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Property Rights: A Test and  
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## **POLITICAL ECONOMY WORKING PAPER**

*FACTOR PROPORTIONS, PUBLIC FINANCES, AND PROPERTY RIGHTS ON LABOR RESOURCES:  
A TEST AND REFORMULATION OF DOMAR'S HYPOTHESIS ON SLAVERY OR SERFDOM*

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March 1990

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ABSTRACT

Relative labor scarcity and land abundance were contributing causes of agricultural slavery or serfdom that Domar correctly emphasized, but he predicted that private and public agents as well as population factors would play different roles in the rise and fall of those forms of coerced labor than they did in colonial Paraguay. A more satisfactory, endogenous account of the influence of those factors can be obtained by reformulating the hypothesis in property rights and rent-seeking terms. In the process, the particular progression and ethnic characteristics of the agrarian class structure and land tenure system in that peripheral Spanish colony are also clarified.

\* I thank Evsey Domar, Gabriel Tortella, Stanley Engerman, Tom Davis, Robert Higgs, Thomas Whigham, Branislava Susnik, Douglass North and John Nye. Errors are my own.

FACTOR PROPORTIONS, PUBLIC FINANCES, AND  
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The causes of slavery or serfdom - Domar contended - may be found in relative factor scarcity and government intervention, which between 1550 and 1650 led to the bonding of a previously free Russian peasantry.<sup>1</sup> Given that similar relative factor supplies and forms of coerced and free labor also arose at roughly the same time but not in the same sequence in a number of peripheral Spanish and Portuguese colonies in America, I propose to test Domar's hypothesis by verifying whether its predictions are consistent with the experience of a roughly representative Spanish colony, Paraguay.<sup>2</sup> I will summarize the hypothesis in section one, briefly describe the forms of coerced and free labor that arose in the test case in section two, contrast the hypothesis' implications with the empirical record in section three, and reformulate certain aspects of the hypothesis so that it is consistent with the case study in section four. Ideally, the reformulated hypothesis should then be tested against the history of Paraguay, the other peripheral colonies, and the regions Domar considered. For space limitations, however, I will limit myself to suggesting, in section five, certain areas where theoretical expectations derived from the reformulated hypothesis and the record of Paraguay are consistent one with the other.

1. A free peasantry will arise, Domar argued, if land is abundant and competition for laborers among employers is free. Assuming only two factors, labor

1. Evsey Domar, "The Causes of Slavery and Serfdom: A Hypothesis," *Journal of Economic History*, 30 (March 1970), pp. 18-32.

2. For a description of these peripheral areas, see James Lockhart and Stuart Schwartz, *Early Latin America* (Cambridge: Cambridge University Press, 1983), pp. 253-304.

and abundant land of even fertility, the marginal product of labor will be constant and equal to the average product. Competition among employers will drive wage rates up until they equal the marginal product of labor and, therefore, all output will be paid out to laborers as wages. Land will not earn rent. Given that landowners will not hire laborers unless rents are positive, and that laborers will not hire themselves out for less than they can earn working easily obtainable land of their own, family size farms fairly equally distributed in size will emerge. The government may raise revenues by taxing the peasantry directly or indirectly, but not by taxing land rents. Economic forces alone, without government interference, will shape the institutional structure. Restricting the right to own land will not significantly alter this result: laborers will now work for a wage, but competition among employers will keep wages high as a proportion of total output. Extending the number of factors to three will leave the results largely unaltered, so long as land is abundant and competition is unhindered. The colonial and nineteenth century U.S. North exemplifies this case.

Serfdom or slavery will arise when labor is scarce relative to land and, in addition, governments intervene to tie laborers to "employers" for, perhaps, a public finance rationale: eliminating employers' competition for laborers allows employers to appropriate the marginal product of labor above a subsistence minimum, surplus from which they can support themselves and equip armies needed to wage war against other states. Tying land will not accomplish the same result, for reasons already explained. It is worth noting here that Domar regarded serfdom and slavery as equivalent and used both terms interchangeably.

The demise of slavery is, for Domar, more certain in a traditional economy than in one where technological innovation is commonplace. More relevant for our purposes is a traditional economy where, according to Domar, slavery ends as a result of a Malthusian mechanism: population growth leads to a fall in the marginal

product of labor and "Now the free man costs little more to employ than the slave, while hopefully being less bothersome and more productive. The ownership of human beings becomes pointless because of the great multiplication of slaves and they become free...".<sup>3</sup> An increasing population turns land scarce. Estates worked by free laborers or tenants without any non-economic compulsion can now produce land rents that the state may tax to, for example, support an army.

The U.S. South's experience with slavery fits the hypothesis "with embarrassing simplicity," Domar thought, and so does the onset of serfdom in Russia and Poland-Lithuania, as well as serfdom's onset and its 13th century demise in Western Europe. Domar could not, however, account for the non-recurrence of serfdom in Western Europe after the Black Death in terms of a switch to less labor intensive techniques (sheep farming), and reluctantly attributed it to exogenous political factors. The population decline could have been uneven across estates, he argued, forcing landowners who had lost comparatively more serfs to favor freedom of peasant movement and those that had lost fewer serfs to oppose it. Disunited landowners could not pressure the government to do their bidding and opened the way for others to do so. Thus, the pressure behind legislation in Richard II's England may not have come from feudal landowners but from "smaller" man. In general, in an economy with scarce labor and abundant land of uniform quality there will never simultaneously exist free land, free peasants and non-working land owners, although any two of them will. Which combination is found depends on the government.

2. Paraguay's early colonial economy was first characterized by American Indian slavery and, from the mid 1550's, by two versions of a form of serfdom, the "encomienda mitaria" and "encomienda yanacona," which replaced

3. Domar, "Causes of Slavery or Serfdom," p. 23.

slavery. The encomiendas were royal grants of Indian labor to worthy Spaniards ("encomenderos"), who were supposed to undertake at their own expense measures required to protect, convert, and acculturate their Indian charges, render military service to defend the colony, and pay certain money taxes to the Royal Treasury.<sup>4</sup> In exchange, the encomenderos would collect for themselves in temporary labor services the tax Indians would otherwise have paid the King.<sup>5</sup> Indians subjected to the encomienda mitaria were confined to towns and took turns providing labor services, usually for two months at a time, on the houses, ranches and plantings of their encomenderos. Once their service was completed Indians would return to the towns where they were confined and another contingent would serve in their stead. Indians subjected to encomiendas yanaconas did not live in their own towns but with the encomenderos to whom they were entrusted, and served continuously rather than by turns. Both forms of the encomienda had declined noticeably by the 1630's, but the stagnant encomiendas and the "pueblos de indios" confining "mita" Indians nevertheless persisted throughout the colonial period. Alongside the estates worked with encomienda labor and the pueblos de indios there arose a progressively more important guarani-speaking, mestizo free peasantry, whose family-size farms spread particularly rapidly in the last decades of colonial rule. A more detailed description follows.

Indigenous slavery appeared early in Spain's colonization of Paraguay. Tribes of the area west of the Paraguay River were a threat to both the Spanish seeking to reach Peru and the guarani-speaking tribes of the Asuncion area. Mutually beneficial Spanish-Indian alliances were formed and joint westward expeditions produced numerous captives that were divided up as slaves among the

4. James Schofield Saeger, "Survival and Abolition: The Eighteenth Century Paraguayan Encomienda," *The Americas*, Vol. 28, (July 81), pp. 59-85.

5. Carlos Pastore, *La lucha por la tierra en el Paraguay* (Montevideo: Editorial Antequera, 1972), p. 12.

Spaniards and their Indian allies. These alliances were cemented in the customary indigenous manner, that is, by the polygamous marital unions of Spanish men and Indian women, whom the Spaniards treated as slaves and traded freely among themselves. From these "marriages" arose a mestizo population, about which more will be said later, and kinship ties between Spaniards, Indians, and mestizos. Kinship had regulated the provision of voluntary, reciprocal labor services among indigenous tribes and temporarily served the same purpose between Spaniards and Indians. The "cuñadazgo," however, soon became a vehicle for exacting coerced indigenous labor. Open enslavement of friendly Indians followed the realization that Peru would not be reached through the River Plate. Resigned to staying in Paraguay, the Spaniards raided friendly Indian settlements in search of slaves. These "rancheadas" sought Indian women in particular, because of their skill as cultivators, and formally stretched until 1555.<sup>6</sup>

Enslavement, flight, and disease rapidly lowered the indigenous population, which in turn moved the colonial administration to do away with Indian slavery and substitute for it the less severe encomiendas. Royal officials finally managed to impose them in 1556, when the Provincial governor assigned in encomiendas mitarias 27,000 able-bodied, adult Indian males (equivalent to a population of 100,000) among a fraction of the Spaniards in Asuncion. Mita Indians were also subject to the "congregacion," a policy that involved resettling mita Indians in segregated "pueblos de indios" to which Spaniards were denied access.<sup>7</sup> Entrustment could and did take place independently of resettlement, especially in the beginning. In fact, the first permanent Indian towns were founded in the

6. Branislava Susnik, *El indio colonial del Paraguay*. Vol. 1, *El guarani colonial*, (Asuncion, Musco Etnografico Andres Barbero, 1965).

7. On the congregacion see E. Bradford Burns, *Latin America, a concise interpretive history* (Englewood Cliffs, N.J.: Prentice Hall, 1972), p. 36.

1580's.<sup>8</sup> Those "recalcitrant" Indians who refused to submit to entrustment could be forced to do so in "just wars" waged to that effect, that is, could be enslaved. Kept under close supervision in the homes and farms of Spaniards, these slaves could not, however, be freely traded by their owners and had to first revert to the crown before being reassigned to another Spaniard, a characteristic of the encomienda mitaria as well. They came to be regarded as belonging to another encomienda, the encomienda "yanacona," which thus disguised and prolonged slavery in a restricted form.<sup>9</sup>

The "new" system did not work well. The encomenderos abused their privileges and shirked their contractual obligations. For example, they shifted mita Indians to the encomienda yanacona and evaded military service by purchasing government offices exempting their holders from it.<sup>10</sup> Encomendero abuses and other reasons attributable to the institution of the encomiendas contributed to the continued decline of the indigenous population. Three successive sets of royal ordinances noted the abuses and legislated against them, but there was no reprieve for the Guarani Indians until the Jesuits began to found mission towns southeast of Asuncion in the 1610's.<sup>11</sup> Thus, the indigenous population appeared to have been reduced to a fraction of its original size by the early seventeenth century.<sup>12</sup>

8. See Margarita Duran Strago, *Presencia Franciscana en el Paraguay: 1538-1824* (Asuncion: Universidad Catolica, 1987) pp. 93-164.

9. Silvio Zavala, *Origenes de la colonizacion en el Rio de la Plata* (Mexico: El Colegio Nacional, 1977).

10. James S. Saeger, "Survival and Abolition," p. 74.

11. See Julio Cesar Chaves, "Las ordenanzas de Ramirez de Velasco, Hernandarias, y Alfaro," *Historia Paraguaya* 13 (1969-70), pp. 107-120, and Alberto Armani, *Ciudad de Dios y Ciudad del Sol. El "estado" jesuita de los guaranies (1609-1769)*, (Mexico, fondo de Cultura Economica, 1986).

12. For a lower bound estimate see Adalberto Lopez, "Shipbuilding in Sixteenth Century Asuncion del Paraguay," *Mariner's Mirror*, 61, No. 1 (Feb. 1975), p. 31-37, and for an upper bound estimate see Juan Carlos Garavaglia, *Mercado interno y economia colonial*, (Mexico, Editorial Grijalbo, 1983).

Attempts were now made to extend the encomienda to mestizos and to introduce African slaves, but they were generally unsuccessful because of legal prohibitions. Thereafter, the encomienda de la mita - although still valuable - languished.<sup>13</sup>

The rest of the seventeenth and the early eighteenth centuries were marked by economic contraction and absence of immigration. The decimated Indian population had by now been "reduced" to Indian towns as well.<sup>14</sup> Over the now vacant lands they had occupied family-size farms owned by mestizo, guarani-speaking peasant proprietors began to spread, more rapidly after trade in agricultural products increased in the later eighteenth and early nineteenth centuries.<sup>15</sup> Greater production of yerba mate in the north and tobacco in the east increased the demand for land, and so did the yerba-derived demand for cattle, which became particularly acute after the Borbonic liberalization of trade of the 1770's.<sup>16</sup> Land prices rose, land rents appeared, and mestizos encroached upon the lands of the pueblos de indios. Wages rose as well, landless peasants migrated to the more rapidly growing areas, and a relatively large immigration was observed.<sup>17</sup> The greater demand for land and labor helped expand the land frontier and increase the relative importance of the stratum of small peasant proprietorships.

13. See Alberto Armani, *Ciudad de Dios Y Ciudad del Sol*; Adalberto Lopez, "Shipbuilding...," pp. 31-37; and Rafael Eladio Velazquez, "La Poblacion del Paraguay en 1682," *Revista Paraguaya de Sociologia*, Vol. 9, No. 24 (Mayo-Agosto), pp. 128-148, respectively.

14. See Rafael Eladio Velazquez, "Caracteres de la encomienda paraguaya en los siglos XVII y XVIII," *Historia Paraguay XIX*, pp. 115-163.

15. See Juan Carlos Garavaglia, *Mercado interno y economia colonial*, pp. 353-379, and *Economia, sociedad y regiones* (Buenos Aires, Ediciones de la Flor, 1987) pp. 193-260.

16. See Jerry W. Cooney, "The Yerba Mate and Cattle Frontier of Paraguay, 1776-1811: Social Economic, and Political Impact," (ms) 1987; "Bureaucrats, Growers, and Defense: The Royal Tobacco Monopoly of Paraguay," (ms) 1987. For the late eighteenth century boom see Jerry W. Cooney, "An Ignored Aspect of the Viceroyalty of the Rio de la Plata," *Intercambio Internacional*, Vol. 2, No. 1 (January 1977), pp. 10-13.

17. See Rene Ferrer de Arrellaga, *Un siglo de expansion colonizadora: los origenes de Concepcion*, (Asuncion, 1985); Jerry W. Cooney, "Foreigners in the Intendencia of Paraguay," *The Americas*, Vol. XXXIX (1982-83), pp. 333-358, respectively.

The Borbonic reforms, in addition, encouraged the development of state enterprises, whose demand for indigenous labor revived a seventeenth century colonial administration policy to grant no new encomiendas and force vacant ones to revert to the crown.<sup>18</sup> The system continued to function along these lines and was finally abolished in 1812, after Independence.

3. Factor supplies did obtain in Paraguay in the proportions hypothesized by Domar.<sup>19</sup> Furthermore, indigenous slavery appeared even though the demand for slave labor arose from the production requirements of what was essentially a subsistence, not an export, economy. Slavery, however, did not result from intervention by the colonial administration. On the contrary, the crown pressed to end indigenous slavery and institute the encomiendas in its stead and, furthermore, legally abolished indigenous slavery in the middle of the sixteenth century (except in cases of just wars). In Paraguay, it appears, indigenous slavery was brought about by private entrepreneurs who, at their own expense, applied the military coercion necessary for its enforcement and reproduction. Labor scarcity also promoted the introduction of the encomiendas, which did require direct government intervention inspired by public finance considerations of the sort Domar suggested. Therefore, Domar's contention that slavery requires direct government intervention is not born out, but his hypothesis that serfdom does is. However, Domar regards government behavior as an exogenous, political variable and would leave a full explanation of its behavior to political scientists. Thus, the hypothesis insufficiently specifies the role of government.

18. See Jerry W. Cooney, "A Colonial Naval Industry: The Fabrica de Cables of Paraguay," *Revista de Historia de America*, 87 (Enero-Junio 1979) and "Paraguayan Astilleros and the Platine Merchant Marine, 1796-1806," *The Historian*, 1980, pp. 55-74; for the escheating of encomienda to the crown, see Saeger, "Survival and Abolition," p. 77.

19. See Elman R. Service, *Spanish Guarani Relations in Early Colonial Paraguay*, (Westport, CT, 1954).

Serfdom or slavery would disappear as a result of population growth, Domar posited, although he did not suggest what forces consistent with the logic of a slave or feudal economy would bring this growth about. In fact, indigenous slavery produced a population decrease that did not stop when the *encomiendas* were instituted and eventually led to the dwindling of their sources of supply and consequent stagnation. This negative population effect is one that Domar's hypothesis makes no provision for. Furthermore, one would have expected the *encomiendas* in Paraguay to have been extended to the growing mestizo population at this point, just as Domar expected serfdom in Europe to recur after the Black Death. However, although attempts in this direction were made, no such extension is observed. Finally, rather than ending because labor becomes plentiful and cheap, the *encomienda mitaria* seems to have been abolished in the context of a general labor shortage and increasing wages. Thus, Domar's hypothesis appears to be inconsistent with the *encomiendas*' abolition.

That out of slavery and serfdom a free peasantry should have arisen poses another problem for Domar's hypothesis, since it suggested that a free peasantry would precede serfdom or slavery. Moreover, the hypothesis suggested that slavery or serfdom would disappear through a population increase that would render labor abundant, land scarce, and would make it worthwhile for landlords to fire their slaves and hire free laborers; assuming that the growing bonded population owns no assets and is freed because it becomes abundant relative to land, which becomes comparatively scarce, one would expect it to be transformed into a free wage labor force, not the free peasantry that flourished in Paraguay. Furthermore, the particular ethnic characteristics exhibited by the Paraguayan peasantry requires an explanation, which the hypothesis cannot provide because it was not built for that purpose.

4. In general, well-defined and enforced private property rights will allow rents accruing to scarce resources to be captured by their owners, while commonly owned resources will be overexploited and the rents that would otherwise accrue to them will be dissipated, as in the classic case of the fisheries.<sup>20</sup> This analysis applies to all resources, labor resources included. Given abundant, evenly fertile land and unhindered competition among employers a free peasantry will emerge, provided private property rights over all resources -including one's own labor- are well defined and are enforced by the government. If so, even if the right to own land in private property is restricted to a certain sector of the population, slavery or serfdom do not result, as Domar points out. On the other hand, if the government fails to enforce or differentially enforces private property rights over labor, it is obvious that slavery is a possible outcome. The different results are clearly due to the alternative delineation and enforcement of property rights by the government. Thus, government intervention appears to be as much of a requirement for the rise of a free peasantry, or of a class of landowners and a class of rural wage laborers, as it is for the rise of serfdom. Conversely, government intervention does not seem a necessary condition for slavery, which private associations may be sufficient to impose and enforce. This is exemplified in the particular case under study. The Spanish kings owned the land and labor resources by Papal decree, but did not or could not rigidly enforce their property rights. Consequently, individual Spaniards initially regarded the indigenous people as a common property resource and exploited their labor as they would have exploited any other such resource; unsurprisingly, the outcome was not a free peasantry but indigenous slavery and depopulation. In fact, by not enforcing its property rights over indigenous labor and letting private entrepreneurs enslave Indians, the crown

<sup>20</sup> H. Scott Gordon, "Economic Theory of Common Property Resources," *Journal of Political Economy*, (1965).



allowed the private rate of return to exceed the social rate of return, thus increasing the incentives for private Spaniards to colonize the New World at the expense of depleting indigenous labour resource. The analogy between ocean fishing and slave hunting may obviously be applied fruitfully to American Indian slavery in Paraguay as well.<sup>21</sup>

Take now the *encomiendas*. The encroachment of private enslavers on royal labor resources and the resulting depopulation would eventually have depleted the tax paying indigenous population and dissipated the rents accruing to it. To put an end to this waste of resources the crown had to intervene and reassert its own property rights over the scarce labor, excluding private encroachers. It did so by means of the policy of *congregacion*, which confined Indians to towns and severely restricting Spaniards' access to these towns. However, to capture some of the labor rents for itself, however, the crown had to, additionally, sell or lease the reclaimed rights to private agents, or, alternatively, itself use the labor resources in royal enterprises. Selling royal rights would simply have given rise to unrestricted indigenous slavery, which had been legally ruled out in the middle of the sixteenth century. Leasing the rights over a period of years, on the other hand, would not have violated existing laws. Leasing the rights full time over a period of years gave rise to the *encomienda yanacona*, while leasing them for part of the year over a period of years gave rise to the *encomienda mitaria*. Leasing, however, created incentives for *encomenderos* to depreciate the resource during the term of the grant and, conversely, made it necessary for the crown to devise some rules of resource use and means by which to enforce resource use in accordance with the rules in question. In other words, the *encomiendas mitarias* created an agency problem.

<sup>21</sup> Robert P. Thomas and Richard Bean, "The Fishers of Men: The Profits of the Slave Trade," *Journal of Economic History*, Vol. 34 (1974), pp. 885-914.

This analysis is consistent with a rent-seeking view of mercantilist states which asserts that such states raise revenues by supplying rent-creating monopoly rights at prices reflecting the monarch's ability to price discriminate. The poorer and closer to the frontier was a colony, the greater the crown's incentives to lease its rights over Indian labor to private agents, since the low labor productivity of the indigenous population meant that the monetary yield of taxes they paid in kind would likely be lower than the costs of tax collection, let alone the costs of defending the colony. On the other hand, the crown's incentives to reclaim the labor resources it had leased rose in the late eighteenth century, when the costs of defense abated, the crown promoted state enterprises, and wages went up. Predictably, the colonial administration chose to reclaim royal rights over labor and itself use Indian labor in state enterprises.

One may conclude, therefore, that the *encomiendas* intended to regulate the slavery that had arisen from the free play of maximization aims in the context of private property rights not clearly defined and enforced. The *encomiendas* aimed at preserving the royal stock of Indian laborers, and at increasing the crown's share of the surplus over subsistence that private users of indigenous labor extracted, that is, at changing the distribution of income that resulted from the institutional arrangements proper of slavery. This required new institutional arrangements, which were put in place by means of a mutually beneficial transaction between the royal government and private entrepreneurs. The crown temporarily transferred its claims to the labor of the Indians to *encomenderos*, who in exchange payed some taxes and assumed responsibility for providing defense and social services. *Encomenderos* accepted the exchange because they had a comparative advantage vis-a-vis the crown in extracting labor from their charges and consuming what it produced. In addition, they had gathered substantial military experience during the

conquest and could organize themselves into an effective militia to defend the colony.

The encomiendas must be viewed as an unusual form of tax-farming that allowed both partners in the transaction to share the rents accruing to royally owned scarce labor resources. They were also a discriminatory system of labor allocation which its beneficiaries had incentives to preserve and those it discriminated against had incentives to reform. Given the defense needs of the seventeenth century, and the later demand for indigenous labor of state enterprises, it should not be surprising that the encomiendas persisted while colonial rule lasted. Conversely, given that by the early nineteenth century, the great majority of Paraguayans were peasants without encomiendas one would have expected the encomiendas to have been abolished after Independence, as in fact they were. Conditions leading to the abolition of the encomienda in Paraguay, therefore, seem to have arisen from the internal logic of existing economic conditions, and resemble those to which Domar attributed the non recurrence of serfdom in England.

Consider now the free mestizo peasantry. Due to the absence of immigration, mestizos occupied the position of "criollos," Indies-born children of Spaniards, although public office and encomiendas were preferentially assigned to peninsular Spaniards nevertheless. Thus, after the first encomiendas were distributed, mestizos left Asuncion for areas to the north and east, where there were relatively large concentrations of still untrusted Indians, who could be subjected to the encomienda mitaria or enslaved. Once the still untrusted population disappeared, however, the mestizos had to rely on their own labor and the still abundant land for a livelihood, that is, they became peasants. As the scarcity of labor became even more pronounced and the encomiendas stagnated, mestizos were not entrusted because they were legally ineligible for subjection. Thus, it was the government's intervention to enforce property rights that allowed a free

peasantry to remain free when economic forces would have led to its bonding. Summarizing then, because the government entrusted Indian labor to a fraction of the Spaniards, confined the indigenous population to reservations, and allowed Spaniards and mestizos to privately own land, there simultaneously emerged indigenous serfs, non-working landowners, and free mestizo peasants. A pattern whose appearance Domar deemed impossible did in fact appear. That is, the discriminatory assignment and enforcement by the government of private property rights over labor and land to permit the state and individuals to share the rents of scarce labor resources resulted in a class structure and land tenure system of particular ethnic characteristics.

On the basis of the previous discussion, preliminary statement of the reformulated hypothesis would read something like this: assuming homogeneous land and abundant, evenly fertile land, a free peasantry will arise so long as private property rights over all resources are clearly defined and enforced by a government financed from direct or indirect taxes levied on the peasants themselves. Provided land remains abundant and evenly fertile, the introduction of a third factor, capital, will not significantly alter the results. Governmental restriction of the right to own land to a certain section of the population will result in a class of landowners and a class of rural wage laborers, and the public finance structure will be correspondingly altered. If labor is scarce but land is abundant and evenly fertile and property rights over all resources are assigned to the government but are not well defined or enforced by it, maximizing behavior will lead private agents with superior coercive capabilities to enslave a militarily inferior population and extract the surplus over subsistence that it can produce. The attempt to enslave laborers will result in a reduction of the population from among which the slaves are obtained, in a manner akin to that predicted by the theory of common property resources. The resource depletion and rent dissipation may move the government to intervene to preserve

the resource and extract the rents accruing to it, provided the returns from doing so are anticipated to outweigh the costs. Preserving the resource implies protecting the laborers, which will require the government to separate encroachers and laborers. Extracting labor rents will require the government to implement a rent-sharing agreement, that is, farm out the collection of labor rents in exchange for the provision of certain public goods. To this effect, the government will tie laborers to the tax farmers and confine laborers to their settlements, that is, restrict competition for laborers and labor mobility. Alternatively, the government may use the labor resources in its own enterprises. Which option is chosen will depend on the government's public finance alternatives, the cost of providing defense, the price of labor, and its capability to steer business ventures. In either case, government restrictions on the right to own land and labor will be necessary. Should restrictions be made along ethnic lines, the resulting class differences and land tenure system will exhibit similar ethnic characteristics as well.

The bonded population, because it is deprived of a greater or lesser part of the surplus over subsistence that it produces, is likely to grow at a slower rate than the mestizo peasantry. As bonded labor becomes relatively more scarce, landowners with labor grants will diminish as a proportion of the population, and so will the pressures they may put on the government to maintain a discriminatory system of labor allocation. Conversely, as the free peasantry becomes a greater proportion of the total population, incentives will increase for it to favor the abolition of the entrustment system, and the growing peasant influence on the government may lead to the abolition of serfdom. However, should the government have reclaimed the labor grants it made originally, it will resist peasant pressures for abolition. In this case, if the peasantry itself cannot prevail on the government, the increase in population may cause the government to regard emerging land rents as a

profitable substitute for tax revenues based on declining labor rents, and serfdom may be abolishing nevertheless.

5. To test the reformulated hypothesis we must establish its capability to account for features of Paraguay's colonial economy other than those which prompted the reformulation. At least three such instances may be mentioned. First, the fact that as the encomiendas stagnated early in the seventeenth century, the crown exempted Jesuit mission Indians from the encomiendas and refused several requests by encomenderos to cancel that exemption; second, that the crown also prohibited the importation of African slaves to replenish the dwindling supply of Indian labor; and, third, that in the eighteenth century, as the crown granted no new encomiendas and retook possession of those whose terms had ended, its share of defense duties increased.

The Indian population of Jesuit mission towns grew rapidly from their inception. By contrast, that of Franciscan missions did not begin to grow until the 18th. century and then only very slowly. Furthermore, under the direction of their Jesuit mentors, mission Indians contributed effectively to defense and, in addition, paid their taxes in money, punctually to boot. When Indians were congregated in missions under Jesuit oversight, segregated from Spaniards, and exempted from the encomienda, the stock of indigenous labor yielded much higher returns than it did when confined to towns under Franciscan supervision, less isolated from Spaniards, and subjected to the encomienda. The crown had no reason, then to yield to encomenderos and reimpose the encomienda on Jesuit mission Indians, and did not. That as the encomienda stagnated the crown should have forbidden encomenderos to import African slaves is also consistent with the hypothesis. Had encomenderos been allowed to import African slaves they would have switched from encomienda labor to African slave labor; the defense commitments they owed under the encomienda would have been correspondingly reduced. By forbidding the

importation of African slaves the crown reduced the encomenderos' ability to substitute African for Indian forced labor and constrained them to adhere to their original defense commitments. Finally, the encomenderos contribution to defense decreased in the eighteenth century, as the crown granted no new encomiendas and retook possession of those whose term had ended. As one would have expected, the crown's share of defense duties increased concomitantly. The old system by which the colonial administration obtained contributions to defense from individuals in exchange for grants of labor was scrapped. Instead, a military reform installed a semi professional army remunerated by the crown in money, not in labor, in land, or both.

In conclusion, Domar's emphasis on relative labor scarcity vis-a-vis land as a contributing cause of agricultural slavery or serfdom is thoroughly warranted. His identification of slavery and serfdom, however, is not. Despite the similarities between both these forms of coerced labor, there are sufficient differences between them to justify dealing with them separately. The case studied here suggests that whether relative labor scarcity vis-a-vis land results in slavery or in serfdom depends on the degree to which the state enforces property rights, which in turn will depend on the rate of return to the state of investing its scarce resources in that activity as compared to others. In Paraguay, indigenous slavery emerged when the state did not enforce its private property rights over the labor of indigenous people and allowed its peninsular subjects to regard indigenous people as a common property resource. Exploitation by private entrepreneurs of crown-owned Indian labor along common property resource lines led to the depletion of the resource and the dissipation of rents that should have accrued to the crown. As the resource became more scarce and, therefore, more valuable, and to prevent further depletion and rent-dissipation, the crown sought to regulate the exploitation of Indian labor by means of the encomienda and the congregacion. These regulatory institutions had

features very similar to schemes for managing open access fisheries. They were intended to curtail access to the resource and the dissipation of rent it could yield to the crown. However, the system did not work well until Indians were congregated in Jesuit missions, segregated from Spaniards and, in addition, exempted from the encomiendas. The growth of a mestizo population legally exempt from the encomiendas in time made labor relatively more abundant and land comparatively more scarce, a tendency that was exacerbated when the Borbonic reforms increased foreign trade and immigration. As land and foreign trade replaced labor as the state's predominant source of tax revenues, the encomiendas were abandoned in favor of other institutional arrangements by which the state sought to obtain revenues and provide defense.

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