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AMERICAN COLONIAL INCOMES, 1650-1774

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ABSTRACT

New data now allow conjectures on the levels of real and nominal incomes in the thirteen American colonies. New England was the poorest region, and the South was the richest. Colonial per capita incomes rose only very slowly, and slowly for five reasons: productivity growth was slow; population in the low-income (but subsistence-plus) frontier grew much faster than that in the high-income coastal settlements; child dependency rates were high and probably even rising; the terms of trade was extremely volatile, presumably suppressing investment in export sectors; and the terms of trade rose very slowly, if at all, in the North, although faster in the South. All of this checked the growth of colony-wide per capita income after a 17th century boom. The American colonies led Great Britain in purchasing power per capita from 1700, and possibly from 1650, until 1774, even counting slaves in the population. That is, average purchasing power in America led Britain early, when Americans were British. The common view that American per capita income did not overtake that of Britain until the start of the 20th century appears to be off the mark by two centuries or longer.

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I. Overview

What were the average income levels in the thirteen colonies that became the United States? Who had more than whom? Which colonies were richest? How did income levels and their distribution change between the mid-17th century and the eve of the Revolution? How did income levels and their distribution compare with those in Britain?

This paper uses a different approach to estimate early American GDP from that used by others. National income and product accounting 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. We work instead from the personal income side, assembling nominal GDP from free labour earnings (including income in-kind), property incomes, and slaves' "retained earnings" (e.g. slave maintenance or actual consumption). No such estimates have been available for any year before 1929, and certainly not for the colonial years. Our estimation technique leads to insights not attainable by the production or expenditure side. First, it offers the chance to challenge previous GDP estimates using different methods and different data. Second, our method exposes the distribution of income among socio-occupational classes, races, and regions, building on the social tables tradition pioneered in the 17th century by Gregory King and others.

We report four key findings about American colonial experience with growth and inequality up to the Revolution:

Colonial income per capita growth was very slow: In the debate over colonial income per capita growth, our results support the slow- or no-growth side. This is not a "pessimist" result, however, since it is consistent with a century-long prosperity based on a colonial supply of primary products to Atlantic markets and on the rapid expansion of an interior poorly integrated with Atlantic markets but producing a high level of subsistence.

Southern relative income per capita declined: The South's relative income per capita fell over the century, 1675-1774, starting from its being the richest part of the thirteen colonies[1] – even when slaves are counted as low-income residents.

Colonial American incomes were relatively equally distributed in 1774 and were probably even more so in the seventeenth century for whites, but became less unequal for all households: Among whites, inequality may have diminished over time because yeoman ruralisation and frontier settlement outran the growth of cities and towns. Including slave households in the distribution should reverse that conclusion. Given slaves' near-bottom incomes, inequality among all households probably rose, as the slave share of total population increased from about 4 per cent in 1650 to about 21 per cent in 1774. Still, the American colonies in 1774 probably had the most equal distribution of income in the Western world – even including the slaves.

Colonial America was an income per capita leader: Before the 20th century, the period during which Americans most clearly led Britain in purchasing power per capita was in the colonial era -- when the Americans were British. We then lost that lead in the Revolution, and had to regain it thereafter.[2] Scholars accepting Maddison's implication (1995, 2001) that America had not caught Britain in income per capita until the start of the 20th century would be off the mark by at least two centuries.

While our exploration of these important issues ranges broadly, it will be subject to three major omissions. The first is that our presentation excludes the Native American population, due to the paucity of information on their living conditions. Second, we cover only the 13 mainland British colonies, ignoring the West Indies and Canada, and all Spanish, French, or Russian settlements. Finally, we see no way to place any monetary valuation on freedom itself. Nor can we quantify inhumane treatment. We follow only slave "incomes", a much narrower concept than their wellbeing.

[1] It was 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).

[2] Our most recent estimates-in-progress, those for 1870, find that the American lead over Britain in purchasing power per capita had disappeared once again, across the Civil War decade of the 1860s.

II. American Colonial Incomes in 1774 [3]

The best place to light our first colonial candle in the statistical darkness of early American income history is the year 1774, on the eve of the Revolution.[4] After all, the c1774 data relating to property and labour incomes are, relatively at least, of high quality. On the property side, we can tap Alice Hanson Jones's classic study of American colonial wealth (1977, 1980). For the earnings of free labour, we can take advantage of Jackson Turner Main's *The Social Structure of Revolutionary America* (1965). Main and other scholars scoured the archives for late colonial newspapers and business accounts that put numbers on what American colonists earned with their labour and their skills. In addition, several scholars have already reckoned the incomes retained by slave labourers after their owners had extracted their rents. This section anchors the rest of the paper, offering the 1774 benchmark against which the 17th and 18th century performance can be gauged.

Our estimation approach starts by counting people by occupations, and mustering evidence about their average labour earnings and property 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 a similarity between our social tables and their social accounting matrices.[5]

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[3] 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".

[4] This section both condenses and extends material published in _____. See also the supporting statistical evidence in http://gpih.ucdavis.edu within the folder "American incomes 1650-1870".

[5] For previous uses of this approach, see 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

Counting early Americans by work status, location, and living arrangement starts from basic population totals themselves. The few local censuses from the colonial period are now collated and referenced in the colonial section of the *Historical Statistics of the United States* (2006). These offer detail by age, sex, race, free/slave status, and location for seven colonies; we clone the demography of the six missing colonies from these seven. Next we derive labour force participants in each demographic group. To do so, we use detailed rates of labour force participation defined by location, sex, race, free/slave status, and age for 1800 supplied by Thomas Weiss. It seems reasonable to assume that there were no behavioural changes over these twenty-six years in 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. Next, we assign occupations to the 1774 labour force, a procedure that uses local censuses, tax assessment lists, occupational directories, and close attention to those missed in those sources (mainly the menial poor). Thus, we are able to create the following occupational groups for the free population: officials, titled, and professionals; merchants and shopkeepers; skilled artisans in manufacturing; skilled in the building trades; farm owner-operators, renters, sharecroppers, and planters; male menial labourers; and female menial labourers (including domestics).

One could avoid estimating household headship if we were only interested in measuring aggregate national income or product, since it depends only on who is in the labour force and their average incomes. 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. 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 argued for the measurement of income per household member.

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growing need to finance wars. On the rise of the quantification culture in late-18th century England, see Hoppit (1996).

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

Annual incomes can be assigned to the most ubiquitous occupations in each location, thanks to the archival gleanings offered by Jackson Turner Main and several other scholars.[6] Some of the documented earnings are annual, e.g. for white-collar professionals, 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, when employed workers toiled at productive labour for six days a week or 313 days a year. 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.

However, 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 comparing our results with theirs. Thus, we also calculate 1774 part-time estimates that use fewer labour days per year for hired labour and even for farmers. 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 farm-operator households, all of which involved outdoor work and thus were influenced by weather; and 222 days for households headed by free urban unskilled labourers and zero-wealth household heads of unknown occupation. Our part-time variant yields

[6] 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); United State BLS (1929); and Winnifred Rothenberg (1988).

average work years closely matching those for England in the late 18th century.[7] Our assumptions yield the following 1774 ratios of part-time to full-time total incomes (labour plus property): for all 13 colonies, free households 0.943, and for all households 0.948. These ratios imply that the difference between "full-time" and "part-time" estimates will not explain much of the gap between our income estimates and those made by others for 1774, as we will see shortly.

Labour earnings include farm operators' profits, estimated by Main (1965), plus slaves' and indentured servants' retained share of what they earned. We call this labour income amalgam "own-labour incomes".

Our property income estimates benefit from Alice Hanson Jones's detailed study of America's wealth in 1774, based on her probate inventory samples and supporting documents.[8] An important advantage of her data is that they identify the occupation or social status of most of those probated in her colonial sample. 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 for the 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.

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 our wage and income data. On average, it appears that colonial assets earned a net rate of return of about 6 per cent per annum (Brock 1975; Davis 1964; Homer and Sylla 1991: pp. 276-79; Nettles 1934). Robert Morris wrote in January 1777

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[7] For estimates of the length of the English work year, see http://www.lse.ac.uk/economicHistory/pdf/Broadberry/BritishGDPLongRun16a.pdf.

[8] 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.

"that 6 per cent was the opportunity cost of capital placed in private securities" and "six per cent was also the rate used by the national government for loans between 1776 and 1790" (Grubb 2013: p. 20, fn. 16). Winifred Rothenberg stresses that 6 per cent was the "lawful interest" stipulated by colonial law (Rothenberg 1985: p. 790).

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 per cent plus rates of depreciation. Following conventional accounting standards, we have assumed zero depreciation on financial assets and real estate (positive depreciation offset by rapid capital gains), 5 per cent depreciation for servants and slaves, 10 per cent for livestock and business equipment, and zero for net changes in producers' perishables and crops.

Since our historical sources arrange own-labour incomes and property incomes by occupation, we can combine the two to get their total incomes. The levels and composition of total personal income in 1774 are shown in Table 1, for the three regions used by Alice Hanson Jones and for the 13 colonies as a whole. Table 1 can be used to calculate any of several ratios, using the denominators in the lower half of the table and the price deflators in the notes to the table.[9] These estimates suggest that the 13 colonies were richer and more productive in 1774 than any previous estimate has implied. For example, our thirteen-colony current-price (part-time) estimate of 164.1 million dollars is 20 per cent greater than the average of the Jones (1980) and McCusker (2000) estimates (136.9 million).[10] Yet our colonial income estimates only differ greatly from those of Jones for the South, where our income estimate ($98.8 million) is almost twice that of Jones ($59.2 million). The colony-wide 20 per cent gap is not driven by any higher estimate of wealth per household of given occupation, 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, our finding fewer households with positive wealth than her estimated number of "potential wealth holders" explains part of the shortfall of our aggregate wealth estimate below hers.

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

[10] For more detailed comparisons, see Lindert and Williamson (2013: Table 4).

Most of the wide gap between southern and northern incomes in 1774 has a simple explanation. In 1774, unlike 1860 and later, the South had a very different occupation mix, with a much higher propertied share and fewer poor. 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 labourers + those with no 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. What drove 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 political connections and wealth in a world of imperfect capital markets. This point can be supported by the following accounting exercise: Of the 107 per cent gap between average free household income in the South ($705) and the Middle Colonies ($340), most is accounted for when the South is given the occupational mix of the Middle Colonies, and only a small share is due to differences in average rates of pay by occupation.

Comparing the thirteen-colony average income per capita with the average for Great Britain (Broadberry *et al.* 2011) finds virtual equality in 1774: the colonial $69.1 (or £15.6) was about the same as Great Britain's $69.5 (£15.7). However, as we shall see in Part IV, a purchasing power parity comparison will reveal a big lead for the colonial population, both in 1774 and earlier.

Inequality and social structure was a marginal topic in the early American literature, until the appearance of Main's *The Social Structure of Revolutionary America* (1965). Afterwards, there was an outpouring of empirical work on American colonial wealth and wage inequality.[11] Most of the colonial inequality literature relied on local observations, missing the

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

inequality arising from differences between colonies and between coastal and hinterland places. We think the problem is solved with our aggregate 1774 estimates.

Incomes were more equally distributed in colonial America than in other times and places, as reported in Table 2. Compare colonial American inequality with that of the United States today, where almost 20 per cent of total income accrues to the top 1 per cent, and where the Gini coefficient is about 0.50.[12] 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 that big income gap between North and South. In short, within any American colonial region, free citizens had much more equal incomes than do today's Americans.

American colonists also had much more equal incomes than did West Europeans at that time, even including slave households. The average Gini for the four northwest European observations reported in Table 2 is 0.57, or 0.14 higher than the American colonies, and 0.22 higher than New England. Thus far, no documented rich country had a more egalitarian distribution in the late 18th century (Milanovic *et al.* 2011).

III. How and When Colonial America Got Rich

By 1774, then, the average American colonial household had a high income, and the colonies seem to have had more equal incomes than the advanced countries of Western Europe. But it didn't start that way. The first 17th century settlers had fearsome mortality, diets were poor, and their settlements were dependent on the net import of foodstuffs. So, how and when did colonial America get rich?

There is still no scholarly consensus over the rate of growth across the colonial era, as Table 3 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

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

century to 1774. In contrast, the newer slow-growth estimates posit rates averaging 0.05 percent 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 remainder of this section examines the movements in prices and demography that should have affected colonial growth. Section IV then presents our new direct evidence on the movement of labour and property incomes before 1774.

Before turning to our best guesses about the levels of colonial incomes in the 17th and 18th centuries, let us first survey the key forces that should have driven income growth in the North American colonies. On balance, what is known about these forces dampens any expectation that growth was rapid in the century before the Revolution.

Overseas trade. 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 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. By 1770 fish accounted for only 34.7 per cent of the region's exports, and the rest was a mixture of rum (4.3 per cent), wood products (14.4 per cent), whale products (14.1 per cent), livestock (20.5 per cent), and many other commodities (12.0 per cent). 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 was distinctive by its high export earnings from "invisibles", such as shipping services. Overall, its export earnings in 1768-1772 amounted to 11.1 per cent of regional product, of which nearly

half consisted of invisibles.[13] Thus, the staple or commodity export share was much smaller, no more than 6 per cent.

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 with England even before the 19th-century rise of its manufactures. Indeed, Sir Josiah Child was already lamenting New England's role in the Empire in the late 17th century: "New-England is the most prejudicial Plantation of the Kingdom of England …. [It] produces generally the same we have here" (Child 1698, as cited in Galenson 1996, p. 201).

The Middle Colonies, by the eve of the Revolution, had 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 per cent of the Middle Colonies' overall income in 1768-1772, and the commodity 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 60 per cent of its foreign exchange earnings, with grains adding another 26.3 per cent. Thus, the region's export revenues were dominated by just two products (86.3 per cent).[14] These staples generated 13 per cent of the region's total income in 1768-1772, a much higher commodity export share than any other region. The dependence on foreign trade was presumably even greater in the tobacco boom of the late 17th century.

The Lower South (the Carolinas and Georgia, with Charlestown and later Savannah the main ports) exported rice and naval stores throughout the 17th and early 18th 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: 55.4 per cent of the region's foreign exchange earnings were from rice, 20.3 per cent from indigo, and 5.7 per cent from naval stores (pitch, tar, and turpentine). Other items included deerskins, wood products, grains, and livestock, but more than 75 per cent consisted of the big two, rice

[13] 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 (Table 1).
[14] McCusker and Menard 1985: Table 6.2, p. 132.

and indigo.[15] 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 per cent. 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.

In short, there were 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. 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.[16] In agriculture, indigo, grain, and tobacco crops were certainly influenced by weather and pests. But in the colonial staple economy, economic volatility was driven mainly by export prices.

Our own research agrees with these narrative accounts (Table 4). Indeed, all four colonial regions recorded higher volatility in their export prices than do either developing countries today or in the 19th century. Thus, colonial price storms might have brought more damage to the North American colonies than to today's Third World. Commodity export prices have always been more volatile than manufactures or services prices,[17] and Table 4 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 ratios being rice (6.53), rum (3.96), and pine (3.96), and the lowest being cod (0.70) and pork (0.69). In short, staple export prices were typically

[15] McCusker and Menard 1985: Table 8.2, p. 174.
[16] This can certainly be documented on the high seas. Maritime insurance was quoted by Philadelphia insurance firms as a per cent 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 per cent 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).
[17] Jacks *et al.* 2011; Williamson 2011: Chapter 10.

much more volatile than manufactured goods prices in 18th century colonial America, and especially so for the Lower South.

However, 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 18th century, that they were shielded from world market volatility.

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?[18] 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 growth in China and India does today. Second, declining transport costs in the Atlantic economy (North 1958; Harley 1988) would have fostered price convergence. Thus, export prices (P_X) should have risen in the American colonies over the long run.

Table 5 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 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 per cent per annum, respectively). While these terms of trade trends were not as big as those observed for 19th century commodity exporters,[19] they could have fostered growth. Since the literature suggests that per capita income grew at something like 0.47 per cent 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 probably driven by the secular terms of trade improvement. Since the terms of trade improved slowly if at all in

[18] Egnal certainly thinks so: "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.

[19] These net barter terms of trade trends for 18th century colonial America were much lower than those for commodity exporters in the 19th century, where they averaged 1.4 per cent per annum (Williamson 2011: Table 3.1, p. 36), twice that of the 18th century colonial Lower and Upper South.

the Middle Colonies and New England, whatever increases in income per capita those northern colonies achieved must have due to labour 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. Between 1700 and 1780, population grew at 2.9 per cent per annum for New England and also for the Middle Colonies, and at 2.4 for the South (McCusker and Menard 1985: p. 218). 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 concluded that the rate of population growth itself has no clear impact on 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. High population growth fed by a rapid net immigration would tend to raise income per capita, because immigrants consist heavily of young adults ready to work. But rapid population growth fed by a high rate of natural increase would cut the labour force share by raising 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). These two sources of population growth, 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.[20] Subsequent quantitative estimates also find that except for the coastal Upper and Lower South, Americans 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.

[20] See Franklin 1751/1959: pp. 227-228 and Malthus 1798/1920, pp. 105-106.

How did the net balance of these forces show up in the age distribution and the dependency ratio? Our best evidence is from the colonial years around 1774, and by then the thirteen colonies had reached very high dependency rates. The 1774 age structure was extraordinary: in New England, 46 per cent of the population consisted of children below age 16; in the Lower South, the figure was 52 per cent; and the average across all thirteen mainland colonies was 50 per cent. These dependency burdens are very high by any standard. For comparison, England in 1771 had only about 35 per cent below age 16. Similarly, in the 1980s the child dependency share was 41 per cent per cent in the average Third World country and only 33 per cent for mature, industrial countries.[21]

The age distribution and the dependency rates before 1774 are almost completely undocumented. We can, however, use Henry Gemery's informed judgment to sketch the colonial patterns of natural increase versus net migration over time and space.[22] 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.

There is also considerable agreement regarding net immigration rates. For the thirteen colonies as a whole, the rate of net (international) immigration had slowed down to much lower levels from 1690 onwards (Gemery 2000, pp. 178-179), as one might expect from a settlement process. As for net immigration for each region, Georgia Villaflor and Kenneth Sokoloff (1982) offer some help. These authors have used muster roll evidence on the places of birth and current residence of those who fought in the

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[21] Wrigley and Schofield (1981, pp. 528-529); Bloom and Freeman (1986: Table 4, p. 390).

[22] 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 per cent in 1703, 48.2 per cent in 1723, 49.1 per cent in 1746, 47.9 per cent in 1749, 47.6 per cent 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.

Seven Years' and Revolutionary Wars. Bostonians left for all other northern places, and New Englanders in general migrated to the Middle Colonies. From Pennsylvania, Maryland, and Virginia, 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.

By 1774, the American mainland colonies had reached exceptionally high dependency rates, implying that their incomes per earner or per household must have looked better compared to England than their incomes per capita. That would have been especially true for New England, with its high natural increase and net emigration of young adults. The dependency ratios of New York and the Carolinas were probably less elevated by global standards. The colonies' higher dependency rates meant lower labour participation rates, bigger households and bigger families in America compared with England. In 1774, the average household size in America was 4.73, versus a rough average household size of 4.13 in England and Wales (1759-1801). Yet as we shall see later, even the per capita income in current pounds sterling were at least as high in the colonies as in the mother country. The income advantage of the colonies will look even greater per household or per earner, especially when we turn to real purchasing power instead of current sterling values.

The geographic battle between ruralizing and urbanizing migrations. The final visible leading actor influencing the movement of income per capita across the colonial era was the urban share. Cities tend to 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 cities implies higher average income and higher inequality. In this respect, colonial America was an exception, since it was ruralizing between 1680 and 1790 (Figure 1). True, the cities were gaining in absolute numbers, but their share of total colonial population was declining. Apparently the rise of opportunities in the countryside and on the frontier outran the rise of opportunities in Boston, Newport, New York City, Philadelphia, Charleston, and lesser coastal and river towns. Other things equal, the westward movement of the colonial population would lead us to expect only modest

income per capita growth, 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.

IV. Backcasting Incomes Across the Colonial Era

Aided by what we know 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.

Starting from the 1774 benchmarks, how does one 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.

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 available wage series.

(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, 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, 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 with these assumptions, we extend nominal incomes back over time. The sections that follow list 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.

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.[23] 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

[23] 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.

experienced great gains in average wealth[24] 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".[25] 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 trends in property incomes inferred from the Mains' sample with trends in labour earnings inferred from wage series.[26] Once the labour and property incomes are combined, 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 7 and Figure 3. New England clearly did advance in average income until around 1725, and then stagnated. This chronology of growth rates agrees with previous scholarship.[27] 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.

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[24] Wealth here refers to gross assets rather than net worth. The Main's 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.

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

[26] Craftsmen wages are from Gloria Main (1994), with interpolations between her averages. The Boston seamen's monthly wage is from Nash (1979, pp. 392-394). We have made some use of Weeden's (1890) Boston wage data in deciding how to interpolate Main's series. The Weeden data are quite sparse, however.

[27] 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) agrees. Davisson's (1967) local study of Essex county Massachusetts also emphasized 17th-century growth.

New England's income estimates contain an urban-rural surprise. Table 7 implies that in the 1770s Boston's income per capita was overtaken by that of the New England countryside. The explanation for this anomalous result can be found in 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's population had a lower share of adult males 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: pp. 244-245). Furthermore, as we have already noted, Boston suffered a net emigration of young adult males to the Middle Colonies. The 1770s stand out as a nadir in the relative economic position of Boston, from which it only recovered in the early 19th century.

For the Middle Colonies – New York, New Jersey, Pennsylvania, and Delaware, it is only for Philadelphia that we can use the same approach of combining labour with property income trend estimates before 1774. However, we do have aggregate regional clues from the production side, thanks to the recent efforts of Joshua Rosenbloom and Thomas Weiss (2013).

Philadelphia -- which will serve as our proxy for the urban combination of Philadelphia, New York City, and smaller towns – yields data on both wage rates and probated personal wealth by occupation.[28] However, the wage rates for Philadelphia labourers 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 for changes in age at death. Given these constraints for Philadelphia, our urban representative for the Middle Colonies, Table 7 offers these suggestions: First, its wage rates and wealth were consistently higher than in Boston

[28] 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.

back to 1725, and probably earlier. Second, its income per capita was stagnant at that high level. Third, inequality probably rose between the mid-18th century and the Revolution, to judge from the rise in property values and in poor relief (Nash 1976a, 1976b).

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 per cent a year. Their slow-growth result has been incorporated into Table 7 and Figure 2.

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.[29] For this rural region starting with the base year 1774, our performance indicator is the gross income of a prototypical farm deriving 22 per cent of its income from tobacco sales, 11 per cent from grain sales, and the remaining 67 per cent from producing farm products that were consumed either on the farm itself or in the immediate surrounding area.[30] Implicit within this gross farm income is the income retained by servants and slaves.

The time series running back from 1774 to c1675 (Table 7 and Figure 2) suggests the following: In its tobacco-based heyday of the late 17th century, farmers in the Chesapeake did about as well as any group in the Americas other than the even richer planters in the West Indies. Over the next century its income per capita fell by a third in terms of the Allen price deflator (Table 7). Yet its average incomes were still higher in 1774 than those in the northern colonies or in England. And the decline in per capita income did not signal any institutional flaw in the Chesapeake, but rather diminishing

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

[30] Exploring several alternative farm income series, we chose one in which this 67% of income had an annual productivity growth rate of 0.1 % (see gpih.ucdavis.edu / American incomes ca 1650-1774, file entitled "Chesapeake income clues 1650-1774a").

There are many other series that might be used to reinforce our time line for aggregate incomes in the Chesapeake. We know that the slave share of total population rose, at least until 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 18th-century drop in the shares of households owning land (Kulikoff 1986, p. 135), though the share owning slaves rose (*ibid*., p. 154). These clues suggest rising inequality, but the best time series on aggregate incomes are those we describe in the text.

returns in a rich region with relatively free entry of newcomers. 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.[31]

For the Lower South (the Carolinas and Georgia) we have no income-side indicators whatsoever that span across the colonial era. To judge how long the colonial Lower South had enjoyed the prosperity it had achieved in 1774, we must turn to production-side indicators. Peter Mancall, Joshua Rosenbloom, and Thomas Weiss (2003) have combined different production clues to assemble regional product for 1720, 1740, and 1770. We equate their 1770 benchmark with ours for 1774 and interpolate to get our 1725 and 1750 benchmarks. The implied result for the Lower South is steady prosperity from the 1720s to the eve of the Revolution, but no per capita income growth.

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 Revolution. Most of the movements between time periods were not dramatic, aside from the northern colonies' growth reversal 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? The answer is relatively easy to give in terms of current sterling prices, yet the differences in real purchasing power are more important and call for a deeper discussion.

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

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[31] 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.

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 percent 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 percent 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 percent advantage over Great Britain, an advantage that would have grown to the estimated 68 percent by 1774.

As support for the existence and magnitude of the income gap between the American colonies and England, we can also compare workers' welfare ratios (purchasing power) that Robert Allen has designed. The colonists had distinctly higher real wages in the 18th century (Figure 3).[32] An important additional insight that this comparison offers is that wages were even further above England than was GDP per capita. This seems to offer more evidence of the greater equality of free colonists' incomes, 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.[33] As Figure 4 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

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[32] As with the price deflator used in Tables 6 and 7 and Figure 2, our Figures 3 and 4 again use Robert Allen's price series for a "barebones bundle", presented in Allen *et al.* (2012). Yet, as we argue in the text, other available price data would yield a similar contrast between the colonies and the mother country.

[33] 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.

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. If we wanted to know which country has grown faster, we could compare 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 procedure of deriving levels of product per capita from late-20th-century price structures. To answer the question "In which country could the average nominal income purchase more of a certain fixed bundle of goods?" in, say, 1774, one must compare 1774 prices directly. As it turns out, the answer in Table 7 and Figures 2 and 3 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.[34]

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 underlying 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.

[34] 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 7 and Figure 2.

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 percent higher in the American colonies, while 22 had sterling prices that were at least 25 percent 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.[35] Using a wider range of homogeneous goods would still make Britain look even more expensive than the American colonies, as did the Allen barebones costs used in Table 7 and in Figures 2 through 4.

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.[36] 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.

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[35] The 25 percent 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 *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.

[36] 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.

V. Inequality Trends within the Colonial Era

Were colonial incomes as relatively equal before 1774 as we have found them to be in that baseline year? Some colonial trends suggest a widening of income gaps, while others might have offset such widening. The literature in the 1960s and 1970s found signs of widening inequality among free households at local levels, and mainly for coastal settlements. So it was for Philadelphia and for several localities in New England between the late 17th century and the Revolution. Within the South, the accumulation of slaveholding among white households was also highly unequal. Against these trends, however, one must weigh the egalitarian implications of colonial ruralisation. As more and more migrated to the yeoman-farmer frontier, any trend toward wider income gaps among free households within regions would have been offset, despite its rise in some localities.[37]

Among all Americans, slave plus free, the trend was probably toward greater inequality across the colonial era, for reasons suggested by Robert Gallman (1980, p. 133) long ago. Between the early white settlements and 1774, slaves rose to take more than 21 per cent of the population of British America.[38] 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, consider the 1774 inequality results in Table 2. The Gini coefficient was 0.464 for all southern households, but only 0.328 for free southern households alone. Making the courageous assumption 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 suggest a rise in Southern inequality due to adding more slaves. Similarly for the thirteen colonies as a whole, with 1774 Gini of 0.437 for the total

[37] For local studies suggesting rising inequality in the century ending with the Revolution, see Lemon and Nash (1968), Lemon (1972), Nash (1976a, 1976b, 1979), Main (1977), Smith (1984), and Henretta (1991). On the egalitarian implications of westward drift, see Williamson and Lindert (1980, Chapter 2).

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

population versus 0.400 among the free alone. Our tentative conclusion is that inequality in the whole population must have risen across the colonial era.

VI. Taking Stock

Our new income estimates have suggested broad outlines of American growth and inequality before the Revolutionary War. Colonial households had higher average purchasing power than their counterparts in the mother country in 1774, with a similar advantage back in 1700. This lead was probably driven by more land and forest per worker, and the accompanying cheapness of food, fuel, and housing. While per capita income growth was no faster in the colonies than in England, they maintained their big lead up to the Revolution. However, the colonial advantage in income per capita was a bit less than the colonial advantage per household, due to higher child dependency rates. The southern colonies were the richest by far, but their lead over New England and the Middle Colonies declined over time. Even including slaves and servants, the colonies had a more egalitarian income distribution than Europe. Income inequality may have drifted downward from the 17th century to the eve of Revolution, as yeoman farms in the interior grew much faster than that of coastal villages, towns, and cities. Yet, that likely egalitarian drift was offset by the rise of the slave population, perhaps enough to have made the American colonies – and especially the South – a less egalitarian place in 1774 than a century before.

While our work has made the quantification of colonial incomes less shaky than the corresponding conjectures offered by previous scholars, our tentative conclusions need further empirical support. Fortunately, data will continue to accumulate, allowing future revisions to improve on those offered here.

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Table 1. Estimated American Personal Incomes 1774

	New England	Middle Atlantic	South Atlantic	All 13 Colonies
	Gross income, millions of current dollars ($4.44/£ sterling)			
Free-labour income, FTE	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
	Relevant denominators			
Free labour force 1774	185,999	156,875	195,938	538,812
Total labour 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
	Income per capita			
Free population	50.4	63.3	131.0	83.9
Total population	50.1	59.8	85.6	69.1

Notes: The estimates exclude Native Americans. The FTE estimates use the full-time assumptions of 313 days per labour year. 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.
Source: Lindert and Williamson (2013: Table 3, p. 742).

Table 2. 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.s6	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).

Notes: The inequality results 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.
Source: Lindert and Williamson (2013: Table 7, p. 756).

Table 3. 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		

Sources and notes: Rosenbloom and Weiss (pending 2013: Table 1), Henretta (1991: Table 5.1), and sources cited in the text. M, R and W = Peter Mancall, Joshua Rosenbloom, and Thomas Weiss, respectively. 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 per cent per annum) and one very low (Waters 1976: -0.30).

Table 4. 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: Jacks *et al.* (2011), Tables 3 and 5.

Table 5. 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.
Sources: All proxy the import price index (Pm) by the British Gilboy-Schumpeter index, modified by McCusker (1992: pp. 334-343). Many export prices are taken for 1720-1775 from Bezanson *et al.* (1935), augmented by the following: *New England*: Export trade weights from Shepherd and Walton (1972: pp. 213-225), and export prices (Px) from Weeden (1890: pp. 878-903) and Lydon (2008: p. 102). *Upper South*: Export trade weights from Shepherd and Walton (1972: pp. 213-225), and export prices (Px) from *Historical Statistics of the United States* (1976 Part 1: Z538, 559, 564, 579, and 583). *Lower South*: Mancall *et al.* (2008). *Middle Colonies*: Mancall *et al.* (2013: p. 292).

Table 6. 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 labourers	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 labourers	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 to Table 6: 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 7. Conjectural Estimates of Real Income per Capita, 1650-1774

For the total colonial population, including slaves.
(A.) *In current pounds sterling*

	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 New England	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
Upper South		18.4	18.3	16.0	16.0	18.4	16.5
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 bare-bones welfare ratios for a family of four*

	1650	1675	1700	1725	1750	1770	1774
New England, all	1.13	1.45	1.76	1.88	1.84	2.11	1.93
Boston	1.75	2.03	2.31	2.55	2.37	2.07	1.68
Other New England	1.07	1.40	1.72	1.84	1.82	2.12	1.93
Middle colonies (w/DE)			*2.60*	2.52	2.60	2.60	2.72
Phila & NYC free				4.84	5.26	4.82	4.85
Other Middle Col's							2.50
Chesapeake		5.98	5.11	4.22	3.94	3.90	3.80
Lower South			*6.77*	6.42	5.87	5.11	5.54
Charleston free							27.34
Other Lower South							4.88
All 13 colonies (in Philadelphia bundles)			*3.45*	3.21	3.21	3.27	3.29
Great Britain	1.22	1.52	2.06	2.03	2.09	2.12	1.96

Notes and sources to Table 7: For the methods of derivation, see text and the three "backcast" files at http://gpih.ucdavis.edu.

The underlying income estimates were averaged over varying time periods, depending on data availability. For the lower South, the estimates are those of Mancall, Rosenbloom, and Weiss (2003); the year "1725" is actually 1720, and "1750" is 1740.

For the period centered on 1700, the figures in italics (Middle Colonies, Lower South, and all thirteen colonies) are backward extrapolations that are even cruder than the estimates for c1725 and later.

All of the welfare ratio estimates are derived by deflating nominal values by five-year averages of Robert Allen's cost of a barebones bundle. These five-year averages are based on the annual series kindly supplied by Allen, and underlie the half-century averages published in Allen *et al.* (2012).

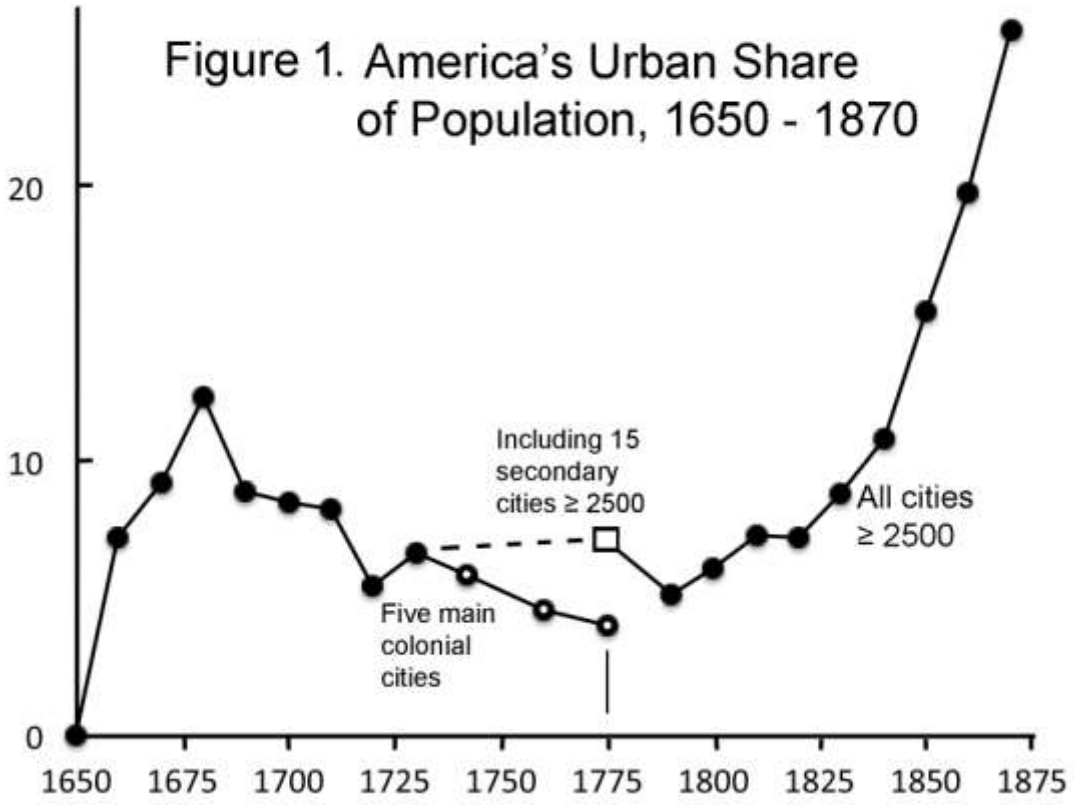
Figure 1. America's Urban Share of Population, 1650 - 1870
20
10
0
1650
1675
1700
1725
1750
1775
1800
1825
1850
1875
Including 15 secondary cities ≥ 2500
All cities ≥ 2500
Five main colonial cities

Figure 2. GDP per Capita in 13 American Colonies and Great Britain, 1650 - 1774

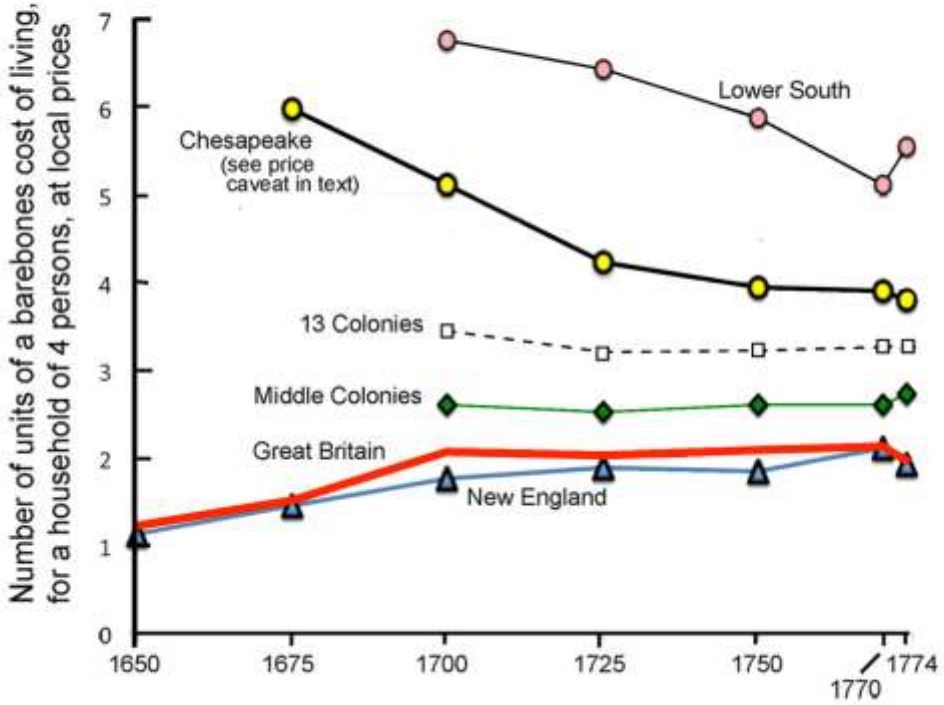

Figure 3. Workers' Purchasing Power in England and the Colonies, 1650 - 1820 (Allen)

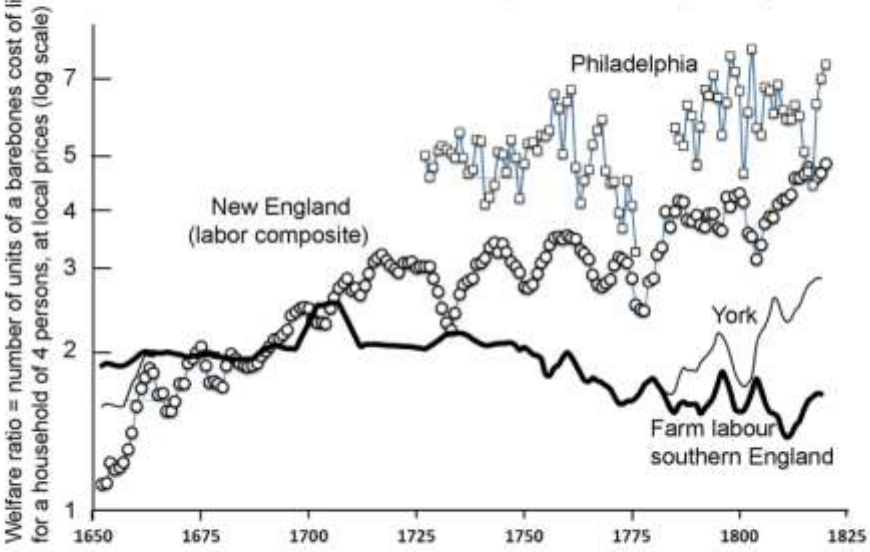

Figure 4. The Cost of Certain Necessities
In England and America, 1632 - 1894