman and Miller (eds.) (1998); Turley (2000).

<sup>3</sup> Scheidel (2005a), *contra* Finley (1998), 148; Brunt (1987), 124-5; Bradley (1994) 12.

14.7% in the cities of Middle Egypt.<sup>4</sup> None of this can be taken to be representative of conditions in Greece or Italy.

In the absence of quantitative data, modern observers deal in impressions. Our sources leave little doubt that in Athens, slaves were essential in mining, worked on the rural estates and in the workshops and businesses of the wealthy, and served them in their homes. There is no sector of the elite economy in which slaves were not commonly employed, and the same is true for Rome.<sup>5</sup> In this regard, the convergence of the qualitative evidence is overwhelming, thereby relieving the need for (otherwise desirable yet impossible) quantification. The opposite is true of the much more controversial issue of the extent to which slaves were employed by commoners, above all in farming. This problem cannot be addressed without statistics; such evidence does not exist; and therefore, no amount of scholarly debate will ever yield compelling answers.<sup>6</sup> However, although the true scale of sub-elite slave-ownership may well be critical for our understanding of the psychological and cultural significance of slavery in Athenian or Roman society,<sup>7</sup> it does not necessarily have to be known in order to analyze economic behavior in elite circles. For that reason, I shall confine myself to an analysis of slave labor by the upper classes, in an environment where we may take its significance in all sectors of employment as a given.

### **Incentives and constraints**

Why would individuals who relied primarily or exclusively on the labor of others choose to employ slaves for a particular type of activity? Fenoaltea's model, familiar to students of modern slavery but far less known among ancient historians, envisions a fundamental divide between two categories of slave labor.<sup>8</sup> Effort-intensive activities are amenable to close supervision and 'pain incentives': these include mining and quarrying, lumbering, basic construction work such as digging, and certain forms of farming, primarily work that can be performed by gangs and does not require high levels of care (such as sugar and cotton production). Conversely, care-intensive activities require rewards to motivate slaves and reduce ill-will that fosters carelessness, shirking, and theft. This category includes artisanal and commercial activities, domestic service, and even some forms of farming, such as viticulture, as well as animal husbandry – in brief, any activities that either depend on a certain accumulation of human capital or are not readily susceptible to close supervision. While the pain-incentive regime allows owners to minimize investment in subsistence and rewards, it raises supervision costs. Care-intensive activities demand better provisioning and general rewards, and more often than not some realistic prospect of manumission. In Fenoaltea's words, '[t]he proposed model thus predicts that the continuum of activities from land- and effort-intensive to capital- and care-intensive will be matched by a continuum in the treatment of unfree labor from harsh and closely supervised to benign and unsupervised (...) and that over this continuum the likelihood of manumission will grow from negligible to substantial'.<sup>9</sup> He observes that for activities that

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<sup>4</sup> Bagnall, Frier and Rutherford (1997), 98.

<sup>5</sup> Westermann (1955) is still the most detailed survey of the evidence. See also Garlan (1988); Fisher (1993); Bradley (1994).

<sup>6</sup> The debate has centered on conditions in classical Athens. Many slaves among family farmers: e.g., Jameson (1977), (1992), (2002). Few slaves: e.g., Wood (1983); Ameling (1998). In principle, a similar (and similarly aporistic) controversy could be launched regarding Roman Italy. Current population estimates for classical Athens make it seem rather unlikely that many smallholders owned enough land to make proper use of slaves, regardless of slave prices: see my addendum in Garnsey (1998), 195–200; cf. also Foxhall (2002). In the United States, farmers who did not own slaves did not employ other people either, at least not in the long term. The real divide is between farms that (can) use additional (long-term) labor and those that cannot, not between those which do or do not use slaves. Cf. Rosivach (1993).

<sup>7</sup> Finley (1981), 97–115; Cartledge (2002a), (2002b).

<sup>8</sup> Fenoaltea (1984).

<sup>9</sup> Fenoaltea (1984), 640. This represents a significant improvement over Hicks (1969), 127–8, who considers the value of slaves the main criterion for good or poor treatment (but cf. 131).

are conducive to pain-incentives, a low subsistence/high supervision regime of slave labor will always yield higher returns than any form of free labor.<sup>10</sup> By contrast, reward-rich activities are intrinsically more suitable for free labor, and the use of slaves in these sectors is therefore inherently unstable. Manumission in particular will tend to erode slavery in this context.<sup>11</sup> This model chimes with the view, advocated among others by Fogel and Engerman, that slavery works best in the context of gang-labor, especially for sugar and cotton, which required ‘a steady and intense rhythm of work’.<sup>12</sup> It also fleshes out Canarella and Tomaske’s earlier optimal utilization model that shows that ‘force intensive slave management techniques [i.e., the equivalent of Fenoaltea’s ‘pain incentives’; W.S.] are optimal if as the intensity of labor extracted from slaves increases, the marginal product of force per additional dollar of expense declines less rapidly than the marginal product of bribes [i.e., ‘reward incentives’, W.S.] per additional dollar of expense in bribes.’<sup>13</sup>

However, notwithstanding the overall plausibility of this model,<sup>14</sup> serious problems remain. From an Americanist perspective, critics have cited the case of tobacco farming, which relied on plantation slavery although the crop requires care, and where gang labor was uncommon, while in those cases where gangs were employed, this appears to have happened in order to ensure careful treatment of the plants.<sup>15</sup> Moreover, under the right circumstances, slave labor could become common and highly profitable in grain cultivation as well, most notably in the Virginia Piedmont.<sup>16</sup> More generally, the focus on gang labor and brute force also makes it hard to explain why so many farmers benefited from keeping just one or a few slaves.<sup>17</sup> Consideration of ancient slave labor compounds these problems. Fenoaltea seeks to accommodate Greek and Roman evidence within his model, but only with mixed results. It is true that the widespread use of slaves in effort-intensive activities such as mining and the prevalence of reward-incentives in care-intensive sectors such as crafts and management support his argument. Then again, large-scale grain farming by slaves was also known in Roman Italy.<sup>18</sup> More importantly, large-scale viticulture in the same region was consistently associated with chattel slavery (even including *servi vinci*, chained slaves of ill repute), although vines are clearly highly care-intensive.<sup>19</sup> To evade this contradiction, Fenoaltea maintains that slavery in viticulture was in fact unsustainable in the long run, a mere ‘short-term phenomenon’ that appeared to ensure the transfer expertise among workers.<sup>20</sup> Thus, slave labor would have worked best to set up new wine and oil plantations, a process that involved a lot of digging. He even goes so far as to conclude that ‘the contrast between the land- and effort-intensity of the modern Southern and Caribbean staples and the capital- and care-intensity of the ancient Mediterranean staples appears to provide much the most significant single explanation of the viability of plantation

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<sup>10</sup> Fenoaltea (1984), 641 (and cf. 644), for the fact that in America, post-slavery contracts did not generate comparable productivity.

<sup>11</sup> On the role of manumission as an incentive, see also Findlay (1975).

<sup>12</sup> Fogel and Engerman (1974), 204; also Fogel (1989), 26, 34, 78, 162. Cf. Metzler (1975), for rational management and economies of scale on US plantations.

<sup>13</sup> Canarella and Tomaske (1975), 626.

<sup>14</sup> I note in passing that the use of slaves in unhealthy locales must have been closely linked to a pain-incentive system: Sallares (2002), 247-55, suggests that agricultural slaves were common in central Italy because of the spread of malaria in the Roman Republican period. Cf. Dusinberre (1996), for slave labor in the rice swamps of South Carolina and Georgia. Work in fever-ridden areas was surely an ‘unpleasant’ activity that was conducive to the use of some form of coerced labor. Cf. already Engerman (1975), 200.

<sup>15</sup> Hanes (1996), 309 and n. 13.

<sup>16</sup> Irwin (1988); Wright (2003). This speaks against the exclusive association of slavery with ‘crops such as tobacco or cotton, which demanded sustained attention during a long growing season’ proposed by Earle (1978) (quote at 51).

<sup>17</sup> Kolchin (1987), 54 (71.9% of US slaveowners in 1860 owned 1-9 slaves).

<sup>18</sup> Spurr (1986), 133-43; Scheidel (1994).

<sup>19</sup> Kolendo (1971); Etienne (1978/79); Carandini (1988). Chained slaves in viticulture: Cato Agr. 56; Colum. RR 1.9.4-5; see generally Backhaus (1989).

<sup>20</sup> Fenoaltea (1984), 647-8.

slavery in the New World and its nonviability in antiquity'.<sup>21</sup> This claim would seem to hinge on a very peculiar definition of 'viability': after all, slave-driven viticulture flourished in Roman Italy for a period several times as long as the period of large-scale cotton production on American slave plantations. In fact, in what amounts to a complete reversal of Fenoaltea's position, the prominence of slaves in Roman wine and olive cultivation prompted De Neeve to consider these activities typical of plantation-style slave labor.<sup>22</sup> It is also telling that contrary to Fenoaltea's assumptions, the most detailed account of Roman arboriculture envisages not merely the use of slaves in skill-intensive long-term activities but even the employment of *external* workers for the purpose of digging up vineyards.<sup>23</sup>

Further difficulties arise from Fenoaltea's contention that slavery was a more competitive labor regime for intrinsically 'unpleasant' occupations.<sup>24</sup> While the use of slaves in mining is perfectly consistent with this observation,<sup>25</sup> the apparent dominance of slave labor in Roman domestic service and animal husbandry compel him to argue that both sectors belong in this category. In his view, domestic service was 'unpleasant' because it placed servants in close proximity to the owner and subjected them to close control and abuse: thus, domestic slavery in antiquity 'seems second only to mining in its suitability to slave labor'.<sup>26</sup> While comparative evidence certainly suggests that slaves considered domestic service a mixed blessing,<sup>27</sup> it is not at all clear that this kind of employment would necessarily have appeared undesirable to the wives and children of displaced Roman farmers who were looking for sustenance.<sup>28</sup> Somewhat paradoxically, the herding of livestock is likewise thought to have been 'unpleasant', partly because of the solitary nature of this activity.<sup>29</sup> In other words, we are asked to assume that workers didn't want to be close to their employers, but they didn't want to be far away from them either. Yet it is not at all obvious that a pastoral lifestyle, free from close supervision and abuse, should have been an inherently unpopular field of employment. Moreover, even Fenoaltea prudently refrains from labeling artisanal and commercial activities 'unpleasant', despite the fact that Greek and Roman slaves appear to have flourished in these spheres for hundreds of years.

His model helps to account for the success of slavery in domestic service, animal husbandry, manufacturing, and commerce in the classical world: reward incentives are well documented in all these areas.<sup>30</sup> At the same time, there is no sign of erosion through manumission: slave herdsmen are still attested in late antiquity,<sup>31</sup> and domestic service seems to have been a quintessentially unfree activity from classical Greece to the end of antiquity, for over a millennium. To complicate matters further, slave employment in these sectors coincided with the presence of free rowers in Greece and Italy and free miners in Roman Spain, Dacia and Egypt, although it is hard to imagine more 'unpleasant' and dangerous activities.<sup>32</sup> In sum, Fenoaltea's model explains the use of slaves in certain areas and makes a valid point

<sup>21</sup> Ibid. 653.

<sup>22</sup> De Neeve (1984a), 75-82. He was, however, mistaken in doubting the suitability of slavery in grain farming: see above, nn. 16 and 18. Wright (2003) observes that in the United States, slaves were concentrated on the most valuable land. The situation in Roman Italy may have been similar: cf. De Neeve (1984b). This relationship could at times be reversed, in the sense that some land became valuable only because it was worked by slaves, primarily in the case of unhealthy land that would not otherwise have been intensively cultivated: see above, n. 14.

<sup>23</sup> For the latter, see Scheidel (1989), 143, on Colum. *RR* 5.1.8, 5.2.2. Cf. also Colum. *RR* 2.2.12; Labeo *ap.* Ulp. *Dig.* 43.24.15.1, for the use of external labor for comparably unskilled tasks.

<sup>24</sup> Fenoaltea (1984), 655. See also Barzel (1977), 93-4.

<sup>25</sup> The persistence of 'collier serfdom' in Scottish mines up to 1799 is a good example for the utility of unfree labor in mining.

<sup>26</sup> Fenoaltea (1984), 655.

<sup>27</sup> E.g., Genovese (1976), 331-8; Jones (1985), 25-8; Jones (1990), 113-17.

<sup>28</sup> Evans (1991), 101-65.

<sup>29</sup> Fenoaltea (1984), 656.

<sup>30</sup> Bradley (1987) is the most detailed study. See also Klees (1998); Weiler (2003).

<sup>31</sup> Russi (1986).

<sup>32</sup> Mrozek (1989), 98-9 (wage labor in Roman mines). Galley slaves became common only in the early modern period: Scheidel (1998).

about the correlation between the character of work and the incidence of manumission, but fails to account for the apparent success of slavery in many care-intensive activities, mostly in ancient Greece and Rome but to a lesser extent in the Americas as well. I want to suggest that this is because the model is incomplete, and needs to incorporate additional variables to provide a more cogent explanatory framework.

In this connection, Hanes' focus on turnover costs and the benefits of guaranteed long-term labor obligations assumes especial importance.<sup>33</sup> The need to replace workers creates transaction costs, including the costs of searching for a replacement, the loss of labor in the meantime, providing the replacement worker with job-specific skills, and supervising an unfamiliar worker. More specifically, in an agrarian context, turnover may cause particular damage if it interferes with time-sensitive activities, when labor input cannot be substituted across time and the loss of a laborer may cause irremediable harm, as in the case of a harvest or other critical seasonal activities.<sup>34</sup> Turnover costs are more likely to become a serious issue in 'thin' labor markets where labor cannot be quickly replaced. In such cases, slavery is attractive not only because it ensures the availability of labor and full control over the labor force but also because gender norms are less likely to interfere with labor needs. Hanes argues that in consequence, US slavery worked well in 'thin' labor markets such as rural plantations, mines, rural foundries, and rural construction projects, as well as in domestic service – partly because of the rural setting of many 'Big Houses', and partly because of the information costs inherent in selecting suitable domestic staff. This model works similarly well for antiquity, and much improves on Fenoaltea's model in accounting for the popularity of slave labor in viticulture. By the same token, it is consistent with the comparatively small importance of slave labor in ancient Egypt, a country where unusually high population densities and low normative living standards supported a 'thick' labor market that eased the substitution of free labor.<sup>35</sup> Further analogies can be drawn regarding close alternatives to formal slavery. As Hanes points out, indentured servitude and slavery represent similar solutions to the problem of turnover: the former preceded the latter in the same sectors of the American economy because it generated similar benefits. The same may be assumed for debt-bondage in archaic Athens and in early Roman society, until it was in both cases eclipsed by the use of chattel slaves.<sup>36</sup>

One notable deficiency of Hanes' model concerns the apparent indifference of southern factory owners to high turnover rates:<sup>37</sup> the logic of the argument suggests that the significance of human capital in this sector ought to have encouraged the use of slaves even in otherwise 'thick' urban labor markets. This is all the more true as a combination of concerns about turnover costs and the desirability of accumulating human capital goes a long way to explaining the widespread use of slaves in Greek and Roman craft production. In my view, Watson's well-known distinction between 'open' and 'closed' slave systems helps to account for this otherwise unexplained discrepancy. In 'open' systems, slaves could be freed and fully assimilated into society, whereas in 'closed' systems, slaves remained a separate group even after manumission and were barred from intermarriage with the free population.<sup>38</sup> This distinction allows us to locate historical slave systems on a spectrum that puts sub-Saharan African slavery (where slaves often came to be incorporated into the owners' families) at the 'open' end, and US slavery (where manumission did not ameliorate the racially constructed inferior status of (ex-)slaves) at the opposite extreme. By implication, one would expect not merely the *quality* but also the overall *frequency* of manumission in a particular slave system to be correlated with its 'openness'. The main question is whether the relative degree of 'openness' should be regarded as a function of economic structure (such as the relative prevalence of certain types of economic activity that did or did not rely on slave labor) or

<sup>33</sup> Hanes (1996).

<sup>34</sup> This aspect received particular attention from contemporary observers in the US: *ibid.* 321-4.

<sup>35</sup> See Frier (2000), 814, for population densities, and below, in the following section, for low rural real incomes.

<sup>36</sup> See below, in the following section. Further corroboration is provided by the rerudescence of dependent contract labor after the abolition of slavery in several parts of the world: e.g., Engerman (1986).

<sup>37</sup> Hanes (1996), 319.

<sup>38</sup> Watson (1980).

rather as an independent and antecedent factor. In the latter case, ‘openness’ or ‘closure’ may have mediated the actual extent to which slaves were employed in effort- or care-intensive activities. For instance, slave labor might not flourish in care-intensive activities that thrive on the prospect of tangible rewards, manumission and proper integration into free society if it is employed within the constraints of a ‘closed’ system that militates against the conferral of such rewards or lessens their appeal. This handicap may account for the underrepresentation of slave labor in the most care- and reward-intensive sectors of the US economy. By contrast, a high degree of ‘openness’ would make it easier to align economic interests with overall socio-cultural conventions and expectations.

Temin classifies five leading slave systems as either ‘open’ or ‘closed’ and grouped them according to the frequency of manumission (Table 1).<sup>39</sup>

Table 1 The Temin matrix

	Frequent manumission	Only exceptional manumission
Open systems	Early Roman Empire	
Closed systems	Classical Greece, Nineteenth-century Brazil	Southern United States, the Caribbean

However, the dual dichotomies of ‘open’ vs. ‘closed’ and ‘frequent’ vs. ‘exceptional’ seem unduly blunt even as ideal types. For instance, it is not at all clear that Brazil was as ‘closed’ as the US, or that ancient Greeks ‘frequently’ freed their slaves. A sliding scale is more suitable for the purpose of capturing the relative standing of each system (see below). More importantly, though, Fenoaltea’s model ought to discourage attempts to assign quasi-typical manumission frequencies to entire slave systems. While ‘openness’ or ‘closure’ may well have been overarching and culturally pervasive qualities, the actual probability of manumission was primarily a function of the specific properties of different types of work (Table 2).

Table 2 The Fenoaltea matrix

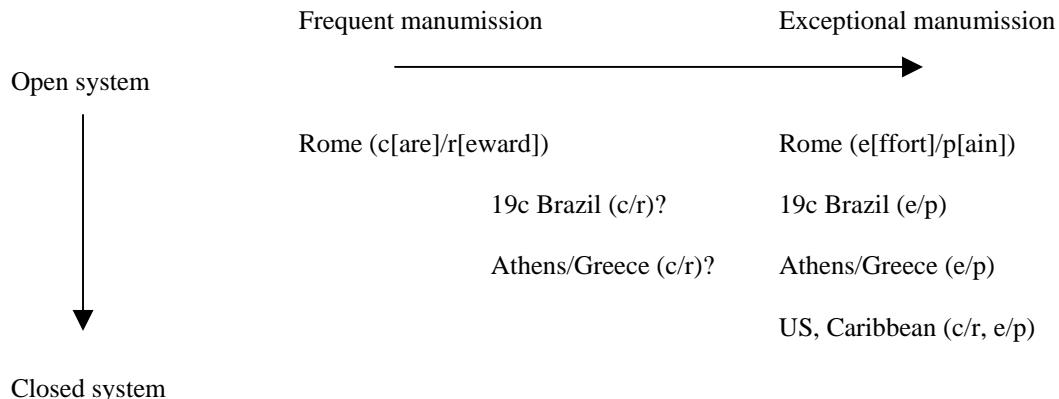
	Frequent manumission	Exceptional manumission
Effort-intensive/Pain incentives	No	Yes
Care-intensive/Reward incentives	Yes	No

I believe that a composite model is required to take account of both sets of criteria (Table 3).

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<sup>39</sup> Temin (2004), 525 table 1.

Table 3 Composite sliding scale



In my composite model, manumission frequencies are specific to particular types of labor (effort/care-intensive) and incentive patterns (pain/rewards), while the overall degree of ‘openness’/‘closure’ logically predicts the actual significance of slave labor in either one of these categories. Thus, in a ‘closed’ system with very low manumission rates (such as the United States), slave labor is much better suited to effort-intensive activities than to care-intensive work. At the other end of the scale, Romans were free to select whichever incentive scheme was appropriate to any given type of labor in the knowledge that societal conventions would not interfere with that scheme’s successful implementation: while secure property rights facilitated ruthless exploitation in sectors where it worked best, a high level of ‘openness’ permitted the application of reward-rich incentive strategies in human-capital-intensive occupations. As far as we can tell, classical Athens and Brazil occupied an intermediate position.

This expanded model also addresses some of the problems raised by existing moncausal explanations. For example, it suggests that it made sense to employ slaves in vineyards, animal husbandry and crafts not because any of these activities were somehow inherently ‘unpleasant’ but because turnover costs and the benefits of human capital accumulation favored the utilization of slave labor in those sectors. At the same time, if task-appropriate rewards cannot readily be bestowed because they are incompatible with societal norms, slavery will not thrive in those sectors. Finally, the fact that ‘closure’ can easily clash with economic interests indicates that it does indeed constitute a (largely) independent factor.

But even an eclectic approach can answer only part of my original question – why did Greek and Roman and American elites rely on slave labor for certain activities to the extent that they did? While we may have gained a better understanding of the set of circumstances that made the use of slaves a more or less promising strategy, we are still unable to account for its actual prevalence. Once again, Fenoaltea and Hanes’ models show the way. As Fenoaltea points out, free labor may (at least to some degree) be substituted for slave labor if the free labor force is abundant and impoverished, and can therefore be subjected to more slavery-like working conditions. As a logical corollary, a combination of high real wages among the free and scarcity of labor is more conducive to slave labor per se, and forestalls this kind of substitution. This, in turn, chimes with Hanes’ argument about turnover costs: turnover was not just a static problem (as in the case of ‘thin’ rural labor markets created by low population densities and the dominance of family labor) but also a dynamic phenomenon: if labor becomes scarce, the cost of turnover rises, rendering slavery a more attractive option.

In the Americas, slavery was at a disadvantage in care-intensive activities not merely because of ‘thin’ settler-society labor markets but more generally because the ‘closed’ nature of the slave system impeded the application of the appropriate reward incentives. Owing to colonial ‘virgin soil’ land/labor ratios, rural labor markets were necessarily ‘thin’, and effort-intensive slave labor was common and

profitable. Greeks and Romans managed to employ slaves in both care- *and* effort-intensive occupations. Therefore, labor markets must have been ‘thin’ in terms of real wages and turnover costs. At the same time, the densely populated classical city-states deviated profoundly from the New World scenario of readily available land and manpower shortage. If classical Athenian or Roman Republican labor markets were indeed ‘thin’, and hence conducive to the use of slave workers, they must have been ‘thin’ for very different reasons. I explore this issue in the following section.

## Commitments

In the most general terms, the emergence of large-scale slavery across economic sectors depends on two fundamental preconditions: (1) a relative shortage of labor (i.e., of labor relative to exploitable resources), and (2) access to slaves. We may also identify several contingent secondary variables: for (1), they include demand for goods and services that could be produced by slaves (1a), and high real wages among the free labor force (1b); for (2), the accumulation of capital (i.e., financial access to slaves) (2a), and physical access to enslavable persons (2b). Accumulation of capital (2a) also feeds back into (1).<sup>40</sup>

This scenario applies to New World slave-systems that benefited from growing demand in Europe (1a) and an exceptionally favorable land/labor ratio (1b) that induced endemic labor scarcity, as well as from the accumulation of capital (2a) driven by (1a) and access to an unusually abundant supply of slaves in sub-Saharan Africa (2b) (and, later in the United States, rapid natural reproduction). In ancient Greece from the archaic period onwards, the opening up of the Mediterranean through mass emigration created new commercial opportunities and markets (1a), while a beneficial configuration of economic and political conditions and developments appears to have raised real incomes (1b),<sup>41</sup> promoting the accumulation of capital (2a) and access to foreign slaves (2b). However, since slavery appears to have thrived as much in the core regions of Aegean Greece as in peripheral ‘colonial’ settings, we face the question of whether any of these factors necessarily generated a sufficiently significant shortage of labor in that core. The same is true for Roman society in the late Republican period: capital accumulation (2a) and access to slaves (2b) increased dramatically during the last two centuries BC (in both cases ultimately because of successful warfare) but slave labor came to be concentrated in central western Italy (as well as Sicily). Again, it is unclear why these changes should have precipitated labor scarcity.

As is well known, Finley looked for an answer in political and ideological conditions: for him, the abolition of debt-bondage (in early sixth-century BC Athens and late fourth-century BC Rome) created a new dichotomy of (fully) free and (fully) slave, leaving slavery as the only viable form of readily exploitable labor for those whose assets required them consistently to employ others for work. In this perspective, class relations take center stage: ‘The peasantry had won their personal freedom and their tenure on the land through struggle, in which they also won citizenship, membership in the community, the *polis*. This in itself was something radically new in the world, and it led in turn to the second remarkable innovation, slave society.’<sup>42</sup> Rihll drew attention to another other crucial variable, namely the

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<sup>40</sup> This schema differs in points of detail and perspective from previously identified sets of criteria. Cf. Finley’s three conditions for the emergence of a proper ‘slave society’, of (1) inequality in assets, (2) developed commodity production and markets, and (3) ‘unavailability of an internal labour supply’ ((1998), 154). It seems to me that all three can be collapsed into a single factor, i.e., labor scarcity, whereas access to slaves is a missing and altogether independent variable. Cf. Rihll (1986), 95, rightly stressing the importance of supply. Cartledge (2002a), 162 treats (1) inequality, (2) access to slaves, and (3) labor shortage as the main variables.

<sup>41</sup> Expansion and growth of slave trade: Rihll (1993). Rising living standards in mainland Greece: Morris (2004), (forthcoming).

<sup>42</sup> Finley (1998), 157-8, also quoted by Morris (2002), 28. Finley did not fully develop this argument with regard to Rome but suggested an analogous process ((1981), 165-6). Harris (2002) argues that Solon abolished enslavement for debt rather than debt-bondage, and that the latter continued to be attested (420-5). However, there is no sign that the latter arrangement represented a common alternative to slavery in the late archaic or classical periods.

growing availability of slaves.<sup>43</sup> More recently, Morris sought to fine-tune this model by stressing the interplay of a variety of factors such as ‘demography, technology, the attitudes and responses of the wealthy, Solon’s role as negotiator, Athens’ international situation, the relative price of different forms of labour, the specification of property rights in people and things, the creation of institutions for measuring and enforcing them, and the legitimacy of Athenian culture’.<sup>44</sup> Ultimately, however, his reconstruction maintains Finley’s emphasis on the consequences of the withdrawal of dependent labor that used to be provided by members of the local in-group.

Labor may become scarce for two reasons: a rapid increase in resources such as land relative to the labor force, and by rising commitments among the free population that conflict with economic activities. Small and socially cohesive polities may be particularly likely to experience the latter phenomenon. The recent comparative survey of thirty-six city-state cultures throughout world history undertaken by the Copenhagen Polis Centre has highlighted certain features that tend to be common to polities in that category. Hansen defines a city-state as ‘a highly institutionalized and highly centralized micro-state (...) with a stratified population’ whose ‘political identity is focused on the city-state itself and based on differentiation from other city-states’.<sup>45</sup> Furthermore, city-states disproportionately often featured ‘debating and voting councils and assemblies’, institutions that most readily develop in the context of micro-states.<sup>46</sup> I hypothesize that the more city-states conformed to the ideal-typical ‘polis’ model of high political and military participation rates and a clearly defined citizen-insider/foreigner-outsider dichotomy, the more likely they were to resort to chattel slavery when the standard requirements ((1) and (2) as defined above) were met.<sup>47</sup> In addition, non-city state polities that nevertheless experienced comparable inducements were likely to adopt similar solutions. A comprehensive survey and any systematic testing of this hypothesis are well beyond the scope of this paper. For a start, I limit myself to nine very brief sketches of historical cases from five millennia and four continents.

Classical Athens provides a suitable starting point. From the end of the tyrannical regime onwards, and increasingly so in the wake of imperial expansion and political democratization after the Persian invasions, adult male citizens accepted growing commitments to the political and judiciary process and especially to the military sector.<sup>48</sup> The growing involvement in these activities of the wage-earning elements of the citizenry would have interfered with long-term or time-sensitive labor arrangements.<sup>49</sup> At the same time, the influx of imperial rents and commercial revenue facilitated the accumulation of capital, growth in demand, and rising wages. Some poleis averted labor shortages by subjugating and collectively enslaving neighboring populations: Sparta is only the best-known example of a seemingly widespread phenomenon.<sup>50</sup> By contrast, islands or central Greek poleis that were surrounded by more formidable neighbors were severely constrained in their ability to adopt this strategy. It is therefore perhaps not by coincidence that Greek sources convey the impression that large-scale slavery was particularly common in a central-Aegean zone of shared economic development that stretched from Corinth and Megara to Athens, Aegina, and Chios.<sup>51</sup> In this area, the combination of high time-commitments of fairly closed citizen-populations, commercial and/or expansionist

<sup>43</sup> Rihll (1986), (1993).

<sup>44</sup> Morris (2002), 29-41 (quote at 41).

<sup>45</sup> Hansen (2000a), 19.

<sup>46</sup> Hansen (2000b), 612.

<sup>47</sup> Cf. Rihll (1993), 109-111 for the nexus between the Greek militia system, politics, and the emergence of a slave society.

<sup>48</sup> See Hansen (1985) and esp. (1988), 14-28, for the demographic background.

<sup>49</sup> The nexus between the expansion of naval service and the public involvement of Athenians of modest means is well established and was already noted by contemporary observers: e.g., Strauss (1996). Note that Athens may have been a latecomer on the scene: slave-rich poleis such as Corinth or Chios appear to have developed sizeable navies well before Athens did (Thuc. 1.13; Hdt. 6.8).

<sup>50</sup> See most recently Luraghi and Alcock (eds.) (2003), on Sparta, and Van Wees (2003) on other captor societies.

<sup>51</sup> Salmon (1984); Legon (1981); Cohen (1992); Jew (1999); Figueira (1981); Roebuck (1986); Sarikakis (1986). Slaves: Athen. 6.265b-267b, 272b-d.

opportunities, maritime access to slave markets in Asia Minor, the northern Aegean (Thrace) and the Black Sea region, and the lack of readily exploitable neighbors may well have been instrumental in precipitating the intrusion of chattel slavery into all sectors of the economy.

Republican Rome followed a comparable trajectory. Starting out as a city-state at the intersection of two different city-state cultures (Latin and Etruscan) and retaining its principal military and governmental institutions in increasingly fossilized form for hundreds of years, Rome placed heavy commitments on the adult male population of its expanding citizen core. Exceptionally high levels of military mobilization and large-scale migration militated against stable long-term employment.<sup>52</sup> These processes coincided with unprecedented growth in the accumulation of capital among the elite and equally abundant opportunities for the enslavement of defeated enemies and the purchase of foreign slaves.<sup>53</sup> Rome dominated its Italian neighbors by incorporating them into a military alliance system instead of turning them into a dependent (non-military) labor force. Combined with a fundamental societal ‘openness’ and inclusiveness that co-existed with a strong concept of citizenship and thereby facilitated the adoption of reward-intensive slave labor regimes, all these factors converged in producing an environment that was strongly conducive to the spread of chattel slavery throughout the economy.<sup>54</sup>

Other city-state cultures experienced similar inducements on a more moderate scale. In the fifteenth and sixteenth centuries, the *negeri* – a cluster of Malay-speaking city-states in Sumatra and Java – relied on a captive labor force of slaves that had been acquired largely through purchase or conquest.<sup>55</sup> The ‘open’ character of the slave system encouraged manumission and the use of slaves in care-intensive tasks. The price of labor was unusually high, supposedly ten times subsistence in rice according to astonished European observers. With regard to disruptive commitments, the ‘Malayan’ insider core of these *negeri* resembled the ‘Roman’ citizenry in its porosity and inclusiveness, and in its military commitment to their polity.

The Yoruba *ilu*, city-states in what is now south-western Nigeria from the sixteenth through the eighteenth centuries, provide a somewhat different example.<sup>56</sup> Just as in Greece, citizens were typically farmers who resided in the city; the distinction between citizens and strangers was crucial, and citizen status underpinned the exploitation of slaves, who were outsiders bought or captured in war.<sup>57</sup> Power depended on control over people rather than land, the latter being plentiful and the former scarce. In this case, the combination of citizen commitments and a quasi-colonial land/labor ratio favored the employment of slaves.

However, city-state status is not a priori conducive to large-scale slavery, and needs to coincide with other crucial factors (most notably (1) and (2) as defined above) to produce this particular outcome. The Hausa city-states in northern Nigeria (c.1450-1804) illustrate this basic point.<sup>58</sup> The period preceding the takeover of the Sokoto Caliphate in the early nineteenth century was characterized by ongoing conflict between the various city-states: the sources frequently refer to slave-raiding expeditions, tribute paid in slaves, and gifts of slaves between polities. The Hausawa – the free citizenry – dominated cities and countryside. Apart from herders and merchants, almost all foreigners who were absorbed into these city-states were slaves or members of certain ‘unfree’ occupational castes. ‘Slaves were unquestionably of

<sup>52</sup> Brunt (1987); Scheidel (2004), (forthcoming).

<sup>53</sup> E.g., Hopkins (1978), 37-96. To some extent, relative labor scarcity at the core may even have been complemented by a more ‘colonial’ situation in those parts of Italy where mass killings and displacements had altered land/labor ratios in ways that were conducive to the introduction of slave labor. However, the extent of any such developments is controversial, and bound up with the question of how badly some regions of Italy had been affected by warfare and confiscations.

<sup>54</sup> Cf. Jongman (2003), for the argument that Italian urbanization was closely associated with the growth of the slave population.

<sup>55</sup> Reid (2000), 424-6.

<sup>56</sup> Peel (2000). Just like ‘*polis*’, ‘*ilu*’ refers to both the city-state and its urban core (*ibid.* 508).

<sup>57</sup> *Ibid.* 515.

<sup>58</sup> Griffith (2000).

central importance to the growth and development of Hausa city-state culture.<sup>59</sup> Even so, slavery never came to define Hausa society or became essential to its economy. Pre-imperial Hausa society differed from Greece and Rome in important respects. As slaves were used in military capacities (including the guarding of cities), and elite cavalry was at the center of military operations,<sup>60</sup> the overall incidence of extra-economic commitments that were specific to the working citizenry appears to have been low. Moreover, access to new slaves was limited compared to conditions under the jihadist Sokoto regime of the Fulani in the nineteenth century when warring and enslaving greatly expanded.<sup>61</sup> These constraints are consistent with the limited development of slavery prior to that period.

As already noted above, other city-states fell back on collective slavery (Sparta and other poleis) or serfdom, such as the city-states of Etruria<sup>62</sup> and the Mixtec city-states in Mexico (c.900-1521), where elites owned large numbers of *tay situndayu* ('serfs', mainly of foreign origin) who worked their estates.<sup>63</sup> In the absence of critical incentives, slaves remained comparatively unimportant in several other city-state cultures. Slaves did not play a major economic role in the independent Sumerian city-states (from c.3000-2300 B.C.) and were primarily used as domestics.<sup>64</sup> The limited scope for expansion in this period and the lack of labor shortages were the main structural constraints, analogous to conditions in Old Kingdom Egypt. This situation only changed in the post-Akkadian Ur III empire (c.2100-2000 B.C.) when slaves assumed greater importance,<sup>65</sup> comparable perhaps to the expansion of slavery following the transition from the independent Hausa city-states to the imperial Sokoto caliphate. Likewise, slaves were of minor significance in the core coalition of Aztec city-states of the imperial period (1428-1520), arguably due to the fact that military commitments tended to be modest,<sup>66</sup> and landless workers were both numerous and readily available for long-term employment (that is, real wages and turnover risks appear to have been low).<sup>67</sup>

Conversely, it is possible to identify systems that were not city-states but nevertheless experienced the specific configuration of demand, opportunity, and 'insider' commitments that is conducive to the spread of slave labor. Medieval Scandinavian societies are a case in point. There, we witness a combination of a strong commitment to military activities within the in-group; an egalitarian ideological superstructure that reinforced the free/slave divide (esp. in the 'New World' environment of Iceland) and propped up the myth of popular political participation; disproportionate capital accumulation among elites; and access to an abundance of enslavable persons (both Norse and non-Norse) and to a variety of slave markets.<sup>68</sup> In the Viking Age, significant levels of slave-owning were perhaps confined to the West Norse of Norway, Ireland and Iceland. Later on, slaves may have been employed on large estates in Denmark, Norway and Iceland but were mostly found on family farms where one or two slaves provided domestic service and support in farming.<sup>69</sup> It was only when military commitments subsided and overall population increased that slavery was eroded by a shift to tenancy arrangements.

Portugal in the age of exploration, though likewise not a city-state, offers another and much better documented example. Slavery greatly expanded in the second half of the fifteenth century and peaked in the sixteenth, when it had come to assume a critical role in the overall labor supply.<sup>70</sup> In this case, the crucial determinants were the extension of Portugal's reach into sub-Saharan Africa from the 1440s

<sup>59</sup> Ibid. 491-2, 494 (quote).

<sup>60</sup> Ibid. 500.

<sup>61</sup> Lovejoy (1981), (2000), 201-8. See also Jumare (1996).

<sup>62</sup> Frankfort (1959); Harris (1971), 114ff.

<sup>63</sup> Lind (2000), 572.

<sup>64</sup> Westenholz (2002), 31.

<sup>65</sup> Siegel (1947).

<sup>66</sup> Hassig (1988), 59-60, for estimates of the relationship between army strength and population size.

<sup>67</sup> Smith (2000), 588. Even the concept of citizenship was lacking (589).

<sup>68</sup> City-states were not completely absent from this environment: see Holm (2000), 256-7, for estimates of military commitments in the Norse city-state of Dublin, and (1986), on slavery.

<sup>69</sup> Karras (1988), 69-95, who stresses the shortcomings of the evidence.

<sup>70</sup> Saunders (1982).

onwards, opening up abundant slave markets that replaced earlier sources of supply which had depended on successful conflict with Muslim polities; and an endemic and intensifying labor shortage caused by the ambition of a tiny population of some 1.5 million Portuguese to establish some measure of control over vast parts of the planet, and consequent (and often permanent) losses to the domestic labor supply. Slave labor became so profitable that the purchase price could be amortized within two years, and even faster for skilled slaves. Whilst concentrated in the cities, especially the capital of Lisbon,<sup>71</sup> slavery spread into both care-intensive and effort-intensive sectors of the economy (viz., artisanal and commercial activities, and work in foundries, on river barges, etc, respectively). Slavery subsequently declined in the seventeenth and eighteenth centuries in response to a demographic recovery, a decline in wages, and the increasing pull of the Brazilian labor market that drove up slave prices.

These observations support the assumption that rising commitments within clearly defined groups of stakeholders that coincide with rapid capital accumulation and improved access to slaves create favorable conditions for the spread of slave labor in the economic sphere.<sup>72</sup> This process differs from the standard ‘New World’ scenario that pits scarce labor among settler population against abundant natural resources, and offers a more suitable explanatory model for the creation of large-scale slave systems at the core rather than the (colonial) periphery of powerful polities.<sup>73</sup> In the most general terms, we may expect any large-scale slave system to conform to one of two ideal types: ‘peripheral’ systems with favorable land/labor ratios, and ‘core’ systems in which a combination of high commitment levels, capital inflows and overseas expansion raises demand for labor. However, as I indicated earlier, this rapid survey can be no more than a pointer for future research.<sup>74</sup> A systematic comparison between different categories of states would be required to identify significant correlations between specific features and levels of slave ownership.<sup>75</sup>

### Costs and tastes

Is it possible to measure the significance of the two key variables (1) and (2) in the ancient Mediterranean world? As I have shown elsewhere, we may gain at least a vague impression of the economic impact of (1) labor shortages and (2) access to slaves by comparing price and wage data from different regions and periods.<sup>76</sup> The principal contrast is between the expanding slave economy of classical Greece and the more mature slave system of the Roman Empire during the first few centuries AD (Table 4).

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<sup>71</sup> For a counterexample, compare the situation in the Netherlands that subsequently faced similar commitments (in terms of the out-migration/population ratio) but mitigated manpower shortages through large-scale immigration of German and Scandinavian men who married Dutch women, esp. in the large cities (De Vries (1986), 107-10), rather than by the importation of slaves. Portugal’s comparatively isolated position may have curbed free immigration.

<sup>72</sup> In the context of city-state cultures, the spread of slave labor may, in turn, free citizens to devote (even) more time to war and politics, a reciprocal process that forces neighboring polities to follow suit or risk defeat, and favors the emergence of a cluster of closely interconnected slave societies.

<sup>73</sup> Both models (for core and periphery) are consistent with Miller’s argument (in this volume) that slavery is a strategy to secure the labor services of vulnerable ‘outsiders’ for tasks that cannot easily be imposed on ‘insiders’.

<sup>74</sup> Pertinent conditions in late medieval Italian city-states in particular varied considerably and merit more detailed analysis. See, e.g., Haverkamp (1974), for the significance of slavery in medieval Genoa.

<sup>75</sup> Cf. Patterson’s chapter in this volume for methodological issues.

<sup>76</sup> Scheidel (2005b).

Table 4 Regional variation in real slave prices in the Greco-Roman Mediterranean (male and female; in wheat equivalent)<sup>77</sup>

Context	Slave prices expressed in:		
	(1) Wheat equivalent (in tons)		(2) Unskilled rural labor
	(1a) Range	(1b) Rough mean	(in annual wages)
Classical Athens (5 <sup>th</sup> /4 <sup>th</sup> c. BC)		~ 1.2-1.6	0.3-0.5
(Delphi (2 <sup>nd</sup> c. BC	?<3.5-4.7	)	
(1 <sup>st</sup> c. BC	?<3.8-7.2	?<4)	
(1 <sup>st</sup> /2 <sup>nd</sup> c. AD)	2-9	?<5.5)	5.5
Roman legal (2 <sup>nd</sup> /3 <sup>rd</sup> c. AD)	3-7	5	
Roman Egypt (2 <sup>nd</sup> /3 <sup>rd</sup> c. AD)	[3.5 or] 4-4.5	4	3
(Levant, 2 <sup>nd</sup> c. AD		similar?)	
(Dacia, 2 <sup>nd</sup> c. AD		similar???)	
(Dura, 3 <sup>rd</sup> c. AD		similar?)	
Roman Price Edict (AD 301)	(2.5-3?)	(2.5-3?)	(2-2.5?)
Roman empire (overall) (1 <sup>st</sup> -3 <sup>rd</sup> c. AD)		~ 4 (+/- 50%)	

Within ancient Mediterranean history, the ‘mature Roman slave system’ of the first three centuries AD stands in marked contrast to conditions in classical Athens in the fifth and fourth centuries BC. Athenian valuations are significantly lower than comparable rates for the Roman Empire. This interpretation is strengthened by the ratio of slave prices to daily wages. Jones and Duncan-Jones, in their earlier more limited earlier attempts to assess the value of slaves in different times and places, were right to maintain that Athenian slaves were significantly cheaper than Roman imperial slaves.<sup>78</sup>

These findings shed new light on the dynamics of chattel slavery in the ancient Mediterranean. Roman Egypt was endowed with an unusually ‘thick’ rural labor market: population densities were much higher than in most pre-industrial countries, and population pressure may well have been an issue.<sup>79</sup> At the same time, slave prices were relatively high – that is, broadly in line with Mediterranean averages (see above, Table 4) –, thanks to the pull of the Italian market rather than local demand. In this environment, slaves were luxury items: most households did not own any slaves, and most that did had only one or two.<sup>80</sup> As far as we can tell, slave labor did not play a great role in production. Hired labor and tenancy were the dominant labor arrangements. Classical Athens provides a counterpoint to this ‘low-equilibrium’

<sup>77</sup> For detailed discussion of the evidence, see Scheidel (2005b).

<sup>78</sup> Jones (1956), 194; Duncan-Jones (1978), 162-4.

<sup>79</sup> See above, n. 35, and Frier (2001).

<sup>80</sup> See above, in the opening section, and also Bagnall, Frier and Rutherford (1997), 98, for low levels slaveownership in the census register P.Oxy. 984 (from Ptolemais or Lykopolis): 5 out of 36 households owned a total of 13 slaves.

scenario: given high real wages and low slave prices, it must have paid to buy slaves instead of relying on hired labor. This is true *a fortiori* if we consider the impact of the comparatively ‘thin’ free labor market of the classical Athenian polis (see above). High real wages indicate labor scarcity. Imported slaves were both cheaper and more dependable than free wage-laborers. In this environment, it may even have been profitable to keep slaves simply to hire them out.

In this comparative evaluation, the Roman Republican period assumes the role of the missing link. In the absence of quantifiable evidence, we can only hypothesize that conditions in Italy and Sicily during the last two or three centuries BC bore a greater resemblance to classical Athens than to Egypt or even Italy itself in the first few centuries AD. As I have argued in the previous section, high demands on the free population, rapid accumulation of capital within the elite, easy access to slave markets, and the growth of markets for goods and services both within and outside Italy can be expected to have generated a similar environment of relatively high real wages and low slave prices.<sup>81</sup>

When commitments fell dramatically following the Augustan transition, population grew, and export markets shrank, the comparative advantage of slavery relative to free wage labor and tenancy must have declined.<sup>82</sup> It is frequently assumed that this process gradually eroded large-scale slavery at least in certain sectors of the Italian economy.<sup>83</sup> This is certainly plausible but perhaps not an inevitable outcome. We also need to take account of the limited flexibility of established institutions.<sup>84</sup> Path dependence militates against gradual fine-tuning of institutions until worsening sub-optimality may trigger sudden adjustments.<sup>85</sup> The feedback loop between institutions and belief systems also merits attention. Once a slave-owning ideology is firmly established, it may prove hard to dislodge it not only in the owner class but also among free workers.<sup>86</sup> There is no sign that the Roman Empire experienced anything remotely comparable to the severe shocks that destroyed large-scale slavery in the Americas and in other colonial settings: the emergence of an abolitionist ideology at the core of the dominant world system that came to affect elite behavior; the unilateral and coercive curtailing of the international slave trade by the world’s leading naval power; a massive civil war in North America; and later colonialist interventions in Africa. In the Roman Empire, by contrast, rule over slaves continued to be a defining element of elite identity; ideological or economic challenges were absent; and the socio-economic standing of the ruling class did not depend on the intrinsic competitiveness of the preferred system of labor. At the very least, we have to allow for the possibility that economic incentives and established tastes diverged over time, and that continuity in tastes helped prop up an increasingly inefficient system. Moreover, we must allow for the probable growth of natural reproduction: once a large slave population had been put into place and sex ratios evened out over time, a steady supply of replacements was guaranteed.<sup>87</sup> Moreover, qualitative evidence points to continuing imports from outside the empire.<sup>88</sup> While dumping prices may well be a vital element in the rapid expansion of a slave system, steady supply at stable price levels suffices to service an existing if bloated system. In consequence, the core of the Roman Empire may have entered a prolonged ‘high-equilibrium’ state of slave-holding.<sup>89</sup>

There can be no simple solution to this problem. Our answers are inevitably conditioned by our perspective. In the idealized universe of neo-classical economics, efficient markets and rational actors who enjoyed costless access to perfect information would not have hesitated to use their resources as

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<sup>81</sup> For discussion, see Scheidel (2005b).

<sup>82</sup> See Scheidel (1996), 93-7, for rough quantification of changing labor commitments.

<sup>83</sup> For (skeptical) discussions, see Garnsey and Saller (1987), 72-3; Morley (1996), 55-82.

<sup>84</sup> E.g., Aoki (2001); Greif and Laitin (forthcoming).

<sup>85</sup> For path dependence, see David (2001). Note that susceptibility to ‘market failure’ (as intimated here) is merely a special sub-category of the more general property of path dependence.

<sup>86</sup> Cf. Scheidel (2002) for the impact of slavery on attitudes toward labor among the free.

<sup>87</sup> Scheidel (1997), (2005a).

<sup>88</sup> See now Bradley (2004).

<sup>89</sup> The available evidence – in so far as it can be taken to reflect the actual diffusion of slave labor in different periods, a notion that well may be largely illusionary – does not indicate a dramatic drop in slave employment even in late antiquity: MacMullen (1987). Cf. also Whittaker (1987).

efficiently as possible by adjusting the relationship between free and unfree sources of labor as factor endowments changed over time. In the fuzzier but more realistic world of sociology and the humanities, concerns about status and the meaning of freedom and slavery would have constrained economic forces and helped perpetuate a well-established regime of labor and domination with all its social and cultural implications even as its efficiency declined over time.<sup>90</sup> Efficiency and utility are not the same thing. This is not to say that neo-classical market forces were unimportant or did not gradually assert themselves over time: it simply means that we are unable to tell whether changes in the economic incentive structure from the beginning of the monarchical period onwards triggered immediate or much delayed adjustments to labor markets, or none at all. In the absence of reliable statistics, our answer will always be colored by preconceived notions – perhaps not of what mattered at all, but surely of what mattered *more*: market or mentality, economics or culture.

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<sup>90</sup> Patterson (1982) for the importance of domination in slavery. Cf. also Kyrtatas (2002), for the Greeks' general emphasis on domination rather than exploitation.

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