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American Incomes 1650-1870: New Evidence, Controlled Conjectures [1]

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Text, tables, and references only – see separate file for figures

ABSTRACT

Significant gains in knowledge flow from measuring national product from the income side, unlike all past measures for America before 1929. Building "social tables" open up new views of the distribution of income. One can also confront the accepted production- and expenditure-side estimates of GDP.

The resulting income estimates reinterpret the history of American growth and inequality. Before the World Wars, the time period in which Americans most clearly led Britain in purchasing power per capita was in the colonial era -- when we were British. We then lost that lead temporarily in the Revolution, and again in the Civil War. The South's relative income was falling for at least 220 years, 1650-1870, starting from its being clearly the richest part of the thirteen colonies, even when slaves are counted as low-income residents. Income inequality rose as much between 1774 and 1860 as it did in our current rise of inequality since the late 1970s. In the Civil War decade, inequality declined among Southern whites and rose in the North and in the nation as a whole.

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[1] This paper summarizes much of Chapters 2-6 of our book-in-progress documenting and interpreting American growth and inequality. For convenience we have retained the chapter-based table and figure numbers (Table 2-1, etc.). Suggestions and criticisms are welcome: phlindert@ucdavis.edu and jwilliam@fas.harvard.edu. Further chapters are in progress, extending the subject to the present and adding interpretations.

Southern blacks gained perhaps 30 per percent in real purchasing power over that same decade, despite some decline in their labor force participation.

I. Overview: Old Debates, New Facts, New Results

How and when did America become so prosperous and unequal? For more than two centuries, generations of Americans have debated competing visions of what was happening to national income and how it is divided among them. Yet they lacked the solid evidence needed to choose between such competing visions. Today, despite improving data about today's conditions, we still know little about the growth, and especially about the inequality, of American incomes before the twentieth century.

When did America incomes grow fast enough to make this country a world leader in average living standards? There is fair agreement about how and when our incomes have grown since the early twentieth century, and even as far back as 1870, thanks to the pioneering work of Simon Kuznets and many others. Yet the mapping of incomes and of Gross Domestic Product remains weak for the years before 1870, weaker than in some West European countries.

To be sure, scholars have struggled admirably to reduce the uncertainties about the pre-1870 history of national income growth.[2] Yet the debate continues about income movements before the Civil War, and even the range of numbers that most agree on have probably gives the wrong impression about how our average incomes compared with those in other countries. Our history textbooks imply that the road to prosperity was paved by the institutional wisdom of the Founding Fathers and those who refined that wisdom over the last two centuries. We will find, however, that even before the Great Depression of the 1930s the road was bumpier than the usual tale of monotonic progress implies.

How unequally was that national income distributed between the rich, middle, and poor, and why? The rise in inequality since the 1970s is now unmistakable, not only

[2] For the current state of knowledge about the history of U.S. GDP and national income, see Richard Sutch's encyclopedic coverage in volume 3 of *Historical Statistics of the United States* (Carter *et al.* 2006, Volume 3, Chapter Ca).

because the widening has continued for almost forty years, but because scholars have just recently found better measures of inequality, avoiding the faulty official numbers that still hide the true movements in inequality. Since the 1960s the official Census Bureau estimates of the distribution of income have badly understated our top incomes, and have hidden much of the post-1980 rise in the share of American incomes going to the richest one percent.[3] Fortunately, that twentieth-century problem has been solved for this country and others by an international research team lead by Anthony Atkinson of Oxford, Thomas Piketty of Paris, Emmanuel Saez of Berkeley. Starting from income tax returns, this team has charted the dramatic twentieth-century fall and rise of top incomes in countries around the world. That only works for the twentieth century, however. For the centuries before the income tax was introduced in 1913, there is still no clear history of American income inequality, though economic historians offered some plausible guesses in a wave of literature cresting around 1980.[4]

Fortunately, the data we need keep accumulating. For economic historians, as for geologists, archeologists, and climate scientists, the body of available information about a given date in the distant past keeps growing, thanks to advances in discovery technology. The leading estimates of early American GDP date from pioneering scholarship in a great quantification wave from roughly the late 1960s through the late

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[3] The main error, though not the only drawback, in the official Census Bureau estimates based on its Current Population Survey (CPS), is known as the "top-coding" problem. The Census Bureau knew it would be sensitive and difficult to ask top-income people about the exact magnitude of their incomes.

The official response to this difficulty is a "top-coding" solution that seriously understates top incomes. As others have pointed out in Congress and the media back in the 1990s, the Census estimates value all household incomes in the top class at the floor of that income top class. That floor was only $50,000 for 1967-1976, then $100,000 for 1977-1984, $300,000 for 1985-1992, and $1 million after 1993. The official CPS estimates imply that between 1980 and 1997 Bill Gates of Microsoft earned less than $8 million -- from which he somehow accumulated a personal net worth valued over $36 billion in 1997 (*Newsweek*, Aug. 4, 1997, 49-50). Worse yet, the published official CPS figures display even lower top-class cutoffs, frustrating any attempt to view what has happened within the top 5 percent of households.

[4] What is now known about American inequality in the twentieth century is summarized by Atkinson, Piketty, and Saez (2011). Rough incomplete numbers on American inequality before the twentieth century were sketched by Williamson and Lindert (1980, Chs. 2-4), with updates by Lindert (2000).

1980s. The same quantification wave gave us new rough impressions about early inequality movements. As of the 1980s, those impressions were still limited to incomplete numbers on the distribution of non-human wealth, shedding only very indirect light on the inequality of human earnings or total income.

Since then several new sources have become available, and these we supplement with some that had been underutilized in the past. The new light was not shed in any easy or automatic way, such as an official release of long-locked archives. Rather the illumination comes from the recent sustained efforts of several scholars. We must acknowledge their labors before describing our own methods of extracting a new history from the mass of information they have patiently built. Table 1-1 lists the most crucial quantitative foundations on which we have built the pre-1870 history of American incomes. Of those, this history benefits especially from the contributions of the four scholars pictured in Figure 1-1. Of the four, the one whose works were already featured in the 1980s was Alice Hanson Jones, whose landmark study of American wealth around 1774 (1977, 1980) launches our new income history in Chapter 2. Jackson Turner Main (1965) scoured the colonial archives and delivered most of what we know about rates of pay on the eve of the Revolution, though the present book is the first to mine his numbers systematically. Gloria Lund Main, first with her late husband and then on her own, wrote widely in American wealth inequality, and has just made available their rich collection of probates from colonial New England from 1631 to 1776. Finally, Steven Ruggles, Director of the University of Minnesota' Population Center, leads the continuing development of the Integrated Public Use Microdata Series (IPUMS), which has revolutionized the use of past censuses since the early 1990s. One of its many accomplishments is the set of one-percent samples of the United States population censuses from 1850 on. Our history of American incomes could not have been written without its linking individuals' wealth to their occupations and other attributes.

[Photographs of Alice Hanson Jones, Jackson Turner Main, Gloria Lund Main, and Steven Ruggles to appear on facing pages. They are omitted here to economize on file size.]

Armed with such new materials, we use a different approach to the historical estimation of what Americans have produced and earned and consumed. National income and product accounting (NIPA) reminds us that one should end up with the same number for GDP by assembling its value from any of three sides -- the production side, the expenditure side, or the income side. To date, all American historical estimates for the years before 1929 have proceeded from either the production side or the expenditure side. Taking the production route, scholars have assembled real GDP by applying fixed base-period prices or value shares to time-series measures of such physical output measures as bushels of grain, tons of meat, yards of cloth, houses built, and numbers of service workers.[5] The second leading approach to GDP before 1929 has taken the expenditure side, adding up household consumption, capital formation, government expenditures, and the difference between exports and imports. Here the leading historical extension has been the pioneering work of Robert Gallman, providing annual estimates back to 1834.[6] The production and expenditure approaches have helped support each other by using much of the same production data from federal censuses.

We work instead on the personal income side, assembling nominal (current-price) GDP from free labor earnings, property incomes, and (up to 1860) slaves' retained earnings (a.k.a slave maintenance or actual consumption). No such estimates have been available for any year before 1929. Our taking this separate path leads to rewards not attainable by sticking to the production side. One immediate reward is the chance to confront and challenge the production-side estimates from a separate vantage point. The production side and the income side should add up to the same nominal or real GDP, once one either multiplies the production side's real GDP by a price index or divides the income side's nominal GDP by that price index. As we shall see, some instructive tensions arise between the two kinds of estimates, exposing the need to re-think the

[5] Production-side estimates of GDP or GNP before 1929 include the following series in Carter *et al. Historical Statistics of the United States* (2006, hereafter *HSUS*): the Millennial Edition series Ca9-Ca17 back to 1790, by Richard Sutch and others; and the Balke-Gordon and Romer series Ca208-Ca218 for 1869-1929, which trace back via Kuznets to Shaw's (1947) commodity output series by sector.
[6] See Gallman's estimates for 1834-1909 in *HSUS* series Ca192-Ca207 and Ca219-232.

index-number alignment of real GDP and its price deflator. Another reward from taking the income route is that it exposes the distribution of income among socio-occupational classes, races, and genders, as well as among regions. Furthermore, following the personal income trail allows us to explore further into the past than just 1834 or 1790. Building on the "social tables" tradition pioneered in the seventeenth century by Gregory King and others, we have been able to capture distributions of national income going back to the colonial America era.

Though we take a very different income-building approach from past scholarly efforts, our numbers should be viewed as an extension of research in the spirit that Paul David so aptly described as "new evidence and controlled conjectures" (David 1967). Our estimates use new evidence that was not available at the time of others' writings on this subject, and we offer them only as controlled conjectures, laden with explicit assumptions about information that is still lacking from the historical record. Far from claiming closure, we present tentative implications of available evidence, awaiting revision when further evidence accumulates.

This study harvests and interprets several new results about the two centuries of American economic growth and inequality before 1870. These include:

(Result 1) Income leadership.
Before the twentieth century, the time period in which Americans most clearly led Britain in purchasing power per capita was in the colonial era -- when we were British. We then lost that lead in the Revolution, and again in the Civil War, and regained it thereafter. Scholars who have accepted the Maddison-based view that America had not caught Britain in income per capita until the start of the twentieth century seem to be off the mark by at least two centuries.

(Result 2) Colonial benign stagnation.
In the debate over colonial growth in income per capita, the new results support the slow- or no-growth side (Mancall-Rosenbloom-Weiss). This is not a "pessimist" result, however. It underlines a sustained century-long prosperity of colonial America as a peripheral frontier economy supplying primary products.

(Result 3) Southern reversal of fortune.

The South's relative income per capita was falling for at least 220 years, 1650-1870, starting from its being clearly the richest part of the thirteen colonies[7] – even when slaves are counted as low-income citizens. The South's relative prosperity did not vanish suddenly with its defeat in the Civil War. While its longer and earlier decline had multiple causes, prominent among them is its failure to provide public education, even for whites.

(Result 4) Income inequality may have risen before the Revolution, but probably not among whites. Among whites, inequality was held down in colonial times because yeoman ruralization and frontier settlement outran the migration of capital and population to the cities. Only with the nineteenth century did the geographic balance of population shift back toward the cities. Yet including blacks in the resident population, with their near-bottom incomes, means that inequality among all households may well have risen, since the black share of total population rose from zero to over 21 percent in colonial times.

(Result 5) America's other great rise in inequality, 1774-1860.
Before the steep and ominous rise of income inequality since the late 1970s, there was an earlier rise that was similar in overall magnitude. Historians of American inequality need to explain the steep rise between 1774 and 1860. We find a clear difference in the locus of the 1774-1860 rise in inequality and that since the 1970s: The earlier rise in our gini coefficient was *not* concentrated in the pulling away of a top one percent from the remaining 99 percent, as has been the pattern since the 1970s. Rather the antebellum rise in inequality brought widening income gaps throughout the whole income spectrum.

(Result 6) The Civil War and inequality among whites, 1860-1870.
Emancipation and defeat reduced Southern inequality, even among whites. By contrast, income gaps widened within the North. The Northern widening and the inter-regional widening were sufficient to keep income inequality from falling at the national level in this stormy decade.

(Result 7) Black incomes and emancipation, 1860-1870.
The Civil War decade raised the real incomes of Southern blacks by something like 30 percent, despite the decline in their labor force participation. Emancipation meant that that they now captured something closer to the marginal product of their labor than the 40-50 percent of it that slavery let them consume.

[7] Though probably not the richest of all the British American colonies, in terms of white incomes. What little we know about white wealth, and indirectly about income, in the British West Indies suggests that white incomes were higher there than in any mainland colony. See McCusker and Menard (1985, Table 3.3, p. 61) and Higman (1996, pp. 321-324).

The remainder of the book-in-progress will add to this list of results. It will survey and interpret the long-run history of America's racial and gender gaps. It will also tackle two mysteries made clear by the emerging comparative history of income inequality over the last hundred years. The first mystery is why every rich nation experienced a drop in "pre-fisc" income inequality between the 1910s and the 1970s, with only slight variation in the extent of this drop. The second is why about half of them, including the United States, reverted to such wide income gaps since the 1970s. The mysteries are comparative and international, and no attempt to explain the wide swings in American inequality can succeed if it restricts its view to American history.

While our exploration of these important themes ranges broadly, it will be subject to three major omissions:

(1) This presentation excludes the Native American population, due to the paucity of information on their living conditions.[8]

(2) For the colonial period, we cover only the 13 mainland British colonies, ignoring the West Indies and Canada, and all Spanish, French, or Russian settlements.

(3) For the slave era, we see no way to place any monetary valuation on freedom itself. Nor can we quantify inhumane treatment. We follow only slaves' "incomes", a much narrower concept than their wellbeing.

II. Colonial Incomes on the Eve of the Revolution [9]

The most opportune place to light our first candle in the statistical darkness of early American income history is the year 1774, on the eve of the Revolution. Economists and historians need fresh information on the income levels that prevailed at the end of the colonial era and the dawn of independence in order to understand

[8] However, see the conjectured incomes per capita for Native Americans in the Lower South 1720-1800, by Mancall *et al.* (2003, Table 4).

[9] This section both condenses and extends material published in Lindert and Williamson (2013). See also the supporting statistical evidence in http://gpih.ucdavis.edu, within the folder "American incomes 1650-1870".

America's growth process and its evolving social structure. Compared with Britain and the rest of the western European leaders, was America rich or poor? Were colonial incomes distributed more equally than in Western Europe, or did slavery make the American colonies more unequal? Which were the economically leading colonies, and which were the laggards?

Another reason to start our two-century exploration at 1774 is a bit of luck regarding the estimation of incomes from property and from labor. The sources are summarized in Table 2-1. On the property side, we can tap Alice Hanson Jones's classic study of American colonial wealth (1977, 1980). For the earnings of free labor, we can take advantage of Jackson Turner Main's *The Social Structure of Revolutionary America* (1965). Main searched for late colonial newspapers and business accounts that put numbers on what American colonists earned with their labor and their cleverness. Perhaps the reason why scholars have failed to mine Main's study for its quantitative richness lies in its unique style of presentation. Main did not arrange his abundant numbers into any tables or charts. Rather, he tried to embed them in hundreds of pages of prose, perhaps because his audience resided in History departments more than in Economics departments. We have gone to the trouble of extracting the numbers from the prose, while noting their context. Finally, we can use several scholars' work to reckon the incomes retained by slave laborers after their owners and employers had extracted their gains.

This section anchors the rest of the paper. It offers the benchmark against which the 18th century performance before and the 19th century performance after can be gauged. It offers a much clearer view of colonial American inequality and how the incomes of different classes compared with those of their counterparts in England. American inequality was much lower in 1774 than in Great Britain, especially among free whites. Inequality was also much lower in New England and the Middle Colonies than in the United States today. We find higher colonial per capita incomes in 1774 than did previous scholars, especially higher in the southern colonies. In 1774, average colonial incomes were considerably higher than those in England and Wales, using either exchange rates or purchasing power parity calculations.

How the 1774 estimates are derived

The method: Link human earnings with property incomes, by occupation. Our approach starts by counting people by occupations or social classes, and mustering evidence about their average incomes. Historians will recognize our approach as that of building social tables, in the *political arithmetick* tradition spawned by such Englishmen as Sir William Petty and Gregory King in the 17th century. Development economists will recognize the similarity between our social tables and their social accounting matrices. That is indeed our approach here, as it has been in other work of ours.[10] Fortunately, the American colonial archives continue to accumulate early local returns that recorded occupations. Reconstructing society from these sources is no easy task, as the reader will see below.

Our path to counting early Americans by work status, location, and living arrangement starts from basic population totals themselves, and then adds early US labor force estimates (themselves constructed from labor participation rates by age-sex-slave/free cells), before dividing up that labor force by occupation and by household headship status.

Population census counts. The few local censuses from the colonial period are now collated and referenced in the colonial section of *HSUS* (2006). These offer detail by sex, race, free/slave status, and rough age distributions for seven colonies; we clone the demography of the six missing colonies from these seven.

Labor force participation rates. Next we derive labor force participants in each demographic group defined by location, sex, race, free/slave status, and age. Following

[10] Lindert and Williamson 1982, 1983; Milanovic, Lindert, and Williamson 2011. We are preceded by at least two early American writers who imitated Petty and King with their own calculations of what their region was worth – presumably to guess at its ability to pay taxes and fight wars. Colonial Governor James Glen of South Carolina made an imaginative social table for his colony in 1751 (cited in McCusker 2006), and Samuel Blodget (1806: p. 99) made another a half-century later for the United States as a whole. Both Glen and Blodget started with occupations and/or social classes in building their social tables, and in so doing they appear to have been readers of the English political arithmeticians, whose writings multiplied with the growing need to finance wars. On the rise of the quantification culture in late-18th century England, see Hoppit (1996).

convention, the labor force consists of all persons producing goods and services sold in significant part (or, for slaves, demanded in significant part) outside the household.

To convert population into labor force, we use the detailed labor participation rates for 1800 supplied by Thomas Weiss. It seems reasonable to assume there were no behavioral changes over these twenty-six years in the rates defined in the detailed cell-specific Weiss estimates, which give separate rates for cell categories such as urban Pennsylvania's free white females age 10-15, or rural South Carolina's male slaves over the age of 10, or small town Connecticut's free white males aged 16 and older. However, since these categories changed in relative importance over time, the regional and national labor participation rates could and did change between 1774 and 1800.

Recorded occupations. Constructing the social make-up of the labor force requires detailed occupation counts for different localities. We draw on newly accessible counts for years near 1774, although only for a few places, only for parts of the labor force, and only with the help of some comparison of occupational mixes over time and space.

Our new reconstruction of the social structure of America on the eve of the Revolution uses local tax assessment lists and occupational directories, as reported in Table 2-1. Such lists allow us to create the following occupational groups for the free population:

- Officials, titled, professionals
- Merchants and shopkeepers
- Skilled artisans in manufacturing
- Skilled in the building trades
- Farm operators (owner-operators, renters, sharecroppers, planters)
- Male menial laborers
- Female menial laborers

The new data modify the occupational structure of the colonies constructed previously by other scholars. For example, relative to Alice Hanson Jones (1977), our estimates shift much of the Middle Colonies' labor force from middling farmers to less wealthy craftsmen and laborers, and to males with no stated occupation.

Unrecorded occupations. Persons with occupations recorded by tax assessment lists or urban occupational directories fall short of persons in the labor force. In most cases they even fail to capture all household heads, the exceptions being three counties

of rural North Carolina between 1779 and 1782, for which the listings seemed to have captured all free household heads.[11]

Not all unlabeled members of the labor force are equal. Some lack an occupational label despite a positive amount of assessed wealth. Some lack an occupational label, and are listed as tax-exempt because they had zero or near-zero wealth. Thus, we distinguished between these no-occupation groups based on data in tax lists and local censuses.

Counting households. One could avoid measuring household headship if we were only interested in measuring aggregate national product, since it depends only on who is in the labor force and their average income. However, we need the headship rates by occupation to measure the distribution of income and thus inequality.

Households are the income recipient units used here to measure income inequality, for both practical and theoretical reasons. Previous investigators have been forced to confront the simple fact that taxable property, such as real estate, is used by all household members, even if only one is the owner and taxpayer. The prevailing practice is to measure income inequality among households, not among individual income earners. In order to compare apples with apples, we do the same. That's the practical reason. The theory comes from Simon Kuznets (1976), who warned against measuring inequality among individual earners and emphasized the superiority of the household focus. Caring about economic inequality means caring about how unequally people consume resources over their lifetimes. Even if data constraints force us to study annual inequality rather than life-cycle inequality, Kuznets pleaded for the measurement of income per household member. The numerator should capture the incomes of all economically active household members, and the denominator should capture all adult-equivalent consumers in the household.

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[11] In addition, both the census of Richmond in 1782 and the household assessment lists of Loudoun County Virginia for 1787 reveal that very few households could have been poor even though these local lists appear to have covered the entire free population. Certainly the shares of poor were lower than in the Massachusetts tax rolls of 1771, or in returns from Philadelphia or from New York State around the time of the Revolution. See the file "Appendix 4 - The richer colonial South: More evidence" at the bottom of the American incomes folder at gpih.ucdavis.edu.

Since the early population censuses usually did not count households, some assumptions must be invoked to estimate who were household heads. Fortunately, historians of early America have already grappled with this issue. Following the leads of Billy Gordon Smith (1981, 1984, 1990) and the late Lucy Simler (1990, 2007) in particular, we estimate the number of household heads from population data around 1774 invoking the following assumptions:

(1) All free white males, 21-up, were household heads, subject to (4) below;

(2) All free white widows with any indication of property ownership or of occupations were household heads;

(3) One-sixth of the free black population consisted of household heads;[12]

(4) The number of free white males, 21-up, who were *not* household heads is matched by the number of free white females, 18-up, who *were* household heads, despite not being included in (2) above. That is, we assume that two errors offset each other when using the white males 21-up as household heads.

These assumptions have generated the total numbers of households by location – that is, by region and by urban versus rural.[13]

Three difficult questions remain about those who were in the labor force, according to the censuses and the Weiss estimates of labor force participation rates, yet who were not reported as household heads: First, how many of them were there for each place defined by region and by urban/rural? Second, what kinds of occupations and earnings rates did they have? Third, whose households did they live in and share

[12] The one-sixth assumption is supported by the somewhat distant 1820 census, the earliest census to give an age distribution for free blacks. As of 1820, 24.3 percent of free blacks consisted of likely household heads, using the same assumptions as for free whites. We believe that the headship rate was probably lower in 1774, both because children were a higher population share of whites and slaves and because fewer free black adults would have been able to establish separate households then. Hence, we choose 16.7 percent, or 1/6, as the headship rate for 1774. For an elaboration, see the file "Estimated mix of occupations 1774 by region" at http://gpih.ucdavis.edu, within the folder "American incomes 1774-1870".

[13] See Excel file "Occs 1774 by region", worksheet (2), and the worksheets on our weighting in the three regional "Property 1774" files, in the supplementary materials for our article (Lindert and Williamson 2013) on the *Journal of Economic History* internet site.

resources with? Guided by the censuses, we estimated the sizes of several groups in the labor force who were not household heads, whether free or slave.

So far, these calculations affect our estimations of both aggregate national income and income inequality. For inequality purposes, and following Kuznets, we must further decide in whose households these non-household-head members of the labor force lived. The data are almost non-existent on this issue. We make the following assumptions about the non-head earners "imported" into the households of others:

> (1) For each region and urban/rural place (e.g. New England big cities or rural South), the non-heads and their individual earnings are absorbed into the same region and place.
> (2) For the free population, within each group defined by region and urban/rural, we assume that the average earning power of each non-household-head imported into free families is the same for all free persons of that occupation in that place.
> (3) Slave non-heads are taken into slave households only, leaving household income the same as the retained earnings of all slaves.
> (4) This same assumption holds for the separately recorded group of Maryland servants, though the assumption is redundant here because these are one-person households.

Labor earnings by occupation. Annual incomes can be assigned to the most ubiquitous occupations in each location, thanks to the enormous archival gleanings from Jack Main and several other scholars.[14] Their time-consuming collection of newspaper quotes and account book entries must be used with care. Some are in the depreciated local colonial currency, whereas others are in (British) pounds sterling. Fortunately, most sources, and Main in particular, were careful to say which was which.

Work days per year. Some of the documented earnings are annual, as for white collar professionals and farmers, and for these we do not need to make any adjustment for the length of the work year. Yet others are monthly, weekly, or daily rates of pay, requiring assumptions about how many days, weeks, or months they spent in gainful employment each year. We offer both "full-time" and "part-time" assumptions. The full-time assumption is, we think, more realistic for the colonial setting, in which people,

[14] See the Excel file "Wage data c1774" at gpih.ucdavis.edu. The main sources are: Jackson T. Main, (1965); Stanley Lebergott (1964); Carroll Wright (1885); Donald Adams (1968, 1970, 1982, 1986, 1992); T. M. Adams (1944); BLS (1929); and Winnifred Rothenberg (1988).

especially women, toiled at productive labor for six days a week or 313 days a year, mostly at home. We believe that for the days when a person did not hold his or her main stated job, he or she nonetheless filled in with other productive work, like weaving and farming at home, and some of this output was traded on the market.

Still, our displayed results must be based more on a "part-time" set of assumptions. One reason is that the work year for hired labor had shrunk somewhat by the middle of the nineteenth century, to which we turn later. Another reason is that most other scholars have preferred more conventional measures of market work, so that we should similarly focus only on out-of-home part-time earnings to facilitate our results with theirs. Thus, we also calculate 1774 part-time estimates that use fewer labor days per year for hired labor. The alternative days worked per year assumptions that seem most plausible to us are: 313 days for those households with the head employed in the professions, commerce, and skilled manufacturing artisanal jobs, and for slave households; 280 days for households with the head employed in construction trades, rural unskilled workers, and (to understate total annual days a bit) farm-operator households; and 222 days for households headed by free urban unskilled laborers and zero-wealth household heads of unknown occupation. Our part-time variant seems to yield average work years matching those for England in the late eighteenth century.[15] For 1774, our part-time assumptions yield the following ratios of part-time to full-time total incomes (labor plus property):

	New England	Middle Colonies	South	Thirteen Colonies
Free households	0.918	0.957	0.948	0.943
All households	0.919	0.958	0.954	0.948

These ratios will imply that the difference between "full-time" and "part-time" estimates will not explain much of the gap between our income estimates and those of others for 1774, as we will see shortly.

[15] See our file "Work days per year, 1774-1860" at http://gpih.ucdavis.edu. For estimates of the length of the English work year, see http://www.lse.ac.uk/economicHistory/pdf/Broadberry/BritishGDPLongRun16a.pdf. By contrast Paolo Malanima's (2010) estimates for central and northern Italy give only 200 days per year as of 1750-1800.

We enlarged the concept of labor earnings to include farm operators' profits, estimated by Main (1965), plus slaves' and indentured servants' retained share of what they earned. As noted previously, we have called this labor income amalgam "own-labor incomes".[16]

Property income.[17] Our property income estimates benefit from Alice Hanson Jones's exhaustive and masterly study of America's wealth in 1774, based on her probate inventory samples and supporting documents.[18] An important advantage of her data is that they identify the occupation or social status of most of those probated in her colonial sample. We have examined her data and procedures in great detail, and find no flaws.[19] Jones realized that a probate-based sample ran the risk of overstating average wealth, and understating wealth inequality, because probate was more likely for the deceased rich than poor. She went to enormous lengths to adjust for this, ending with what she called *w*B* estimates that were meant to capture more of the poor. We have moved in the same direction, using a different procedure. Our greater weighting of the poorer households was achieved by introducing the new data on occupational structure described earlier. As it turns out, our estimates imply an even greater probate-wealth markdown than did her *w*B* estimates.

Wealth is not property income or total income. Jones confined her income-measurement efforts to brief conjectures about wealth-income ratios, using 20th century aggregate capital-output ratios borrowed from the macroeconomics literature of the 1970s . We have followed a different route, in order to exploit the wage and income data just described. Our reading of the limited evidence on colonial rates of return suggests

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[16] See the Excel file "Own-labor incomes 1774" at gpih.ucdavis.edu.

[17] Appendix 3 in the Supplemental Materials to Lindert and Williamson (2013) describes in detail our estimation of property incomes from Alice Hanson Jones's wealth estimates for 1774.

[18] See Jones (1977, 1980) and her ISPCR data file 7329 at the Inter-University Consortium for Political and Social Research at the University of Michigan.

[19] In a set of side experiments, we tried to replicate Jones's A*-weighted estimates using her own data and her own procedures. In no case did we achieve exact replication, and for one regional wealth total, we were off by 4 percent. We could not find the source of this discrepancy, but suspect that she had to take some shortcuts in the pre-spreadsheet era that we have not understood. Despite the discrepancy, we feel confident of both her estimates and ours. See the Excel files "Property 1774" for each region.

that, on average, assets probably earned a net rate of return of 6 percent per annum. True, there are only meager data documenting colonial interest rates around 1774 (Homer and Sylla 1991: pp. 276-79). Around 1800, federal government bonds had a market yield of 6.94 percent per annum, while New England municipals yielded 6.13 percent (Homer and Sylla 1991: p. 286). But for earlier years, Winifred Rothenberg notes that 6 percent was the "lawful interest" stipulated by colonial law, even though "beginning in 1785, interest rates began to climb to 7, 8, and 9 percent" (Rothenberg 1985: p. 790). Later we will quantify the sensitivity of our income estimates to this 6 percent rate of return assumption.

The gross rate of return, which is more appropriate to the calculation of gross national product for comparison with other studies, equals this net 6 percent plus rates of depreciation that differed by asset. Following NIPA accounting standards, we have assumed zero depreciation on financial assets and real estate (positive depreciation offset by rapid capital gains), 5 percent depreciation for servants and slaves, 10 percent for livestock and business equipment, and zero for net changes in producers' perishables and crops.

Combining own-labor income and property incomes, using occupations. Here we gain from having invested so much effort in gathering occupation data. Since historical sources often arrange own-labor incomes and property incomes by occupation, we can combine the two to get their total incomes. Occupational categories provide the income link that has been missing in past studies, which have had to confine themselves to following trends in wealth alone or in wage rates alone.

At first glance, using the occupational link might seem to leave us with too much aggregation for any close look at inequalities, since a large minority Americans ended up in a single occupational category – farmers. Yet we can take advantage of the fact that the farm and plantation sector happens to be so property-oriented. Farm households' incomes differed largely because of variation in their property, for which our source materials yield more individual-level detail than they do for wage rates. For farmers, we can thus dissect the property income ranks, dividing them into the top 2 percent of farmers, the next 18 percent of farmers, a middling 40 percent, and a bottom 40 percent.

This disaggregation will sharpen our focus on the degree of income inequality within each region.[20]

Households were practically the whole economy. Our calculations offer what NIPA accountants call total private income of the household sector. However, the colonial government sector's contribution consisted only of the wages and salaries of government employees and military personnel, which are already included in our occupations and own-labor earnings. There were no government corporations in 1774. Nor do we need to worry about the retained earnings of private corporations, since they amounted to little at the end of the century. The same assumptions will be made for 1800 in Part IV. When Part V compares 1774-1800 with similar accounts for 1850-1870, the non-household sector will begin to take a significant share of national income for the later dates.

Results: 1774 Income Levels

Our estimates of labor and property incomes shed new light on average incomes in 1774. The levels and composition of total personal income are shown in Tables 2-2 and 2-3, for the three regions used by Alice Hanson Jones and for a geographically fixed "nation", defined as the 13 colonies in 1774 (and the easternmost 15 states plus the District of Columbia in Part IV for 1800). Table 2-2 can be used to calculate any of several important ratios, using the denominators in the lower half of the table and the price deflators in the notes to the table.[21]

Our estimates suggest that the 13 colonies were richer and more productive in 1774 than any previous estimate has implied. The left half of Table 2-3 underlines the contrast, focusing on the more recent and more prominent set of competing estimates. Our thirteen-colony current-price (part-time) estimate of 164.1 million dollars is 20 percent greater than the average of the Jones and McCusker estimates (136.9 million). Yet our colonial income

[20] To see how we have combined different kinds of incomes, of both household heads and of their dependents, and for the derivation of the final inequality estimates for 1774, see the Excel file "American incomes 1774" at gpih.ucdavis.edu.

[21] This section draws on additional evidence reported in Appendix 4 of the supplementary materials to Lindert and Williamson (2013a), downloadable from the *Journal of Economic History*'s internet site or from gpih.ucdavis.edu.

estimates differ greatly from those of Jones for only one region, the South, for which our income estimate ($98.8 million) is almost twice that of Jones ($59.2 million). There are two gaps between Jones and ourselves to confront here: The gap in estimates for the 13 colonies as a whole, and the gap for the South alone. While there will always be errors in any measure of early incomes, including our own, we offer reasons for believing that the 13-colony gap and the southern colonial surprise are not due to errors we have introduced.

For the 13 colonies as a whole, the large 20 percent gap is not driven by any higher estimate of wealth per household, since we rely on Jones' own work. Supplementing her data with our new occupation weights, we get a slightly *lower* property per wealth holder than she did. Furthermore, because we find many fewer households with wealth than her estimated number of "potential wealth holders", our aggregate wealth estimate is only about 70 percent of her implied total wealth.[22]

Our conversion of wealth into property income, as described earlier, involved multiplying different asset holdings by net and gross rates of return. A reader feeling that our income estimates seem too large might want to challenge both our net and our gross rates of return as being somewhat high. It seems very unlikely that our 6 percent figure understates the net rate of return, the opportunity cost of not having lent at interest. The colonies and the early republic had a legal usury limit of 6 percent that was vigorously supported by law and custom (Homer and Sylla 1991: p. 271 and *passim*). That is, the usury constraint seems to have checked a strong demand for capital, so that the 6 percent ceiling might very well have been below market. Could the (illegal, market) rate of interest foregone by holders of directly productive assets have been higher, say 8 percent? This is a distinct possibility for 1800, a date for which the literature suggests even greater capital scarcity than for 1774. Yet, as we have shown elsewhere, shifting to the higher rate of return would raise our total income estimates for 1774 further above those conjectured by other scholars.

The discrepancy between our income totals and those of Jones seems to have resulted from the weakness of her income conjecture, which lacks the firm grounding that she secured

[22] In this passage, "wealth" means household net worth. For property incomes, see the http://gpih.ucdavis.edu file on total property incomes for 1774.

for her pioneering wealth estimates. One might start by wondering what she assumed about rates of pay for labor, including the earnings retained by slaves. In fact, she did not make any assumption at all, but took a single leap of faith that we have already noted: By picking up some capital/output ratios quoted in the aggregate growth literature from the 1970s, she jumped from her impressive and reliable wealth estimates to total income guesswork which stands or falls on her assumed aggregate wealth/income ratio (not necessarily the same as a capital/output ratio). The macro literature offered Jones capital/output ratios ranging from 2.5 to 10 for the 19th and 20th centuries. Within this wide range, she said, "I hazard that ratios of three or three and a half to one may be reasonable" (Jones 1980: p. 62). Yet we find that the 1774 ratio of net worth (wealth) to national income was only 1.89.[23]

The strikingly wide gap between southern and northern incomes in 1774 has a simpler explanation. In 1774, unlike 1860 and later, the South had a very different mix of free men's occupations, with a much higher propertied share and fewer poor. On the eve of the Revolution, the South was still a staple-exporting frontier with rich productivity in producing tobacco, rice, and indigo. We find these sharp contrasts between the regional occupation mixes among free household heads in 1774:

	New England	Middle colonies	Southern colonies
Farm operators	43.9	25.8	72.7
Professions, commerce, crafts	11.0	32.5	14.3
No occupation given, some wealth	16.7	28.7	11.0
Menial laborers + those with zero wealth	28.4	13.0	1.9

Southern farm operators not only had higher average incomes than other farmers, but they constituted a larger share of households, while low-paying occupations took a lower share among free southerners. The advantage of the colonial South should not seem surprising, even without any gap in wage rates for given occupations. What drove

[23] Robert Gallman and Thomas Weiss have preferred her top wealth-income ratio, 3.5 to one, and that is used in Table 2-2's display of her estimates. Decomposing our aggregate 13-colony wealth-income ratio of 1.89 into regional wealth/income ratios for 1774, we estimated the ratio at 0.96 for New England, 1.80 for the Middle Colonies, and 2.25 for the South.

the income gap between regions was not pay differentials mysteriously unexploited by potential migrants, but rather a mix of southern occupations featuring those for which entry required prior accumulation of poltical connections and wealth in a world of imperfect capital markets. We support this point with an exercise in accounting for income differences between regions. Of the 107 percent gap between average free household income in the South ($705) and the Middle Colonies ($340), most would be accounted for by giving the South the occupational mix of the Middle Colonies, and only a small share would be due to differences in average rates of pay for given occupations.

Other evidence supports our finding of a richer colonial South than previously thought. Alice Hanson Jones's wealth estimates had already shown that wealth per wealth holder was 56 percent higher in the South than the average for other colonies. That again stemmed largely from her estimates of the occupational mix, even before our revisions magnified the contrast. Both her occupational mix and ours show a remarkable lack of poor southern whites, defined as those in menial trades or those having zero tax-assessable wealth. While our occupational calculations for the South have used only Jones's estimates plus the finding that there may have been no household heads with zero wealth in three North Carolina counties, two archival data sets from Virginia in the 1780s also suggest that there were few demonstrably poor white household heads in the South. Tax returns from 1787 for rural Loudoun County at the north end of Virginia appear to have covered all white households, yet with very little evidence of a large poor white class with zero net assets. Similarly, while a special census of the rural town of Richmond, Virginia in 1782 did reveal some white household heads with menial occupations or the possibility of zero wealth, their share of white household heads was no higher than in the rural towns of Chester County Pennsylvania, and lower than the share in rural Massachusetts. More important than these comparisons within regional countrysides, or between their respective small towns, was the inter-regional difference in rural and urban shares. The South was overwhelmingly rural, where the poverty share among the free population was lowest. While the percentage of true white paupers was not zero in the South, it was not as high as in the North.[24]

[24] See Appendix 4 of the supplementary materials to Lindert and Williamson (2013) for evidence from Virginia in the 1780s, and for commentary on the inequality literature for the Chesapeake.

A Relatively Egalitarian Colonial America in 1774

Until the appearance of Main's *The Social Structure of Revolutionary America* (1965), inequality and social structure was a marginal topic in the early American literature. Things changed dramatically afterwards, as it did in the economics literature after the appearance of Simon Kuznets's presidential address to the *American Economic Association* (1955) on what came to be called the Kuznets Curve hypothesis. Since then, there has been an outpouring of empirical work on American colonial wealth inequality, income inequality, and wage inequality[25] led by Alice Hanson Jones's (1977, 1980) impressive work with probated wealth. As we have seen, however, getting from wealth to income distributions using the Jones data is a challenge. The rest of the colonial inequality literature relies on local observations and we are never sure just how representative these cities, towns, and counties are. We think the problem is solved with our 1774 estimates.

Incomes were more equally distributed in colonial America than in other times and places, as reported in Table 2-4. Compare colonial American inequality with that of the United States today, where almost 20 percent of total income accrues to the top 1 percent, and where the Gini coefficient is about 0.50.[26] That colonial America was a more egalitarian place is even more apparent when we compare modern America with colonial New England (Gini 0.35), the Middle Atlantic (Gini 0.38), and, surprisingly, the free South (Gini 0.33). It might seem impossible that the free populations in each region could have a Gini less than that for the total (e.g. 0.33, 0.35, and 0.38, all less than 0.40), but recall that there was also great regional inequality between all three. In short, within any American colonial region, free citizens had much more equal incomes than do today's Americans.

Free American colonists also had much more equal incomes than did West Europeans at that time. The average Gini for the four northwest European observations reported in Table 2-6 is 0.57, or 0.14 higher than the American colonies, and 0.22 higher than New England.

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[25] See the summaries in Williamson and Lindert (1980: Chap. 2) and Henretta (1991: pp. 148-153).

[26] Atkinson *et al.* (2011: Table 5, p. 31).

Indeed, there was no documented place on the planet that had a more egalitarian distribution in the late 18th century (Milanovic *et al.* 2011).

If people had more equal incomes in America than elsewhere, which kinds of colonists were better off than their counterparts in Europe? Figure 2-1 offers an Anglo-American comparison. On the horizontal axis each society is ranked from its poorest to its richest, and on the vertical axis their average group incomes are displayed in logarithms. It appears that an American colonist of any rank had a higher income than his or her English counterpart of the same rank until we reach the top percentile. Indeed, it turns out that even American slaves were above the bottom of the Anglo-American income ladder, although such comparisons fail to account for loss of freedom, (presumably) longer hours worked, and harsher working conditions. As one can gather from Figure 2-1, colonial households as a whole had higher incomes than households in England and Wales. If one simply converted from dollars directly into sterling at the exchange rate of $4.44/£, colonial households averaged £78 each, versus about £50 per family in England and Wales, converting either the revised version of Massie's 1759 social table or that of Colquhoun's 1801-1803. At a first rough comparison, the American colonists had much higher incomes in 1774 –- 56 percent higher, as one might have predicted given that so many English continued to risk the migration across the Atlantic.[27] American slaves even had higher household income than the bottom 20 percent of households in America, mainly the free unskilled poor in northern cities and towns, and higher than the unskilled in England. As we shall see in Part IV, however, the colonists temporarily lost their income lead by 1790. America's wartime economic disaster, combined with the slow growth of British GDP per capita in the last quarter of the 18th century, suggests as much.

As is widely recognized, simple exchange rate conversion does not adequately account for cost of living differences between classes and places. This familiar point has a number of important applications in the colonial American context, and they deserve emphasis and further investigation. One is that the cost of a standard consumption bundle was lower in the colonies than it was in England. So say some recent calculations for this era (Allen *et al.* 2012;

[27] In Part III below, this 56 percent advantage will become 63 percent, using a different calculation based on the Broadberry *et al.* (2011) time series for Great Britain (not England and Wales) and the Robert Allen cost of living index.

and see Part III).[28] Of course, an upper-class cost of living bundle, including the cost of music, theater, and servants, must have been lower in London than in the northern American colonies. These "real inequality" dimensions will be noted again in Part III's viewing of the whole colonial eighteenth century.[29]

Summing Up for 1774

The only way to push back the quantitative frontiers of inequality and living standard history is to adapt to the data environments of the deep past. In the archeological extreme, that means accepting skeletal remains and DNA as our main forms of evidence. Even a journey back to the late 18th century has had to accept an eclectic array of incomplete evidence. One of the most underexploited frontiers for the early modern era is occupation counting, an approach which has allowed us to estimate aggregate incomes and their distribution among social classes. Working on that frontier, we have emerged with a rich harvest dealing with early American incomes and inequality. It appears that the colonists had higher incomes in 1774 than previously thought, more than half again higher than England. In addition, we have found that free American colonists had more equal incomes than did households in England and Wales, or any other measureable part of the world. The colonists also had greater purchasing power than their English counterparts over all of the income ranks except at the top one percent, although Part IV will show that their income advantage was lost in the fight for Independence.

Regional inequality was also an important feature of the American colonies. Our estimates suggest that per capita incomes were far higher in the South than in the North in 1774, and that poor whites were much less common there than in other colonies. It appears that the colonial South lacked the large numbers of poor whites that could be counted in Boston, Philadelphia, New York and lesser coastal towns. In short, our results suggest that mass poverty did not spread among the southern white population until the 19th century. It

[28] Such adjustments should also deal with the relative cost and quality of housing (Shammas 2007).
[29] On the more general issue of class- and place-specific costs of living, see Williamson (1977) and Hoffman *et al.* (2002).

seems to us that the colonial income distribution in the South needs further research of the sort already done for the Chesapeake.[30]

III. How Colonial America Got Rich and Relatively Equal

By 1774, then, the average American colonial household thus had a high income, and the colonies seem to have had more equal incomes than the advanced countries of Western Europe. The South was the richest of the colonies, and even their slaves had higher living standards than did the poorest in England. The average American colonist ate better, was much taller, and lived longer than did the average Englishman. But it didn't start that way, since the first early 17th century generation of settlers had extremely high mortality, diets were poor, and their settlements were dependent on the net import of foodstuffs. So, how and when did colonial America get rich?

Beyond "optimism" and "pessimism"

A first step toward introducing the scholarly debate over the history of colonial prosperity is to purge from that discussion some unhelpful terminology that has crept into economic historians' debates over growth in the past.

British and American debates about growth and inequality in the 18th and 19th century have developed a rhetoric that ought to be purged since it uses terms that actually might mean to some the opposite of what they seem to suggest. The terminology emerged during the famous Hobsbawm and Hartwell debate in the 1960s on English workers' living standards during the Industrial Revolution. An "optimist" (Hartwell) was somebody who thought that workers' living standards grew, and a "pessimist" (Hobsbawm) was somebody who denied that they did so. The present authors (Lindert and Williamson 1983) accepted this conventional terminology, an acceptance that we now regret. The same terminology has crept into the debates over

[30] See, for example, Stiverson (1977), Kulikoff (1986), Carr *et al.* (1991), and Walsh (2010), as well as Gallman's (1982) study of Perquimans County, North Carolina.

colonial American growth: Yes, says the optimist, there was "fast" growth in income per capita across colonial times; no, says the pessimist, growth was slow and could well have been nonexistent.

In our view, the optimists are actually delivering pessimistic messages about well-being in the past, and the pessimists are positively cheery about past living conditions. The reason is straightforward: Our strongest evidence about income per capita or living standards in the distant past is where its level ended up, not where it started. Invariably, the evidence documenting earlier levels is shakier than is the evidence documenting more recent levels. But the faster the growth one posits, the lower the starting level. Perhaps without realizing it, the income growth optimist is somebody who believes that people were mired in deep misery at the start of the period (industrial revolution, or colonization, or getting independence, or whatever). Perhaps without realizing it, the income growth pessimist is somebody who feels that they started off with, and kept, a high living standard.

Clearly, the optimist versus pessimist terminology refers to growth rates, when it should be about levels. Thus, we drop the optimist versus pessimist language in what follows. We therefore set aside the literature's implicit view that stagnation in colonial productivity reflected a failure to innovate, or that rapid growth showed American vigor.

The debates over colonial growth

There is still no scholarly consensus over the rate of growth across the colonial era, as Table 3-1 warns with its survey of 18th century colonial income per capita growth rate estimates. Earlier authors tended to posit high growth rates, averaging 0.47 per cent per annum, which would imply a doubling of average incomes from the mid-17th century to 1774. In contrast, the newer slow-growth estimates posit rates averaging 0.05 per cent a year, or roughly zero, based on "controlled conjectures" prepared by Mancall and Weiss (1999) on all colonies, Mancall, Rosenbloom, and Weiss (2003) on the Lower South, and Rosenbloom and Weiss (2013) on the Middle Colonies. We offer two empirical contributions, both suggesting no growth in average incomes between 1650 and 1774. First, the next section examines the movements in prices and

demography that should have affected colonial growth. We will then turn to our new direct evidence on the movement of labor and property incomes before 1774.

Leading Actors: Likely influences on a peripheral economy's livelihood

Several kinds of forces should have buffeted fortunes in the new American economy. Some arose from world trade movements, and others from colonial demographic movements.

Overseas trade patterns. The North American colonies joined the world economy as a tiny periphery whose incomes above subsistence depended on the prices they could get for their primary product exports. While exports varied in their importance to each local economy, all four colonial zones on the North American mainland shared much the same patterns of price volatility and price trends.

Surveying the four colonial economic zones from north to south, we find that even though their exports varied in their importance to their local economies, all four zones shared much the same patterns of price volatility and price trends.

New England was the most diverse of the four regions even after it started to harvest fish off the Grand Banks and discovered its consumers in the Catholic Mediterranean. By 1770 fish accounted for only 34.7 percent of the region's exports, and the rest was a mixture of rum (4.3 percent), wood products (14.4 percent), whale products (14.1 percent), livestock (20.5 percent), and many other commodities (12.0 percent). These New England commodities were exported everywhere in the Atlantic economy, not just to Britain. The salted fish went to Mediterranean ports, livestock to the West Indies, whaling products to England where it was also re-exported to the Continent, and wood products (mainly staves and cask heads for barrels) to everywhere. Beyond such commodities, New England stood out in its high earnings on exporting "invisibles" (services), such as shipping services. Overall, its export earnings amounted to 11.1 percent of regional product, of which nearly half consisted of invisibles.[31]

[31] The colonial patterns of foreign transactions are captured for the period 1768-1772 in the seminal work by Shepherd and Walton (1972). The regional income denominators in this and the following paragraphs are our own for 1774, available at gpih.ucdavis.edu.

Another way to summarize New England's position in inter-regional trade is to note that its comparative advantage was close to that of England itself, implying that new England might have served as a trade competitor against the Mother Country, even before the nineteenth-century rise of its manufactures. Indeed, Sir Josiah Child was already lamenting New England's role in the Empire in the late seventeenth century:

> "New-England is the most prejudicial Plantation of the Kingdom of England …. All our American Plantations, except that of New England, produce commodities of different Natures from those of this Kingdom …. Whereas New-England produces generally the same we have here, viz. Corn and Cattle".[32]

The Middle Colonies, by the eve of the Revolution, had also emerged as significant exporters of flour, pork, wheat, and other classic farm products of the temperate zone. Yet exports of goods and services accounted for only 9.4 percent of the Middle Colonies' overall income, and the commodity (goods) export share was even smaller.

The Upper South -- Virginia, Maryland, and Delaware, with Norfolk as the region's only large port before Baltimore began to emerge after 1750 -- exported mainly tobacco, making up for 60 percent of foreign exchange earnings, with grains adding another 26.3 percent. Thus, the region's export revenues were dominated by just two products (86.3 percent).[33] As late as 1768-1772 these staples directly generated 13.0 percent of the region's total income, a somewhat higher share than in other regions, and the dependence on foreign trade was presumably even greater in the tobacco boom of the late seventeenth century.

The Lower South -- the Carolinas and Georgia, Charlestown and later Savannah the main ports -- exported rice and naval stores throughout the eighteenth century, and added indigo to the list in the late 1740s. These three staples took up a large share of the Lower South total export revenues: in 1768-1772, 55.4 percent of the region's foreign

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[32] Sir Josiah Child, *A New Discourse of Trade* (London: 1698), pp. 166, 204-206; as cited in Galenson (1996, p. 201). Beyond corn and cattle, Child should have mentioned the fisheries of both countries. Yet his point seems correct enough.
[33] McCusker and Menard 1985: Table 6.2, p. 132.

exchange earnings were from rice, 20.3 percent from indigo, and 5.7 percent from naval stores (pitch, tar, and turpentine). Other items included deerskins (from trade with natives), wood products, grains, and livestock, but more than 75 percent consisted of the big two, rice and indigo.[34] While the Lower South's exports were thus concentrated into two or three products, they did not constitute a particularly large share of regional product -- only 9.0 percent. The Lower South was thus based more on domestic production than were other regions. For all the attention given to its exports, it was not as trade-dependent as the other colonies.

Thus there seem to have been two economies present in all four regions: a small, coastal-based, export-staple, high-income economy, and a large, low-income frontier economy only poorly integrated with the rich coast.

Colonial price volatility 1700-1776. It was just as well that the colonies depended so little on overseas trade. The world economy around them generated wide swings in prices for traded goods. On this the traditional qualitative narratives are borne out by new quantitative evidence.

The qualitative histories of colonial America have been sprinkled with commentary on economic ups and downs, booms and slumps, good times and bad. Some of this economic volatility was driven by political events like Indian Wars on the borders, embargoes, European conflicts on the seas, and Parliamentary decree.[35] In agriculture, indigo, grain, and tobacco crops were certainly influenced by variance in climate and pests. In the colonial staple economy, however, economic volatility was driven mainly by the influence of overseas conditions on export prices, since the American colonies were only marginal world suppliers of fish, wheat and even rice.

The latest scholarly numbers agree with these narrative accounts, as shown in Table 3-2. Indeed, all four colonial regions recorded higher volatility in their export

[34] McCusker and Menard 1985: Table 8.2, p. 174.

[35] This can certainly be documented on the high seas. Maritime insurance was quoted by Philadelphia insurance firms as a percent of the value of cargo carried. On the Philadelphia and London route, and without convoy, over the thirty years before the Revolution, the rate in percent fell from a high of 15 (1745-1746) to a low of 2.5 (1749-1755), rose to a high of 22.5 (1757), fell to a low of 6.7 (1759), rose again to a high of 15 (1762), and finally fell to a low of 2 or 3 (1767-1771). See Egnal (1998: Appendix D, pp. 184-185).

prices than do either developing countries or developed countries since the nineteenth century. These price storms might, like hurricanes, have brought more damage to the American and Caribbean economies than to today's peripheral economies on other continents. So we should have feared, given that the colonies exported mainly primary products. Commodity or staple prices have always been more volatile than manufactures or services prices,[36] and Table 3-2 shows that the colonial experience fits the rule. On average, such primary-staple prices were more than three times as volatile as manufactured goods prices (P_M), the highest ratio by far being rice (6.53) and the lowest being cod fish (0.70). In short, with very few exceptions staple prices were much more volatile than manufactured goods prices in eighteenth century colonial America, and especially so for the Lower South.

As we have noted, these classic peripheral-economy vulnerabilities wreaked less havoc on the mainland colonies simply because foreign trade was only about a tenth of their incomes; their economic activity had already moved so far inland by the start of the eighteenth century.

Lucky trends in the terms of trade. Price volatility may have suppressed colonial growth, but were the prices of each region's staples booming in the long run, thus, on that account at least, fostering growth in the coastal staple districts?[37] What would we expect to find? First, a quickening of GDP growth in Western Europe would have put upward pressure on commodity prices, just as China and India do today. Second, declining transport costs in the Atlantic economy (North 1958; Harley 1988) would have fostered price convergence. As we shall see below, high imported food prices fell in England, while low exported food prices rose in the American colonies (Allen *et al.* 2012). Thus, export prices (P_X) should have risen in the American colonies over the long run.

Table 3-9 documents the impact of P_X on each region's net barter terms of trade (P_X/P_M), and it shows that fact confirms theory. Despite their export-price volatility, all

[36] Jacks *et al.* 2011; Williamson 2011: Chapter 10.
[37] Marc Egnal has said as much -- "there was a strong correlation between … prices of the chief staples and the well-being of the colonists" (Egnal 1998: p. 12) -- but refers to evidence from the settled, coastal regions to prove the point.

four colonial regions underwent a rise in their terms of trade, but the improvement was only significant for the Upper and Lower South (0.66 and 0.75 percent per annum, respectively). While these terms of trade trends were not as big as those observed for 19th century commodity exporters,[38] they were certainly big enough to have left their mark on growth. Since the literature suggests that per capita income grew at something like 0.47 percent per annum in the rich, coastal, staples districts, and observing an even faster growth in the South's terms of trade (averaging 0.71), it appears that most of the per capita income growth in the staple districts of the Upper and Lower South were driven by the secular terms of trade improvement. Since the terms of trade improved slowly if at all in the Middle Colonies and New England, whatever increases in income per capita those northern colonies achieved must have due to labor productivity growth alone. This suggests one reason why the southern colonies had so much higher per capita incomes by 1774.

Rapid population growth and the dependency ratio. The colonies had some of world history's highest population growth rates, not only in the initial settlement phases, but all the way up to the Revolution. Figure 3-1 sketches the rates of colonial population growth by region.[39] Between 1700 and 1780, population grew at 2.9 for New England and also for the Middle Colonies, and at 2.4 for the South. Furthermore, these rates were well above those in the rest of the world.

Should this rapid population growth have raised or lowered the colonial levels of income per person? Economists have long ago realized that the rate of population growth itself has no clear implication for either the level or the rate of economic growth. Rather, its net impact depends on whether the high population growth raised or lowered the share of the population that was of working age, say 15-64. High population growth fed by a rapid net immigration would tend to raise income per capita, because immigrants tend to consist heavily of young adults ready to work. On the other hand, rapid population growth fed by a rapid rate of natural increase (births minus deaths as a

[38] These net barter terms of trade trends for eighteenth century colonial America were much lower than those for commodity exporters in the nineteenth century, where they averaged 1.4 percent per annum (Williamson 2011: Table 3.1, p. 36), twice that of the eighteenth century colonial Lower and Upper South.

[39] Figure 3-1 is reproduced from McCusker and Menard (1985, p. 218).

share of population) would cut the labor force share, i.e. raise the dependency ratio. It would do so by raising either the share of children (if fertility were high) or the share of retired elderly (if adult life expectancy were high).

Both of these sources of population growth, the rate of natural increase and the rate of net immigration, with their opposing implications for the level of income per capita, were at play in the colonial era. The American colonists had extraordinary rates of natural increase, fed by early marriage and high fertility, and by low mortality outside of the South. As early as 1751 Benjamin Franklin attributed all of these features to the abundance of land, and half a century later Robert Malthus agreed.[40] Subsequent quantitative estimates also find that except for the coastal Upper and Lower South, Americans also had lower crude death rates and longer life expectancies than did the Europeans (Gemery 2000: pp. 158-169). Yet the colonies also had historically high rates of immigration, which would have lowered dependency ratios.

How did the net balance of these forces show up in the age distribution and the dependency ratio? Our clearest view is of the final colonial result in 1774. Certainly by then the thirteen colonies had reached very high dependency rates, again implying that income per earner or per household must have been even higher relative to Europe than a comparison of incomes per capita would reveal. The 1774 age structure was extraordinary: in New England, 46 percent of the population consisted of children below age 16; in the Lower South, the figure was 52 percent; and the average across all thirteen mainland colonies was 50 percent. These dependency burdens are very high by any standard. For comparison, England in 1771 had only about 35 percent below age 16 as of 1771. Similarly, in the 1980s the child dependency share was 41 percent per cent in the average Third World country and only 33 percent for mature, industrial countries.[41]

The age distribution and the dependency rates before 1774 are almost completely undocumented. We can, however, use Henry Gemery's informed weighing of the meager colonial evidence to sketch the colonial patterns of natural increase versus

[40] See Franklin 1751/1959: pp. 227-228 and Malthus 1798/1920, pp. 105-106.
[41] Wrigley and Schofield (1981, pp. 528-529); Bloom and Freeman (1986: Table 4, p. 390).

net migration over time and space.[42] Turning first to the rate of natural increase, apparently death rates were higher in the disease environment of the South, though fertility rates may have been similar to those in the North. It also appears that the chances of survival improved greatly in the South, and had risen nearly to northern levels by the mid-18th century. Since much of this took the form of falling child mortality, the dependency rate must have risen in the South over time.

On immigration rates, there is also a very rough consensus. For the thirteen colonies as a whole, the percentage rate of net (international) immigration had slowed down to very low rates from 1690 on (Gemery 2000, pp. 178-179), as one might expect from a settlement process. As for the geography of net immigration for each region, our best guesses (i.e. those of Gemery 2000) are especially tentative, since it is hard to measure both oceanic migration and intra-colonial migration. Fortunately, Georgia Villaflor and Kenneth Sokoloff (1982) have used muster roll evidence on the places of birth and current residence of those who fought in the French and Indian (Seven Years') War and the Revolutionary War. Within the North, Bostonians left for all other northern places, and New Englanders in general migrated to the Middle Colonies. Yet from Pennsylvania south, the prevailing direction of migration was southward. Thus New England was the main region experiencing emigration to other colonies, and the main recipients of net immigration were New York and the Carolinas.

Our summary guesses about vital rates and the dependency ratios are limited, yet sufficient to shape our expectations about incomes per capita. By 1774 the American mainland colonies had reached exceptionally high dependency rates, implying that their transatlantic incomes per earner or per household must have looked even better than their relative incomes per capita. That would have been especially true for New England, with its high natural increase and net emigration of young adults. The

[42] Gemery (2000). For a complementary survey of colonial population history, see Galenson (1996). One candle in the age-distribution darkness before the 1770s consists of New York census data on the white population. The share under age 16 was 52.7 percent in 1703, 48.2 percent in 1723, 49.1 percent in 1746, 47.9 percent in 1749, 47.6 percent in 1756, and 46.1 in 1771 (Gemery 2000, p. 455). That is, the child share was consistently high back to 1723, and even a bit higher in 1703.

dependency ratios of New York and the Carolinas were probably less elevated by global standards.

The geographic battle between ruralizing and urbanizing migrations. The final visible leading actor influencing the movement of incomes per capita across the colonial era was the urban share. As a general rule, cities have higher average incomes and more income inequality than the countryside. Development economists and historians have noted the implication that, as a purely accounting matter, any forces that shift population toward the cities would imply higher average incomes and higher income inequality. In this respect, colonial America was an exception. As shown in Figure 3-2, the colonies were actually ruralizing after 1680. True, the cities were gaining in absolute population, but their share of total colonial population was declining. Urbanization did not set in until after the Revolution. Apparently the rise of opportunities in the countryside and on the frontier outran the rise of opportunities in Boston, Newport, New York City, Philadelphia, and Charleston. Other things equal, the ruralization of the colonial economy between 1680 and 1790 would lead us to expect only modest growth of income per capita, as conjectured by the slow-growth camp in the colonial debate.

Most of the forces surveyed in this section should have restrained any growth in colonial incomes per capita. The volatility of the terms of trade should have weighed against the favorable trend in the terms of trade, a trend that was strong only for the Southern colonies. Both of these influences should have been dampened by the colonies' low share of trade in domestic product. To this absence of positive growth forces we have added the high and rising dependency ratio, which should have held down the rate of growth in income per capita.

Backcasting incomes across the colonial era

Aided by what we know about other scholars' guesses, and about the likely roles of trade and demography as leading actors in the colonial economy, we now turn to our own controlled conjectures about the broad sweep of colonial income growth.

The method and assumptions. Starting from the 1774 benchmarks, how does one project, or "backcast", to earlier and less documented times? As with all such extrapolations into the past we have information on just a few factors driving income

per capita growth. The method we use is similar to the controlled conjectures technique pioneered by Paul David (1967) for estimating growth from 1840 and 1860 back to 1800, and extended to the colonial era by Thomas Weiss and his collaborators.

For the colonial era we have time series for wage rates and personal wealth, evidence that invites re-application of our technique of adding own-labour and property incomes together to get total income per person or per household. Our backcasts will represent the true income movements more faithfully, the smaller are the net errors from our making the following assumptions about missing information:

(1) For New England and for the urban Middle Colonies, we assume
    (1a) The 1774 occupational mix within each region and by urban/rural location, applied to all earlier years as well.
    (1b) Free labour incomes for all occupations moved in proportion with the wage series for craftsmen and seamen (urban), or for farm labourers (rural).
    (1c) Unemployment rates, and the resulting deviations from wage-based estimates of free labour income, were comparable at all benchmark dates.
    (1d) The net rate of return on income-producing wealth remained at 6 per cent, from c1774 back to c1650.
    (1e) Depreciation rates on different kinds of assets were fixed at the rates assumed for 1774.
(2) For the Middle Colonies as a whole, there was no change in the ratio of the Rosenbloom and Weiss (2013) estimates of real incomes per capita to the true values, 1720-1774.
(3) For the Upper South, gross farm income per farm was in the same ratio to total regional income over the whole period c1675-1774.
(4) For the Lower South, there was no change in the ratio of the Mancall, Rosenbloom, and Weiss (2003) estimates of real incomes per capita to the true values, 1720-1774.
(5) In all regions, slaves' retained earnings kept the same shares of the corresponding free labour earnings in earlier years as they did in 1774.

Armed -- or burdened -- with these assumptions, we extend nominal incomes back over time. Table 3-4 lists the indicators that we employ to track nominal income movements. While the data permit annual series in some cases, our realistic goal here is to average the limited data over quarter centuries. Where possible, we trace back to a "circa 1650" era that draws on incomplete data for 1638-1662. The next quarter century is an average of 1663-1687, and so on until we reach a "circa 1770" benchmark averaging data for 1763-1774, followed by our 1774-only benchmark described above. Regions

differ in the availability of indicators that are closely tied to income, as well as in the underlying history being traced. Let us therefore proceed region by region, from north to south.

New England. New England offers the richest opportunity to follow household property income, thanks to a data set that has just become available in July of 2013. Gloria Main has supplied us with a large probate sample developed by herself and Jackson Turner Main in the 1970s and 1980s, and the data are now downloadable.[43] The sample is both large (18,509 observations from 1631 to 1776) and broad in its coverage. Unlike most other probate samples, this one includes the value of real estate, the deceased wealth holder's age at death, occupation, as well as other variables. Using regression techniques, we have held age constant by calibrating the (regression-predicted) estate values to age 45, with historical interactions of place, time period and occupation. Table 6 documents a notable pattern: from around 1650 to 1774, only farmers in the later-settled hinterland experienced great gains in average wealth[44] and property income. These hinterland farmers apparently kept improving the land and adding livestock and other forms of capital, as if to prove Adam Smith right in his 1766 conjecture that "In the northern colonies … the lands are generaly cultivated by the proprietors, which is the most favourable method to the progress of agriculture".[45] Their average wealth had almost tripled (rose 163 per cent) in real terms by the 1770s, bringing them close to the average wealth of the upper classes in Boston.

We can assemble the total income of New England back to 1650 by combining the property incomes inferred from the Mains' sample with measures of labor earnings. On the property side, the Mains' data help us plot the aggregate trend in the average property incomes of New England households, assuming a 1774-fixed share of household lacking wealth and fixed rates of net return and of depreciation. To these

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[43] To download the sample and its variable definitions and some code values, go to http://gpih.ucdavis.edu, into the same folder on "American Incomes c1650-1870" cited elsewhere in this paper.

[44] Wealth here refers to gross assets rather than net worth. The Mains' data set gives both kinds of value, but we prefer gross wealth for purposes of national product accounting and for comparisons with other GDP estimates.

[45] Adam Smith, *Lectures on Jurisprudence* (1766/1978), p. 523.

property incomes we should then add measures of free and slave labor earnings. These measures are available, using the wage indicators listed for New England in Table 3-4 above. The wage data are thinner than the probate data, and can trace overall labor earnings only very roughly.

Once the labor and property incomes are placed side by side, we find a colonial trend in New England that will also show up in data for Philadelphia: a rise in the share of income coming from property. In New England this estimated rise was gradual, up from 9.2 per cent around 1650 to 14.6 per cent in the 1770s. In Philadelphia, it rose from 8.7 per cent to 15.7 per cent in just half a century, between the 1720s and the 1770s. Presumably, it marched upward even faster in the South, given the steep rise in slaves per white household. A rising property share is hardly a surprising outcome for a newly settled and prosperous region.

Putting together the total income picture for New England, and for the other regions of the thirteen colonies, yields the conjectural income history shown in Table 3-6 and re-expressed in Figure 3-3. New England clearly did advance in average income until around 1725, and then stagnated. This chronology of growth rates agrees with previous scholarship.[46] Even though it was the region with the most visible progress between 1675 and 1725, it remained the poorest, as we have already seen for our baseline year 1774.

New England's income numbers contain an urban-rural surprise. Table 3-6 implies that in the 1770s Boston's income per capita was overtaken by that of the New England countryside, contrary to the usual urban-pattern. The explanation for this anomalous result relates to the population denominator. Income per capita was indeed lower, even though our 1774 estimates found that Boston had slightly higher incomes per household and slightly higher wage rates than the countryside. What dragged down Boston's relative income per capita was its higher dependency rate in the 1770s. The available census data reveal that Boston came to have a lower share of adult males in the

[46] New England had high growth rates to 1680, slow to 1710, according to Terry Anderson (1975, p. 171; 1979, Table 3). Jones (1980, p. 75) appears to agree. Davisson's (1967) earlier local study of Essex county Massachusetts also emphasized seventeenth-century growth.

population than either its hinterland or the other main colonial cities. One reason is that the French and Indian wars took an especially heavy toll on Boston's male population, which disproportionately supplied troops to fight in the Canadian campaign (Nash 1979: 244-245). Furthermore, as we have seen earlier in this section, Boston suffered a net emigration of young adult males to other colonies. The 1770s, like the Revolutionary War that followed, stand out as a nadir in the relative economic position of Boston, from which it only recovered in the early nineteenth century.

Middle Colonies. For the Middle Colonies – New York, New Jersey, Pennsylvania, and Delaware -- it is only for the city of Philadelphia that we can follow the same approach of combining labor clues with property income clues before 1774. We do have, however, aggregate regional clues from the production side, thanks to the recent efforts of Joshua Rosenbloom and Thomas Weiss (2014).

For Philadelphia, which will serve as our proxy for the urban combination of Philadelphia and New York City (then just Manhattan), we have both useful wage rates and useful averages of probated personal wealth by occupation, thanks especially to the efforts of Gary Nash and Billy Gordon Smith.[47] There are limitations to even these data sets, however. The wage rates for Philadelphia laborers and seaman extend back only to 1725. Nash's averages for probated wealth go back further to 1685-1715, but even these cover only personal estate and not real estate, and without adjusting from wealth at death to wealth of the living.

Within these constraints, Table 3-6 reaches a simple result for Philadelphia, our urban representative for the Middle Colonies. Its wage rates and its wealth were consistently higher than in Boston back to 1725, and probably earlier. Yet its incomes per capita were stagnant at that high level. Meanwhile, inequality probably rose between the mid-eighteenth century and the Revolution, to judge from the rise in property values and in poor relief (Nash 1976a, 1976b).

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[47] Nash (1979), B. G. Smith (1981, 1984, 1990). As for the countryside in the Middle Colonies, we do have excellent studies of Chester County Pennsylvania (Lemon and Nash 1968, Lemon 1972, and Simler 1990, 2007). Yet these focused on inequality and on the structure of household headships, without giving a reliable aggregate time series on wealth or wages.

For the Middle Atlantic region as a whole, the new estimates by Rosenbloom and Weiss suggest a very slow rise of real income per capita, perhaps 0.1 percent a year. Their slow-growth result has been incorporated into Table 3-6 and Figure 3-3 here.

The Chesapeake. For the colonial Upper South, or Chesapeake, some very suggestive time-series indicators have been offered by Lois Green Carr, Russell Menard, Lorena Walsh, and Allan Kulikoff. Their combined efforts have produced a deep understanding of the region's colonial fortunes.[48] For this rural region, the indicator that we can follow back before 1774 does not separate property income from labor income. Rather it captures the gross incomes of a prototypical farm deriving 22 percent of its income from tobacco sales, 11 percent from grain sales, and the remaining 67 percent from producing farm products that were consumed either on the farm itself or in the immediate surrounding area, such as a county.[49] Implicit within this gross farm income is the income retained by slaves.

The time series running back from 1774 to c1675 (Table 3-6 and Figure 3-3) summarizes what these authors have described in rich detail. In its tobacco-based heyday of the late seventeenth century, farmers in the Chesapeake did about as well as any group other than the even richer planters in the West Indies. Over the next century its income per capita fell by a third, despite the improvement in its terms of trade between 1700 and 1776 (Table 3-3). Yet its average incomes were still higher in 1774 than those in the northern colonies or in England. The decline in per capita income did not signal any institutional flaw in the Chesapeake, but rather the kind of diminishing returns we should expect in a rich region with relatively free entry of newcomers.

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[48] See Kulikoff (1976, 1979, 1986), Carr *et al.* (1991), and Walsh (1999, 2010).

[49] While we use typical farm incomes as our indicator here, there are many other series that might be woven together, with further data, to construct an alternative time line for aggregate incomes in the Chesapeake. We know that the slave share of total population rose, at least until the 1750. Lorena Walsh (2010) offers several multi-year farm accounts. Allan Kulikoff's work suggests that mean estate wealth rose in Prince George's County Maryland (1976, pp. 504-513), yet returns from different counties find an eighteenth-century drop in the shares of households owning land (Kulikoff 1986, p. 135), though the share owning slaves rose (ibid., p. 154). The clues suggest rising inequality, yet the best time series on aggregate incomes remain the ones we describe in the text and in the "Chesapeake income clues" and "Chesapeake backcasting" file at gpih.ucdavis.edu.

A caveat must be attached here, however: Using alternative prices deflators could replace the Chesapeake's real income drop with mere stagnation over the century ending in the Revolution.[50]

The Lower South. For the Lower South (the Carolinas and Georgia) we have no income-side indicators whatsoever that can span across colonial decades or quarter centuries. To judge how long the colonial Lower South had enjoyed the prosperity it had achieved in 1774, we must turn to an indicator from the production side. Peter Mancall, Joshua Rosenbloom, and Thomas Weiss (2003) have combined different production clues to assemble regional product for 1720, 1740, 1770, and 1800. We equate their 1770 benchmark with ours for 1774 and interpolate to get our 1725 and 1750 benchmarks.[51] The implied result for the Lower South is steady prosperity from the 1720s to the eve of the Revolution, as reported in Table 3-6 and Figure 3-3.

Thirteen colonies versus the mother country, 1650-1774

Guessing at the thirteen colonies' overall growth path. Taken together, the four regions' estimated GDPs per capita imply an eighteenth century history of GDP per capita for the whole of the thirteen colonies.

The thirteen colonies as a whole seem to have sustained their prosperity, and their regional rankings, over the entire three quarters of a century leading up to the

[50] The prices used to convert current-price Chesapeake incomes into "real" constant-price measures and welfare ratios are in some doubt. We have divided our estimates of the Chesapeake's nominal income by the price of a bundle of staple consumer goods, data supplied by Robert Allen. This price series disagrees with those of P.M.G. Harris (1996) and used by John McCusker (in Carter *et al.* 2006, series Eg247). The disagreement is sharpest for 1675-1700, in which the Allen series shows a 15 per cent consumer price rise while McCusker shows a 14 per cent wholesale price drop. Using the Harris and McCusker series, one would find no significant change in real income from 1675 on. Until this issue is resolved, we should not extend the estimates back before 1700.

[51] There is, however, some conflict between MRW and at least one series tracing private wealth for the Lower South across the late colonial era. Russell Menard's (1996, pp. 277-278) averages for the wealth of probated estates in low-country South Carolina. His average moveable wealth, extracted from probate records, rose from £204 sterling in 1678-98 to £1,145 sterling in 1764. Yet Menard attaches caveats to these measures. They cannot reflect the possible changes in the population share, the social selectivity, or the age movements for those whose estates were probated.

Revolution. So say Table 3-6 and Figure 3-3. The movements between time periods were not dramatic, aside from the reversals of the northern colonies' growth of 1750-1770 associated with the turmoil and inflation between about 1770 and 1774.

Were the thirteen mainland colonies ahead of the mother country in income per capita? Our conjectural estimates clearly imply that the colonists' average incomes per capita were even further above that of Great Britain in real terms than in nominal sterling values (with slaves counted as low-income residents). The nominal, or current-price, comparisons imply that the advantage of the colonies over the home country was only 7-13 per cent between c1700 and c1770, and vanished for 1774. Yet when we switch from a simple exchange-rate comparison to comparing real purchasing powers, the colonies' advantage jumps to 54-68 per cent for all the benchmark dates from 1700 to 1774. This striking result would probably withstand considerable error in judging the pre-1774 colonial growth rates. Even if colonial income per capita had actually grown at the 0.5 per cent annual rate implied by the fast-growth view, then back around 1700 the average colonial income per capita would already have had a ten per cent advantage over Great Britain, an advantage that would have grown to the estimated 68 per cent by 1774.

As support for the existence and magnitude of the income gap between the American colonies and the mother country, we compare the kind of workers' welfare ratios (purchasing power) that Robert Allen has designed. The colonists had distinctly higher real wages, at least in the eighteenth century and the early nineteenth, as shown in Figure 3-4. An important additional result of this wage comparison is that it finds the two colonial labor groups even further above Britain in this wage-based measure than in the total GDP per capita measures we examined in Table 3-6 and Figure 3-3 above. This may be another reflection of the greater equality of free persons' incomes in the colonies, a result already noted for 1774.

The striking trans-Atlantic contrast owes much to the fact that the bundle of basic consumer goods was indeed much cheaper in mainland North America than in Britain. That bundle includes the food products that deliver calories and protein most cheaply in the form of grains, beans or peas, meat, and butter or oil. The non-foods included in the

bundle are soap, linen/cotton, candles or lamp oil, and fuels like firewood or coal.[52] As Figure 3-5 shows, such common necessities were almost always cheaper, in terms of current sterling, in the colonies than in England.

To get the comparisons right, dividing people's current-price nominal income by the cost of such a bundle is certainly superior to comparing incomes by using official exchange rates, since the latter fail to capture differences in the prices of things that do not enter international trade.

And to get the comparisons right, we should compare price structures from the same era. The issue of who was ahead of whom in any one era must be based on contemporaneous price comparisons, not the awkward use of international price comparisons from the late 20th century, extended backward on still different price indices for each country. The fundamental reason is that different calculations answer different questions. To answer the question "In which country could the average nominal income have purchased more of a certain fixed bundle of goods?" in, say, 1774, one must compare 1774 prices directly.

If we had wanted to know which country has grown faster, we could have compared their separate growth rates in real GDP per capita, calculated from their separate national price structures. Angus Maddison helpfully delivered a rich harvest of such growth comparisons. Yet we should beware his "long-span" procedure of deriving levels of product per capita from late-20th-century price structures. The only way to check for cumulative index-number biases is to gather fresh direct price and quantity data across countries from earlier centuries. Marianne Ward and John Devereux (2003, 2004, 2006) have performed such direct comparisons using data from the nineteenth century, and Douglas Campbell and Ju Hyun Pyun (2013) have recently confirmed those findings. Ward and Devereux found that the United States appears to have had a higher real purchasing power of GDP as early as 1830. Our present results extend this dawn of American income leadership back to 1700 or earlier.

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[52] See Allen *et al.* (2012), including its online supplement. For a family of four, this bundle is assumed to cost 3.15 times what it would cost for an adult male living alone.

As it turns out, the answer in Table 3-6 and Figures 3-3 and 3-4 is that the era in which the Americans first overtook Britain in purchasing power per capita came at least two centuries earlier than the Maddison GDP figures have implied.[53]

Would better price data reverse the gap in purchasing power? Given that the seeming American lead in real income per capita rests so heavily on the relative cheapness of Robert Allen's bare bones bundles for American locations relative to English locations, one should carefully scrutinize the available price data.

What other data could one gather to develop more accurate time series for a GDP deflator or, for comparison with wage rates, a consumer price index? One immediately confronts the paucity of goods and services that are identical between places or time periods. For example, comparing the Yangtze Delta with England in 1750 requires an indirect way to compare prices for rice, such a small share of the English diet, and bread, not consumed in the Yangtze Delta at all. Robert Allen has plausibly developed a calorie (and protein) standard for comparing across these heterogeneous grains, and has compared different fuel prices using British-Thermal-Unit equivalencies. Still, his barebones-bundle cost only compares prices for food, fuel, and four other commodities.

More price comparisons could be added, yet they still show most goods to be cheaper in the American colonies than in England. Of the 40 commodity comparisons that are possible for either the period 1730-1753 or the period 1754-1774, only 3 had sterling prices that were at least 25 per cent higher in the American colonies, while 22 had sterling prices that were at least 25 per cent lower in the colonies. Similar results emerge for 1792-1808 or for 1840-1860. That is, for the wider range of commodities that can be compared across the Atlantic -- just as for Allen's food, fuel, and only four other goods -- the American prices tended to be lower than English prices, when both sets are expressed in sterling.[54] Using a wider range of homogeneous goods would still

[53] Maddison implies "USA"/UK = 0.42 in 1700, then 0.74 in 1820, in stark contrast with our estimates ranging from 1.54 to 1.68 for 1700-1774 in Table 3-6 and Figure 3-3.
[54] The 25 per cent figure uses the English price as the comparison base. The three colonial cases with American/England above 1.25 were Pennsylvania sugar in the period 1730-1753, and Massachusetts beans and cheese in the period 1754-1774. The data sources are Gregory Clark for England, Carroll Wright for Massachusetts, Anne Bezanson

make Britain look more expensive than the American colonies, as did the Allen barebones costs used in Table 3-6 and in Figures 3-3 through 3-5.

The missing price data on heterogeneous goods and services, if somehow adjusted hedonically, would presumably show many prices to be lower in the mother country than in the colonies, since the heterogeneous kinds of goods and services tend to be consumption luxuries, capital goods, and government services.[55] At the top end of society, for example, surely the richest Londoners enjoyed cheaper (quality-adjusted) fashion wear, carriages, and entertainment. Yet the more homogeneous goods that loomed so large in the budgets of common folks were cheaper in the mainland colonies of North America.

Inequality trends within the colonial era

Within the colonies, were incomes as relatively equal before 1774 as we have found them to be in that baseline year? For free households, some colonial trends suggest a widening of income gaps, while others might have offset such widening. Scholarship from the 1960s and 1970s had found local signs of widening inequality among free households. So it was for Philadelphia and for several localities in New England between the late seventeenth century and the Revolution. Within the South, the accumulation of slaveholding was also highly unequal among white households. Against these trends, however, one must weigh the egalitarian implications of the colonial era's ruralization. As more and more drifted toward a yeoman farming frontier, it seems likely that there was little or no trend toward wider income gaps among free households within regions, despite the rise for certain localities.[56]

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et al. for Pennsylvania, Lorena Walsh *et al.* for MD-VA (Chesapeake), and T.M. Adams for Vermont after 1790. See the file on "Price comparisons between American and England, specific goods, c1650 - c1870" at gpih.ucdavis.edu.

[55] For comparisons of middle-class bundles, such as those recently presented by H.M. Boot (1999, pp. 649-655) for London in 1823-1824, the trans-Atlantic contrast might still show relative cheapness in America, partly because of the lower American prices for meat, a relative luxury.

[56] For local studies suggesting rising inequality in the century ending with the Revolution, see Lemon and Nash (1968), Lemon (1972), Nash (1976a, 1976b, 1979),

Among all Americans, slave plus free, the trend was more clearly toward greater inequality across the colonial era, for reasons suggested by Robert Gallman (1980, p. 133) long ago. Between the original white settlements and 1774, slaves rose to take more than 21 percent of the population of British America, as Figure 3-5 reminds us.[57] Adding so many near the bottom of the income ranks must have raised inequality considerably. As a rough clue to the magnitude of this effect, one could return to the 1774 inequality results in Table 2-4. For the South in 1774, the Gini coefficient of inequality was 0.464 for all households, but only 0.328 for free Southerners alone. If one were willing to assume, very courageously, that around 1700 a South without slaves would have had the same income distribution as for the free in 1774, then this huge gap in ginis would represent the rise in Southern inequality due to adding slaves. Similarly for the thirteen colonies as a whole, using Table 2-4's Ginis of 0.437 for the total population versus 0.400 among the free alone. Our tentative hunch is that inequality in the whole population must have risen across the colonial era. That is, incomes were even more compressed among the overwhelmingly white population of the seventeenth century than among households on the eve of Revolution. As we shall see, the gaps kept getting wider up to the Civil War.

IV. Losing the Lead: The Cost of Revolution and Independence

Our next benchmark for appraising early American national income is the census year 1800. The turbulent period between 1774 and 1800 brought, of course, the Revolutionary War, the troubled Confederacy, and then the beginning of the Federal Republic after 1789. Since 1800 is the earliest benchmark following 1774 that the evidence will support, this section cannot map the fall and rise of average incomes between 1774 and 1800. But we will be able to speak to a number of issues. How big was the economic cost of the Revolutionary

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Main (1977), and Smith (1984). On the egalitarian implications of westward drift, see Williamson and Lindert (1980, Chapter 2).

[57] The shares in Figure 3-5 refer to the mainland British colonies through 1780, and then to the United States. The source is Carter *et al*., *Historical Statistics of the United States* (2006, series Eg1, Eg41, Aa145, and Aa147).

War and financially dysfunctional confederacy? Did America lose its income per capita lead over England? Which regions were hardest hit during the quarter-century, the South or the North? What happened to the income per capita gap that favored the urban coastal regions compared with the rapidly settling "subsistence plus" hinterland? And when we compare our 1800 estimates with that constructed by others for 1840, can we see the beginnings of modern economic growth?

Post-Revolutionary incomes circa 1800

As we did for 1774, Table 4-1 summarizes our sources and methods for the 1800 estimates. On the labor-income side, our procedures for 1800 are roughly the same as those we applied to 1774 in Part II above, although the data sources are more abundant. The population data are also on sounder footing, given the availability of the second US census. The labor force by location, age, sex, and slave/servant status relies on the work of Thomas Weiss once more. Occupations and assumptions about slave and servant retained income (or, more simply, their "maintenance") are also taken from the same kinds of sources as for 1774, although they are of higher quality and more abundant. What makes the 1800 income estimates distinctive, however, is not the construction of labor incomes but rather that of property incomes.

In 1798, Congress passed its first federal direct tax. This one-off tax was levied on real estate wealth and slaves, and its purpose was to fund a possible conflict with France.[58] The 1798 federal tax returns remain by far the most useful source available for estimating the property income side of 1800 national income. True, one might view these returns with some suspicion. Can we trust the quality of the data collected by tax authorities representing a new nation that had just fought a bloody and expensive war to shed its Imperial government partly over tax issues? This suspicion turns out to be warranted, especially given evidence that properties had already been under-assessed in local tax returns from the previous two decades. For example, warned by Gerard Warden's (1976) investigation of the Massachusetts

[58] The best introduction to the quantitative dimensions of the 1798 direct tax returns is still that of Lee Soltow (1989). For the underlying political history, see Robin Einhorn (2009).

1771 tax rolls, we found implausibly low assessments not only in those rolls but also in the Philadelphia 1772 returns supplied to us by Billy Gordon Smith and in the 1786 New York City returns supplied to us by Herbert Klein. While these city tax rolls were useful for identifying urban occupational distributions -- including occupations revealed by the presence or absence of each asset type -- they are not useful for estimating assessed values themselves. Thus, while the 1798 federal returns are the superior source from which to construct 1800 property incomes, we must identify, and adjust for, their likely biases before using them.

The 1798 direct tax probably under-assessed real estate market values by something like 15.5 percent in New England and the Middle Atlantic, a figure based on a contemporary study of marketed real estate in Connecticut in that same year. That is, Lee Soltow (1989: pp. 37, 256-257) found correspondence in the Oliver Wolcott papers showing that for 518 Connecticut properties sold in 1798, the average ratio of federal-assessed value to market value was 0.845. Thus, we have raised our 1800 property income estimates by this 15.5 percent underassessment in New England and the Middle Atlantic, and also by the 7 percent rise in average asset values from 1798 to 1800 suggested by the contemporary Samuel Blodget (1806).

In the South, the federal tax authorities appear to have under-assessed rich households' realty, and slaves, by even more than that 15.5 percent underassessment we have identified for the North. Elsewhere, we describe the peculiarities of Southern assessment for the 1798 tax, and present our preferred estimates for the extent of the underassessment.[59] The adjustment for the extra southern underassessment raises real estate plus slave wealth values by 30.1 percent for the South Atlantic. This combined with the nationwide underassessment of real estate by 15.5 percent raises real estate plus slave wealth values by 40.4 percent for the South Atlantic, or 27.7 percent for the whole Eastern seaboard.

Since the 1798 federal returns covered only real estate and slaves, we had to use the same ratios of total property/(realty plus slave values) obtained from the 1774 evidence to inflate them to total property. We apply region-specific ratios to each of the three regions – New England, the Middle Atlantic, and the South.

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[59] Appendix 3, in the supplementary materials to our article (Lindert and Williamson 2013a), at the *Journal of Economic History* web site.

There is one other important difference between the data sources on the property income side between 1774 and 1798-1800. The 1798 tax returns are very handy in that they were aggregated for us at the time. But a serious drawback of the 1798 return is that it does not report property income by occupation. Thus, we cannot document the occupational distribution of *total* income for 1800, although we can document the distribution of own-labor incomes by occupation, as well as the aggregate value of property income and total income. In short, we cannot compare the distribution of income in 1800 with 1774, although we can say quite a bit about regional income gaps.

Our estimates of labor and property incomes shed new light on the evolution of American incomes over a quarter century of war, slow postwar recovery, and national emergence. The levels and composition of total personal income are shown in Tables 2-2, and 2-3 has added a contrast of our estimates with those of other scholars. We retain the three region definitions used by Alice Hanson Jones and make comparisons across the quarter-century based on a geographically fixed "nation". In 1800, that "nation" is defined as the original 13 colonies and in 1800 as the easternmost 15 states (Maine and Vermont were carved out of the original New England four) plus the District of Columbia (carved out of the Upper South). As we pointed out for Table 2-2, one can calculate any of several important ratios, using the denominators in the lower half of the table and the price deflators in the notes to the table.

Unlike those for 1774, our 1800 total income estimates are not above those constructed by other scholars. In fact, our estimates, as shown in Table 2-3, are in the lower half of several competing estimates for the nation as a whole. Our 1800 totals for the Lower South match those of Peter Mancall, Joshua Rosenbloom, and Thomas Weiss (2003), even though we used the income approach and they used the output approach. It might seem comforting that our 1800 estimates are so close to those constructed by others. However, ours would have been a bit higher than most if we had been able to make all the adjustments that we feel are warranted. We are especially concerned about two such adjustments. One of these can be quantified but one cannot.

The first potential adjustment is one already mentioned in Part II. Using the interest rate on public debt as a measure of the opportunity cost of assets, it appears that the net rate of return on property was higher in 1800 than in 1774, presumably in response to Revolutionary

War and Confederation inflation, financial disruption, and perhaps even productivity advance (Homer and Sylla 1991: pp. 274-96). As we noted in Part II, if the interest rate tended to be 8 percent in 1800 versus 6 percent in 1774, then the measured 1774-1800 decline in real per capita income would be a bit less, 14 percent, rather than the bigger decline of 20 percent implied by the baseline estimates.

The second adjustment relates to an omission from the baseline 1800 estimates. We have no 1800 data, or even guesses, about farm operators' pure residual profits, as distinct from returns to their land and other assets plus the implicit value of their own farm labor. For 1774, we were able to use a few testimonies unearthed by Jackson T. Main (1965) to guesstimate that the farm profit residual was 18.9 percent of all farm operators' income in New England, 21.1 percent in the Middle Atlantic, 34 percent in the South, and 28.8 percent for the 13 colonies as a whole. We cannot apply these ratios to 1800, however, since we lack any delineation between farm operators and free farm laborers in the census or in the Weiss labor force estimates on which we rely. Until evidence on this issue emerges, we can only propose our alternative estimates in Table 4-5, and repeat that accordingly the nation experienced a per capita income decline of perhaps as much as 20 percent over the quarter century, although the true decline might turn out to be a little less when and if an estimate of 1800 farmers' pure profits can be added in the future.

Revolutionary shocks: War damage, diminished trade, and a crisis at the top

One key result stands out when one confronts the implications in terms of real income per capita, as we have done in Table 4-2 here. The new estimates imply that real income per capita dropped seriously over that quarter-century. The real per capita income decline between 1774 and 1800 was about 20 percent and thus was almost as serious an economic disaster as the 1929-1933 drop into the Great Depression. If other authors are correct in reporting brisk income gains across the 1790s, then the Revolutionary War and Confederation turmoil could have been America's greatest income slump ever, in percentage terms.

What stands out in the longer run perspective is the economic turbulence between our two benchmark years 1774 and 1800, first with the war years themselves and then with the

troubled Confederation in the 1780s. The last quarter of the 18th century found the economy on a rickety swinging bridge, a metaphor that also describes scholarly attempts to span that gap with numbers from what has been called a statistical dark age. Like late 18th century France, early 19th century Latin America, early 20th century Russia, and late 20th century Africa, scholars of the early United States have had great difficulty bridging the data gap across their revolutionary upheaval and early nation-building. On the one hand, Thomas Berry (1968, 1988), Louis Johnston and Samuel Williamson (2010), Richard Sylla (2011) and others have emphasized the strong growth experienced across the 1790s. Fast growth during that decade could be explained by "miracle growth" that always seems to follow destructive wars when only physical capital needs to be rebuilt, or it could be due to the policy wisdom of Alexander Hamilton and other founding fathers, or it could be explained by the recovery of foreign markets, or by all three. While we will offer informed guesses, we do not yet know which of these was most important. Of one thing we are certain, however: the more we come to accept a sanguine view of the 1790s, the more we must infer a true economic disaster between 1774 and 1790.

Any study attempting to measure incomes for 1774 and 1800 alone cannot quantify the depth of any economic depression in between. Yet, the search for the magnitude of the Revolutionary War and post-war depression can be guided by posing this question: How deep would the per capita income loss have been from 1774 to 1790 if the scholars cited above are right about the growth from 1790 to 1800, and if our estimate of the net decline from 1774 to 1800 is also right? This question has eight possible conjectural answers, based on our two estimates for 1800 ("baseline" and "alternative") times the four leading series documenting real income per capita growth from 1790 to 1800. The four series are those by Richard Sutch, Louis Johnston and Samuel Williamson, Thomas Berry, and John McCusker.[60] All eight conjectures imply very big drops in income per capita between 1774 and 1790. Based on the Sutch estimates of growth across the 1790s and our alternative estimate for 1800, GDP per capita might have dropped by 18 percent over those sixteen years 1774-1790, the lowest estimated fall. The largest estimated drop is 30 percent, based on Berry's series

[60] See Series Ca11, Series Ca16, and Series Ca17 in Susan Carter *et al.* the *Historical Statistics of the United States* (2006) and McCusker (2000).

and our baseline estimate for 1800. All of these estimates certainly agree with the statement by John McCusker and Russell Menard that the "Colonists paid a high cost for their freedom", and by Allan Kulikoff that the drop in incomes was "equal to the early years of the Great Depression", and with their consensus that recovery was painfully slow.[61]

What could have caused such sustained income losses? There is good *prima facie* evidence that three related negative shocks could have been large enough to cause the deep depression between 1774 and 1790. The first was the economic destruction of the war itself, as well as the impact of nearly two decades of hyperinflation and a dysfunctional financial system. Narratives listing the many forms of wartime economic destruction and disruption, with emphasis on the countryside, can be found in Mancall (1991: pp. 130-59), James Henretta (1991), and, especially, Allan Kulikoff (2000: pp. 256-80; 2005; 2014). But some detail might give the reader a better sense of the economic damage. We start with Kulikoff:

> "War tore the country apart; refuges and soldiers wandered the countryside; armies stole cattle and crops; people starved. Trade atrophied; money lost its value; jobs disappeared … The war ended but the misery continued … searing the memories of all who lived through it" (Kulikoff 2014: p. 1).

And the financially dysfunctional economy of the 1780s inhibited recovery:

> "state and national financial policies … kept small-scale farmers and artisans impoverished, reducing their ability to rebuild …" (Kulikoff 2014: p. 3).

But the more permanent damage of the war itself was harder to restore. Immigration, so important to the Middle Atlantic, ceased, increasing labor scarcity there. In the South, slaves took advantage of the conflict to run away, and many joined British forces: indeed, the "loss of slaves … numbered 30,000, a tenth of all working-age slaves" (Kulikoff 2014: p. 16). About a third of all white males over the age of 16 served in the Continental Army, their state militia, or the British Army -- reducing wartime private sector capacity – and

[61] McCusker and Russell Menard (1985: p. 374); Allan Kulikoff (2005: p. 27).

10 to 15 percent died. Many also suffered wounds that made heavy farm work impossible when peace returned.

The second negative shock consisted of the disruptions of overseas trade during the Revolution and, after 1793, the Napoleonic Wars (O'Rourke 2006). As James Shepherd and Gary Walton (1976) have noted, the loss of trade in the 1780s was domestic as well as foreign, because the loose Confederation that preceded the Federal union allowed the new states to tax interstate trade, with disastrous effects on the magnitude of that trade as well as trade with the rest of the world (Mittal *et al.* 2011; Shepherd 1993): indeed, "eleven of the thirteen colonies passed their own tariff laws during the 1780s" (Irwin 2011: p. 94). However, the larger and longer negative shocks to America's trade involved Britain and its possessions. Available price and trade data show that the colonies, especially in the Lower South, suffered heavy volume and value losses in trade and shipping as the war deepened, and that they recovered only slowly and partially across the 1780s. Chesapeake tobacco exports fell from 100 million pounds per year in the early 1770s to about 9 million per year in the late 1770s and early 1780s. In 1781 exports of Carolina rice to Britain were only a fifth of pre-war levels (Kulikoff 2014: pp. 3-4). The Middle Colonies and New England suffered as well:

> "By 1779 … Philadelphia tonnage shipped [had fallen] to one-seventeenth of the prewar average … forcing merchants out of business [and] fisheries – essential to the northern New England and Long Island economies – closed down as the British prevented American ships from going to the fishing banks" (Kulikoff 2014: pp. 4-5).

In real per capita terms, New England's commodity exports rose by a trivial total of 1.2 percent between 1768/72 and 1791/92, rose by a very modest 9.9 percent in the Middle Atlantic, but fell by a spectacular 39.1 percent in the Upper South, and by an even bigger 49.7 percent in the Lower South (Mancall *et al.* 2008a: Table 1 estimates an even larger 67 percent fall), yielding a decline of 24.4 percent for the thirteen colonies as a whole.[62] The most painful of these shocks was the loss of well over half of all trade with

[62] Shepherd and Walton (1976: especially Table 5 and the surrounding text). The Mancall *et al.* (2008, Table 1) estimate for the Lower South refers to the twenty years 1770-1790.

England between 1771 and 1791. In addition, America lost Imperial bounties like those on the South's indigo and naval stores, and suffered a reversal from New England's colonial bounties to prohibitive duties on its whale oil exports.

While these negative demand shocks to American commodity exports were very large, especially for the Lower South, the initial share of exports in regional income was only about 9-13 percent in the early 1770s, according to the Shepherd-Walton export values per capita in 1768-1772 and our 1774 income estimates for the three main regions combined. While the huge depression of 1774-1790 was hardly just "export-led", it was still significant economy-wide. A 24.4 percent per capita trade fall times a 9-13 percent initial share of trade in income equals no more than a 2.3-3.1 percent total fall in per capita income. The numbers are bigger for the South, where per capita exports fell by perhaps 45 percent and the initial trade share was again 9-13 percent, implying a per capita income loss of 4-6 percent. These calculations only deal with *foreign* trade losses; the trade losses would be considerably higher if they included the decline in inter-colonial and subsequent inter-state trade between 1774 and 1790. Finally, these negative trade shocks created a move to more subsistence farming in the staples districts (Kulikoff 2014: pp. 11-12), and presumably lower agricultural productivity.

While we cannot be precise, it appears to us that most of the 20 percent fall in per capita income 1774-1800 must have been due to war damage and postwar financial problems. The trade and world market shocks, while significant, were a smaller source of the disaster, and they also recovered more quickly. Perhaps this was predictable since, as we learned in Part III, those trade shares were so small nation-wide. But trade was a far bigger share of the economies lying along the urban, coastal strips of each of the main regions, an issue we assess next.

The third major negative shock involved what we call a *crisis at the top*, and it was felt primarily in the coastal cities and smaller river towns. Obviously, this shock was related to the trade losses (after all, coastal and urban trade shares were much higher there than in the rural hinterland: see Part III), but may have transcended them and therefore could have caused even greater income losses. America's urban centers were severely damaged by British naval attacks, blockades, occupation, and by the eventual departure of skilled and well-connected loyalists, especially from New York, Charleston, and Savanna. In Richard Hildreth's summary,

"one large portion of the wealthy men of colonial times had been expatriated, and another part impoverished".[63]

The damage to urban economic activity was considerable, and potentially enough to bring great declines to per capita incomes, even though population kept growing. To identify the extent of the urban damage, one could start by noting that the combined share of Boston, New York City, Philadelphia, and Charleston in a growing national population shrank from 5.1 percent in 1774 to 2.7 percent in 1790, recovering only partially to 3.4 percent in 1800. To the extent that urbanization is a close correlate of levels of economic development, this big fall in the American city population share certainly confirms what our income estimates document. There is even stronger evidence confirming an urban crisis: the share of white collar in total employment was 12.7 percent in 1774, but it fell to 8 percent in 1800; the ratio of earnings per free worker in urban jobs relative to that of total free workers dropped from 3.4 to 1.5; and the ratio of white collar earnings per worker to that of total free workers fell even more, from 5.2 to 1.7. This evidence offers strong support for an urban crisis, and it also supports the view that America had not yet recovered from the Revolutionary economic disaster even by 1800.

V. Regaining the Lead: Unequal Growth 1800-1860

[Part V remains a work in progress. Our remarks here are thus preliminary. We continue to search for a way to add pure farm profits to the 1800 estimates, and pure profits in nonfarm enterprises for all dates. Yet the 1850 and 1860 results seem secure enough to report on growth and inequality issues up to 1860 here – in connection with Table 4-2 regarding growth, and in connection with Tables 5-1 through 5-4 regarding inequality change.]

Achieving Modern Economic Growth 1800-1860

Table 4-2 supplies our real per capita income growth estimates, 1800-1860, for the East Coast (the thirteen original colonies which became the 15 east coast states and

[63] Hildreth's summary (1849, vol. III: pp. 465-6) is cited by McCusker and Menard (1985: p. 365).

the District of Colombia), and for the expanding United States. For the entire six decades, real per capita incomes on the east coast grew at 1.53 percent per annum.

Our estimated "original 13" real per capita income growth rate for 1800-1860 is considerably higher than those previously estimated: Abramovitz-David (2000) 0.93; Weiss (1992: broad) 0.94; Weiss (1992: narrow) 1.06; Gallman (2000) 1.18; and David (1996/2005) 0.90. These estimates average about 1 percent per annum, not quite enough to pass the Kuznets test for achieving modern economic growth: the Kuznets criterion was that per capita income growth exceed 1 percent per annum over long periods. Nor is their estimated growth rate fast enough to imply any catch up on the leader, Britain, as we shall see in a moment. In contrast, our 1.53 percent per annum rate passes Kuznets's test with flying colors. In contrast with previous research, our new estimates suggest that the young republic was one of the first to join the modern economic growth club.

The rate of growth in our eastern-seaboard original thirteen region was also well above the west European average of 1.11 percent for 1820-1860. It outperformed the United Kingdom (1.27 percent per annum) implying catching up growth after losing the lead over the quarter century 1774-1800. According to Stephen Broadberry and his collaborators (2012), per capita income in Great Britain had reached 30.75 £ sterling in 1860, which, at current exchange rates, was $149.13. The US figure in Table 4-2 is $160.16 for the whole United States, and $169.18 for the former colonies on the East Coast. While we are continuing to refine our purchasing-power-parity (PPP) estimates for 1860, the United States appears to have reclaimed its income per capita lead by 1860 (the original 13 colonies 13-14 percent higher than Britain). As we have already suggested, Angus Maddison may have been more than two centuries off the mark when claiming that America only overtook Britain just after 1900. Still, he could have been right that there was a post bellum overtake, depending on what we find in our Civil War Chapter 6, where our 1870 income estimates will be presented, after which we will revisit the debate over growth between 1870 and 1929 in Chapter 6. But it looks like America overtook Britain at least three times – by 1700, again by 1860, and again soon after the Civil War. Of course, it also lost its lead twice.

We need to add a word of caution about growth rates involving our 1800 income estimates. As noted, we have been unable to measure pure profit residuals in 1800, either for the dominant farm sector or for the rest of the economy. Since we have farm pure profit residuals for 1774 and 1860, the incompleteness of our measures for 1800 might overstate the growth rate for 1800-1860, just as it might understate the recovery from the economic disaster of 1774-1790. Having said as much, we stress the following: the 1800 estimate plays no role in assessing per capita income relative to England in 1774 or relative to Britain in 1860. We know that American incomes exceeded those of the Mother Country at both dates. We also know that American income per capita fell between 1774 and 1800. These facts make American catching up growth rates 1800-1860 all the more plausible.

Continuing reversal of Southern fortunes

Table 4-2 reports that the South's relative income per capita continued to slide down between 1800 and 1860. The absolute decline of South Atlantic per capita income over the last quarter of the 18th century and its relative decline over the first six decades of the 19th century stand out starkly, and it seems to offer a classic example of reversal of fortune (Acemoglu *et al.* 2002) over a remarkably short period of time. According to Richard Easterlin (1960, 1961), the South Atlantic was well behind the Northeast and the nation as a whole by 1840. Part II showed that it was well ahead of all other regions in 1774, but Part IV showed that it had lost much of that lead by 1800. We also noted that this reversal of fortunes draws support from the apparent absence of any large army of poor whites in the colonial South. To repeat, what few local colonial censuses and tax records we do have reveal that nearly all white households in the South around 1774 were assessed as having positive wealth. The traditional image of the South as a repository for much of the nation's poor whites had become an attribute of the region by 1860, although it had fewer poor whites in 1774 than any other region.

Why the Old South's reversal of fortune? A benign explanation would be that the colonial South was still a labor-scarce frontier in 1774 with high returns to coastal land producing valuable export crops, like indigo, rice, and tobacco. Populating a rich frontier

would lower the returns per person. The South's rich-frontier-like decline after 1774 was repeated in two other rich-frontier places many decades later: the relative decline of the land-rich West South Central between 1840 and 1860, and the relative decline of the Pacific region (and contiguous Nevada) as its gold (and silver) mining-led super-incomes of the 1850s and 1860s dissipated.

Still, the Southern reversal of fortune must have had multiple causes, and we do not yet know what weights to attach to them: the decline of frontier super-returns, the exceptionally severe market and war damage incurred during the Revolutionary conflict and early confederation, failure to invest in broad-based mass education, or some other fundamental institutional weakness associated with slavery and elite control (Engerman and Sokoloff 2012).

The Rise of American Inequality to 1860

While social tables are not an inherently superior way to estimate aggregate national income or product, they have the clear advantage of being able to reveal the inequality of income in historical settings where occupational labels and social status conveyed a great deal information about incomes. Thanks to the social tables, we have been able to report a detailed description of American income inequality on the eve of the Revolution. Now we will do the same for the eve of the Civil War.

As we have seen in Part II, incomes were much more equally distributed in colonial America than in the United States today, or in other countries in the late eighteenth century. If Americans were more equal in 1774 than today, when did income inequality rise? Has the rise been only a late 20th century phenomenon? Or did it happen earlier, in the 19th century?

The next available benchmarks for charting the American income distribution are 1850 and 1860.[64] Tables 5-1 and 5-2 allow us to compare the 1850 and 1860 results

[64] A later draft will add an income distribution for 1870.

We should here acknowledge Lee Soltow's monumental study of wealth inequality among adult men in the United States 1850-1870 (1975, especially Chapters 4 and 5). Writing before the IPUMS samples were developed, Soltow drew his own giant random samples of wealth holding from the 1850, 1860, and 1870 censuses. While most

with the 1774 results from Table 2-4. The main finding is clear enough: Inequality rose across America over this 86-year span of history – for the US as a whole, for every region, among free households alone, and among slave and free combined.

While income gaps widened in all parts of the eastern seaboard, the widening was most pronounced in the South. Among slave and free household combined, the South Atlantic Gini rose from 0.464 in 1774 to 0.610 in 1860 -- a figure much the same for the East South Central (0.552) and West South Central (0.569). What is especially notable about the South Atlantic was the enormous increase in income inequality among free households, where the Gini rose from .328 in 1774 to .527 in 1860. The top-one-percent share of income increased from 6.3 to 11.1 percent among free households in the South Atlantic, while the share going to the poorest 40 percent fell from 21.9 to 10.8 percent. Any historian looking for the rise of a poor white underclass in the Old South will find it between 1774 and 1860 – not in the colonial period, and not solely after the Civil War.

Why did the income gaps widen more over those nine decades in the South than in the North? We cannot offer a full explanation here. Yet one obvious suspect can be identified: The antebellum South had a far more elitist approach to education. Relative to the North, its education growth was concentrated on a more restricted and elite set of children. In the South, parents who could afford it paid much larger amounts for tuition than their Northern counterparts. Taxes paid less, and a smaller share of white children were enrolled in school. The South supplied fewer teachers per 100 children of school age. The fact that for several decades the South educated a smaller share of their youth, and spent so much private money on each pupil, must have contributed to the greater income inequality among Southern whites in 1850 and beyond.[65]

In the North between the eve of the Revolution and the eve of the Civil War, the early egalitarian condition might be viewed as moving westward, rather than disappearing. The relatively egalitarian gini coefficients below 0.400 moved westward

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of his detailed results are consistent with ours, comparisons are difficult. His work reported only on wealth, whereas ours combines the putative returns from that wealth with labor earnings.

[65] See Go and Lindert (2010), especially its Table 2.

from New England and the Middle Colonies to the North Central free states in 1850 and 1860.

The rise in overall inequality was still in progress during the last decade of the long 1774-1860 era. During the 1850s, every census region but the Pacific underwent a sharp rise in inequality, with or without slave households. The same was true for the nation as a whole. Or so say the gini coefficients of Tables 5-1 and 5-2 and Figure 5-1. What the 1850s did not reveal, however, was a uniform rise in the share held by the top one percent of households. The top-one-percent share dropped for all Southern regions, despite the continued rise in slave values, while it rose in all the Northern regions other than the Pacific.

The long rise in inequality before the Civil War was as great as the more familiar widening that we have been experiencing since the 1970s. Table 5-3 and Figure 5-1 map the extent of American inequality changes since 1774 using the gini coefficient as our index. The two great surges in inequality were equally dramatic in overall magnitude, though the rise since the 1970s has occurred in four decades, not nine. The same theme is sounded by the top-one-percent shares of total income (Figure 5-2). To repeat, the 1774-1860 rise was similar in overall magnitude to the one we have been living through recently, but the recent rise has been more rapid: the earlier rise stretched out across many more decades than just the four antebellum ones. Yet our inference about timing may be misleading, since we simply do not know whether that rise started in 1790, 1800, 1820, or even 1830. It matters. If the rise started in 1790, the surge was indeed lass dramatic than what we have experienced in our lifetimes. If instead it started in 1820 or 1830, then it may have been as dramatic as the current surge.

When placed in international perspective, the two great surges in American inequality start to look very different. America started from much lower levels of inequality than did industrializing European countries. Thus, our early rise in inequality exceeded theirs, so that by the early twentieth century America had joined an inequality club, catching up with Britain, the Netherlands, Japan, and others. In contrast, since 1914 America has undergone the same trends as other industrial countries. Figures 5-1 and 5-2 show that American inequality trends are practically indistinguishable from others over the last century. All shared the mid-century egalitarian 'income revolution'

(Kuznets's term), alias 'the great compression' (Goldin and Margo 1992), though the egalitarian movement had somewhat different starting and ending dates in different countries. Since about 1975, the United States has shared a dramatic reversal with other rich countries. This time, however, the magnitudes have differed. The steep rise in inequality has been felt by all rich English-speaking countries and by East Asia (especially China and Singapore). However, continental and Nordic Europe have not felt the same income gap widening. In short, while the inequality movements of the last hundred years are strikingly similar across countries, before the twentieth century America was exceptional in that it lost its unique equality.

VI. The Civil War Upheaval

[Part VI also remains a work in progress, and our remarks here are again preliminary.]

The Civil War, in addition to causing by far the greatest wartime loss of life in the country's history, caused incomes to drop, even on a per capita basis. The losses were concentrated, of course, on the Southern white population. The South's income loss per capita was severe even when we include the black population, as illustrated by the 1860-1870 plunge in the South Atlantic region's income per capita in Figure 4-2. The victorious North, however, did not prosper across this decade, according to our tentative estimates. As a result, the average purchasing power of the nation as a whole dropped enough to lose our lead over Great Britain by 1870. Once again American income leadership proved vulnerable, as it had done in the Revolutionary War. Leadership was to be regained by the start of the twentieth century, and reinforced by Europe's damage and America's prosperity during World War I. Only during the great depression of the 1930s did America again lose its lead over other industrialized countries. In that depression our income per capita fell a bit behind that of Switzerland, while Britain, the Netherlands, Australia, and New Zealand virtually caught up with us temporarily, before

World War II raised incomes in the United States far above those of almost all countries.[66]

The Civil War decade appears to have brought a reduction in income inequality among Southerners, even within the white population, as shown by a comparison of Tables 5-2 and 5-3. By contrast, income gaps widened within the North. The Northern widening and the inter-regional widening were sufficient to keep income inequality from falling at the national level.[67]

For freed blacks, incomes are exceedingly hard to document for any time before 1940, though scholars have offered as many clues as possible. One needs information on their wealth, their occupational mix, their wage or salary rates, and their farm operator incomes, all by region. The first two kinds of information are available in the 1870 census. We know their 1870 wealth, which was zero for most black households and very low for the rest. We know their occupations in each census, and scholars have rightly used the occupational mix as the single best clue to blacks' income disadvantage between emancipation and 1940.

As for their rates of pay in given occupations, the fragmentary testimony for years around 1870 suggests that they got paid nearly what whites got paid – for the same low-pay occupations. For farm hands in 1879-1880, in 184 farms of the Ransom-Sutch sample that hired both black and white labor, the blacks were paid 96 percent of what the white farm hands were paid. In 1875, black teachers got paid 93 percent of the white teacher pay in the South (Smith 1984, p. 690).[68] Other testimony also seems to fall

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[66] The comparisons of real income per capita in the 1930s are based on Angus Maddison's last estimates. Our Part III's caveats about using his "long-span" procedure of deriving levels of product per capita from late-20th-century price structures still apply here, but perhaps with less force, given that the 1930s were much closer to the postwar era in which his purchasing power parity calculations are anchored.

[67] Our results for the changes in inequality between 1860 and 1870 do not match, but are not radically different from, those presented by Lee Soltow (1975, pp. 99-103) on the basis of his spin sample from the censuses. It is difficult, however, to compare our apples with his oranges. We are measuring income among households, whereas he was measuring "total estate" wealth among adult males.

[68] Smith further reports a 100 percent ratio of teacher pay rates for 1880, and then much lower rates in the Jim Crow depths of the 1890s. However, for 1890 Robert Margo (1990, p. 26) finds an average ratio of 95 percent.

into this 93-96 percent range for a given occupation. We have been able to apply such percentages to the all-races wage rates reported by Stanley Lebergott and others, to estimate just how much less a black workers received, and how more a white worker received, than the all-race average for each occupation.[69]

For black farm operators, most of whom were Southern tenants, the information requirements are more severe. The 1870 agricultural census was too weak for the South to allow a replication of our use of Lee Craig's (1991) technique for estimating their own-labor income, inclusive of farm profits, by place and race. The best resource available for estimating Southern farm operator incomes of the expanded Ransom-Sutch (2001) sample of Southern farms in 1879-1880. Using some fragile assumptions, we were able to use that sample to estimate relationships of farm operator incomes by race to the local farm wage rates, relationships that we then applied to farm operators in the IPUMS sample for 1870.[70]

For Southern blacks as a whole, the calculations suggest real income gains from emancipation, in addition to the immense human value of freedom itself. Their real income gains might have been something like 33 percent, despite the decline in their rates of labor force participation.[71] The reason seems straightforward: Emancipation

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[69] Our calculations of these implicit black and white rates had to allow, of course, for the employment shares of blacks and whites in each occupation-sex-place group.

[70] The complex estimation procedure is described in an Appendix F-3, available upon request.

[71] In a later draft we will map the changes in Southern blacks' labor force participation by age and gender and region, using the IPUMS samples. We are preceded, of course, by Ransom and Sutch's (1977; 2001, pp. 11-14) estimates of the 1860-1880 reduction in black labor force participation in the South.

As for the days that the freed blacks worked per year, Ransom and Sutch find (2001 edition of 1977, Table C1, p. 233) these ranges of annual days by age-sex group in the rural South:

Males 16+	242-276 (259)
Females, 16+	235-258 (247)
Children, 10-15	199-210 (205)

These rural Southern rates are generally below the "part-time" rates we assumed for free-family members in all regions, namely 280 days for households with the head employed in construction trades, rural unskilled workers, and farm-operator households; and 222 days for households headed by free urban unskilled laborers and zero-wealth household heads of unknown occupation.

meant that that free blacks captured something closer to the marginal product of their labor than the 40-50 percent of it that slavery let them consume. And given the decline in Southern white incomes, the ratio of black to white income per capita in the South roughly doubled from 1860 to 1870, as shown in Table 6-1. What remains to be charted in the history of black incomes is the extent to which their incomes retreated again after 1870, with the suppression of their rights in the long Jim Crow era.

VII. Taking Stock

Our new income estimates reveal the broad outlines of American growth and inequality before 1870. The DAE session allows us to take stock of things learned and of tasks unfinished.

We must first emphasize what our work has not yet achieved. All of the income estimates are tentative. Improvements in our 1800 (under-)estimates are still in progress. When those tasks are completed, we will follow the story from 1870 to the late twentieth century, with special attention to trends in racial and gender inequality. American progress on both of these fronts was long delayed, yet did occur. Our final non-achievement to date is obvious enough: We have not yet offered causal interpretations of these movements.

Still, the view of early American incomes is now clearer. In terms of when this country reached real incomes per capita[72] higher than the West European leaders, we have sketched a new time line for the two centuries 1650-1870. The mainland American colonists had incomes much higher than Britain and other West European countries by the late seventeenth century, and they kept their lead until the Revolution. Americans lost all of that lead when gaining independence and struggling with the construction of the young republic. Yet across the first half of the nineteenth century, they regained that

[72] We reiterate that our concept of real income here means the ability to buy the barebones subsistence bundle of goods defined by Allen *et al.* (2012). As we have noted in connection with Figures 3-5, 5-1, and 5-2, the American advantage would have been smaller or nonexistent if one were to compare current-price national products per capita at the exchange rate.

world leadership in national income per capita – until the Civil War again damaged average incomes more in this country than in the leading Western European countries.

Our new evidence also now tells us that America had exceptional equality on the eve of the Revolution, but then lost it in the century that followed. The great rise in inequality seems to have reflected, at least in part, a natural process of frontier settlement. As long as institutions permit persons of moderate means to gain ownership of highly productive frontier lands, inequality will start low and then inexorably rise. Common labor is initially scarce and property initially extracts low rents, yielding a relatively egalitarian society. Yet once labor starts to fill up the land, the returns to land rise relative to the returns to labor or capital, tipping the social and income scales in favor of landholders. By the start of the twentieth century, around the time that Jackson Turner Main's grandfather proclaimed the end of the frontier, American income inequality had risen to match that of Western Europe.

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Table 1-1. Crucial New and Underused Data Sources, Roughly in order of their Historical Context

•• Gloria and Jack Main's 18,509 New England colonial probates, uploaded July 2013
•• Robert C. Allen *et al.* (2012) on the prices of consumer staples
•• Alan Kulikoff, Billy G. Smith, and Lorena Walsh on Philadelphia and the Chesapeake
•• Jackson Turner Main's income tour of Revolutionary America (1965)
•• State historical archives, especially for pre-1850 occupational data
•• Alice Hanson Jones on 1774 wealth (1977, 1980)
•• The Direct Tax returns of 1798, previewed by Lee Soltow (1989)
•• Tom Weiss on the labor force in 1800 (1992)
•• Wage data collated by American Almanac, Weeks Report, Aldrich Report, Stan Lebergott, Bob Margo, etc.
•• IPUMS USA linking individual wealth with other population attributes, 1850-1870, from the Minnesota Population Center, headed by Steven Ruggles
•• Lee Craig (1991) on 1860 farm earnings
•• Ransom-Sutch turbocharged sample of 1880 Southern farms (2001)
•• Steve Broadberry *et al.* on British GDP (in progress)

Table 2-1. Main Data Inputs for 1774 Income Estimates

	Data sources and adjustments for occupational shares
(A.) Population, labor force	Local censuses, labor force participation rates for 1800 supplied by Thomas Weiss, expanding on Weiss (1992).
(B.) Occupations of household heads and of the labor force	
New England (CT, MA, ME, NH, RI, VT)	
• Big city = Boston	• Boston 1780 shares from Main (1965), backed by Boston 1790 shares from Price (1974) and the downloaded Boston 1800 occupational directory
• 19 lesser cities & rural	• Use the 1771 Massachusetts-Maine tax returns to estimate the shares of land-owning farmers, non-land-owning farmers, and others with positive vs. zero realty. Then for the towns, apply the non-farm, non-big city occupation mix from Lancaster PA 1800 to lesser cities in 1774, and the Chester County PA rural occupation mix of non-farmers in 1800 to the rest of New England 1774.
Middle Colonies (NY, NJ, PA, DE)	
• Big-city = Phila., NYC	• Philadelphia 1772 occupations from assessment lists supplied by Billie Gordon Smith*
• 3 NJ lesser cities	• Lancaster Borough PA 1773
• Rural	• Chester County PA 1800, 9 rural townships
South (GA, MD, NC, SC, VA)	
• Big City = Charleston**	• Charleston 1790 directory, downloaded. Re-weighted away from slave holders and land owners, based on assessments for 3 North Carolina counties, 1779-1782
• Rural	• Start with Alice Hanson Jones's rural *w* weights from 4 colonies (MD, VA, NC, SC), and apply the same adjustment as for Charleston based on 3 NC counties
(C.) Free labor earnings and farm profits	Secondary literature: J.T. Main, Stanley Lebergott, Carroll Wright, Bureau of Labor Statistics, T. M. Adams, Donald Adams, Winnifred Rothenberg, and others.
(D.) Slave retained earnings	Slave retained earnings by age and sex could be derived from any two of these three parameters: free wage rate for same occupations, expropriation rate, and the slave hire rate (Fogel-Engerman, for Queen Anne's County MD 1796-1804). We used the latter two, cross-checked against the literature on slave consumption (e.g. Mancall *et al*. 2001).***
(E.) Property income	Applying a 6% rate of net return plus asset-specific depreciation to Alice Hanson Jones's wealth, re-weighted using new occupational data.

Notes to Table 2-1:

For further details on the derivation of these occupational shares, see the worksheets on LW occupational weighting in the three regional "Property 1774" Excel files, available at gpih.ucdavis.edu and through the *Journal of Economic History*'s supplementary materials link for our article (Lindert and Williamson 2013).
* See Smith (1984, 1990), supported by Price (1974) on Philadelphia 1780-1783.
** The earliest Baltimore occupational directory available is for 1799, and the earliest for Norfolk VA is for 1801. Both are posted on the http://gpih.ucdavis.edu site.
*** See the file "slave earnings retention 1800" at gpih.ucdavis.edu

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Notes to Table 2-2:
The estimates exclude Native Americans.
The baseline estimates use the full-time assumptions of 313 days per labor year, in occupations where the primary earnings data are sub-annual (e.g. daily or monthly wage rates). The part-time assumptions retain the explicitly annual income estimates for titled and professionals, for commercial proprietors, for manufacturing trades, servants, slaves, and household heads of unstated occupations having positive wealth. Part-time work years for explicit pay are assumed to have been only 280 days for construction workers, farm operators, and the rural unskilled. For urban unskilled and for household heads with zero wealth and unstated occupations, we assumed a work year of only 222 days.
Delaware is here included with the Middle Colonies for both years, following Alice Hanson Jones's sample design.

Notes to Table 2-3:
(1) Gross income, Net income = our baseline estimates of personal income, gross and net of depreciation. For the "part-time" variant, see text.
(2) For details on the 1800 estimates, see Part IV.
(3) This culled set omits very old estimates, and if a modern source offers more than one estimate, this set selects the most recent. It also selects the highest in the Jones range, as recommended by Gallman and Weiss.
(4) John McCusker's (2001) price deflators = 97 for 1774, 151 for 1800 if 1860 = 100, or 93.3 for 1774 if 1840 = 100.
(5) The western states included in the LW "US (all)" estimates are KY and TN, plus MS for labor incomes only.

Table 2-2. Estimated American Personal Incomes, 1774-1800

	New England	Middle Atlantic	South Atlantic	All 13 Colonies (15 states + DC)
	Gross income, millions of current dollars ($4.44/£ sterling)			
Circa 1774				
FTE free own-labor income	31.09	28.85	62.81	122.75
Ditto, part-time (see text)	28.16	27.26	58.27	113.70
Slave retained earnings	0.13	1.06	12.18	13.37
Gross property income	4.84	8.37	23.83	37.04
Gross total income	36.06	38.28	98.81	173.16
Ditto, with part-time	33.13	36.69	94.28	164.11
Circa 1800				
FTE free own-labor income	73.65	84.20	87.77	245.62
Ditto, with part-time	66.57	76.91	80.88	224.36
Slave retained earnings	0.07	2.10	37.34	39.51
Gross property income	21.39	47.83	89.77	158.99
Gross total income	95.11	134.13	214.88	444.12
Ditto, with part-time	88.03	126.83	208.00	422.86
	Relevant denominators			
Free labor force 1774	185,999	156,875	195,938	538,812
Total labor force 1774	188,230	175,655	436,136	800,021
Free population 1774	657,567	582,134	719,875	1,959,577
Total population 1774	661,563	613,685	1,101,151	2,376,399
Free labor force 1800	334,685	380,162	402,504	1,117,351
Total labor force 1800	335,500	404,900	835,590	1,575,990
Free population 1800	1,231,671	1,423,924	1,428,695	4,084,290
Total population 1800	1,233,011	1,464,548	2,222,221	4,919,780
	Income per capita (part-time)			
Free population 1774	50.2	61.2	114.0	76.9
Total population 1774	50.1	59.8	85.6	69.1
Free population 1800	71.4	87.6	119.4	93.9
Total population 1800	71.4	86.6	93.6	86.0

Table 2-3. Alternative Estimates of National Income, 1774 and 1800, in current $ and 1840 $ (millions)

	1774 current $m	**1774** 1840 $m	**1800** current $m	**1800** 1840 $m	**Source**
US (orig 13)	142.2	152.5			GDP: McCusker (2000)
	131.7	141.6			Gross inc: Jones (1980)
	173.2	185.7	444.1	305.9	Gross income: LW (2013a)
	164.1	176.3	422.8	291.3	" , part-time: LW (2013a)
US (all)			508.7	350.3	GDP: McCusker (2000)
	150.3	161.6	515.5	355.5	GDP: Mancall &Weiss (1999)
	135-157	145-169			GDP: Gallman (1972)
	134.8	145.0	500.1	344.9	GDP: Goldin & Lewis (1980)
	132.6	142.6			Narrow GDP: Weiss (1992)
			430.9	297.2	Berry (1988)
			446.3	307.8	David (1996)
			510.4	351.5	GDP: Mancall *et al*. (2003)
			470.7	324.2	Gross income: LW (2013a)
			448.1	308.7	" , part-time: LW (2013a)
New Eng.	35.5	38.2			Income: Jones (1980)
	34.6	37.1	95.1	65.5	Gross income: LW (2013a)
Middle Atl.	36.5	39.3			Income: Jones (1980)
	39.7	42.6	134.1	92.4	Gross income: LW (2013a)
South Atl.	59.2	63.6			Income: Jones (1980)
	98.9	106.0	214.9	148.0	Gross income: LW (2013a)
Lower	22.0	23.7	93.5	64.4	GDP: Mancall *et al*. (2003)
South Atl.			94.1	64.8	Gross income: LW (2013a)

Table 2-4. Inequality in the American Colonies 1774

Region:	All 13 colonies	All 13 colonies	New England	Middle Colonies	South	South
Households:	All	Free only	All	All	All	Free only
Gini coefficient:	0.437	0.400	0.354	0.381	0.464	0.328
	Income shares in % of total income					
Top 1% of HHs:	7.1	6.1	3.8	6.4	7.9	6.3
Top 5%:	22.2	21.6	11.4	19.3	25.6	21.3
Top 10%:	30.8	29.6	20.1	28.3	34.3	30.8
Top 20%:	47.3	43.8	35.7	43.8	49.1	42.3
Next 40%:	40.3	41.6	52.5	40.1	39.4	35.7
Bottom 40%:	12.3	14.6	11.8	16.1	11.4	21.9
	Household income levels in $ (at $4.44/£ sterling)					
Mean:	345	406	278	289	411	620
Median:	282	377	371	274	322	585
Top 1% of HHs:	2379	2471	1059	1862	3243	3910
Top 5%:	1272	1754	631	1118	2105	2635
Top 10%:	859	1202	559	818	1410	1910
Top 20%:	776	890	496	634	1011	1312
Next 40%:	369	339	365	290	406	694
Bottom 40%:	104	230	82	117	118	199

Western Europe, as a comparison group

Region: (All households)	England & Wales	England & Wales	Holland	Netherlands
Year:	1759	1802	1732	1808
Gini coefficient:	0.522	0.593	0.610	0.563
	Income shares in % of total income			
Top 1% of HHs:	17.5	14.6	13.7	17.0
Top 5%:	35.4	39.2	37.0	39.5
Top 10%:	45.1	48.8	50.9	51.3
Top 20%:	57.5	63.2	65.8	64.7
Next 40%:	30.0	27.8	25.6	22.8
Bottom 40%:	12.5	9.0	8.5	12.5
	Household income levels			
Mean:	£ 43.4	90.6*	fl. 67.8	319.3
Median:	£ 25.0	55.0	fl. 35.0	150.0

* £106.8 if we count government revenue, the King, and certain pensioners

listed separately by Colquhoun (Lindert and Williamson 1983).

Note to Table 2-4 and Figure 2-1:

See the Excel file "American incomes 1774", where the Lorenz curves and inequality parameters are derived and compared on the last five worksheets.

The inequality results in Table 2-4 are based on the full-time (FTE) measures of incomes at 313 days per year. Inequality would have been raised only slightly by using the part-time work year assumptions described in the text. For example, using the part-time work years would yield a 13-colony Gini coefficient of 0.440 for all households, or 0.408 for free households. Figure 2-1 is based on the part-time work years, for better comparability with English and Dutch inequality.

Sources and notes to Table 3-1:

RW = Rosenbloom and Weiss (pending 2013), Table 1, Henretta (1991: Table 5.1);
MRW = Peter Mancall, Joshua Rosenbloom, and Thomas Weiss; and other sources cited above.
The slow-growth estimates all use the "controlled conjecture" method about sectors and productivity growth.
The fast-growth estimates are only those that use extensive data.
Furthermore, the list excludes two extreme outliers, one very high (Ball 1976: 1.27 percent per annum) and one very low (Waters 1976: -0.30).

Table 3-1. Past Estimates of 18th Century Colonial Income Per Capita Growth

Period	Region	Per Capita Growth (%)	Data	Source
Fast-Growth Estimates				
1688-1764	Lower South	0.5	Product per capita	Menard (1996, p. 257)
1700-1770	all colonies	0.4	Wealth per capita	Jones (1980)
1713-1775	all colonies	0.5	Mainly imports per capita	Egnal (1998)
1713-1775	Lower South	0.9	Mainly imports per capita	Egnal (1998)
1650-1770	So. New Eng	0.35	Wealth per capita	Main and Main (1988)
1700-1779	So. New Eng	0.51	Wealth per capita	Anderson (1979)
1705-1776	Chesapeake	0.4	Wealth per capita	Kulikoff (1979)
1713-1775	North	0.6	Mainly imports per capita	Egnal (1998)
1713-1775	Upper South	0.1	Mainly imports per capita	Egnal (1998)
1700-1775	Upper South	0.5	All evidence c1991	Henretta (1991: p. 176)
	Average =	0.47		
Slow-Growth Estimates				
1700-1770	all colonies	0.05	GDP per capita	MW (1999)
1720-1770	Lower South	-0.03	GDP per capita	MRW (2003)
1720-1770	Middle Col's	0.13	GDP per capita	RW (2013)

Average = 0.05

Table 3-2. Colonial Price Volatility 1700-1776 in Long-run Perspective

Region, commodity	Period	St. dev. log change	Relative to import prices
New England			
Cod	1700-1776	0.042	0.70
Rum	1720-1775	0.235	3.96
Pine	1720-1775	0.235	3.96
Exports (Px)	1700-1776	0.180	3.04
Imports (Pm)	1700-1776	0.059	
Terms of trade (Px/Pm)	1700-1776	0.186	3.14
Middle Colonies			
Flour	1720-1775	0.192	3.15
Wheat	1720-1775	0.209	3.42
Pork	1720-1775	0.042	0.69
Exports (Px)	1700-1776	0.189	3.10
Imports (Pm)	1700-1776	0.061	
Terms of trade (Px/Pm)	1700-1776	0.200	3.28
Upper South			
Wheat	1720-1775	0.154	2.43
Corn	1720-1775	0.185	2.92
Flour	1720-1775	0.157	2.48
Tobacco	1700-1776	0.163	2.56
Exports (Px)	1700-1776	0.128	2.02
Imports (Pm)	1700-1776	0.063	
Terms of trade (Px/Pm)	1700-1776	0.139	2.18
Lower South			
Rice	1720-1775	0.295	6.53
Indigo	1747-1775	0.136	3.01
Naval stores	1720-1775	0.148	3.26
Exports (Px)	1700-1776	0.210	4.64
Imports (Pm)	1700-1776	0.045	
Terms of trade (Px/Pm)	1700-1776	0.210	4.64
Colony commodity average		0.181	3.16
As compared with --			
		Commodities	Manufactures
United States	1873-1896	0.065	0.105
United Kingdom	1820-1869	0.137	
19th & 20th c. international	1860-2005	0.062	
Average of the three		0.088	

Source: David Jacks *et al.* (2011), Tables 3 and 5.

Table 3-3. Trends in the Colonies' Terms of Trade, 1700-1776

Colonial region	Annual % rise in terms of trade (Px/Pm)	Commodities playing the biggest role
New England	+ 0.063	Fish
Middle Colonies	+ 0.098	Flour and wheat
Upper South	+ 0.659	Corn, flour, and wheat
Lower South	+ 0.749	Rice and especially indigo at period end

Note: Calculated from the slope in a regression on time.

Table 3-4. Indicators Guiding the Income Backcasts from 1774 to 1650

Place	Income type	Source note	Indicator series
Boston	Free labor	(NE-a)	Boston seamen and male skilled craftsmen, nominal wage rates back to 1725, male craftsmen 1725 back to 1650.
Boston	Property	(NE-b)	Sample of 18,509 probates from colonial New England 1631-1776, Boston subset of 1,492 probates.
New England rural	Free labor	(NE-c)	New England farm labor wage rates, benchmark dates 1652-1769.
New England rural	Property	(NE-b)	Sample of 18,509 probates from colonial New England 1631-1776, non-Boston subset.
New England slaves	Slave labor	(NE-c)	Assumed to be a fixed share of free farm wage.
Mid Colonies, urban	Free labor	(MC-a)	Philadelphia laborers and Philadelphia seamen, wages back to 1725, averaged.
Mid Colonies, urban	Property	(MC-b)	Philadelphia probated personal wealth by occupational group, 1685/1715 -1756/1775.
Mid Colonies, all	Total income	(MC-c)	production-side income per capita.
Upper South, rural	Farm income	(Ches-a)	Gross farm income index, Chesapeake tobacco-and-grain farms, back to 1675.
Lower South	All income	(LS-a)	Regional GDP per capita 1720-1775, as estimated by MRW (2003).

Notes to Table 3-4:

(NE-a) For craftsmen, Gloria Main (1977), with interpolations between her broad averages. The Boston seamen's monthly wage is from Nash (1979, pp. 392-394). Robert Allen and we have made some use of Weeden's (1890) Boston wage data in choosing how to interpolate Gloria Main's series. The Weeden data are quite sparse, however.

(NE-b) Gloria L. Main and Jackson T. Main, colonial New England probate sample, http://gpih.ucdavis.edu. Regression-adjusted to age 45.
For related occupation-specific series on Boston probated wealth from 1685-1715 to 1756-1775, see Gary B. Nash, *Urban Crucible* (1979, pp. 397-398).

(NE-c) Gloria Main (1977) adult male farm wage rate, with interpolations between her broad averages.

(MC-a) Indexed to the simple average of Philadelphia laborer wage rate and seaman wage rate, 1774 = 100, from Nash (1979, pp. 392-394).
The file "Wage indices 1650-1774" compares these with the B.G. Smith series for Philadelphia 1750-1775.

(MC-b) The urban wealth indexes are derived in the file "Nash Philly probates backcast results", using the Philadelphia probated personal estate data by occupation in Nash (1979, pp. 396-398). Realty not included.
The adjustments for probate bias were necessarily less complete in this case than in the use of the Mains' probate sample for New England.
Here we could re-weight to the occupational group weights of the living, but we could not adjust for differences in age at death.
That is, the average wealth for a given occupation in a given period is an average for probates at death, not probates for a given age.

(MC-c) Conjectural estimates by Rosenbloom and Weiss (2014).

(Ches-a) The sources are: Carr, Menard, and Walsh (1991), Walsh (1999), and Walsh (2010). For our calculations, see Variant 4 in the file "Chesapeake income clues" at http://gpih.ucdavis.edu. Guided by that literature, we assume that 22 percent of gross farm income came from tobacco sales, 11 percent from grain sales, and the remaining 67 percent from production consumed on local farms. This farm-consumed production was assumed to grow at 0.1 percent per annum per capita.

(LS-a) The source is Mancall, Rosenbloom, and Weiss (2003).

Table 3-5. Predicted Wealth for 45-year-old Colonial New Englanders, by Time and Place, for Selected Occupations
(among those having positive gross assets)

	c1650	c1675	c1700	c1725	c1750	c1770
(A.) *Gross wealth in "bare-bones" consumer bundles for one man*						
Boston commerce, professions	305.6	297.7	354.2	. .	. .	319.2
Hinterland farmers	109.1	127.8	165.0	230.5	205.9	287.0
Hinterland artisans	75.2	62.5	70.4	62.4	50.2	50.4
Hinterland laborers	23.3	22.3	31.0	27.6	22.2	24.8
Hinterland widows	50.4	35.5	34.5	22.8	24.7	24.9
(B.) *Cost of "bare-bones" bundle* (£)						
One person	2.02	1.60	1.34	1.37	1.68	1.64
Four persons	6.38	5.03	4.22	4.33	5.28	5.15
(C.) *Gross wealth in current £ sterling*						
Boston commerce, professions	618.8	475.8	474.8	. .	. .	522.0
Hinterland farmers	220.9	204.2	221.1	316.5	345.3	469.4
Hinterland artisans	152.3	99.8	94.4	85.7	84.2	82.4
Hinterland laborers	47.2	35.7	41.5	37.9	37.2	40.5
Hinterland widows	102.0	56.8	46.2	31.3	41.5	40.7

Sources and notes:
The underlying probate data set is available at http://gpih.ucdavis.edu.
The costs of bare-bones consumer bundles are annual series underlying (Allen *et al.* 2012), kindly supplied by Robert C. Allen.
The time periods are quarter centuries centered on the year shown (e.g. "c1650" = probates from 1638 through 1662), except that "c1770" corresponds to 1763-1776.
In the first period (c1650) there were only 25 widows in the probate data set.
The "hinterland" consists of all sampled towns founded later than 1638 (thus excluding Boston, New Haven, Hartford, and eastern coastline towns).
For more extensive probate regression results, see the files "Mains' New England probate data, regression equation" and "Mains' New England probate backcast results" at gpih.ucdavis.edu.

Table 3-6. Conjectural Estimates of Gross Income per Capita, 1650-1774

For the total population, including slaves.

(A.) *In current pounds sterling (per capita)*

	1650	1675	1700	1725	1750	1770	1774
New England, all	7.0	7.2	7.7	8.3	10.3	11.6	11.3
Boston	10.9	10.1	10.1	11.2	13.2	11.4	9.8
Other NE	6.6	7.0	7.5	8.1	10.2	11.6	11.3
Middle colonies (w/DE)			*10.1*	10.5	11.7	14.7	13.5
Phila & NYC free				20.1	23.6	27.2	24.0
Other Middle Col's							12.4
Chesapeake		18.4	18.3	16.0	16.0	18.4	16.6
Lower South			*24.3*	24.3	23.8	24.1	24.1
Charleston free							119.0
Other Lower South							21.3
All 13 colonies			*13.1*	12.7	14.2	16.5	15.6
Great Britain	7.6	9.3	11.5	11.9	12.9	15.2	15.7

(B.) *In units of the local bare-bones consumer bundle for one man*

	1650	1675	1700	1725	1750	1770	1774
New England, all	3.6	4.6	5.5	5.9	5.8	6.7	6.1
Boston	5.5	6.4	7.3	8.0	7.5	6.5	5.3
Other New England	3.4	4.4	5.4	5.8	5.7	6.7	6.1
Middle colonies (w/DE)			8.2	7.9	8.2	8.2	8.6
Phila & NYC free				15.2	16.6	15.2	15.3
Other Middle Col's							7.9
Chesapeake		18.8	16.1	13.3	12.4	12.3	12.0
Lower South			21.3	20.2	18.5	16.1	17.4
Charleston free							86.1
Other Lower South							15.4
All 13 colonies			10.9	10.1	10.1	10.3	10.4
Great Britain	3.9	4.8	6.5	6.4	6.6	6.7	6.2

Notes to Table 3-6:
For the methods of derivation, see text and Table 3-4, and see the regional "backcast" files at http://gpih.ucdavis.edu.
The underlying data were averaged of over varying time periods, shaped by data availability. The periods over which incomes and the cost of living were averaged are 1638-1662 for "1650" here, 1663-1687 for "1675", 1688-1712 for "1700", 1713-1737 for "1725", 1738-1762 for "1750", 1763-1774 for "1770", and finally just 1774 alone.
For the lower South, the estimates are those of Mancall, Rosenbloom, and Weiss (2003); the year "1725" is actually 1720, and "1750" is 1740. Similarly for the Middle Colonies as a whole, taken from Rosenbloom and Weiss (2014).

All colonial costs of purchasing a bare-bones consumer bundle are based on annual data kindly supplied by Robert C. Allen, underlying the averages described in Allen *et al.* (2012). The Great Britain series divided the Broadberry *et al.* (2011 online) nominal GDP by annual data for London and southern England underlying Allen *et al.* (2011).

Table 4-1. Main Data Inputs for 1800 Income Estimates

(A.) Population, labor force

U.S. census, labor force participation rates for 1800 supplied by Thomas Weiss, expanding on his estimates in Weiss (1992).

(B.) Occupations of household heads and of the labor force

- City directories and tax lists for Baltimore 1799, Boston 1800, Charleston 1800, Hartford 1799, New York City 1799, Norfolk 1801, Philadelphia 1800;
- Town directories and tax lists for Lancaster PA 1800, Lexington KY 1806, Pittsburgh 1815; and
- Rural tax lists from Burke County GA 1799, Chester County PA 1799-1802.

C.) Free labor earnings and farm profits

Same sources and methods as in Table 2-1, but we can offer no estimate of farm profits.

(D.) Slave retained earnings

Same sources and methods as in Table 2-1.

(E.) Property income

The 1798 direct tax on real estates and slaves, via Pitkin (1817) and the Connecticut State History Museum. See also Soltow (1989), Einhorn (2006). We assumed similar local ratios of real estate and slave valuations to total property as in 1774.

Note to Table 4-1: See the details of these data sources and their use in http://gpih.ucdavis.edu

Table 4-2. Real Income per Capita 1774-1860

(A.) Total product per capita, part-time work years (1840 dollars)

	1774	1800	1840	1860
New England	61.83	56.66	129.01	181.39
Middle Atlantic	73.81	68.73	119.68	186.65
South Atlantic	105.70	74.29	85.49	137.75
East North Central			71.50	135.78
West North Central			79.27	136.20
East South Central			85.49	132.83
West South Central			161.65	175.30
Mountain				209.07
Pacific				501.81
"Original thirteen"	85.26	68.22	110.93	169.18
All USA			101.03	160.16

(B.) Implied real growth rates per annum

	1774-1800	1800-1840	1840-1860	1800-1860
New England	-0.33	2.08	1.72	1.96
Middle Atlantic	-0.27	1.40	2.25	1.68
South Atlantic	-1.35	0.35	2.41	1.03
East North Central			3.26	
West North Central			2.74	
East South Central			2.23	
West South Central			0.41	
"Original thirteen"	-0.85	1.22	2.13	1.53
All USA			2.33	

Notes to Table 4-2:
(1) A later draft will add our 1850 income benchmark.
(2) A geographic variance:
For 1774 and 1800, Delaware is included in the Middle Colonies, following Alice Hanson Jones's procedure; and Florida was not yet included in 1800.
Yet for 1840 and 1860, Delaware is included in the South Atlantic, as is Florida.
(3) Price deflators: Figure for 1800-1860 comparisons are Weiss's (1993) broad-GDP deflator. Index for 1800 = 126, index for 1860 = 106.
Figures for comparing 1774 and 1800 = David-Solar CPI, spliced to the Weiss-Sutch GDP deflator at 1800 (1840 = 100). So 1774 = 81.

Table 5-1. The Inequality of American Household Incomes, 1850

Region	Gini coeff.	Percent shares of total income: Top 1	Top 5	Top 10	Top 20	Bottom 40	Mean h'hold income (curr $)
In 1850, all households							
New England	0.417	6.7	18.8	29.7	46.3	14.6	828
Middle Atlantic	0.447	7.9	21.3	33.2	50.1	13.8	774
South Atlantic, w FL	0.574	13.8	32.2	44.3	61.2	8.7	505
South Atlantic, no FL	0.575	13.9	32.3	44.5	61.4	8.8	503
East North Central	0.328	5.6	16.1	25.6	40.8	20.4	654
West North Central	0.399	6.2	18.4	29.1	45.2	16.2	588
East South Central	0.537	15.6	31.2	42.1	57.7	9.8	526
West South Central	0.516	14.0	29.1	40.8	57.5	12.2	628
Mountain	0.318	6.7	16.7	25.5	40.4	21.6	802
Pacific	0.432	7.2	21.2	32.3	48.7	14.7	3635
All USA	0.487	10.4	24.9	36.5	52.7	11.7	672
"Original 13"	0.497	9.2	23.7	36.1	53.1	10.8	689
In 1850, free households only							
South Atlantic, w FL	0.479	11.3	27.2	38.5	53.0	13.7	770
South Atlantic, no FL	0.480	11.3	27.3	38.6	53.1	13.6	772
West North Central	0.351	5.9	17.3	27.4	42.7	19.7	653
East South Central	0.439	12.8	28.1	37.6	51.0	16.7	781
West South Central	0.454	12.6	26.3	36.5	51.0	15.2	927
All USA	0.436	9.7	23.3	34.2	49.5	15.3	779
"Original 13"	0.449	8.6	22.1	33.7	50.0	13.9	786

Table 5-2. The Inequality of American Household Incomes, 1860

Region	Gini coeff.	Percent shares of total income: Top 1	Top 5	Top 10	Top 20	Bottom 40	Mean h'hold income (curr $)
In 1860, all households							
New England	0.457	7.0	20.5	32.3	49.4	12.7	889
Middle Atlantic	0.488	9.1	23.3	35.7	52.9	11.8	977
South Atlantic, w FL	0.608	13.7	33.6	47.5	64.8	7.7	651
South Atlantic, no FL	0.610	13.9	33.9	47.8	65.2	7.8	648
East North Central	0.399	7.0	19.1	29.6	45.5	16.6	761
West North Central	0.419	6.9	20.0	30.7	46.6	15.1	749
East South Central	0.552	12.5	31.4	44.4	60.8	10.8	705
West South Central	0.569	16.0	34.9	47.2	62.7	10.9	860
Mountain	0.515	10.2	26.2	39.2	56.1	11.6	1,003
Pacific	0.415	6.5	18.8	29.7	46.1	14.6	1,937
All USA	0.511	10.0	25.6	38.0	54.9	10.7	829
"Original 13"	0.529	9.9	25.5	38.4	56.0	9.3	852
In 1860, free households only							
South Atlantic, w FL	0.525	11.0	27.9	40.5	56.6	10.9	989
South Atlantic, no FL	0.527	11.1	28.1	40.7	56.8	10.8	993
West North Central	0.388	6.6	19.2	29.5	44.9	17.1	806
East South Central	0.490	10.1	26.9	39.1	54.6	13.3	1,041
West South Central	0.523	13.6	31.1	42.5	57.4	11.9	1,295
All USA	0.474	9.4	24.1	35.9	52.1	13.0	944
"Original 13"	0.491	9.3	23.9	36.2	53.1	11.7	959
USA 2006	0.493	18.0	(Atkinson-Piketty-Saez 2011)				

Table 5-3. The Inequality of American Household Incomes, 1870

Region	Gini coeff.	Percent shares of total income: Top 1	Top 5	Top 10	Top 20	Bottom 40	Mean h'hold income (curr $)
In 1870, all households							
New England	0.516	10.4	27.8	40.6	56.0	11.1	1,372
Middle Atlantic	0.518	9.3	26.0	40.1	56.3	10.8	1,410
South Atlantic	0.532	8.9	25.7	37.6	55.5	8.9	695
East North Central	0.470	9.3	26.3	37.5	52.6	13.9	1,067
West North Central	0.482	9.9	28.7	40.7	54.4	13.9	1,102
East South Central	0.493	8.9	25.0	36.4	52.9	11.6	835
West South Central	0.484	7.9	22.6	33.8	50.7	10.7	927
Mountain	0.467	7.0	21.7	34.0	51.7	13.5	1,049
Pacific	0.503	12.5	29.2	41.5	55.9	12.6	1,767
All USA	0.514	10.0	27.7	39.9	55.5	11.1	1,110
"Original 13"	0.538	10.0	28.0	41.1	57.2	9.5	1,191
In 1870, white households only							
New England	0.515	10.4	27.7	40.5	55.9	11.2	1,377
Middle Atlantic	0.516	9.3	25.9	40.0	56.1	11.0	1,426
South Atlantic	0.490	7.8	23.3	35.0	51.0	10.5	916
East North Central	0.469	9.3	26.3	37.5	52.6	13.9	1,076
West North Central	0.479	9.7	28.4	40.6	54.2	14.0	1,122
East South Central	0.475	8.2	24.0	35.1	50.9	12.0	1,038
West South Central	0.447	7.4	21.0	32.0	47.8	12.5	1,176
Mountain	0.465	7.2	21.9	34.2	51.6	13.7	1,029
Pacific	0.498	13.0	29.5	41.4	55.6	13.0	1,761
All USA	0.499	9.6	26.8	39.1	54.5	11.9	1,206
"Original 13"	0.517	9.6	26.7	39.9	55.8	10.7	1,306

Table 5.4. Gini Coefficients of Inequality of Pre-fisc Household Incomes since the Eighteenth Century

	America	Britain	Netherlands	Notes
1732			0.630	Holland
1759		0.522		Eng-Wales
1774	0.437			
1800		0.593	0.540	Eng-Wales 1801/03, Netherlands 1798
1850	0.487			
1860	0.511	0.490		Eng-Wales 1867
1867		0.506		(UK)
1870	0.514			
1911		0.483	0.500	UK = 1911, Netherlands = 1914
1929	0.490			USA = "consumer units"
1967	0.408	0.322		UK = APS
1976	0.402	0.339		UK = APS
1985	0.431	0.469	0.473	USA = APS
1990	0.455	0.490	0.474	"
1995	0.463	0.507	0.484	"
2000	0.483	0.512	0.424	"
2005	0.498	0.503	0.426	"
2008	0.498	0.508	0.417	"
2010	0.512	0.523	0.424	"

Sources and notes to Table 5.4 and Figures 5-1 and 5-2:
For the American colonies 1774 and USA 1850-1870, our calculations use the sources cited in the text. For England-Wales and the United Kingdom in the 17th-19th centuries, Lindert and Williamson (1982, 1983), as updated in the Excel files for "early income distributions" at http://gpih.ucdavis.edu.
Van Zanden (1995) and Soltow and van Zanden (1998: 35, 172) for Holland 1732, and for Netherlands 1798 and 1914.
OECD income inequality series for Britain and Netherlands 1985-2010.
"Pre-fisc" refers to original income before taxes and transfers.
APS = Downloaded data underlying Atkinson-Piketty-Saez (2011) data starting 1960s, using the gini that excludes capital gains, with post-2006 data spliced onto this series using OECD series. Updated past 2005 by splicing OECD pre-fisc gini's onto the APS series.

Table 6-1. Income per capita by Race and Region, 1850 - 1870

	(in current dollars)			Ratio,
	White	Non-white	All races	non-white/white
South 1850*	145.6	31.6	106.8	0.217
South 1860	198.0	43.5	144.6	0.220
South 1870	188.8	83.7	153.8	0.443
USA 1850*	146.4	31.5	130.9	0.215
USA 1860	185.6	43.6	167.7	0.235
USA 1870	245.4	94.4	227.4	0.385

Notes to Table 6-1:
See the extended "Regional household incomes" tables in the American 1650-1870 folder at gpih.ucdavis.edu.
"South" excludes Missouri, and equals the three southern regions of the Census Bureau (South Atlantic, ESC, and WSC).
*For 1850, "white" actually refers to the entire free population and "non-white" = slaves.
Alternative price deflators:
(a) Robert Allen's (2012) cost of a barebones bundle in Philadelphia: For 1850, the 1846-1850 average = $9.05; for 1860, the 1856-1860 average = $10.59; for 1870, the 1866-1870 average = $15.69.
(b) The David-Solar (1977) index, based on 1860 = 100: For 1850, the 1846-1850 average = 94.4; for 1860, the 1856-1860 average = 101.2; for 1870, the 1866-1870 average = 172.2.

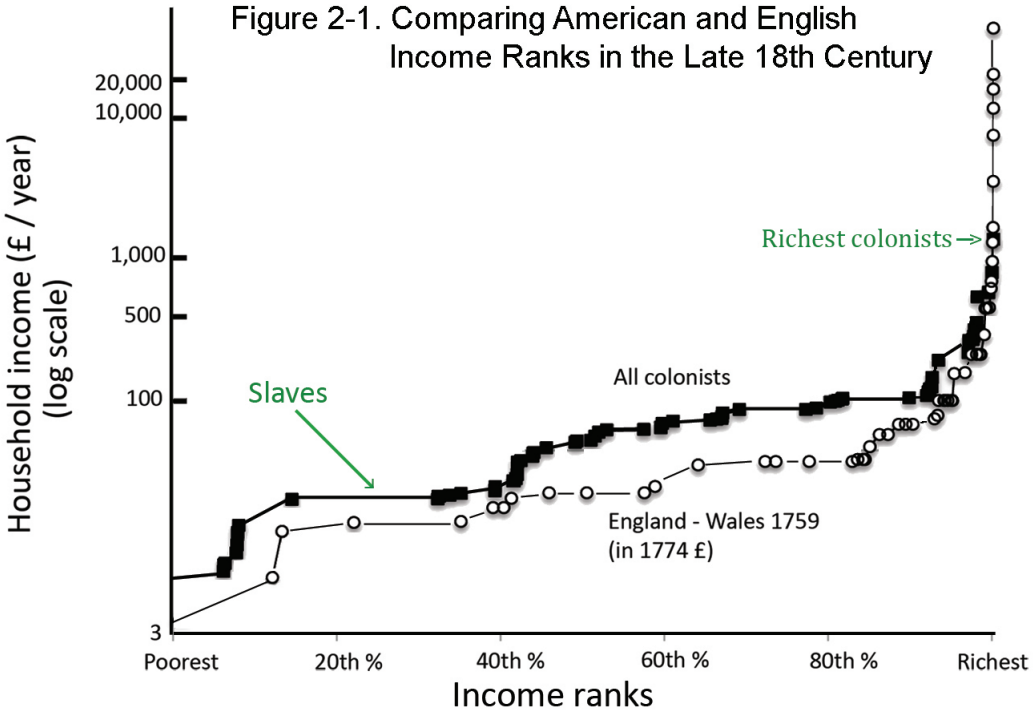
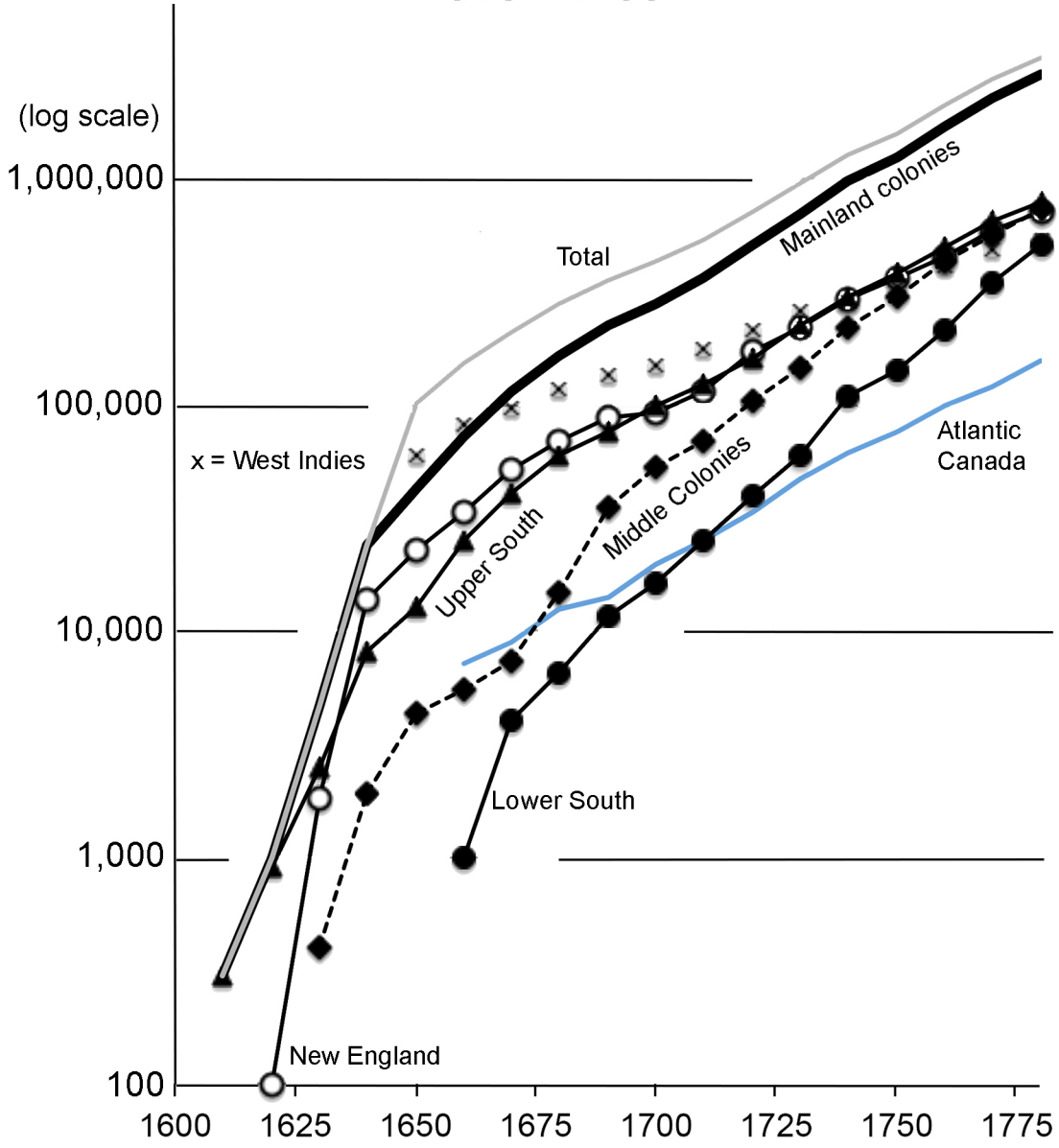

Figure 2-1. Comparing American and English
Income Ranks in the Late 18th Century
Household income (£ / year)
(log scale)
20,000
10,000
1,000
500
100
3
Richest colonists
All colonists
Slaves
England - Wales 1759
(in 1774 £)
Poorest
20th %
40th %
60th %
80th %
Richest
Income ranks

Figure 3-1. Population of British America
1610 - 1780



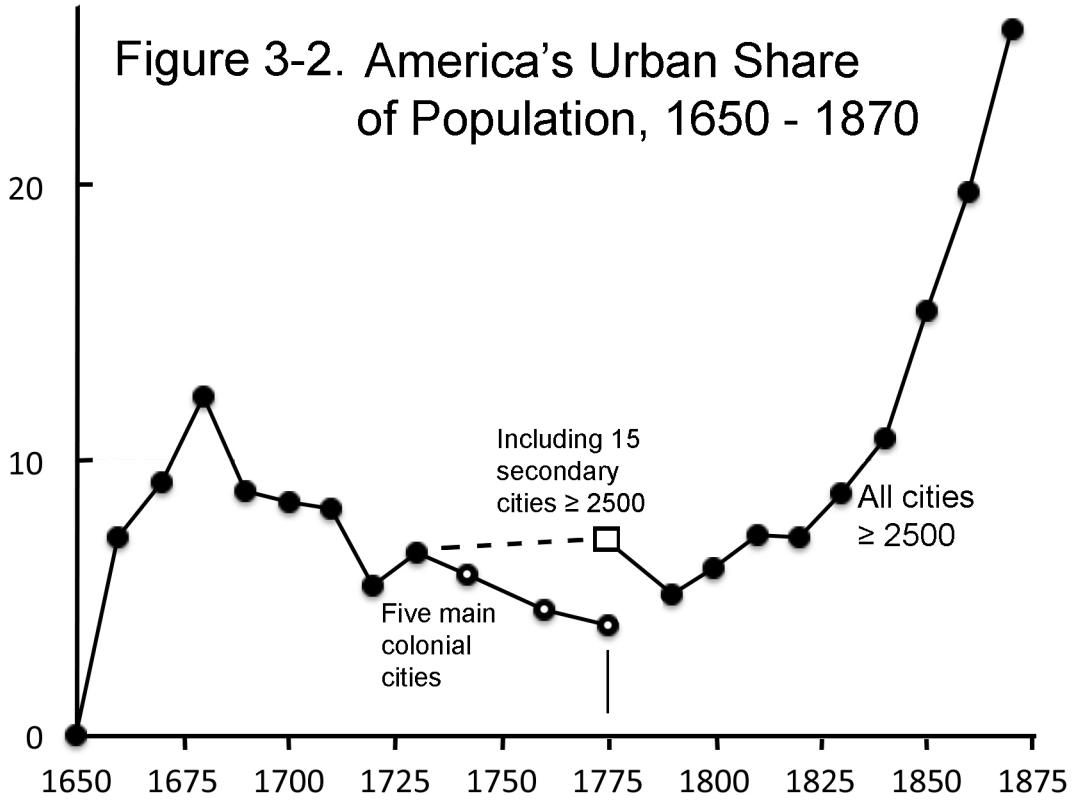

Figure 3-2. America's Urban Share of Population, 1650 - 1870
20
10
0
1650
1675
1700
1725
1750
1775
1800
1825
1850
1875
Including 15 secondary cities ≥ 2500
All cities ≥ 2500
Five main colonial cities

Figure 3-3. GDP per Capita in 13 American Colonies and Great Britain, 1650 - 1774

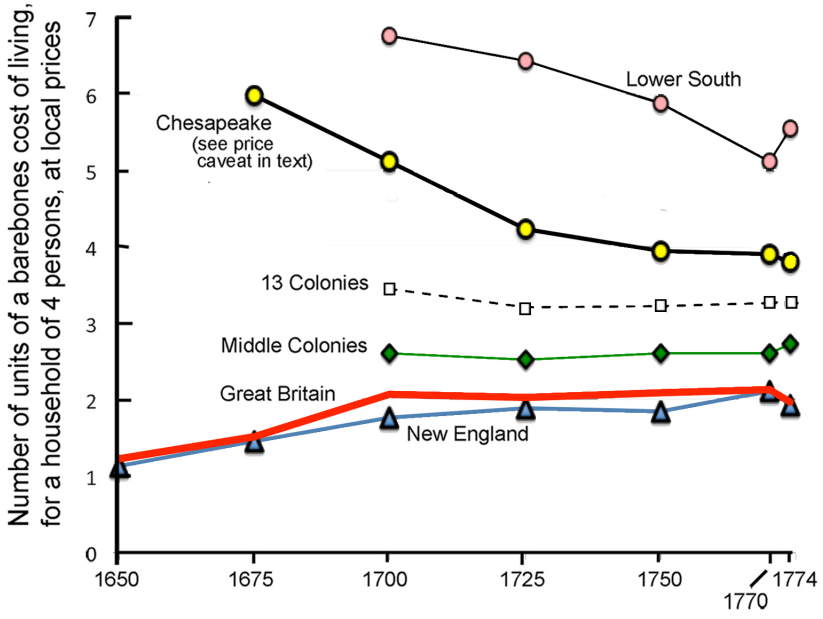
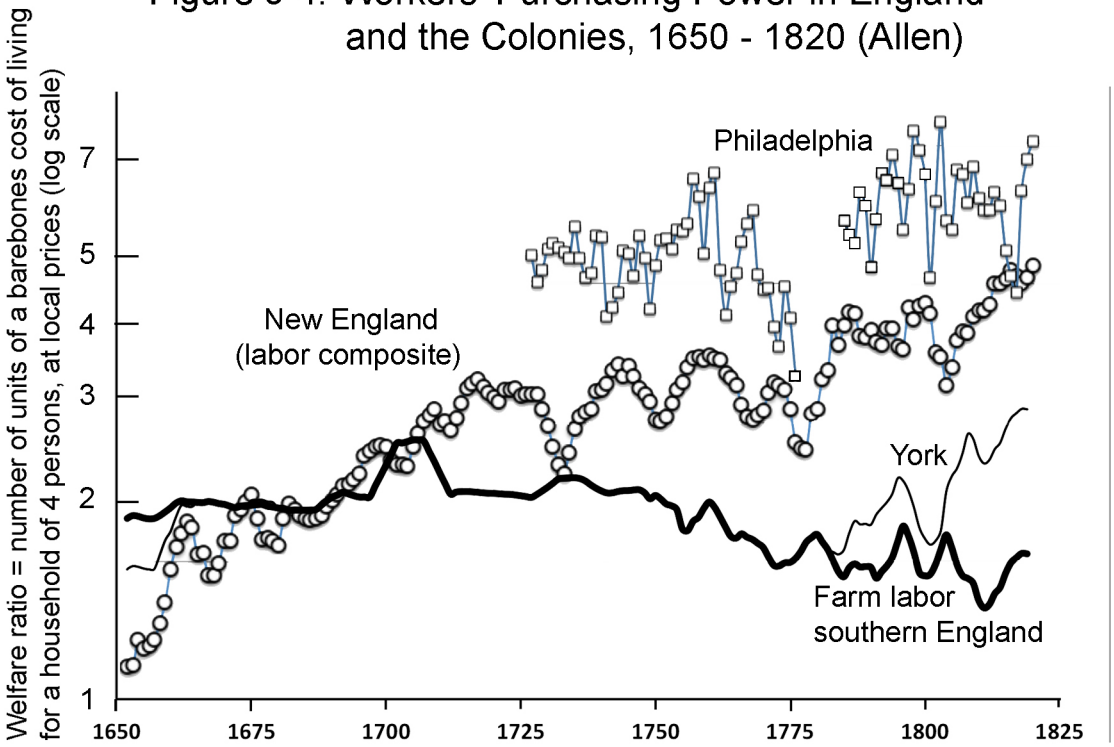


Figure 3-4. Workers' Purchasing Power in England and the Colonies, 1650 - 1820 (Allen)



Notes to Figure 3-4:
Five-year moving averages of data kindly supplied by Robert C. Allen. Each worker is assumed to have done 250 days of paid work a year.
The New England composite = a spliced mixture of Gloria Main's adult male farm labor, Boston laborers, and seamen out of Boston. Philadelphia = a composite of urban laborers and seamen out of Philadelphia.

Figure 3-5. The Cost or Certain Necessities
In England and America, 1632 - 1894

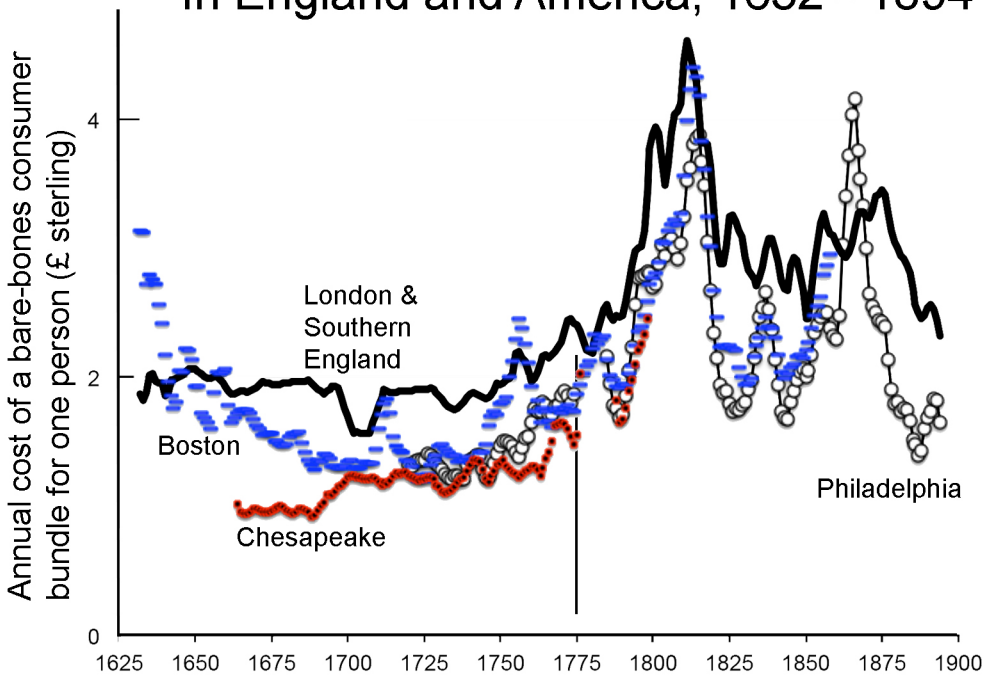


Figure 4-1. Nominal GDP per capita
Britain and America 1650 -1870

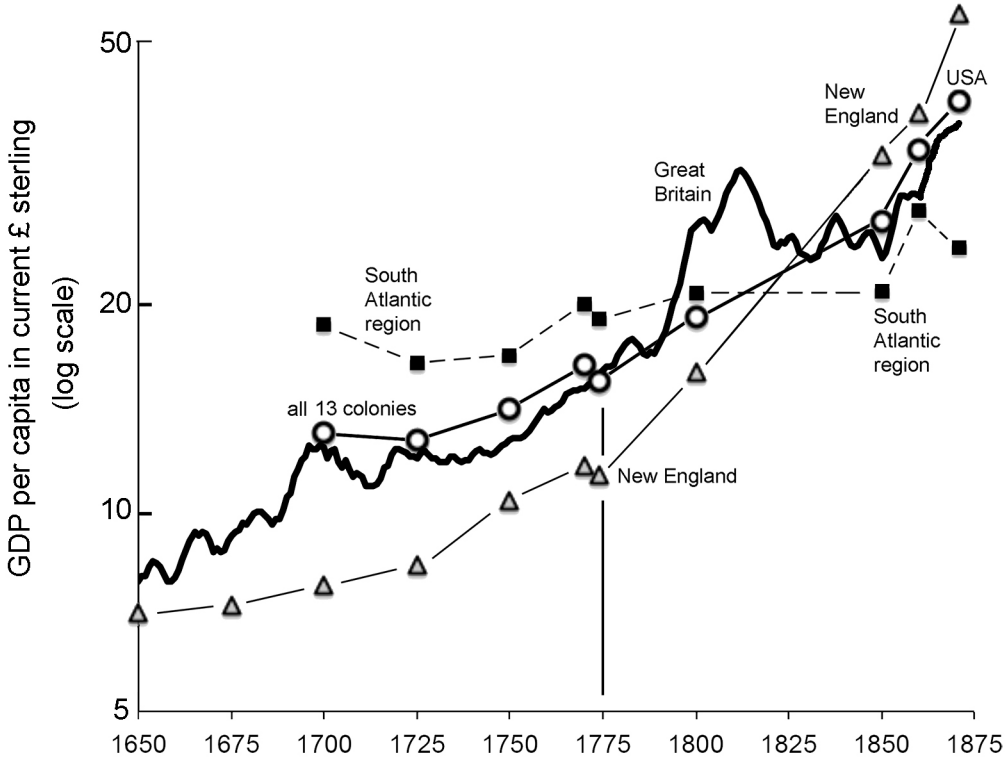


Figure 4-2. Real GDP per capita
Britain and America 1650 -1870

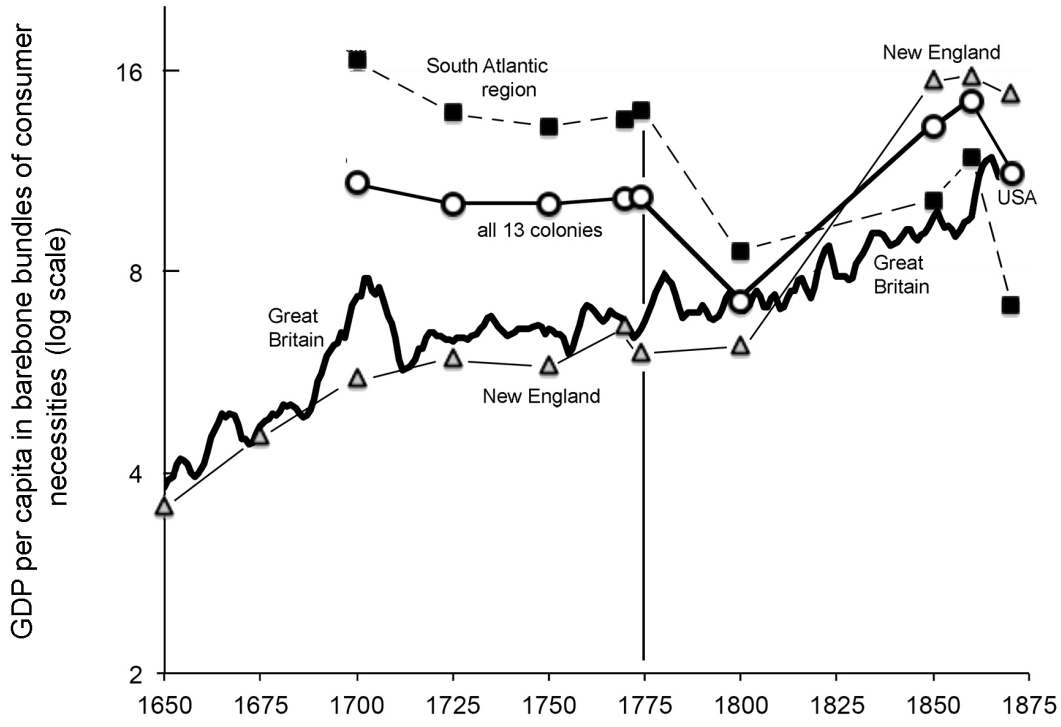


Figure 5-1. Income Inequality in America, Britain, and the Netherlands 1732 - 2010

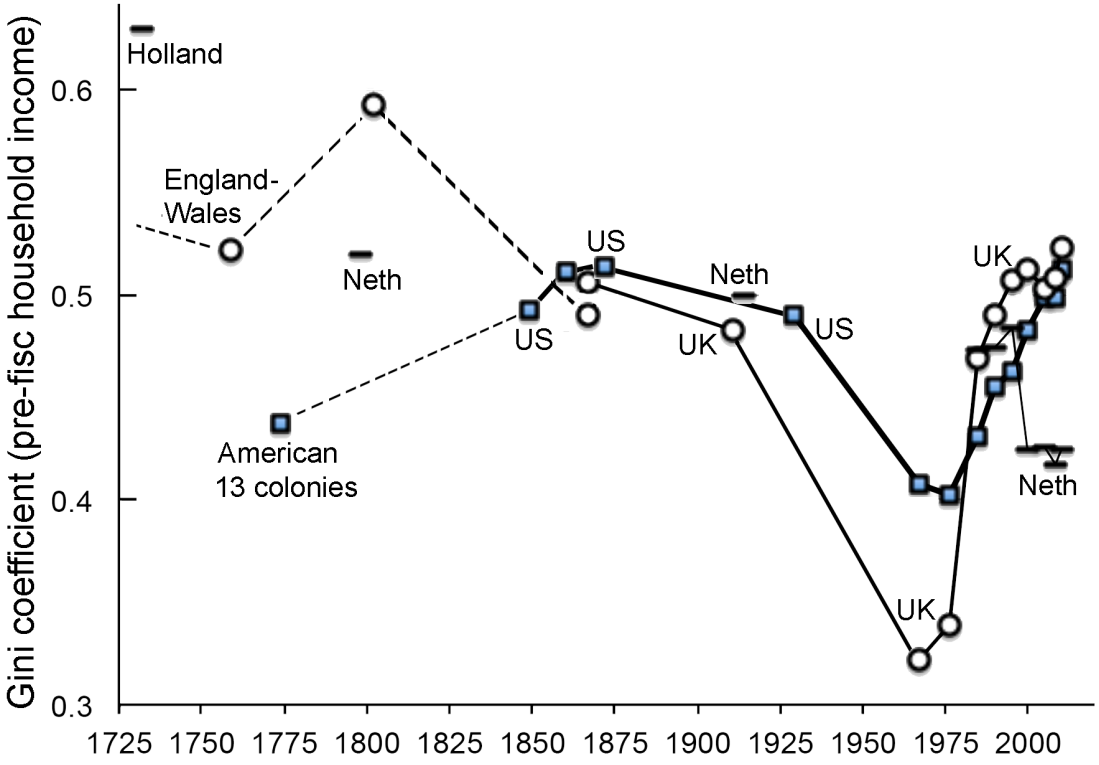


Figure 5-2. Top One Percent's Share of Income in Four Countries in Recent Centuries

