Volume Title: Capital in the Nineteenth Century

Volume Authors/Editors: Robert E. Gallman and Paul W. Rhode

Volume Publisher: University of Chicago Press

Volume ISBNs: 978-0-226-63311-4 (cloth); 978-0-226-63325-1 (electronic)

Volume URL: https://www.nber.org/books-and-chapters/capital-nineteenth-century

Conference Date: n/a

Publication Date: February 2020

Chapter Title: Wealth in the Colonial and Early National Periods

Chapter Author(s): Robert E. Gallman, Paul W. Rhode

Chapter URL: https://www.nber.org/books-and-chapters/capital-nineteenth-century/wealth-colonial-and-early-national-periods

Chapter pages in book: (p. 297 – 331)

CHAPTER FOURTEEN

Wealth in the Colonial and Early National Periods

14.1. Introduction

The materials from which wealth and capital estimates may be made for the late eighteenth and early nineteenth centuries are moderately rich, and the various series overlap sufficiently so that useful consistency tests can be conducted. We begin by identifying the principal estimates.

14.2. Principal Aggregate and Component Wealth Estimates

The aggregate estimates that have the firmest empirical basis are those prepared by Alice Hanson Jones (1978, 1980) for the year 1774. These estimates are based on a sample of probate records, adjusted to allow for nonprobate wealth and weighted so as to reflect wealth holdings by the living population. Jones provides considerable detail: fifteen components of wealth are distinguished. Two divisions that would have proved helpful were apparently not made: those between the value of slaves and of indentured servants, and between the value of land and improvements thereon. The estimating procedures were exceptionally careful. Perhaps the weakest element in the procedures—the estimation of nonprobate wealth—is relatively unimportant, so far as the estimation of aggregate wealth is concerned. Nonprobate wealth accounts for less than one-fifth of total wealth (Jones 1980, 39–40, 129, 349–51).

Gallman wrote this chapter. Rhode made minor revisions for clarity and consistency.

Jones (1980, 10) also provides a dollar/pound exchange rate, which "may be thought of as the number of dollars at 1774 prices which a pound sterling would have bought if the American dollar had then existed with the same gold content as the one of 1792."

The most extensive comprehensive estimates are those prepared by Samuel Blodget (1810).[1] Blodget made detailed estimates (eleven components are distinguished) for 1805 and then extended the aggregate series (called "value of all real and personal property in the US") to 1774, 1784, and the 1790–1809 period. The 1774 and 1784 values are expressed in dollars, presumably the same kind of dollars as those appearing in the Jones exchange rate for 1774. Blodget also provides for the same years fifty additional relevant series (some estimates are missing for the early years), of which the most useful for present purposes are the number of slaves; the number of persons to each square mile; the number of dwelling houses inhabited; the acreage of improved land (divided into three types; acres of unimproved land can be inferred from other information); the average price per acre of cultivated land; the same for land in its natural state; the number of horses; the number of horned cattle; the capital stock of toll bridge companies, turnpikes, canals, insurance companies, and banks; the public debt; the tonnage of merchant vessels; the value of merchandise imports; the average price of labor per day; the average price of wheat per bushel; and the amount of metallic money and banknotes in circulation. The 1805 estimates were worked over by Raymond Goldsmith (1952, 315–16), who made some adjustments and developed further details.

The federal government levied direct taxes in 1798, 1813, and 1815. The act of 1798 called for the enumeration of slaves over twelve years of age and under fifty, and for the enumeration and valuation of "every dwelling house, which, with the outhouses, appurtenant thereto, and the land, whereon the same were erected, not exceeding two acres," was worth more than one hundred dollars (Pitkin 1835, 309).[2] Houses worth one hundred dollars or less were apparently to be enumerated, but not valued. The returns were incomplete, but Lee Soltow (1987, 181–85) has estimated the total number and value of all houses, as well as the number and value of each of the two components, rural and urban houses. "Value" seems to have been intended to mean market value. Soltow refers to the valuation date as 1798; Pitkin refers to it as 1799. Since the law was passed in July of 1798, and since the appraisal apparatus must have been quite elaborate, it seems reasonable to suppose that assessments

were not begun until 1799. In what follows—particularly having to do with deflation—this interpretation is adopted. However, when Soltow's estimation procedures are under discussion, Soltow's view that the assessment year was 1798 is necessarily accepted.

In 1813 a second direct tax was levied, this one based "on the value of all lands and lots of ground, with their improvements, dwelling houses and slaves" (Pitkin 1816, 329).[3] Pitkin's account of the assessment process is not clear. Apparently, the secretary of the treasury offered two systems by which the burden of the tax could be distributed among the counties of each state. (The burden was distributed among states on the basis of population, as the Constitution required.) Where states had property taxes, state assessments would serve; otherwise, the value of property in each county could be established by extrapolation from 1799 on the basis of population. But Pitkin also says that assessments were to be made within the sixty days following 1 February 1814, and that appraisals were to be made "at the rate each of them was worth in money," which suggests that a separate assessment was made, beyond the systems of valuation previously described. In any case, seven states assumed the burden of the tax, and for none of these states was an assessment returned. The 1813 returns, therefore, are far from complete.

In 1815 a new tax was levied and appraisals were to be made for all states, even those that assumed the burden. The 1814 appraisals were to be acceptable unless property values had changed in the meantime; in only one case (Maryland) was the precise 1814 valuation repeated, but in nine other cases the 1814 and 1815 values are so close that, given the major change in prices between the two years, it seems likely that 1814 prices dominate the valuations for these states as well. It is also clear that the assessments did not represent a simple extrapolation of the 1799 values on population (see table 14.1).

As Pitkin (1816, 333) noted, "The quotas of each state were not again apportioned among the several counties, in this tax, as in the former, but the valuations through each state are to be equalized by the principal assessors, and the tax is to be laid and collected on the assessments thus equalized" (Pitkin 1816, 333). Although some states returned the value of all types of property together in one aggregate, Pitkin worked out a division of the totals between the value of slaves and the value of real property.

There are a number of annual series describing elements of the wealth stock or providing part of the means for estimating elements of the wealth

TABLE 14.1 **Comparison of 1799 and 1815 assessments**

	Percentage increase of					
	assessments			population		Per capita rate of increase
	Current prices	Constant prices				
	1799–1815	1799–1815		1800–10	1800–20	
N.H.	67%	42%	*	17%	33%	0.80%
Mass. and Me.	68	45	*	22	43	0.5
R.I.	89	60	*	11	20	2
Conn.	83	55	*	4	10	2.3
Vt.	94	64	*	41	53	0.7
N.Y.	168	127	*	63	133	0.9
N.J.	163	86		16	31	2.6
Pa.	239	141		34	74	2.8
Del.	116	83	*	13	13	3.1
Md.	229	178	*	11	19	5.7
Va. and W.Va.	133	65		11	21	2.2
N.C.	67	42	*	16	34	0.8
S.C.	326	202		20	45	5.3
Ga.	161	85		55	110	0.1
Ky.	212	122		84	155	0.1
Tenn.	295	235	*	148	300	0.2

Sources:
Column 1: Pitkin (1835, 313). Column 2: computed from Pitkin's (1816, 313) data, deflated by Adams's (1975, 311) Philadelphia construction cost index as reported in column 7. The starred rates are based on data deflated by an 1814 index number; the unstarred items are based on data deflated by an 1815 index number (see text). Columns 3 and 4: US Bureau of the Census 1960, series A-124–29, 131–33, 149–50, 152–56, and 159–60. Column 5: based on data underlying column 2 and estimated rates of population growth, 1799–1815, based on data underlying columns 3 and 4. The rates in the last column for Maryland and South Carolina seem implausibly high, but whether this means that the estimates for 1799 are too low, that the estimates for 1815 are too high, or that the deflator is inappropriate is by no means clear.

stock. Notable are figures of the value of net claims of Americans on foreigners (negative throughout this period), which cover the years 1789 onward but can also be extended to 1774; estimates of the value of imports (important in the derivation of the value of inventories); and the tonnage of the merchant marine.[4]

Finally, the work of Towne and Rasmussen (1960) and Poulson (1975) provides evidence for 1800 (Towne and Rasmussen) and 1810 (Towne and Rasmussen, Poulson) on the value of output of agricultural, mined (1810 only), and manufactured (1810 only) goods, which proves useful for purposes of testing and for assembling estimates of the value of inventories.

14.3. Evaluation of Estimates

14.3.1. Consistency Tests

This section performs tests of the consistency of the estimates against related data.

1774. According to Jones (1980, 90, 122, 128), the value of the total physical wealth of the colonies in 1774 (i.e., including slaves and servants, and excluding financial assets and liabilities) was £109,590,000. Multiplying by Jones's (1980, 10) dollar/pound exchange rate of $4.15 yields a total value of $454,715,500, compared with Blodget's estimate for the same year of $600,000,000.

Blodget's (1810, 68, 196) concept, however, is more comprehensive than Jones's. It is supposed to cover "all real and personal property in the U.S." Blodget (1810, 196) shows exactly what is included in this aggregate in his detailed breakdown for 1805. The following items are clearly not included in Jones's total: (1) public buildings, etc.; (2) specie; (3) bank stock, insurance stock and all other incorporated funds; and (4) turnpike, canal, and toll bridge stock.

Blodget gives the value of specie for 1774—$4 million—but does not provide data with respect to the other categories. Assuming that they were of about the same importance, relative to the total value of real and personal property, in 1774 as in 1805 (possibly too large an estimate), they must have amounted to about $11 million in 1774. Thus, Blodget's value should be reduced by about $15 million, to make it more nearly comparable with Jones's: $600 million minus $15 million equals $585 million.

Another deduction is also surely called for, however. Blodget's (1810, 196) total land estimates are based on the assumption that the United States contained 640 million acres before the Louisiana Purchase, while the correct figure is 526 million acres; see the 1783 entry for "treaty with Great Britain" in US Bureau of the Census 1960, series J-4. Deducting the extra 114 million acres from Blodget's total, valuing this land at Blodget's price for acres of land "in their natural state" yields the following result: $585 minus $40 million equals $545 million.

It is likely, however, that a further deduction is required. Jones (1980, 354) points out that Blodget's land figure is "of the same order of magnitude" as hers, but somewhat lower. Now in order to get Blodget's value of land figure for 1774, we are obliged to do a little estimating. The value for "improved land including pastures" is easily obtained, since Blodget

(1810, 60) gives both the number of these acres and their average price. But Blodget, in his 1805 estimate, refers to two other types of land: "acres adjoining the cultivated lands" and "the residue of all lands in the United States." The former can be obtained for 1774 only by extrapolation on the value of "improved land"—on the whole, not a bad procedure. The latter can be computed by subtracting the number of acres of "improved land" plus the number of acres of "adjoining" land from the total number of acres in the United States, and then multiplying by Blodget's (1810, 60) price for acres "in their natural state." Following through with these calculations—and employing the proper total of acres of land in the United States, rather than Blodget's figure—yields a total value of land in 1774 of $318 million. Since this value exceeds Jones's (1980, 10, 90) estimate of the value of real estate in 1774 (£60,221 times $4.15), $249.9 million, it could not be the value Jones had in mind when she said that Blodget's estimate was of the same order of magnitude as hers, but lower.

By way of experiment, one could drop Blodget's residual category, since this land is less likely to have been owned by private persons and therefore less likely to be incorporated in the holdings of the people Jones sampled. Such a deduction reduces "Blodget's" estimate of the value of land in 1774 (i.e., Blodget's estimate, adjusted as described above) to $169 million, a figure more likely to have been regarded by Jones as similar to but lower than hers.[5] Subtracting the value of the residual land from Blodget's overall total reduces the latter to $545 million minus $149 million equals $396 million, a value closer to Jones's figure of $455 million. The match would be even closer were we to adjust Blodget's land estimate (improved land plus adjoining land) to bring it into conformity with Jones's probable estimate.

The totals are still not perfectly comparable, however, since Jones's estimate includes the value of indentured servants, while Blodget's apparently does not. Data in Jones (1980, 115, 353) suggest that servants accounted for about 22 percent of the value of slaves and servants.

Thus: £21,463,000 times 0.22 equals £4,722,000; £4,722,000 times $4.15 equals $19,597,000. Deducting the value of servants reduces Jones's estimate to: $455 million minus $20 million equals $435 million. The adjusted Jones and Blodget figures, then, are within 10 percent of each other.

There are two other respects in which the work of Jones and Blodget can be compared. Jones (1980, 39) estimates that there were 480,932 slaves in the colonies in 1774; Blodget (1810, 59) puts the figure at around 500,000. Jones (1980, 354) says that Blodget's estimates of the number of horses and horned cattle are similar to hers, but lower.

On the whole, then, Jones's and Blodget's work appears to be consistent. The importance of the point is not simply that consistency strengthens our belief in these two estimates, but that there is now a better reason than before to believe that Blodget's work with respect to the early nineteenth century can be profitably compared with Jones's for the late eighteenth—that is, that the two were dealing with roughly the same aggregate conceptually (with the exceptions previously discussed), and that, in the one year of overlap, they obtained roughly the same results.

1798/99, 1805, 1813/15. The existing data and estimates for the last year or two of the eighteenth century and the early years of the nineteenth also permit a number of consistency tests to be run.

(1) Blodget's (1810, 60) estimate of acres under crops in 1800 is consistent with the Towne and Rasmussen (1960, 294–99, 303, 305) statements of crop outputs and with yield estimates for 1791, based on the returns of crop reporters (Blodget 1810, 97–98). The relationships among Blodget's estimates of the stock of horned cattle (p. 60), the number slaughtered (p. 90), and the Towne and Rasmussen (1960) figures of the amounts of beef and pork produced are also altogether plausible. See Gallman (1972, 197–200, 204).

(2) Based chiefly on Blodget's figures, Goldsmith (1952, 315) estimates that farm residences and service buildings were worth $210 million in 1805, while nonfarm residences and other buildings (exclusive of mills and public buildings) ran $120 million. According to Lee Soltow (1987, 182)—working with data assembled by the assessors of the direct tax of 1798—rural dwellings of free persons appraised under that law were worth $95.6 million, and urban dwellings were worth $55.7 million (numbers of houses multiplied by mean values). Soltow (1987, 181) tells us that these values were about 85 percent of market value, while according to Adams (1975, 311, col. 7), construction costs were about 1.084 times as high in 1799 as in 1805. Adding $1 million to the 1799 rural value to account for slave dwellings (a guess), adjusting upward by 17.6 percent to allow for undervaluation, and deflating on the base 1805 on the basis of prices of new residences yields the following estimates. In 1799, rural property was worth $105 million, and urban property $60 million; in 1805, farm property was worth $210 million, and nonfarm property $120 million. The proportions between rural and urban, farm and nonfarm property values are virtually identical, which is moderately encouraging, even though rural and urban, farm and nonfarm are not identical breakdowns.

The 1805 values may be more comprehensive than those for 1799, since they include barns, sheds, warehouses, and other structures, while the 1799 values include only dwelling houses and "the out houses, appurtenant thereto" (Pitkin 1835, 309). On the other hand, the 1799 figures include the value of the land on which the dwellings were located (up to two acres), while the 1805 data probably refer only to structures (Goldsmith 1952, 315). Goldsmith (1952, 319) suggests that land may have accounted for about one-sixth of the value of dwellings and the land on which they stood in 1850. This figure is close to the value one would obtain if one were to assume that land accounted for 36.3 percent of the value of urban residential real estate (see the treatment of nonfarm residences, 1840–1900, above) and that rural residential land bore a price equal to the one assigned to cultivated land by Blodget (1810, 60). (Assuming one acre per rural plot, the ratio of the value of land to the total value of land and structures is 14.9 percent; two acres, 16.5 percent.) Allowing one acre per rural dwelling, the following figures were computed: rural, $102 million; urban, $39 million. The calculations were conducted in current prices, and then the estimated values of structures were deflated.

The value of nonresidential structures in 1805 is unlikely to have amounted to more than three-tenths of the total value of residential and nonresidential structures.[6] Adjusting on this basis gives the following: farm dwellings, $147 million; and nonfarm dwellings, $84 million.

In per capita terms, the adjusted estimates are thus: 1799, $27; 1805, $37.

The computed increase over this period, which is an increase in real terms, seems very large, suggesting that the two sets of estimates may be inconsistent. Where does the inconsistency arise? There are two possibilities: each estimate either depends upon (Blodget-Goldsmith) or implies (Soltow) an estimate of the number of families. The inconsistency between the two estimates—if, indeed, there is one—could have arisen because of problems with the estimates of the numbers of families, or because of differences with respect to the estimation of the value of dwellings per family. Let us consider each possibility.

Blodget sets the number of families in 1805 at about 1 million, a figure Goldsmith raises to 1.1 million. The bases for this adjustment are Goldsmith's derivation of average free family size (5.73) by interpolation between the census figures for 1790 and 1850, and his apparent assumption that enslaved families were, on average, the same size as free families (Goldsmith 1952, 315). Assuming that there were about 5.2 million free persons in 1805 (Blodget 1810, 58), which is likely, then we may

infer (with Goldsmith) that there were about 908,000 free families in 1805 (5.2 million divided by 5.73). According to Soltow (1987, 183) there were 715,000 free families in 1798. Assuming that there were between 4.1 and 4.2 million free persons in that year (Blodget 1810, 58; the second digit of Blodget's figure for 1798 is clearly a misprint, a "9" appearing where a "1" was surely intended), then Soltow also seems to have assumed an average free family size of about 5.7 or 5.8. The difference between Blodget-Goldsmith and Soltow, with respect to the per capita values, then, lies not in their views of average family size, but in their estimation of the value of dwellings per family.[7]

(3) Another way to check the estimates is to draw comparisons between Jones and Soltow. To do so requires a long chain of reasoning and estimation, as follows:

(a) Convert Jones's (1980, 90) real estate estimate from pounds into dollars: £60,221,000 times $4.15 per pound equals $249,917,150.

(b) In 1799, dwellings accounted for 24 percent of the value of land and dwellings, according to Soltow (1987). Other structures could not have amounted to more than 35 percent of the value of all structures.[8] Assuming that both conditions also held in 1774, then dwellings must have come to no more than 21 percent of the value of real estate, or about $52 million.

(c) Assuming that land under dwellings represented about 15 percent of the value of dwellings (see above, 1799), then dwelling structures in 1774 must have been worth about $45 million.

(d) Shifting Adams's variant B construction price index to the base 1805, and extending it to the years before 1785 on the index described in the notes to table 14.2 yields a construction price index of 79 in 1774. The value of dwellings in 1774, in prices of 1805, then comes to $57 million.

(e) Dividing by the total population in 1774, 2.3 million (Jones 1980, 37), yields $25. This is the per capita value of dwellings in 1774, expressed in prices of 1805. It compares with the 1799 value derived, above, from Soltow's manipulation of the direct tax data, of $27, again in 1805 prices. These are not wildly implausible results, but they come at the end of a long chain of reasoning and estimating. What seems plausible will also depend upon one's preconceived notions of the probable course of development between 1774 and 1799—notions that are likely to differ somewhat from one analyst to the next. Given the nature of the test, the results are modestly encouraging.

(4) A final test can be conducted through the direct tax returns for 1813–15. According to Pitkin (1835, 40), the value of houses, lands, and

TABLE 14.2 **Value of structures, measured in current and 1860 prices, 1774–1815, in millions of dollars**

		1774	1799	1805	1815
A. Value, current prices					
1	Farm dwellings			147	
2	Rural dwellings		110		
3	Nonfarm dwellings		84		
4	Urban dwellings		42		
5	All dwellings	45	152	231	457
6	Farm structures			210	
7	Rural Structures		157		
8	Nonfarm structures		142		
9	Urban structures		70		
10	All structures	67	227	352	697
B. Price index		80	110	101	155
C. Value, 1860 prices					
1	Farm dwellings			146	
2	Rural dwellings		100		
3	Nonfarm dwellings		83		
4	Urban dwellings		38		
5	All dwellings	56	138	229	295
6	Farm structures			208	
7	Rural structures		141		
8	Nonfarm structures		141		
9	Urban structures		64		
10	All structures	84	206	349	450

Sources:
Line A1: Goldsmith 1952, 315, "farm residences and service buildings" × 0.7, to remove the service buildings. The estimate of 0.7 is a guess, based on the belief that farm service buildings probably accounted for a smaller proportion of the value of farm buildings than nonfarm service buildings did of nonfarm buildings. In 1840 and 1850, the share of the former in the latter was a little less than four-tenths. At a guess, then, farm service buildings may have accounted for three-tenths of the value of farm buildings, while farm residences may have accounted for the remaining seven-tenths.

Line A2: Soltow's (1987) estimate of the value of rural dwellings was increased by $1 million to account for slave dwellings. The new total was divided by 0.85 to allow for undervaluation, per Soltow. The value of land under rural dwellings was estimated on the assumption that rural dwellings occupied, on average, one acre of land each, and that the value of land under rural houses equaled the value per acre of cultivated land, according to Blodget (1810, 60). No allowance was made for the value of land under slave dwellings. The value of land under rural dwellings, thus computed, was subtracted from the estimate of the value of dwellings to obtain the value of dwelling structures, exclusive of land.

Line A3: Goldsmith 1952, 315, "non-farm residences and other buildings" × 0.7, the ratio of nonfarm dwellings to all nonfarm structures (exclusive of public buildings, which are not incorporated in his "other buildings").

Line A4: Derived from Soltow 1987, 182, for number of urban houses times the average value, divided by 0.85 (to adjust for undervaluation) on the assumption that urban residential structures accounted for 63.7 percent of the value of urban residential structures plus land, the same fraction employed in the estimation of the value of nonfarm residential structures in the year 1840.

Line A5, 1774: The value of real estate, according to Jones (1980, 90), converted to dollars, per Jones's exchange rate (p. 10), multiplied by 0.21 to yield the value of dwellings (see text), with the result multiplied by 0.85 to remove the value of land (15 percent of the value of dwellings). 1799: line A2 + line A4. 1805: line A1 + line A3. 1815: Pitkin 1835, 313, value of houses and lands, adjusted to an 1815 valuation. The valuation adjustment was made on the basis of Adams's (1975) construction cost index, variant B. The following states were supposed to have returned 1814 valuations (compare Pitkin 1816, 329–30, with Pitkin 1835, 313): New Hampshire, Massachusetts, Vermont, Rhode Island, Connecticut, Delaware, Maryland, New York, North Carolina, and Tennessee. The adjusted figure was then multiplied by 0.24 to obtain the value of dwellings alone, and by 1.06 to include dwellings worth $100 or less (see Soltow 1987). This total was increased by $3 million to account for slave dwellings; the result was divided by 0.85 to allow for underenumeration—the same allowance as Soltow (1987) claims is required for 1799—and then multiplied by 0.85 to obtain the value of structures, exclusive of the land on which they were built.

slaves "as revised and equalized, by the principal assessors, in 1814 and 1815" came to $1,902 million, exclusive of property in Louisiana, the returns for which were incomplete. Pitkin estimated that the value of land and houses alone amounted to $1,631 million. Assuming that the value of dwellings represented the same share as in 1799 of the value of land and dwellings together (0.24, according to Soltow), then the value of dwellings was $391 million. Adjusting for the value of slave dwellings, for the value of houses worth $100 or less, for the undervaluation of property, and to remove the value of the land on which houses stood—in each case following the procedures described above for 1799—results in an estimate of the value of free and slave dwellings (structures only) of $409 million. Weighting the Adams price index numbers by the proportions of the total value of land and structures assessed in the two years 1814 and 1815 yields a price index number of 1.407, on the base 1805. The real value of structures in 1815, then, was about $291 million.

The 1815 estimate—$35 in per capita terms—may be compared to estimates for 1774, $25; 1799, $27; and 1805, $37. All values are expressed in prices of 1805. There is no way of determining with absolute certainty that these figures are or are not consistent, one with the other, making proper allowance for historical changes in material circumstances. If in fact firm conclusions of this type could be made, there would be no need to put together a capital stock series: the information sought through the series would already be known. It does seem highly unlikely that the real value

---

Sources: (*continued*)

Line A6: Goldsmith 1952, 315.

Line A7: line A2 ÷ 0.7. See the notes for line A1, above.

Line A8: Goldsmith 1952, 315; nonfarm residences and other buildings plus mills plus public buildings, the last reduced from a value of $20 million to $17 million to eliminate Washington city lots, naval and military stores, arms, ammunition, frigates, dock yards and timber, all of which are included in Blodget's figure which Goldsmith identifies with public buildings. Blodget (1810, 60) puts a value of $1.5 million on the Washington lots and says that the Navy had twenty vessels in 1804. If they averaged 200 tons each, they were probably worth about $0.1 million in 1805. How much the inventories of military supplies and the naval dockyards were worth is by no means clear, but Blodget (1810, 66) sets a figure of $1,709,189 on expenditures for the army, navy, and contingencies, which at least establishes an order of magnitude. At a guess, then, the items that should be deducted from the Blodget-Goldsmith total to get it down to a figure approximating the value of all public buildings is about $3 million.

Line A9: line A4 ÷ 0.6. See line A1.

Line A10, 1774: Line A5 ÷ 0.670, the same ratio as in 1799. 1815: line A5 ÷ 0.656, the ratio of the value of dwellings to the value of structures in 1805.

Line B, price index: The index for 1840 from table 7.2 extrapolated to 1785 on the Adams (1975) construction cost index, variant B, and extended to 1774 on the Bezanson price index (US Bureau of the Census 1960, series E-82) and a wage rate index, both shifted to the base 1785 and the two weighted equally. The wage rate index was constructed from the David-Solar (1977, 59) common wage rate index (this index is based on data for Massachusetts) and the Adams index of the wage rate of agricultural workers in Maryland, both shifted to the base 1785 without reweighting, and then combined with equal weights.

Lines C1–C10: The values in panel A deflated by the price index numbers in line B.

of dwellings per capita rose from $27 to as much as $37 between 1799 and 1805. It may be, then, that the estimate for 1799 is a little too low, and the one for 1805 too high. On the whole, the results are quite encouraging.

14.4.2. The Remaining Blodget Estimates

We have seen that Blodget's estimate for 1774 is consistent with Alice Jones's work for that year, while his figures for 1805 are readily squared with various independent sources of evidence. His estimate of the value of dwellings for that year may be high, but it seems not very far out of line. The question then arises as to the usefulness of the rest of his series, the estimates for 1784, 1790–1804, and 1806–1809. As will appear, a number of Blodget's series seem to be quite useful, but the overall estimates of the value of all property follow a course over time that is sufficiently peculiar as to call them into question. Specifically, the value of property per capita (using Blodget's population estimates) rises steadily and quite pronouncedly until 1796. Then it turns down—at first rather modestly and slowly, and then more dramatically. A similar pattern appears when the per capita values are deflated, except that the downturn occurs after 1793, while for the next ten years the figures rise and fall modestly, showing no clear trend. The pattern of rise and decline is made much more intense if one deletes from the series the principal elements other than the value of structures: the value of land, animal inventories, shipping, specie, slaves, and inventories. The residual (per capita, in real terms) rises quite dramatically to the early 1790s, and then falls equally dramatically. A possible cause of this development—and perhaps for the peculiar behavior of the aggregate series—may be found in the relationship between Blodget's estimates of the population and of dwellings (see note 7). Presumably, Blodget's figures with respect to dwellings tell us something about his view of the changing value of dwellings, the principal component of the value of structures. In fact, the number of dwellings, according to Blodget, increased faster than the population down to the early 1790s. The population and the number of dwellings then increased at about the same rate for almost a decade, and then, after the mid-1800s, population began to grow faster than the number of dwellings. There does not seem to be any good reason why these developments should have taken place, and while they are not pronounced enough to account fully for the peculiar behavior of the aggregate and residual series, they do appear to contribute to it. In any case, the movements described are sufficiently dubious so that one should probably place little confidence in the aggregate

and residual series, apart from the two dates discussed in previous sections. Various component series, however, do seem useful, as will be seen in the subsequent sections.

14.4. The Capital Stock Estimates

14.4.1. Introduction

The general procedure followed was to build up comprehensive estimates at the benchmark years 1774 and 1805, based chiefly on the work of Jones, Blodget, and Goldsmith. For 1774 this meant extracting capital figures from the more comprehensive wealth estimates provided by Jones. Certain new estimates were also substituted for elements of the Jones and Blodget-Goldsmith estimates. The reason for the substitution was sometimes that the new estimate was deemed superior to the old; more often, the purpose was to link the early estimates with those for the years 1840 onward. For example, new estimates of inventories held in 1805 were substituted for the figures given by Blodget and Goldsmith, not in the secure belief that the new estimates were better, but because the estimating procedures adopted to make the new estimates were consistent with those used to assemble the inventory figures for 1840 onward. Comparisons between the 1805 and 1840–1900 estimates can thus be made with some confidence that the comparisons reveal real differences, rather than simply differences in estimating techniques.

Estimates were also built up for the years 1799 and 1815, based on the work of Soltow and Pitkin, as well as the series described in the previous paragraph. These sources are incomplete, so that comprehensive estimates for 1799 and 1815 had to be computed by blowing up the incomplete figures on the basis of relationships observed in 1805.

Finally, estimates of the value of agricultural land improvements (other than structures, which have already been discussed) were constructed on the basis of Blodget's estimates of the acreage of improved land (as adjusted) and the procedures employed to build similar estimates for the years 1840 to 1900, described above.

14.4.2. Structures

The chief estimating procedures have already been described in the sections above on testing. Details are contained in the notes to table 14.2.

Briefly, the Goldsmith revisions of Blodget's estimates for 1805 were accepted, with one minor modification. The reader should recall that the tests suggest that these estimates are somewhat too high.

Estimates of the value of rural and urban dwellings in 1799 were derived from Soltow's work, in precisely the way described in the testing sections above. They were blown up to include other structures, on the basis of the relationships between the values of dwellings and other structures in 1805 and in later years, again in the manner described previously. These estimates are based on very firm data on dwellings, carefully developed by Soltow. The extension of the estimates to cover other structures rests on much shakier ground, however.

The Pitkin data for 1815 are less detailed than Soltow's—there is no breakdown between rural and urban property—and Pitkin's handling of them does not measure up to Soltow's management of the 1799 data. The 1815 figures are also short, since they do not cover Louisiana, and the procedures by which they were created are less clear and less certainly professional than is the case for 1799. Nonetheless, the tests suggest that they may not be bad. The components of the estimates that appear to have been valued on the basis of 1814 prices were shifted to an 1815 basis, and the value of dwellings was blown up to cover missing elements of the value of structures, on the basis of relationships that hold for 1805.

The 1774 figures were computed in precisely the way described in the testing section above. The underlying basis for these estimates is the very strong work of Jones (1978, 1980). Unfortunately, Jones does not provide a breakdown of her real estate estimate into the components, land and improvements. It was necessary, therefore, to work out estimating devices for drawing this distinction, and at this stage the opportunity for error to enter emerged. Nonetheless, the tests suggest that the final results are reasonably good.

The estimates for the years 1799, 1805, and 1815 were deflated by use of a price index number for 1840 (table 7.2), extrapolated to these dates on the Adams cost index of residential construction. The Adams index is a good index, but it has some deficiencies in the present context. First, it is a cost index, rather than the desired price index, as discussed in chapter 7. It does allow for shifts in the structure of costs in response to changes in relative prices, a feature that makes it more like a price index than a standard fixed weight cost index would be. As a proxy for a price index it has an important weakness: since it does not allow for productivity improvements, it overstates increases in prices and understates decreases in prices

TABLE 14.3 **Wage rates and construction costs, 1840 base**

		1785	1799	1805	1815	1840
Wage rates						
1	Philadelphia construction labor	97.6	106.4	90.0	160.0	100
2	Maryland farm labor	99.6	117.1	117.9	141.6	100
3	Massachussetts common labor	57.1	67.5	80.5	119.5	100
Construction materials prices						
4	Adams	91.8	132.2	146.0	173.6	100
5	Bezanson	102.6	116.3	138.4	184.0	100
6	Warren-Pearson	55.4	78.5	89.2	116.9	100

Sources:
Lines 1 and 2: Adams 1975, 1986. Adams's (1968, 1982) farm wage rate series for Philadelphia and the Brandywine region match his construction series less closely, but the gaps in these series make drawing meaningful comparisons difficult. Line 3: David and Solar 1977. Line 4: The Adams materials price index was derived from table A-1 in Adams 1975. Lines 5–6: The Warren-Pearson and Bezanson construction materials price indexes were taken from US Bureau of the Census 1960, series E-8 ("building materials") and E-76 ("lumber products and naval stores"). All indexes were shifted to the base 1840 without reweighting.

over time. Thus, a capital stock series deflated by it is likely to understate the true rate of change of the real capital stock.

The index also refers only to costs of commercial building projects—that is, projects built by people in the construction trades. Many structures during this period were likely to have been built by farmers from farm materials, a point also discussed in chapter 7. It does not appear that this represents an important problem during the period under consideration here, however. According to Adams's data, the wage rates of construction workers and farm workers moved similarly during these years (see table 14.3).

Construction cost indexes based on these two series (lines 1 and 2) and on a common materials cost series (line 4) would not be far different from each other; see Adams 1975, 1986. A further problem is that the index refers to Philadelphia alone, and there are indications that price movements in Philadelphia did not match those in other parts of the country. For example, wage series from Massachusetts (line 3) and a construction materials price index from New York exhibit patterns (line 6) quite different from those of the Adams series.

The Massachusetts common wage is based on David and Solar (1977); Rothenberg's (1988) Massachusetts farm wage rate series displays a very similar pattern. The Bezanson price index refers to Philadelphia, while the Warren-Pearson index refers to New York. The Adams series represents

the materials prices that enter his Philadelphia cost index. The Philadelphia series—those of Adams and Bezanson—move fairly closely together, while the New York and Massachusetts series display a common pattern, but one far removed from the one exhibited by the Philadelphia series.

How important a matter is the disparity between the Massachusetts-New York series and the Philadelphia-Maryland series? A test was run by producing a construction cost index for Massachusetts-New York, based on the David-Solar wage series, the Warren-Pearson materials price index, and Adams's weighting scheme. (Unfortunately, there is no very good way to incorporate other geographic areas into the test.) The resulting series was combined with Adams's figures, and the new index thus produced was used to deflate the "all structures" figures for 1799, 1805, and 1815 in table 14.2.[9] The results were as follows: for 1799, the revised constant price figure was just under 24 percent larger than the figure in table 14.2; for 1805, a little more than 11 percent larger; and for 1815, less than 16 percent larger.

Despite these marked differences, the original estimates were left unchanged. There are two reasons for this decision. First, the construction cost index derived for Massachusetts–New York is markedly inferior to the Adams index, since it does not reflect the wage rates of skilled construction workers, and because the materials price index is not nearly so carefully weighted as is the Adams materials index. Second, we know that the best construction cost index is virtually certain to give a biased representation of construction prices; it is virtually certain to overstate price increases and understate price decreases. Leaving New York and New England unrepresented in the construction cost index apparently imparts a bias in the opposite direction, compensating in some measure for the cost index bias. Whether the compensation is too much, too little, or exactly the right amount one cannot say. But it seems highly probable that the Adams series alone gives a better representation of the course of *prices* than does the combined index.

Finally, it is likely that price *levels* of structures varied from state to state, while the relative importance (price weights) of the various states changed as time passed. How, if at all, did shifts in the weights to be appropriately attached to state price indexes affect the level of the true national price index? Must the Adams index be adjusted to take this matter into account?

A test was run making use of data in the 1840 census (US Census Office 1841, 91). The census requested information on the numbers of two types of houses constructed in the census year, those built of brick and

TABLE 14.4 **State fixed effects from the Regression**

Maine	0.955
New Hampshire	0.860
Massachusetts	1.932
Rhode Island	1.379
Connecticut	1.854
Vermont	0.679
New York	1.423
New Jersey	1.103
Pennsylvania	0.843
Ohio	1.034
Indiana	0.517
Illinois	0.887
Michigan	0.862
Wisconsin	0.619
Iowa	0.384
North Carolina	0.496
South Carolina	1.602
Georgia	0.657
Florida	1.142
Alabama	1.492
Mississippi	1.492
Louisiana	2.645
Arkansas	2.060
District of Columbia	0.490
Delaware	0.442
Maryland	0.764
Virginia	0.666
Tennessee	0.413
Kentucky	0.513
Missouri	0.735

Sources: See text.

stone and those built of wood, as well as the value of both types of houses taken together. The state data were used in a regression analysis to obtain intercept values and coefficients for each of the two types of houses. The intercept values and the coefficients were then employed to value the houses constructed in each state, and the figures thus obtained were divided through the census returns of the value of houses built to get an index number for each state.[10] The state index numbers, which appear in table 14.4, compare the value of houses constructed in the state with the value that would have obtained if construction costs had been at the level of the national average. Clearly, the index numbers reflect not only variations in building costs—which are required for the proposed analysis—but also differences in the average size and quality of new houses from state to state. Since cost, size, and quality are likely to have varied together—frontier

areas having lower building costs, smaller houses, and houses of lower quality than urban centers—the index numbers almost certainly exaggerate the regional variations in building costs, a point to be borne in mind as the analysis unfolds.

The individual state index numbers were then used to deflate the state returns of the value of real estate in 1799, according to the direct tax (Pitkin 1835, 313). (These figures appear to provide the best available weights for the index numbers.) The sum of the deflated returns was then divided through the aggregate current price value of real estate in 1799, according to the direct tax. The result is an index number of 0.932, which compares with the 1840 index number of 1.000; that is, according to these calculations, the shifting weights among states tended to raise, very slightly, the true price index of structures between 1799 and 1840. Indeed, the index numbers almost certainly overstate the true impact of the redistribution of the value of structures among states in this period, because the state index numbers overstate (for reasons previously given) the true variation in building costs among states. It appears, then, that it is unnecessary to adjust the Adams cost index to take into account the effects of the shifting value-of-structures weights among states. This is particularly the case in view of the fact that the Adams index is a cost index and is likely, therefore, to exaggerate the extent to which the prices of buildings rose, or understate the extent to which they fell, during this period.

The index was extended from 1785 (the earliest date in the series) to 1774 on a general Philadelphia price index and a wage index designed to capture wage changes in New England and the Middle Colonies. This is the best series available, but clearly it is far weaker than the series for the years 1799, 1805, and 1815—which, in turn, is weaker than the series for the period 1840–1900.

14.4.3. Shipping

Blodget and Goldsmith provide an estimate of the value of ships in 1805; Jones apparently combined ships with other items of "equipment of nonfarm business." Rather than adopt the former and attempt to disengage the value of ships from the larger aggregate in the case of the latter, it seemed preferable to produce fresh estimates (see table 14.5). The data available to do so are reasonably good, and they permit establishing a clear link with the shipping estimates for the years 1799, 1815, and 1840–1900. The new estimate for 1805 ($68 million) is substantially higher than the

Blodget-Goldsmith figure ($40 million). The new estimate for 1774 is also apparently substantially higher than the comparable figure probably buried in Jones's aggregate; it runs $7 million, whereas Jones's estimate of the value of all "equipment of non-farm business" comes to less than $2 million. Why this should be so is by no means clear. The new estimate at least has the virtue that it has emerged from a process of estimation common to all of the shipping estimates, 1774–1900, in this series, so that observed changes in shipping values over time are at least not the product of shifts in estimating procedure. The estimating procedure is described in chapter 10, especially in the notes to table 10.1. The following notes describe the steps taken to derive the figures for 1774–1815. Steam vessels were of negligible importance. Therefore, these notes focus on sailing vessels.

The official series on the tonnage of sailing vessels extends back only to 1790, but Blodget (1810, 62), whose data closely follow the official series, provides a figure for 1774. The official series are inflated by the tonnage of vessels that had left the fleet. Periodically, this ghost tonnage was cleared from the records. Line 1 of table 10.1 exhibits the fruit of an effort to distribute the ghost tonnage among the years in which vessels actually left the fleet. If this procedure was successful, line B represents the true tonnage of the American fleet in each year.

The estimates were first valued in constant prices, using data from table 10.1. In all likelihood, these estimates somewhat overstate the true real values of vessels treated in table 14.5. The reason is that large vessels cost more per ton than did small ones, and vessel size increased over time. Thus, the 1860 prices applied to the tonnage series probably represent larger vessels—more valuable per ton—than the vessels represented in table 14.5. This in turn means that the rate of change described by the shipping series—say, from 1774 to 1860—probably understates the true growth rate of shipping. Current price estimates were assembled by inflating the constant price series. The price index (described in the notes to the table) leaves something to be desired, but it may capture the trend in prices adequately. It is less likely to describe accurately the year-to-year movements, which are probably less pronounced than the price series shows.

The weakest element of all consists of the value of real estate improvements associated with the shipping industry (docks, etc.). These estimates were made by extrapolation (in current prices) on the value of vessels. They were deflated by the series described in the notes to table 7.1. While these procedures are quite slapdash, the results are unlikely to be very markedly wrong, at least with respect to trend.

TABLE 14.5 **Value of vessels and real estate in shipping, measured in current and 1860 prices, 1774–1815, in millions of dollars**

	1774	1799	1805	1815
A. Tonnage of vessels (in thousands of tons)				
1 Steam	—	—	—	3
2 Sail	198	919	1,091	1,261
B. Adjusted tonnage (000 tons)				
Ghost tonnage deleted	198	792	1,041	1,170
C. Value, at 1860 prices, in millions of dollars				
1 Steam	—	—	—	0.3
2 Sail	6.5	26.1	34.4	38.6
D. Price index (1860 = 100)	105	161	197	279
E. Value, at current prices, in millions of dollars				
1 Steam	—	—	—	0.8
2 Sail	6.9	42.0	67.8	107.7
F. Value of real estate improvements, at 1860 prices, in millions of dollars	1.5	6.6	11.7	12.1
G. Price index (1860 = 100)	80	110	101	155
H. Value of real estate improvements, at current prices, in mil. dollars	1.2	7.3	11.8	18.7

Sources:
Line A1: US Bureau of the Census 1960, series Q-155. Line A2: 1774 from Blodget 1810, 62; 1799–1815, US Bureau of the Census 1960), series Q-161 (hereafter *Historical Statistics*). Series Q161 includes canal boats and barges. The estimates for 1840–70 (see table 10.1) were adjusted to eliminate these vessels. No similar adjustment was made to the 1774–1815 data, on the ground that the tonnage of such vessels was negligible during this period. The official data refer to the stock as of December 31, and presumably the Blodget estimate for 1774 has a similar reference. The data in the table for 1799–1815 are in fact averages of data for two years, a device employed to approximate the vessel inventory as of July 1 (thus, for example, the data listed under the year 1799 are in fact averages of data for 1798 and 1799), and to place the shipping estimates on the same basis as the estimates for the rest of the capital stock. It was impossible to correct the 1774 estimate in the same way. The Blodget and *Historical Statistics* series are very similar, down to 1802, when suddenly Blodget gives a much larger value than does *Historical Statistics*. According to *Historical Statistics*, ghost tonnage of 197,000 tons was cleared in "1800–01." It seems more likely, however, that the clearance took place in 1802. Thus, the *Historical Statistics* figure for 1802 plus 197,000 comes to 1,089,000, which approximates Blodget's 1,003,000. It seems reasonable to suppose, then, that *Historical Statistics* and Blodget are largely consistent before 1802, and to accept Blodget's 1774 figure as a logical extension of the *Historical Statistics* series. It is well to remember, however, that Blodget offers no source for this figure.

Line B: According to the US Bureau of the Census 1960, 439, the data in line A2 were periodically cleared of ghost tonnage; 1800–01, 197,000 tons; 1811, amount unknown, but inspection of the series suggests it was about 180,000 tons; 1818, 182,000 tons. The dating of the first clearing to 1800–1801 is certainly wrong (see the notes to Line A2, above). The proper date is 1802. Line B was computed by assuming that the 182,000 tons of ghost tonnage accumulated between 1811 and 1818 at a rate of 26,000 tons per year. Thus, to clear the series in line A2 requires that 78,000 tons be subtracted from the value for 1814 and 104,000 for the value for 1815, or a total of 91,000 from the "calendar" 1815 appearing in this table. The 180,000 tons accumulated between 1802 and 1811 were assumed to have built up at the rate of 20,000 per year, the adjustments being carried out in a manner analogous to that described above. The 197,000 tons added before 1802 were also assumed to have accumulated at a rate of 20,000 tons per year. The required adjustments will be evident.

14.4.4. International Sector

The procedures followed to develop the estimates in table 14.6 were similar to those described in chapter 12. The international sector contributes two elements to the capital stock: the stock of monetary metals owned by Americans and their governments, and the net international position of the United States (foreign debts held by Americans minus American debts held by foreigners). With respect to the first element Blodget (1810, 66), provides estimates for 1774, 1799, and 1805; Hepburn (1915) for 1815.

The net international position of the United States is available in *Historical Statistics* (based on the work of North and Simon) for the years back to 1789. Jones gives the aggregate debts and credits of Americans in 1774. Since each debt by an American to an American creates a credit of equal value, the difference between debts and credits in 1774 should measure the net international position of the American colonies at that date, exclusive of institutional claims. The value obtained is also plausible. According to Jacob Price (1980), pre-1776 colonial debt still owing to British creditors in 1790 (exclusive of interest) ran to £2.9 million, or about $12 million, at Jones's exchange rate. Price (1980, 8) goes on to state:

> These figures do not, however, represent the total prewar debt owed at the peak (about 1774). Some merchants and planters voluntarily settled with their British creditors in the 1780s, particularly those desirous of reestablishing credit in Great Britain. (Outside Virginia, others were obliged to settle when state

---

Sources: (*continued*)

Line C1: column 1 multiplied by price per ton of steam vessels in 1860, table 10.1, line 4. Line C2: column 5 multiplied by price per ton of sailing vessels in 1860, table 10.1, line 8. N.B.: Insofar as vessel designs, the distribution of vessels among types, and vessel sizes changed, line C2 misstates changes in the real value of vessels. In all likelihood, since price per ton increased with vessel size, and since the average sizes of vessels were increasing between this period and 1860, this series overstates the real value of vessels, 1774–1815, and understates the growth rate of the stock of vessels, expressed in constant prices (see the text and the notes to Table 10.1).

Line D: Price data are limited and are often contradictory. See, for example, Davis, Gallman, and Hutchins 1988, 393, and Brady 1966, 110–11. The results contained in line D are thus subject to doubt. As of 1791, according to Hutchins (1941, 202) quoting Tench Coxe, the "best double-decked ships, with live oak lower timber, and red cedar top timbers can be built and fitted for taking a cargo at $34 per ton," while in the early 1830s, the "best American ships rarely cost over $55 per ton." Brady (1966, 110) has an index number for 1834 of 189, on the base 1860. Thus, an appropriate price index number for 1791 might be 117 (34/55 × 189). A series of price index numbers for 1774, 1799, 1805, and 1815 was created by combining US Bureau of the Census 1960, series E-76 (Bezanson's Philadelphia price index for lumber and naval stores), extrapolated to 1774 on series E-81, with David and Solar's (1977, 59) common wage index, both shifted to the base 1860 without reweighting. This series was used to link the two index numbers previously obtained (1834: 189; 1791: 117) and to extend them to 1774.

Line H: extrapolated (simple splicing: 0.174) from 1840–1900 on line E2.

Line G: table 14.2.

Line F: 100 × line H ÷ line G.

TABLE 14.6 **Value of net US international assets, measured in current and 1860 prices, 1774–1815, in millions of dollars**

		1774	1799	1805	1815
1	Stock of monetary metals	4	17	18	25
2	Net international position of the United States	–26	–81	–75	–80
3	Line 1 plus line 2	–22	–64	–57	–55
4	Price index (1860 = 100)	82	135	152	183
5	100 × line 1 ÷ line 4	5	13	12	14
6	100 × line 2 ÷ line 4	–32	–60	–49	–44
7	Line 5 plus line 6, net international position in 1860 prices	–27	–47	–37	–30

Sources: Line 1: 1774, 1799, 1805, Blodget 1810, 66; 1815, Hepburn 1915, 129. Line 2: US Bureau of the Census 1960, series U-207. Line 4: US Bureau of the Census 1960, series E-1, shifted to the base 1860 without reweighting. Lines 3, 5, 6, and 7: See text.

courts—for example, those of Maryland in 1787—recognized the validity of prewar bonds and other specialties securing debts to British merchants.) More important, during the last year before the war (the twelve or so months ending September 1775), importations into the colonies were prohibited by Congress, though exports to Britain were permitted. At that time, we learn from a later writer, "the factors, whom the Glasgow merchants had established in America, by their prudent exertions, and the friendly terms on which they generally were with the planters [perhaps not all of them], had been enabled to make large remittances to their constituents, before matters were brought to the last extremity." According to the well-informed Bristol merchant Richard Champion, the amounts owing from America were reduced from £6 million in December 1774 to £2 million in December 1775.

At $4.15 to the pound, £6 million comes to just under $25 million, a close check with Jones's figure; see Price 1980, 8–11. The series were deflated by the Warren-Pearson all-commodities price index, shifted to the base 1860 without reweighting.

14.4.5. Animal Inventories

Table 14.7 presents figures for animal inventories. Blodget (1810, 60) has estimates of the number of horses and horned cattle, 1774, 1784, 1790–1809; figures apparently refer to mature animals on farms (see Gallman 1972, 204). These estimates were valued in 1860 prices and were used to

TABLE 14.7 **Value of animal inventories, measured in current and 1860 prices, 1774–1840**

	1774	1799	1805	1809	1815	1840
Number of mature animals, in millions						
Horses	0.4	1.03	1.2	1.4		3.85
Cattle	0.85	2.35	2.95	3.66		15.00
Value, at 1860 prices, in millions of dollars						
Horses	22.5	58.0	67.5	78.8		216.7
Cattle	15.9	44.0	55.2	68.5		280.7
Total	38.4	102.0	122.7	147.3		497.4
All stocks	52.2	138.6	166.7	200.2	241.2	676.0
Price index (1860 = 100)	80.6	86.8	96.0		146.8	
Value at current prices, in millions of dollars						
All stocks	42.1	120.3	160.0		354.1	

Sources:

Lines 1 and 2, 1774–1809: Blodget 1810, 60. 1840: Census estimates are summarized in the 1950 US Census of Agriculture (US Bureau of the Census 1952, 361–63). Also in this census is a discussion of the coverage of each preceding census (pp. 364–68) and a comparison of the census figures with the estimates of the Bureau of Agricultural Economics (pp. 352–353). On the basis of this information, census estimates were adjusted to eliminate young animals. (The information regarding the age coverage of the census given in tables on pp. 352–53 of the 1950 census is at variance with the text comments on pp. 364–68. The text is correct.)

Line 3: line 1 × the 1860 prices of cattle ($18.71). Line 4: line 2 × the 1860 prices of horses ($56.29). These estimates are only crude approximations to the true prices of mature animals. They were derived from 1867 figures produced by the Bureau of Agricultural Economics (US Bureau of the Census 1960, 289–90), adjusted downward slightly to allow for the fact that the application of these prices to 1860 census data on the numbers of animals of all types generates a value slightly higher than the 1860 census return of the value of animals. Since the 1860 census returned some young animals, the derived prices are about 5 percent lower than the true prices of mature animals. For present purposes—to generate an extrapolating series—this disparity between the prices estimated and the prices sought is a matter of very modest importance.

Line 5: line 3 + line 4.

Line 6, 1774–1809: extrapolated from 1840 on line 5. 1815: extrapolated from 1809 on the assumption that the real value of the total stock grew at a rate of 3.167 percent per year between 1809 and 1815. The rate of change was computed on the basis of the Towne and Rasmussen (1960, 282) data on the value of output of the following animal products, expressed in prices of 1910–14: cattle and calves, hogs, sheep and lambs, and horses and mules. The weight accorded to the horses and mules, however, was increased so that in 1820 it equaled the weight given to cattle and calves (see the text). 1840, table 7.3.

Line 7: Price index numbers were first established for 1800 and 1810 in the following way. Index numbers on the base 1860 were computed from data in Towne and Rasmussen 1960, 283–86, for the prices of horses and mules, beef and veal, pork, and mutton and lamb. The first two index numbers were used to inflate (separately) the real value of horses and horned cattle in 1800 and the values shown in lines 3 and 4, above, for 1809. The other two indexes, weighted equally (see table 7.3), were combined and used to inflate the difference between lines 5 and 6, 1800 and 1809. (This procedure probably gives too great a weight to the proxies for the prices of swine and sheep, since part of the difference between lines 5 and 6 reflects the value of young horses, mules, and cattle. Since there was no good basis for adjusting to remove this problem, and since the index numbers were expected to be useful crude approximations at best, no adjustments were made.) The current price aggregate divided by the constant price aggregate (line 6) yielded implicit price indexes for 1800 and 1810 (1809 weights), 91.6 and 95.1. Index numbers for the other years—except 1774—were constructed by extrapolating the 1810 estimate (see below) on the basis of prices of beef and pork, taken from Cole 1938. Cole gives monthly prices. The ones chosen in this case were January prices at Philadelphia. In the case of beef, mess beef, 1799 and 1805; Philadelphia mess beef, 1810 and 1815. In the case of pork, Burlington, 1799; Burlington mess, 1805; mess, 1810; Philadelphia mess, 1815. Some effort was made to see whether these descriptive changes imply real changes in quality. The device used was to compare price change across a period of designation change with price changes observed for other types of beef or pork, for which there was no designation change. Conversions were derived on the basis of information supplied by Cole (1938, ix and x). The beef index was given a weight of 4; the pork index was given a weight of 1 (see table 7.3). Where gaps appeared, the index was interpolated on one of its components. Estimates were made for all the years 1798 through 1810, and the resulting index numbers vary little from year to year, with one exception. Stability is also the impression given by the indexes derived from Towne and Rasmussen (see above). Therefore it seemed reasonable to extrapolate the 1810 index number from Towne and Rasmussen, 95.1, on the series derived from Cole. The index numbers for 1800 were not used as bases for this extrapolation because the year 1800 is the year referred to above—the one in which the Cole-based index number is far out of line with the index numbers of the other years. It seems probable that 1800 was an unusual year, and that Towne and Rasmussen took that into account when they derived their price data for 1800. That is, it seems probable that the Towne and Rasmussen price data for 1800 should be understood to refer to trend-level figures for the turn of the century, and not to 1800 specifically. The price index number for 1774 was obtained by dividing the current price estimate for that year (based on Jones) by the constant price estimate (based on Blodget; see the text).

Line 8: line 6 × line 7 ÷ 100.

extrapolate the total value of all animal inventories (1860 prices) from 1840 to the years 1774, 1799, 1805, and 1809. The 1809 figure was extrapolated to 1815 on the assumption that the annual rate of growth of animal stocks between 1809 and 1815 was the same as the rate of growth of the real value of the products of cattle, hogs, sheep, horses and mules combined, according to Towne and Rasmussen (1960), between 1810 and 1820. For purposes of these computations, however, the horses and mules component of the Towne and Rasmussen series received the same weight as the cattle component, approximating the relationship of the value of the inventories of these animals in the years 1840 to 1860. The extrapolation rests on the assumption that in the years between 1809 and 1815 the value of the output of animal products changed at about the rate of the value of inventories, and that the annual rates of change of these variables were constant between 1809 and 1820. These assumptions are unlikely to yield a reliable estimate of the true real value of animal inventories in 1815, but they *are* likely to produce something approximating the trend level of the real value of animal inventories in that year, which is the best that can be hoped for.

Apart from the problems peculiar to the 1815 estimate, there are three major potential sources of error in this set of estimates. First, Blodget's estimates of the numbers of animals may be wrong, since there is no obvious, reliable, comprehensive source from which he could have drawn them (other than state property tax assessments). The figures for 1800, however, have survived a certain amount of testing (Gallman 1972, 204), which suggests that Blodget's evidence may be adequate to at least establish a trend level for the turn of the century. The reasonably close match between Blodget's overall estimate in 1774 and Jones's figure for that year (see above) also tends to increase one's confidence in Blodget's ability to establish accurate wealth estimates, and Jones (1980, 354), as we have seen, has reported that Blodget's estimates of the number of horses and horned cattle in 1774 are consistent—if a little too low—with the results she obtained from her sample. Since Jones's data include all animals while Blodget's apparently cover only mature animals, it should not be a surprise that the Blodget figures are lower than those of Jones.

Second, it is possible that the quantitative relationships between the extrapolating series and the series being extrapolated changed between 1774 and 1840. That would constitute a more serious worry if the extrapolator accounted for a small fraction of the full series, or if the relationship was unstable. In fact, the extrapolator accounts for about three-quarters

of the full series, and the relationship is quite stable in the years 1840–1870 (see Gallman 1972, 204). The proportions run thus: 73.6 percent for 1840, 74.4 percent for 1850, 72.8 percent for 1860, and 76.3 percent for 1870. They rise in subsequent years, going from about 80 percent in 1880 to 90 percent in 1900.

Finally, the process of deflation rests on the assumption that a horse is a horse and a cow is a cow. If in fact the types of animals represented in the stock changed importantly over time—particularly, if the quality of animals in the stock changed—then this procedure would not be warranted. But while there can be little doubt that the types of animals did shift and there may have been quality improvements in some elements of the stock, it is doubtful that these sources of error are important.[11] To the extent that these factors produce errors in the estimates, the errors probably lead to *overestimates* of the real value of animal stocks in the early years. Rates of growth computed from series in which the estimates for the early years are too large will necessarily be biased in a *downward* direction.

The constant price series was inflated to produce current price estimates. First, comprehensive benchmark price index numbers were established for 1800, 1810, 1820, and 1860 on the basis of data in Towne and Rasmussen. It should be said that the prices for cattle, swine, and sheep were derived from prices of meat products, and therefore represent imperfectly the prices of the animals for which they are proxies. The benchmark estimates, in turn, were interpolated (to 1805 and 1815) and extrapolated (to 1799) on more limited animal products price series (pork, beef) taken from A. H. Cole. These series seem to tell the same story, with respect to price movements in the early nineteenth century, as do the Towne and Rasmussen data. However, the Cole data lack information on the prices of horses and mules, and thus seem inadequate bases for extrapolating the price index back to 1774. Since Jones has pointed out that her data on animal inventories are consistent with Blodget's, it seemed the better part of wisdom to accept Jones's estimate of the value of animal inventories (current prices) and convert it from pounds sterling to dollars. The price index for 1774, then, is the index implicit in the constant price series, derived from Blodget's data, and the current price series, derived from Jones's work.

14.4.6. Inventories

1799–1815. For these years, the procedures to develop the series in table 14.8 are similar to those employed to estimate the value of inventories for the

TABLE 14.8 **Value of inventories, measured in current and 1860 prices, 1774–1815, in millions of dollars**

		1774	1799	1805	1815
1	Value of imports, excluding duties, at current prices	17	81	126	85
2	Duties	15	24	38	
3	Value of imports, including duties	17	96	150	123
4	Value of inventories of imports (line 3 × 0.5)	9	48	75	62
5	Price index (1860 = 100)	85	167	153	220
6	Value of imports, excluding duties, at 1860 prices (100 × line 1 ÷ line 5)	20	49	82	39
7	Value of imports, including duties, as a ratio of the value of imports excluding duties, 1860: 1.144				
8	Line 7 × 0.5 = 0.572				
9	Inventories of imported goods, at 1860 prices (line 6 × line 8)	11	28	47	22
	Agricultural products				
10	Inventories, at current prices	20	125	175	251
11	Price index (1860 = 100)	61	95	111	119
12	Inventories, at 1860 prices	33	131	157	211
	Mined and manufactured products				
13	Inventories, at current prices	10	67	86	130
14	Price index (1860 = 100)	65	120	119	158
15	Inventories, at 1860 prices	15	56	72	82
	Totals				
16	Inventories, at current prices	39	240	336	443
17	Inventories, at 1860 prices	59	215	276	315

Sources: See text.

years 1840 to 1900 (see chapter 12). The following notes refer to the estimates for these years. The year 1774 is a special case, and is dealt with separately at the end.

Imports. The value of merchandise imports was taken from North (1960, 600). The years are fiscal years, ending 30 September, and the values were established at the ports of embarkation. Ideally, the values would refer to calendar years and include shipping costs, but given the nature of the estimates to be derived from them, these deviations from the ideal are of modest importance. See North's account for a description of other weaknesses of the data.

Pitkin's (1835, 333–34) statements of duties were added to the value of imports. Before 1815 they include "tonnage, passports, clearances, light money etc.," which appear to have accounted for about one-twentieth of the total of duties plus the other items.

The series, exclusive of duties, was deflated and then used as an extrapolator for the 1860 value of imports plus duties to create a constant price series. The deflator (shifted to the base 1860 without reweighting) consisted of the Bezanson index of prices of goods imported into Philadelphia (US Bureau of the Census 1975, series E-99). The index numbers refer to calendar years, so that they do not exactly match the years to which the import data refer. No effort was made to adjust for this inconsistency, which on the whole is a matter of modest importance.

The value of inventories of imports was assumed to be equal to one-half the value of imports, including duties.

Agriculture. Benchmark estimates were prepared from the data of Towne and Rasmussen (1960) for the years 1800, 1810, and 1820. (As indicated previously, the Towne and Rasmussen estimates of crops and animal products are consistent, in 1800, with various pieces of evidence supplied by Blodget.) The procedure was as follows. Various items (the value of inventory changes of livestock, chickens and eggs, other poultry, dairy products, truck crops and fruits, and "miscellaneous") were deducted from the Towne and Rasmussen estimates of the value of farm output. The seed and feed allowances for corn, oats, and hay were added back in (see chapter 12 for justifications of these additions and subtractions). The constant price data were then shifted to the price base 1860 by the two components, livestock products and crops, but without reweighting within these broad classes. The constant price data were then interpolated to the years 1805 and 1815 and extrapolated to the year 1799, on the assumptions that the annual rate of change remained constant between 1799 and 1810 and between 1810 and 1820. These assumptions are unlikely to mirror reality very exactly, but are perhaps adequate for the purpose of obtaining approximations to trend level values. The implicit price index numbers were extrapolated to 1799 and interpolated to 1805 and 1815 on the Bezanson agricultural price index (US Bureau of the Census 1975, series E-100).

Mining and Manufacturing. Estimates were derived for the year 1810 by extrapolating the 1840 and 1850 figures (tables 12.3 and 12.4) on Poulson's (1975) current and constant price estimates of the value of output of mined products (less gold) and value added by manufacturing. The constant price series was then carried to the years 1799, 1805, and 1815 on the assumption that mining and manufacturing accounted for the same share of inventories (0.26) in these years as in 1810. Once again, this appears to be the best way to get approximations of trend values. The implicit price index for 1810 was extrapolated to the other years on the Bezanson price index of industrial goods in US Bureau of the Census 1975, series E-101.

1774. The value of imports was computed by extrapolating the Shepherd and Walton estimate for 1772 (US Bureau of the Census 1975, series Z-287, New England, Middle Colonies, Upper South, Lower South) to 1774 (on the sum of US Bureau of the Census 1975, series Z-214 and Z-228) and then converting to "dollars" by means of the Jones (1980, 10) exchange rate of $4.15. No adjustment could be made for duties. The alternative procedure of extrapolating the value of imports from 1790 on the Blodget series produces a much lower value: $9–10 million, as compared with $17 million. Shepherd and Walton appear to be the better source.

Jones (1980) has an estimate of the value of crop inventories, which implies about the same per capita value, in real terms, as the estimates for 1799–1815, a plausible result. The crop estimate, expressed in dollars, was blown up to include the rest of the inventories of agricultural goods, on the assumption that these elements composed the same share as in 1799 of the total value of inventories of agricultural goods.

Jones (1980) has an estimate of the value of business inventories, which presumably includes imported goods and domestically produced goods. Subtracting the estimate of the value of inventories of imports, described above, from the Jones figure of the value of business inventories, expressed in dollar values, should yield the value of inventories of nonagricultural, domestically produced goods, most of which would be mined and manufactured goods. Unfortunately, however, the procedure more than exhausts the Jones business inventories, and therefore a new estimate of the value of mined and manufactured goods in inventory had to be made. The estimate was based on the assumption that the share of mined and manufactured goods in the real value of inventories was the same in 1774 as it was in 1799, a technique that may overstate the value of these inventories in 1774. It is also true that relying exclusively on Jones would result in a substantially lower (almost 50 percent lower) estimate of the value of all inventories, and perhaps a more accurate estimate. The virtue of the estimate adopted is that it was constructed by means of evidence and estimating procedures similar to those used to produce the estimates for the years 1799 to 1900, and is therefore more likely to be comparable with these figures than would an estimate employing only the data supplied by Jones. This is an important virtue; the estimates assembled in this study are intended to form time series, and thus they should be comparable above all else. The price indexes described above, in the section dealing with 1799–1815, were extended to 1784 and then carried to 1774

on the Bezanson general price index for Philadelphia in US Bureau of the Census 1975, series E-111.

14.4.7. Equipment

Table 14.9 provides estimates of the value of equipment. They are derived as follows.

1799–1815. Goldsmith (1952), basing his work on Blodget's data, estimated that agricultural implements amounted in value to $32 million in 1805. The estimate is not particularly strong, but there is little choice but to accept it if complete estimates are to be prepared. As to other equipment, Goldsmith has no suggestions. Extrapolating the value of equipment in mining, manufacturing, and trade from 1840 to 1810 on Poulson's (1975) estimates (current prices) of value added in mining and manufacturing, and then carrying the figure to 1805 on the assumption that the rate of change was unaltered between 1805 and 1840 yields a figure of roughly the same value as Goldsmith's agricultural implements figure. At a guess, then, equipment of all types amounted to about $65 million in 1805. This estimate was extrapolated to 1799 and 1815 on the value of inventories of all kinds and the value of shipping. Structures were left out of the extrapolator because the estimate of the value of structures in 1805 is suspect. A deflator was constructed by extrapolating the weighted average price index number of agricultural, manufacturing and trade equipment in 1840 to 1799, 1805, and 1815 on the Warren-Pearson price index of metals and metal products (US Bureau of the Census 1975, series E-58)—the best option, but by no means a good one, in view of the fact that most equipment was made of wood. Unfortunately, however, there is no wood price index that is likely to be superior.

1774. Jones's (1980, 90) estimates of the value of the equipment of "farm and household" and "equipment of nonfarm business" were converted to

TABLE 14.9 **Value of equipment, measured in current and 1860 prices, 1774–1815, in millions of dollars**

		1774	1799	1805	1815
1	Value, at current prices	15	46	65	88
2	Price index	161	225	224	289
3	Value, at 1860 prices	9	20	29	30

Sources: See text.

dollars and accepted. Household equipment refers not to furniture, bedding, or eating and cooking equipment, but rather to tools employed in producing goods that at a later date were to be produced chiefly in shops and mills—that is, artisan's tools. It would be helpful to be able to distinguish between farm and household equipment—especially in view of the fact that household equipment of this type is excluded from the capital stock estimates—but that proved impossible. The estimate was deflated by the index described above for 1799, carried to 1774 on the Bezanson general price index for Philadelphia (US Bureau of the Census 1975, series E-111).

14.4.8. Other Improvements to Farmland

The estimating procedures are described in full in chapter 7, which deals with the 1840–1900 period. These notes describe procedures peculiar to the 1774–1815 period. The bases for estimating the value of fences, irrigation works, and drainage works are very slender. These improvements have therefore been omitted. Table 14.10 summarizes the main results; table 14.11 provides the details to back up the main results.

TABLE 14.10 **Value of agricultural land improvements (clearing and breaking), measured in current and 1860 prices, 1774–1815, in millions of dollars**

		1774	1799	1805	1815
1	Improved land, from Blodget, millions of acres	20.86	36.30	39.40	—
2	Line 1, adjusted	15.88	28.05	30.58	—
3	Man-months of labor clearing improved land	14.77	26.09	28.44	32.84
4	1860 monthly wage rate (weighted averages of regional rates)	$18.24	$18.37	$18.49	$18.60
5	Value of clearing, at 1860 prices, in millions of dollars (line 3 × line 4)	269.40	479.27	525.86	610.82
6	Current monthly wage rate	$7.68	$14.57	$13.39	$12.21
7	Value of clearing, at current prices. in millions of dollars (line 3 × line 6)	113.40	380.13	380.81	401.00
8	Value added per cleared acre (line 7 ÷ line 2)	7.14	13.55	12.45	—

Sources:
Line 1: Blodget (1810, 60. Line 2: line 1 adjusted to make the figures comparable to those underlying the estimates for 1840–1900; see text. Line 3, 1774–1805: line 2 × 0.93; 1815: 1805 extrapolated to 1815 on the assumption that the annual rate of change in 1805–15, was the same as the annual rate of change in 1799–1805. See text. Line 4: Regional estimates of labor consumed in land clearing and breaking (see text) were weighted with 1860 regional wage rates (see table 7.6), to produce average annual constant price wage rate estimates for the years 1774, 1800, and 1809. The wage rate with 1800 weights was applied to the data in line 3 for 1799; the mean of the wage rates with 1800 and 1809 weights was applied to the 1805 data; the wage rate with 1809 weights was applied to the 1815 data. Line 5: line 3 × line 4. Line 6: See table 14.11. Line 7: line 3 × line 6. Line 8: line 7 ÷ line 2.

TABLE 14.11 **Background data for calculations of land clearing and breaking, 1774–1818**

	1774	1800	1809	1815	1818
I. Improved land, in millions of acres					
New England	3.20	5.28	5.40		
Middle Atlantic	3.24	5.77	7.07		
East North Central		0.23	1.06		
West North Central			0.07		
South Atlantic	9.44	15.95	15.9		
East South Central		1.23	2.22		
West South Central			0.22		
Totals: Blodget's Adjusted	15.88	28.45	31.94		
Weighted regional estimates	13.52	29.70	39.00		
II. Labor consumed in clearing and breaking land, in millions of man-months (I., above, divided by 0.93)					
New England	2.98	4.91	5.02		
Middle Atlantic	3.01	5.37	6.58		
East North Central		0.21	0.99		
West North Central			0.07		
South Atlantic	8.78	14.83	14.79		
East South Central		1.14	2.06		
West South Central			0.2		
Total	14.77	26.46	29.71		
III. Value of land clearing and breaking, at 1860 prices, in millions of dollars					
New England	65.86	108.5	110.9		
Middle Atlantic	57.58	102.7	125.9		
East North Central		4.3	20.5		
West North Central			1.4		
South Atlantic	145.92	246.5	245.8		
East South Central		24.0	43.5		
West South Central			4.7		
Totals	269.36	486.1	552.6		
IV. Average 1860 wage rates, various weights					
(III, totals, divided by II, totals)	$18.24	$18.37	$18.60		

V. Regional wage rates, adjusted for the value of board	1800	1818
New England	$18.89	$17.85
Middle Atlantic	15.59	14.73
East North Central	14.07	13.29
West North Central		15.23
South Atlantic	12.86	12.15
East South Central	13.56	15.54

VI. Value of land clearing and breaking, at current prices, (II, 1800 and 1809, times V, 1800 and 1818), in millions of dollars		
New England	92.75	89.61
Middle Atlantic	83.72	96.92
East North Central	2.95	3.16
West North Central		1.07

continues

TABLE 14.11 (*continued*)

	1774	1800	1809	1815	1818
VI. Value of land clearing and breaking, at current prices, (II, 1800 and 1809, times V, 1800 and 1818), in millions of dollars					
South Atlantic		190.71			179.7
East South Central		15.46			32.01
Totals		385.59			412.47
VII. Average wage rates (VI divided by II)		$14.57			$13.88
VIII. Indexes of Adams's farm wage rate series, Base 1818 = 100					
	1774	1800	1809	1815	1818
1. Brandywine	—	—	100[b]	90	100
2. Philadelphia	—	—	94.1[b]	96.1	100
3. Maryland	55.3	—	96.0[b]	80	100
IX. Estimated wage rates, including the value of board					
	$7.68	14.57[a]	13.39[b]	12.21	13.88

Sources: See text.

Notes: [a]1799 rather than 1800; [b]1805 rather than 1809. Adjustments to Blodget's improved acres: The 1800 number in table 14.11, line 1 is slightly (0.4 million acres) higher than the 1799 number in table 14.10, line 2. Weighted regional estimates: estimates based on 1840 per capita rates and regions distribution of population in 1774, 1800, and 1809. Estimated average wage rates for 1800 and 1818 (1809 weights) were carried to 1774, 1799, 1805, and 1815 on Adams's (1968, 1982, 1986) farm wage rates for the Brandywine, Philadelphia, and Maryland. The 1800 and 1818 data were taken from Lebergott (1964, 257, 539) and adjusted upward by 50 percent to incorporate the value of board (see chapter 7). It should be said that Adams finds that board in the Brandywine region was relatively more valuable than this, equal to between 53 percent (1801) and 94 percent (1804) of the straight wage in this period. It seemed safer to adhere to Lebergott's correction and to use it systematically, rather than to rely on the evidence of the Brandywine alone to describe circumstances in the nation at large. Lebergott (1964) does not give regional data for 1800. Regional estimates were constructed on the basis of Lebergott's average US estimates for 1800 and 1818, and the percentage deviation in 1818 of the regional wage rates from the average US rate. In Section VIII, 1815 is calculated as 1818 × 0.88 (which is the mean of indexes for Philadelphia and Maryland); 1805 is calculated as 1818 × 0.965 (which is the mean of Brandywine, Philadelphia, and Maryland); 1799 is 1800; and 1774 is 1818 × 0.553.

Blodget's estimates of the acreage of improved land—"acres in tillage," "meadows and fallow ground," and other improved lands "including pastures"—were accepted subject to one revision: half of the land in the last category was treated as improved, and the other half as unimproved. The purpose of this adjustment is to bring Blodget's totals into conformity with the standards of the censuses of 1850 to 1900, and thus to make them comparable to the estimates for the 1840–1900 period in chapter 7 (see Gallman 1972, 202, note 13).

Virtually all the land improved in the period treated in this section had previously been forest. According to Primack (see chapter 7), techniques for clearing forestland did not change before 1860. Labor embodied in the clearing of an acre of cleared land was therefore assumed to be the

same in 1774–1815 as in 1840–60: approximately 0.93 months per acre (see tables 7.4 and 7.5).

Blodget has no estimate of the acreage of cleared land in 1815. It was therefore necessary to extrapolate the labor embodied in cleared land from 1805 to 1815. The assumption was made that the annual rate of change of the labor content of cleared land was the same between 1805 and 1815 as between 1799 and 1805. The estimate is probably adequate, if viewed as a trend-level estimate.

For purposes of valuation, it was necessary to divide Blodget's improved land estimates (as adjusted) among geographic regions. This was accomplished by applying the 1840 regional rates of improved land per capita to regional population estimates for 1774 (Jones 1980, 37), 1800, and 1810 (US Bureau of the Census 1960, series A-123 to A-180), and then distributing the adjusted improved land estimates among regions on the basis of these figures. The data for 1800 were used to distribute the 1799 and 1805 totals, while the data for 1810 were used for the 1815 total. The aggregate results appear in table 14.11. Blodget (1810) does not provide sufficient details with regard to the land supply in 1809 to permit the adjustment of his improved land estimate for that year to be carried out in the same way as the adjustments for the 1774 and 1800 estimates. Instead, the ratio of the adjusted estimates to the unadjusted estimates (0.78) for 1774 through 1805 was applied to Blodget's 1809 estimate of the acreage of improved land, to obtain the adjusted figure for that year.

Constant price estimates were made by applying Lebergott's (1964) regional wage rates (adjusted for the value of board—see chapter 7) to the relevant regional totals of the labor content of cleared land. The 1815 current price estimate was made by weighting Lebergott's 1818 regional wage rates (adjusted for board) with 1809 labor weights (i.e., the labor content of cleared land), and then carrying the average wage rate so computed from 1818 to 1815 on Adams's farm wage rate series (see table 14.11). Similarly, Lebergott's 1818 regional data and 1800 national average estimate were used to derive regional figures for 1800. These data were then weighted by the regional figures on the labor content of cleared land to produce an appropriately weighted average wage rate for 1800, which was then carried to 1774, 1799, and 1805 on Adams's series.

Two sets of consistency tests can be made. According to Jones (1980, 10, 90), the value of real estate in 1774 came to about $250 million. The value imparted to land by clearing it (table 14.10, $113 million) and building structures (table 14.3, $67 million) amounted to $180 million, leaving

$70 million to be accounted for by the value of fencing, drainage and irrigation works, privately owned roads, and the value of the land itself. In 1840, fencing, drainage and irrigation works were equal in value to about 29.2 percent of the value of clearing. If this relationship applied also to 1774, then the value of the land itself and the value of privately-owned roads amounted to only $37 million ($70 million minus 29.2 percent of $113 million). If Jones's real estate estimate refers to all the land in what was to become the United States, 526 million acres, then the land itself plus the value of privately-owned roads came to seven cents an acre. If on the other hand we assume that Jones's real estate figure covers only the land that Blodget refers to as "cultivated" and "adjoining"—which the previous consistency tests (see section 14.3.1, 1774) suggested was the case—then the value of the land itself plus the value of privately-owned roads comes to about 36.6 cents per acre. This is close to Blodget's estimate of the value of land in its natural state in 1774, 35 cents per acre (for qualifications, see the discussion in chapter 7.)

The results of the second test are less satisfactory. According to table 14.10, line 8, the average value added to land by clearing was in $7.14 per acre in 1774, $13.55 in 1799, and $12.45 in 1805. Blodget's (1810, 60) estimates of the average value of cultivated land per acre in these years are much lower: $2.50, $5.50, and $6.25 respectively. Blodget's figures refer to market prices, while the data in table 14.10 are gross reproduction cost estimates; but the same considerations apply to the test against the Jones data, described above.

The clear suggestion is that Blodget's estimates of the average price of cultivated land are inconsistent with the land clearing data and perhaps the Jones data as well (which qualifies the results of the consistency test described in the introductory parts of this section). It seems probable that Blodget's figures are just too low, though the possibility that the clearing estimates are too high cannot be entirely excluded. For example, it may have been more common to leave stumps in the ground when clearing land in the seventeenth, eighteenth, and early nineteenth centuries than became usual later on (see chapter 7). Thus the estimating procedure employed may be more appropriate to the years 1840 to 1900 than to the years 1774 to 1815. It is also possible, of course, that the wage rates employed in the estimation are unrepresentative and too high. The success of the test with the Jones data leads one to suppose that the Blodget estimates are more likely to be wrong than are the clearing estimates or the wage rates. But one's satisfaction with the test against the Jones data

is qualified by the fact that the Blodget estimates play a role, however peripheral, in this test (see the introductory parts of this section for the consistency tests between the Blodget and Jones estimates). Clearly, the tests are less than conclusive, though the check against the Jones data is moderately reassuring.

14.5. Conclusion

This chapter summarizes Gallman's capital stock estimates for the period from 1774 to 1815.