Counting Housework: New Estimates of Real Product in the United States, 1800–1860

NANCY FOLBRE AND BARNET WAGMAN

Women engaged primarily in the provision of domestic services for family members make important contributions to total output. This article provides estimates of the size and sectoral allocation of the nonmarket household work force in the United States between 1800 and 1860. Those estimates are then used as a basis for several alternative imputations of the value of these women's work, which modify the historical picture of economic growth over this period.

"Scholarly opinion currently evinces disturbing symptoms of latent schizophrenia on the subject of economic growth. . . ."[1] The opening clause of Paul David's classic 1967 essay on "controlled conjectures" of real product seems even more appropriate to a consideration of the value of women's nonmarket household services in the early nineteenth century. Many macroeconomists and national income accountants now insist on the importance of imputing values to nonmarket production.[2] Many development economists now emphasize the need to revise conventional measures of women's labor inputs.[3] Yet economic historians continue to rely, for the most part, on traditional definitions of market gross domestic product (GDP) based on conventional census measures of "gainful" employment.

This lag may reflect the "path-dependent" nature of economic theory and empirical research. The assumptions of conventional national income accounting resemble the traditional QWERTY keyboard adopted by typewriter manufacturers—it was not the best, but it happened to provide a simple solution to a technical problem (keys that

[1] David, "The Growth of Real Product," p. 151.

[2] Chadeau, "Measuring Household Activities"; Eisner, "Extended Accounts"; and Waring, *If Women Counted*.

[3] Goldschmidt-Clermont, *Unpaid Work in the Household* and *Economic Evaluations*; and Benería, "Conceptualizing the Labour Force."

275

tended to jam). Once users became familiar with the QWERTY pattern, manufacturers rightly feared there would be little demand for a new keyboard—even for the Dvorak system, which dramatically increased typing speed.[4] New measures of the value of nonmarket production represent an expansion of the traditional conceptual keyboard, offering not greater speed but greater scope in the measurement of economic output.

This article explores that offer by applying expanded concepts of the labor force and its output to the historical picture of economic growth in the United States between 1800 and 1860. We first examine the evolution of concepts of real product, emphasizing how the nineteenth-century appreciation of household services was gradually supplanted by an emphasis on marketed output and a tendency to limit household imputations to home manufactures. We then briefly review the histori-cal evidence regarding housewives' activities, suggesting that the de-mand for their services expanded even as the demand for home-produced goods fell. Finally, we construct a set of conjectural estimates of the nonmarket labor force, its sectoral allocation, and its product per worker between 1800 and 1860. These estimates build on the sectoral productivity model developed by Paul David and on the labor force estimates developed by Stanley Lebergott and Thomas Weiss.[5]

CONCEPTS OF "REAL PRODUCT"

Definitions of economic output, like the QWERTY keyboard, gained acceptance as the result of a number of interrelated but decentralized decisions. The decisions of census bureaus in the United States and Great Britain had an important impact. The U.S. Census never included women primarily engaged in "keeping house" among the gainfully occupied. However, between 1851 and 1881, British censuses placed such women in an occupational category alongside other productive workers—distinctly separate from the "unoccupied," "unproductive," or "dependent" classes. Between 1875 and 1905, the state census of Massachusetts followed similar conventions.[6] The housewife's work was officially deemed productive, and married women without a listed gainful occupation were not automatically assumed to be housewives. Some were described as "*having nothing to do but superintend the households,*" and there were those who did even less than that. In 1875, there were "4,786 wives of heads simply ornamental" (these, however, amounted to less than 2 percent of all wives).[7]

---

[4] David, "Understanding the Economics of QWERTY."
[5] David, "The Growth of Real Product"; Lebergott, *Manpower in Economic Growth*; and Weiss, "Revised Estimates" and "U.S. Labor Force Estimates."
[6] Folbre, "The Unproductive Housewife."
[7] *Census of Massachusetts*, p. xlix.

By the end of the nineteenth century new conventions had been adopted, though not without controversy. The Association for the Advancement of Women formally protested U.S. federal census terminology in 1878, complaining that housewives were "not even incidentally named as in any wise affecting the causes of increase or decrease of population or wealth."[8]

National income accounts followed a similar pattern. In the first edition of his *Essay on the Progress of Nations* Ezra Seaman included an estimate of the value of ordinary domestic labor along with other services, education, amusements, and government.[9] In the 1852 edition, however, he changed his mind, explaining his allegiance to the Smithian doctrine of unproductive labor.[10]

Between 1920 and 1940 two major studies estimated the value of housewives' services.[11] After 1940, however, a different consensus emerged, which affirmed the qualitative importance of nonmarket household labor but largely disregarded its quantitative dimensions. Simon Kuznets, an enormously important contributor to the modern system of accounts, constantly reminded his readers that nonmarket labor was important to economic welfare, but he questioned its relevance to the measurement of growth. He remained skeptical of the merits of imputing its value or studying its dimensions in more detail.[12] Most economic historians have followed Kuznets's lead.[13] Only recently has new research on household production and women's nonmarket work generated widespread interest in methods of imputation.[14]

HOUSEHOLD-PRODUCED GOODS AND SERVICES IN THE NINETEENTH
CENTURY

Women's productive activities in the home always extended far beyond home "manufactures," but the expansion of factory-produced textiles and other commodities in the early nineteenth century almost certainly increased the relative importance of services. Indeed, one could argue that the much-vaunted transition from manufacturing to services took place first within the home. The widespread popularity of books instructing women in new standards of housekeeping and household "management" attests to the demand for high-quality household

[8] U.S. Congress, Memorial of Mary F. Eastman.
[9] Seaman, *Essays on the Progress of Nations*, p. 305. See also the discussion in Gallman, "Estimates of American National Product."
[10] Seaman, *Essays on the Progress of Nations*, 2nd edn., p. 284.
[11] King et al., *Income in the United States*; and Reid, *Economics of Household Production*.
[12] One of the earliest statements of his position can be found in Kuznets, *National Income*.
[13] Although Stanley Lebergott welcomed the prospect of special studies of household work relevant to national income, he did not pursue them. See *Manpower in Economic Growth*, p. 73; see also Gallman, "Gross National Product." Lack of attention to housewives' services is also apparent in Weiss, *The Service Sector*. See also Goldin, "The Female Labor Force."
[14] See especially Waring, *If Women Counted*.

services, as does the rapid growth of the paid employment of domestic servants.[15]

Attention to the nineteenth-century household as a unit of production has traditionally focused on the types of household manufactures (primarily textile goods) documented by Tench Coxe in 1810 and tabulated by the U.S. censuses between 1840 and 1860.[16] Recent research has broadened the picture to include women's significant contributions to marketed and consumed agricultural output on farms—particularly milk, butter, and garden produce—in the early nineteenth century.[17] Even more noteworthy are new historical accounts of demand for women's services in the management of the household, preparation of meals, and care of children and other dependents. Technological change often led to higher-quality products rather than a reduction in labor time—as with improved milling of grain, which contributed to the substitution of time-consuming yeast breads for earlier quick breads based on coarser flour.[18]

Massachusetts census data offer some useful indicators of the extent of services that women provided as wives, mothers, sisters, and daughters. In 1885, only 28.6 percent of women 14 years and older had a listed gainful occupation, compared with 85.7 percent of men. But when women providing household services to family members were included, 89.3 percent of all women in this age category were workers.[19] By the conventional federal standards, only 11.8 percent of workers were engaged in "domestic and personal service"; but by Massachusetts's more inclusive standards, 41.8 percent of all workers were in the service sector. By the "gainful" workers criterion, "manufacturing and mechanical" industries were predominant, comprising 48.3 percent of the work force. By the broader "work" criterion, those industries engaged only 30.9 percent. One important implication is that trends in productivity in domestic and personal services could easily have influenced total labor productivity more than trends in the traditionally emphasized agricultural and manufacturing sectors.

These estimates understate married women's participation in market work, which extended well beyond wage labor to include performing industrial homework, taking in boarders and lodgers, and contributing to the output of family farms or enterprises.[20] They also obscure the fact

[15] Beecher, *A Treatise on Domestic Economy*. See also Beecher and Stowe, *The American Woman's Home*. On domestic servants see Dudden, *Serving Women*.

[16] Coxe, "Digest of Manufactures." For a summary of the census data on household manufactures found in the censuses of agriculture, see Tryon, *Household Manufactures*.

[17] Jensen, *Loosening the Bonds*. See also Craig, "The Value of Household Labor."

[18] Boydston, *Home and Work*; Matthews, *Just a Housewife*. On grain milling and bread, see Cowan, *More Work for Mother*.

[19] For a more detailed discussion of this issue, see Folbre and Abel, "Women's Work."

[20] On this point, see Bose, "Devaluing Women's Work"; and Abel and Folbre, "Women's Market Participation."

that most women who engaged in market work continued to devote substantial time to household production, as did many men. Still, the figures lend specificity to the analysis of household services. What varied across states and over time was women's participation in market work, probably not their productive work in general.

Many women who described themselves as housewives probably enjoyed substantial amounts of leisure, particularly if they had domestic servants. By the same token, many men who described themselves as farmers or capitalists were primarily engaged in overseeing the labor of others. Indeed, the assumption that women provided approximately the same amount of labor as men probably understates their contribution, as many contemporary time-budget studies show that women work significantly longer hours, overall, than men.[21]

CONJECTURAL ESTIMATES OF NONMARKET WORKERS AND PER CAPITA PRODUCTS

Scholars have long recognized that measures of market output and its growth over time are only loosely related to changes in the standard of living, which is shaped by factors such as nutrition, health, and the quality of the social and natural environment. The value of nonmarket goods and services looms large as another important component of the standard of living, one well worth empirical scrutiny.[22] Although the lack of data requires conjectural estimates based on stylized assumptions, it is not obvious that these are any more speculative than many other estimates that have graced debates over U.S. economic growth before 1860. In any case, systematic speculation is clearly warranted when it can serve as an impetus to empirical research.

The Labor Force

The size of the nonmarket labor force can be approximated using assumptions quite similar to those employed in estimates of the paid labor force during this period. Weiss estimated the paid labor force of free males 16 and over by applying a labor force participation rate of 90 percent to this category of the population for 1800 to 1860. Similarly, he applied a labor force participation rate of 21 percent for boys aged 10 to 15. Because he is critical of census-based estimates of women's market participation, which show a very uneven pattern of increase, he substituted a set of estimates based on the assumption that the labor force participation rate of women 16 and older increased from 7.6 percent in 1800 to 11.3 percent in 1860, whereas that of girls aged 10 to

---

[21] Hartmann, "The Family"; and Fuchs, *Women's Quest.*
[22] For a study of the English case see Humphries, "Enclosures."

TABLE 1
FREE LABOR FORCE BY GENDER: MARKET AND NONMARKET, 1800–1860

Year	Men, Market Work		Women, Market Work		Women, Nonmarket Work	
	N (1,000s)	%	N (1,000s)	%	N (1,000s)	%
1800	1,070	50.9	105	5.0	929	44.1
1810	1,467	50.6	150	5.2	1,281	44.2
1820	2,004	50.5	212	5.4	1,753	44.2
1830	2,769	50.6	308	5.6	2,391	43.7
1840	3,834	51.0	441	5.9	3,246	43.2
1850	5,562	51.4	676	6.2	4,586	42.4
1860	7,750	51.4	991	6.6	6,325	42.0

15 remained constant at 6.8 percent from 1800 to 1850 and then decreased to 6.6 percent.[23]

Similar reasoning can be used to construct a measure of the number of workers engaged primarily in nonmarket work. Our earlier discussion of the Massachusetts census data suggests that free women were just as likely to engage in productive work as free men, though far less likely to engage in market work. Therefore, we can construct a measure of the total (market and nonmarket) free female work force by applying the free male labor force participation rates to the female population. The size of the nonmarket female work force is the difference between the total (market and nonmarket) work force and the number engaged in market employment.

The growth of these components of the total free work force between 1800 and 1860 is shown in Table 1. The nonmarket component declined relative to the free paid work force with the increase in women's participation in paid employment. Yet it grew significantly in absolute terms. Moreover, it grew more rapidly than the population. The number of nonmarket workers per capita increased from about .18 to about .20, while the number of market workers (free and slave) per capita increased from about .32 to about .36 over the period. Changes in the age structure of the population wrought by immigration and early fertility decline compensated for the "loss" of nonmarket workers to the market sector.

Sectoral Composition

A great deal of attention has been focused on the allocation of the paid labor force between farm and nonfarm employment between 1800 and 1860, partly because this allocation provided the basis for Paul David's exploration of the pace of economic growth during the period.[24] How should the nonmarket workers we are counting be allocated in terms of sectors? They could be assigned to a single sector of their own, the

---

[23] Weiss, "U.S. Labor Force Estimates," Appendix and Tables 8, 9, and 12.
[24] David, "The Growth of Real Product."

TABLE 2
SIZE AND SECTORAL COMPOSITION OF EXPANDED (MARKET AND NONMARKET)
LABOR FORCE

Year	Farm Market		Nonfarm Market		Farm Nonmarket		Nonfarm Nonmarket	
	N (1,000s)	%	N (1,000s)	%	N (1,000s)	%	N (1,000s)	%
1800	1,264	48.1	435	16.6	688	26.2	240	9.1
1810	1,704	46.8	653	17.9	910	25.0	371	10.2
1820	2,270	46.0	909	18.4	1,224	24.8	529	10.7
1830	2,969	44.7	1,284	19.3	1,621	24.4	770	11.6
1840	3,879	43.0	1,893	21.0	2,093	23.2	1,153	12.8
1850	4,980	38.9	3,224	25.2	2,577	20.1	2,009	15.7
1860	6,234	35.6	4,958	28.3	3,181	18.2	3,144	17.9

"household sector," but it seems likely that nonmarket production in farming differed considerably from that which took place off the farm: the activities of wives, mothers, and daughters were strongly influenced by the activities of the paid male workers they lived with and cared for. Their productivity was affected by their access to land, livestock, and other inputs into the production of food, as well as by methods of obtaining water and of gathering and using fuel. All these factors probably varied between farm and nonfarm households.

The total of nonmarket women workers can be allocated between farm and nonfarm in the same proportion as the free paid labor force, on the assumption that most lived where the market income earner in their family lived. Table 2 displays the results in percentage terms, based on Weiss's estimates of farm/nonfarm composition of the free labor force for 1800, 1830, and 1860.[25] The free paid labor force shifted out of agriculture more rapidly than the total paid labor force, which included slaves. As a result, the share of the total (market and nonmarket) labor force employed on farms declined slightly more (from 74.3 to 53.8 percent) over the period than the share of the market labor force employed on farms (from 74.3 to 55.7 percent). The shift in nonmarket work from farm to nonfarm settings probably had a significant effect on the economy as a whole, resulting in an increased demand for purchased food as opportunities for producing for personal consumption declined. It may also have increased the overall productivity of household services such as making purchases and fetching water and fuel, which were probably affected favorably by urban economies of scale.

One shortcoming of this sectoral allocation, also relevant to the labor force estimates described earlier, is that farm women who engaged primarily in nonmarket work probably also devoted substantial time and

[25] Weiss, "U.S. Labor Force Estimates," table 1. For alternative estimates based on David's assumptions, see the Appendix.

effort to activities that increased the value of market output.[26] The allocation presented in Table 2 may understate the role of farm market labor relative to farm nonmarket labor. This raises doubts regarding conventional estimates of agricultural output per worker, constructed by dividing the gross value of agricultural output by the number of market workers engaged in agriculture. Because the number of market workers in agriculture underestimates total labor inputs into marketed output by a significant amount, farm productivity is overstated. "Hidden" market work in the nonfarm sector is less likely to distort measures of output per worker there. If the "hidden" labor inputs remained constant, trends would remain unaffected, but there is reason to believe that these inputs declined over time as young children increasingly attended school and women moved into paid employment. Product per labor hour on farms may well have risen faster than existing series indicate.

Per Capita Output

Estimates of the growth of per capita product in the United States between 1800 and 1860 have been based largely on assumptions regarding the size of the labor force, its sectoral composition, and product per worker in farm and nonfarm employment. Lack of accurate data on product per worker makes assumptions here particularly conjectural. Paul David presented estimates based on the assumption that productivity in nonagricultural employment was a constant multiple of productivity in agricultural employment, set by reference to one point in the period, the 1839/40 census year. Slaves and free workers were treated the same.[27] In more recent research, Weiss utilized a similar methodology, substituting more detailed, disaggregated estimates that alter the trajectory of growth in per capita output.[28]

Although both David and Weiss limited their attention to the market sector, a similar methodology can be used to generate lower- and upper-bound estimates of the value of nonmarket production. The following estimates build on Weiss's assumptions and estimates of per capita market product and employ three alternative sets of assumptions that resemble those deployed in debates over the growth of market product.[29]

[26] Craig's analysis of a matched sample of rural households from the 1860 censuses of agriculture and population suggests that the contribution of adult women to marketed farm output in the Northeast amounted to approximately the wage of a male hired hand for seven or eight months, equivalent to about .52 the output of an adult male. Indeed, Craig notes that if women also provided household services equal in value to those of a full-time domestic wage worker, their total contribution exceeded that of men. See Craig, "The Value of Household Labor."

[27] David, "The Growth of Real Product," p. 160.

[28] Weiss, "Economic Growth Before 1860."

[29] Estimates based on David's assumptions are available from the authors upon request. The

CASE 1: ASSUMING CONSTANT PRODUCT PER PERSON IN THE FARM NONMARKET
AND NONFARM NONMARKET SECTORS

Lack of attention to nonmarket production of goods and services is consistent with the often implicit assumption that no important technological changes or shifts in supply or demand take place there. The implications of this assumption can be explored by setting product per person in nonmarket production in the farm and nonfarm sectors equal to some constant amount over the entire period, representing fulfillment of a constant, unchanging need for household services.

Weiss estimated agricultural output per worker equal to $156 (in constant 1840 dollars) in 1830. In 1832, the wages of a female domestic servant were equivalent to about .6 of the wages of agricultural workers.[30] Applying the same proportion to output per worker yields a farm nonmarket output per farm nonmarket worker of $93.60. In the same year, the wages of a domestic servant were equivalent to about .405 of those of a manufacturing worker.[31] Weiss calculated that nonfarm output per worker was 2.31 times greater than farm output over the period. Multiplying these two figures, we set nonfarm, nonmarket output per worker at .94 of agricultural output per worker in 1830, or $145.95.

Multiplying these benchmarks times the numerical estimates and sectoral allocations presented earlier yields a very low estimate of the value of nonmarket services, ranging from $19 per capita in 1800 to $24 per capita in 1860 (see Table 3, case 1). Its value grows over time only as a result of changes in the age structure of the population and the shift from nonmarket farm to nonmarket, nonfarm work, and it represents a declining share of total (market and nonmarket) output per capita. Total output per capita grew 62.4 percent over the entire period, relative to 71.2 percent for market production alone. Decadal growth rates are similar for market and total output per capita, largely driven by changes in estimated market farm output per worker.

CASE 2: ASSUMING THAT PRODUCT PER WORKER IN NONMARKET SECTORS IS LOWER
THAN IN MARKET SECTORS BUT INCREASES AT THE SAME RATE

This estimate uses the same benchmarks described in case 1 but treats them as a proportion of the changing levels of output per worker in the farm and nonfarm sectors, implying identical rates of productivity increase in market and nonmarket sectors. The result (see Table 3, case 2) is a more rapid rate of growth in the value of nonmarket production per capita, from $20 in 1800 to $34 in 1860. Nonmarket production remains virtually constant at about 22 percent of the value of total

comparisons between market output per capita and total output per capita in cases 1 to 3 are quite similar.

[30] Lebergott, *Manpower in Economic Growth*, p. 283 and table A-23, p. 539.
[31] Ibid., table A-31, p. 547.

TABLE 3
PER CAPITA OUTPUT AND GROWTH RATES OF MARKET AND TOTAL (MARKET PLUS NONMARKET) PRODUCT

Year	Case 1				Case 2			Case 3		
	Market	Nonmarket	Total	Nonmarket/Total (%)	Nonmarket	Total	Nonmarket/Total (%)	Nonmarket	Total	Nonmarket/Total (%)
1800	73	19	92	20.5	20	93	21.5	40	113	35.4
1810	75	19	94	20.5	20	95	21.3	41	116	35.6
1820	77	20	97	20.6	21	98	21.5	43	120	36.0
1830	83	21	104	19.8	23	106	22.7	48	131	36.6
1840	91	21	112	19.0	25	116	21.6	53	144	36.7
1850	100	23	123	18.7	27	127	21.3	59	159	37.0
1860	125	24	149	16.1	34	159	21.3	74	199	37.3
Growth Rates (%)										
Overall	71.2	28.0	62.4		70.3	71.0		85.6	76.3	
Annual	0.9	0.4	0.8		0.9	0.9		1.0	0.9	
1800–1810	0.3	0.3	0.3		0.2	0.3		0.3	0.3	
1810–1820	0.3	0.3	0.3		0.4	0.3		0.5	0.3	
1820–1830	0.8	0.4	0.7		0.9	0.8		0.4	0.8	
1830–1840	0.9	0.4	0.8		0.9	0.9		1.0	0.9	
1840–1850	0.9	0.8	0.9		0.7	0.9		1.0	1.0	
1850–1860	2.2	0.4	1.9		2.2	2.2		2.4	2.3	

Note: The market product figures are based on assumptions similar to those used by Weiss. See the Appendix.

production. Total output per capita grows 71.0 percent, about the same as for market production.

CASE 3: ASSUMING THAT PRODUCT PER WORKER IN NONMARKET SECTORS IS THE
SAME AS IN MARKET SECTORS AND INCREASES AT THE SAME RATE

Relative wages in the market sector are not a very good measure of the productivity of nonmarket workers relative to market workers. Apart from the obvious problem of selection bias (women who work for a wage may be less productive than others in nonmarket work), discrimination against women in the market sector lowers their wages relative to those of men. An additional factor is the possibility that lower product per hour in household production may be counterbalanced by longer total hours of work in the household, raising product per person relative to market production.

As an upper-bound estimate, consider the possibility that nonmarket product per person was equivalent in value to market production per person in the corresponding market sector (see Table 3, case 3). Not surprisingly, nonmarket production comprises a larger share of total production than in the other two cases. It also increases as a share of the total, because the shift from farm to nonfarm is more rapid for nonmarket workers (none of whom were slaves) than for the paid labor force as a whole. In this case, total product per capita increases 76.3 percent over the period, slightly more than market product per capita. The sectoral reallocation means that the market growth rate underestimates the total growth rate even though rates of productivity growth are the same. A similar trend would be evident even if a share of nonmarket farm workers were allocated to the market farm worker sector. If this share changed over time, however, none of these estimates of market or nonmarket product per worker would be valid. Comparisons between cases 1 to 3 and the growth rate of market output per capita based on Weiss's calculations are provided in Table 3. The most visible differences between market and total output per capita pertain to levels rather than trends, simply because productivities in all sectors were linked.

We consider case 3 to be the best feasible estimate of total output per capita. Even though it is based on the farm/nonfarm allocation used by Weiss, it obviates the market/nonmarket distinction in both sectors by setting output per worker of both types equal. The most unsatisfactory feature of case 3 is its reliance on the conventional series regarding output per worker in farm and nonfarm sectors, and the related assumption that nonmarket workers were more productive off the farm than on it; but this provides a basis for comparison with similar estimates of market output per capita. The most interesting feature is that total output grows more than market output over the period,

counter to conventional assumptions that inclusion of nonmarket output in the total always slows measured growth.

CONCLUSION

Economists have never been completely happy with estimates of output that ignore nonmarket work. Nineteenth-century census data provide an empirical basis for estimating the size of the nonmarket labor force and its per capita output. Whether or not these estimates are included in measures of total output and growth, they are certainly relevant to debates over trends in the standard of living. Additional empirical research is sorely needed but is unlikely to proceed very rapidly unless economists concede the limitations of an accounting system that ignores the productive efforts of most adult women.

Like keyboard operators who have many years of experience touch-typing with QWERTY, economists have invested a great deal of human capital in learning and developing a system for measuring market output. The transition to a broader accounting system will doubtless be awkward and expensive. But in this case, more than mere efficiency is at stake. Further efforts to impute the value of nonmarket household services could enrich our understanding of economic growth. Surely economic historians will be more willing than typists to pay the costs of developing and applying an alternative conceptual keyboard, if they judge it useful.

Appendix

Much of the debate over measurements of real output and growth rates has focused on the relative rates of growth before and after 1840. Many of the technical details are unimportant to the broad comparisons we make in this paper. We were unable to use Weiss's comparisons of his own results with those of Paul David, because they employed a scaling factor designed not to bias upward the rate of growth before 1840. We multiplied the agricultural output per worker estimates (both his and David's) by estimates of the agricultural labor force (both his and David's), deducted the product from GDP, and derived series for nonagricultural output per worker. The parameters we used were drawn from two articles by Weiss.[32]

The method we used does not conform exactly to that used by Weiss. However, the main comparisons we make in this article are robust across all three methods of deriving estimates: using a constant ratio of farm to nonfarm output per worker; simply "adding on" a measure of nonmarket output; or generating a new nonfarm output per worker series. The data and algorithms we used are presented in a Lotus spreadsheet titled *con6.wkl*, available on request.

Our discussion in this paper relies on estimates generated using the Weiss estimates for narrow GDP, because these are based on more recent and more detailed research than are the David estimates. Although there are major differences between these, they are not particularly relevant to the issues that concern us here. An alternative version of Table 3, based on the David estimates, is also available on request.

---

[32] Weiss, "Economic Growth Before 1860" and "U.S. Labor Force Estimates."

REFERENCES

Abel, Marjorie, and Nancy Folbre, "Women's Market Participation in the Late 19th Century: A Methodology for Revising Estimates," *Historical Methods*, 23 (Fall 1990), pp. 167–76.

Beecher, Catherine, *A Treatise on Domestic Economy* (New York, 1974).

Beecher, Catherine, and Harriet Beecher Stowe, *The American Woman's Home* (New York, 1869).

Beneria, Lourdes, "Conceptualizing the Labour Force: The Underestimation of Women's Activities," *Journal of Development Studies*, 17 (Apr. 1981), pp. 10–28.

Bose, Christine, "Devaluing Women's Work: The Undercount of Women's Employment in 1900," in Christine Bose, Roslyn Feldberg, and Natalie Sokoloff, eds., *Hidden Aspects of Women's Work* (New York, 1987), pp. 95–115.

Boydston, Jeanne, *Home and Work: Housework, Wages, and the Ideology of Labor in the Early Republic* (New York, 1991).

Census of Massachusetts, 1875 (Boston, 1877).

Chadeau, Ann, "Measuring Household Activities: Some International Comparisons," *The Review of Income and Wealth*, 31 (Sept. 1985), pp. 237–54.

Cowan, Ruth Schwartz, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York, 1983).

Coxe, Tench, "Digest of Manufactures," in *American State Papers*, vol. 2: *Finance* (Philadelphia, 1814).

Craig, Lee, "The Value of Household Labor in Antebellum Northern Agriculture," this JOURNAL, 51 (Mar. 1991), pp. 67–81.

David, Paul, "The Growth of Real Product in the United States Before 1840: New Evidence, Controlled Conjectures," this JOURNAL, 27 (June 1967), pp. 151–97.

David, Paul, "Understanding the Economics of QWERTY: The Necessity of History," in William N. Parker, ed., *Economic History and the Modern Economist* (New York, 1986), pp. 30–49.

Dudden, Faye E., *Serving Women: Household Service in Nineteenth Century America* (Middletown, CT, 1983).

Eisner, Robert, "Extended Accounts for National Income and Product," *Journal of Economic Literature*, 26 (Dec. 1988), pp. 1611–84.

Folbre, Nancy, "The Unproductive Housewife: Her Evolution in Nineteenth Century Economic Thought," *Signs: Journal of Women in Culture and Society*, 16 (Spring 1991), pp. 463–84.

Folbre, Nancy, and Marjorie Abel, "Women's Work and Women's Households: Gender Bias in the U.S. Census," *Social Research*, 56 (Fall 1989), pp. 545–70.

Fuchs, Victor, *Women's Quest for Economic Equality* (Cambridge, MA, 1988).

Gallman, Robert, "Estimates of American National Product Made Before the Civil War," *Economic Development and Cultural Change*, 9 (Apr. 1961), pp. 397–412.

Gallman, Robert, "Gross National Product in the United States, 1834–1909," in Dorothy S. Brady, ed., *Output, Employment, and Productivity in the United States After 1800*, NBER Studies in Income and Wealth Vol. 30 (New York, 1966), pp. 3–76.

Goldin, Claudia, "The Female Labor Force and American Economic Growth, 1890–1980," in Stanley L. Engerman and Robert E. Gallman, eds., *Long-Term Factors in American Economic Growth*, NBER Studies in Income and Wealth Vol. 51 (Chicago, 1986), pp. 557–604.

Goldschmidt-Clermont, Luisella, *Unpaid Work in the Household* (Geneva, 1982).

Goldschmidt-Clermont, Luisella, *Economic Evaluations of Unpaid Household Work: Africa, Asia, Latin America, and Oceania* (Geneva, 1987).

Hartmann, Heidi, "The Family as a Locus of Gender, Class and Political Struggle," *Signs: Journal of Women in Culture and Society*, 6 (Spring 1981), pp. 366–94.

Humphries, Jane, "Enclosures, Common Rights, and Women: The Proletarianization of Families in the Late Eighteenth and Early Nineteenth Centuries," this JOURNAL, 50 (Mar. 1990), pp. 17–42.

Jensen, Joan M., *Loosening the Bonds: Mid-Atlantic Farm Women, 1750–1850* (New Haven, 1986).

King, Willford I., et al., *Income in the United States, Its Amount and Distribution* (New York, 1921).

Kuznets, Simon, *National Income and Its Composition, 1919–1938* (New York, 1941).

Lebergott, Stanley, *Manpower in Economic Growth: The American Record Since 1800* (New York, 1964).

Matthews, Glenna, *Just a Housewife: The Rise and Fall of Domesticity in America* (New York, 1987).

Reid, Margaret, *Economics of Household Production* (New York, 1934).

Seaman, Ezra, *Essays on the Progress of Nations* (Detroit and New York, 1846).

Seaman, Ezra, *Essays on the Progress of Nations* (2nd edn., New York, 1852).

Tryon, Rolla, *Household Manufactures in the United States, 1640–1860* (Chicago, 1917).

U.S. Congress, Senate, *Memorial of Mary F. Eastman, Henrietta L. T. Woolcott, and Others, Officers of the Association for the Advancement of Women, Praying That the Tenth Census May Contain a Just Enumeration of Women As Laborers and Producers*, 45th Cong., 2d sess., 1878. S. Doc. 84, Vol. 2, Serial 1786.

Waring, Marilyn, *If Women Counted: Towards a Feminist Economics* (New York, 1988).

Weiss, Thomas, *The Service Sector in the United States, 1839–1899* (New York, 1975).

Weiss, Thomas, "Revised Estimates of the United States Workforce, 1800–1860," in Stanley L. Engerman and Robert E. Gallman, eds., *Long-Term Factors in American Economic Growth*, NBER Studies in Income and Wealth Vol. 51 (Chicago, 1986), pp. 641–78.

Weiss, Thomas, "Economic Growth Before 1860: Revised Conjectures," NBER Working Paper No. 7 (Oct. 1989).

Weiss, Thomas, "U.S. Labor Force Estimates and Economic Growth, 1800–1860," in Robert Gallman and John Wallis, eds., *The Standard of Living in Nineteenth Century America* (Chicago, 1992).