

IS U.S. GROWTH UNDERSTATED BECAUSE OF THE UNDERGROUND ECONOMY? EMPLOYMENT RATIOS SUGGEST NOT

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Has the underground economy caused the increase in United States GNP in recent years to be understated relative to earlier periods? The ratio of employment to population provides powerful evidence that it has not. This ratio was as high in the middle 1970s as in previous periods and in 1978-80 rose to its highest level of the postwar era, suggesting that employment growth has not been understated. Employment series based on both establishment reports and household surveys yield exceptionally high ratios in recent years. This article provides a step-by-step explanation of why employment data are pertinent to the question raised about GNP.

This explanation may be summarized as follows. GNP measured as the sum of final products is not understated unless GNP measured as the sum of national income and other charges against GNP is also understated. Appreciable understatement of the growth of charges against GNP as a result of growth of the underground economy is highly unlikely in the absence of understatement of the growth of wages and salaries, because of the way the estimates are made. Understatement of the growth of wages and salaries without understatement of the growth of employment based on establishment reports is highly unlikely because of the way data are collected.

The article explains briefly the relationship between income tax evasion and errors in measuring the various components of charges against GNP. It also explains how illegal activities are meant to be handled in GNP measurement.

INTRODUCTION

Peter M. Gutmann, Edgar L. Feige, and several others have argued that expansion of the "underground economy"—alternative terms such as "informal," "unobserved," "unmeasured," "irregular," and "second" economy are also used—has led to increasing understatement of United States output and other measures of economic activity. I shall address here the specific question: Has growth of the underground economy caused the *increase* shown in recent years by the Bureau of Economic Analysis (BEA) series for United States national income and product to be understated in comparison with increases in earlier periods? This article introduces the ratio of employment to population as an important piece of evidence that this has not happened.¹ I focus on a comparison of the periods before and after 1973. This is because Feige argues that understatement of the growth of real national income as a result of expansion of the underground economy is responsible for most of the unexplained slowdown in the growth of productivity, and my estimates indicate the unexplained slowdown starts after 1973.²

¹A full discussion of the question raised is not attempted here, but mention should be made of a second important fragment of such a discussion. This is Robert P. Parker's "The Understatement of GNP and of Charges Against GNP in 1976 Due to Legal-Source Income Not Reported on Individual Income Tax Returns," Bureau of Economic Analysis, July 1980, xeroxed. An earlier version was published in Hearings before the House Subcommittee on Oversight on "Underground Economy," 1979.

²Edgar L. Feige, "The Theory and Measurement of the Unobserved Sector of the U.S. Economy: Causes, Consequences, and Implications," paper delivered at the 93rd annual meeting of the American Economic Association, September 6, 1980. Edward F. Denison, *Accounting for Slower Economic Growth: The United States in the 1970s*, The Brookings Institution, 1979.

The stated or implied allegation of those writing on the underground economy is that its expansion has caused economic statistics generally, and national income and product in particular, to be increasingly understated, and for the rate of increase in this understatement to be accelerating. Such quantitative evidence as they adduce consists almost entirely of a rise in some financial ratio, such as the ratio of some variant of cash or large bills to some variant of deposits or the ratio of some measure of the money supply (with or without an adjustment for turnover) to GNP. They hypothesize that, of the many possible reasons for a rise in such a ratio, the real reason is illegal transactions. They then infer that this means that GNP is increasingly understated because of growth of the underground economy. The evidence, such as it is, applies to GNP in current prices; it has nothing to do with the deflation of GNP. An error in current-dollar GNP from this source would introduce an approximately equal percentage bias in constant-dollar GNP.

The ratio of employment to population is far more pertinent than such financial ratios. It can be expected to decline if growth of the underground economy causes understatement of data, for under these conditions people would drop out of "reported" employment.³ (Both Feige and Gutmann say it will also cause overstatement of unemployment.)⁴ As will be shown, the employment ratio has not dropped. From 1947 through 1977 it fluctuated within a moderate range, with no tendency toward a decline during the mid-1970s. In 1978-80 the ratio broke out of the 1947-77 range. However, the breakout was not downward but upward. The employment ratio was higher from 1978 through 1980 than at any time from 1948 through 1977.

There is no doubt at all that a similar breakout on the downside would have been greeted as conclusive evidence that the underground economy had exploded. Even though it seems only fair that those who live by the ratio should die by the ratio, it is not my intent to adduce a breakout on the upside as evidence that the underground economy has collapsed. I do believe that it counts very heavily against the thesis that an expanding underground economy is causing increasing understatement of employment or output on any significant scale. The employment ratio provides far more pertinent evidence concerning possible biases in output measures than do the financial ratios; subsequent sections demonstrate its pertinence.

DEFINITION OF NATIONAL INCOME AND PRODUCT WITH RESPECT TO ILLEGAL ACTIVITIES

Growth of the underground economy is supposed to result in large part from illegal activities of one type or another, especially tax evasion. To consider

³Given the method by which population was estimated, people could not drop out of the population series after 1970 until the series was adjusted to the 1980 Census of Population. (The change in the population could be understated as a result of an omission of illegal immigration.) The adjustment to the 1980 census, which could not be incorporated in the tables of this article because similar adjustments for the Current Population Survey were not available at the time of writing, was upward. This is likely to be the result of more complete Census coverage in 1980 than in 1970, but in any case is not enough to change the conclusions of this paper.

⁴Edgard L. Feige, "How Big Is The Irregular Economy?," p. 11, and Peter M. Gutmann, "Statistical Illusions, Mistaken Policies," p. 17, both in *Challenge*, November/December 1979.

the question I have posed, therefore, it is necessary first to address briefly another question: How are illegal activities meant to be handled in national income and product measures? The U.S. definition of these measures states that illegal activities are excluded, but this needs considerable amplification to be operational. My understanding is as follows.

1. The value of products that are illegal, at least in the uses to which they are put, is to be excluded. The main such products at present are drugs, including marijuana (and including the distribution of imported drugs); net receipts of illegal enterprises conducting gambling activities; and services of prostitutes. Murder-for-hire is another example.

Alcoholic beverages, abortions, and material formerly considered pornographic were once in this category but have become legal. Gambling too has been increasingly legalized. I am not aware of significant products that were formerly legal being made illegal in recent years and continuing to be produced in significant amount. Although the scope of illegal products has narrowed, I have no opinion as to whether the value of illegal products has grown or shrunk relative to that of legal products.

Two reasons are usually given for excluding illegal products (or activities). Some national accountants exclude illegal products on the pragmatic ground that they cannot be measured. For others, including the writer, the reason is that representatives of the people have determined such products to be “bads” rather than “goods” with sufficient conviction to outlaw them.⁵ (This reliance on decisions of governments because they are agents of individuals is the same as that warranting inclusion in national product of government purchases, valued at the prices paid.) Another important consideration is that much of the value of illegal products—an estimated 99.5 percent in the case of drugs—exists only because their illegality has made their prices high. The value of the quantities of drugs now produced would be of trivial importance in the economy if they were legalized.

2. Legal products are to be included even if their producers evade taxes, or ignore the minimum wage, the Sherman Act, and other legislation, or are illegal immigrants, gangsters, or escaped convicts.⁶

3. Despite the preceding statement, legal products that are stolen from the inventories of business enterprises without ever being sold to final purchasers

⁵The earliest Department of Commerce statement, in *National Income, 1929–32*, p. 5, gives only the second reason: “The estimator must perforce follow the overt expression of social opinion as embodied in the nation’s legal code.” *National Income in the United States, 1929–35*, p. 7, remarks first that: “Most earnings from illegal pursuits are impractical of measurement.” It then adds that they *may* also be excluded from national income because they are derived from “antisocial activities.” *National Income 1929–36* says “There is some disagreement as to whether [earnings from illegal pursuits] should be included under any circumstances because of their antisocial nature, but because of the impracticability of measurement, this question need not be answered here.” *National Income 1954 Edition* is content to observe that “the exclusion of illegal transactions is a tradition-based convention . . .” Later publications seem not to have discussed the subject.

⁶In general, legal products are to be included even if the purveyor is supposed to be licensed or certified but is not. There is a grey area, however, where it is hard to draw the line. Medical advice from a clearly unqualified as well as unlicensed dispenser, practicing illegally, is not the same product as the medical advice of a fully qualified licensed physician and should be excluded. But the advice of a fully qualified foreign physician who is not licensed but practices illegally probably should be included on the grounds it is the same product as that of the licensed physician.

never appear in national income or product.⁷ The main and perhaps only reason is that data needed to include them are inadequate.

4. Many illegal activities yield no product that could be counted in GNP and national income even if those aggregates were not defined to exclude illegal activities. Stealing (apart from merchandise stolen from business) is in this category. It involves a transfer, either of goods whose production has been previously counted, or of money, and is akin to gifts between individuals. Of gross amounts illegally gambled, only the enterprise's net receipts measure a payment for a service; the amount returned to betters would be excluded as a transfer even if the enterprise were legal, just as it is in betting at parimutuels. Usurious interest that consumers pay to loan sharks is akin to legal consumer interest, which is excluded from national income and product. Not-for-hire crimes of violence, such as the murder of a spouse or neighbor in a quarrel, may have utility to the perpetrators but are akin to do-it-yourself household production that is excluded from national income and product. Imports of illegal drugs are like other imports that are excluded.

5. The desired treatment of legal intermediate products used to produce illegal final products is conceptually ambiguous. Statistically, they are generally included when national income and product are measured as the sum of incomes and other charges against GNP. They probably are mostly excluded when production is measured as the sum of expenditures for final products, but grain used to produce alcoholic beverages under Prohibition was specifically included.

PERTINENCE OF THE ACCURACY OF EMPLOYMENT DATA

If employment data presented in BEA's national income and product accounts (NIPA's) are accurate—or no less accurate than formerly—there is a high probability that expansion of the illegal economy has not biased appreciably the series for national income or product in current prices. This conclusion follows from three steps, detailed below, whose conclusions may be summarized as follows: 1. GNP measured from the income side of the accounts (charges against gross national product) and GNP measured from the product side move alike, both before and after 1973, so if the income-side estimate is essentially correct, so is the product-side estimate. 2. The course of the income-side estimate is unlikely to be much biased by growth of the underground economy unless wages and salaries are similarly biased. 3. Wages and salaries and employment can be expected to share any bias to which either of them is subject.

1. GNP is measured in two ways. First, GNP is measured as the sum of final products. Second, GNP is measured as the sum of national income and other charges against GNP. The difference between the estimates "from the product side" and "from the income side" of the accounts is the statistical discrepancy in the NIPA's. GNP and NNP, as published, are measured from the product side, while national income, as published, is measured from the income side. But the statistical discrepancy has been neither large nor persistently

⁷See Edward F. Denison, "Effects of Selected Changes in the Institutional and Human Environment Upon Output Per Unit of Input," *Survey of Current Business*, January 1978, p. 41.

rising or falling since 1973 (or in earlier periods) so if estimates from one side of the account are right so are those from the other; if one is wrong, so is the other.⁸ This discussion will be directly concerned with estimates from the income side.

2. Without a substantial error in wages and salaries a substantial error in the trend of GNP or national income resulting from a growing underground economy is unlikely. This is not only because, as shown in Table 1, wages and salaries represent over half—51.3 percent in 1979—of GNP (and 63.0 percent of national income). It is also because growth of the underground economy would not lead to increasing understatement of most of the remainder of charges against GNP.

TABLE 1
CHARGES AGAINST GROSS NATIONAL PRODUCT,
AND PERCENTAGE DISTRIBUTIONS OF CHARGES AGAINST
GROSS NATIONAL PRODUCT AND NATIONAL INCOME, 1979
(Values in billions of dollars)

	Percentage Distributions		
	Charges against GNP	Charges against GNP	National Income
Total	2,411.7	100.0	100.0
Wages and salaries	1,235.9	51.3	63.0
Employer contributions for social insurance	106.4	4.4	5.4
Other labor income	118.6	4.9	6.0
Proprietors' income with inventory valuation and capital consumption adjustments:			
Farm	30.8	1.3	1.6
Nonfarm	100.7	4.2	5.1
Rental income of persons with capital consumption adjustment:			
Owner-occupied nonfarm homes	11.7	0.5	0.6
Other	18.8	0.8	1.0
Corporate profits tax liability	87.6	3.6	4.5
Corporate profits after tax with inventory valuation and capital consumption adjustments	109.2	4.5	5.6
Net interest	143.4	5.9	7.3
Subsidies less current surplus of government enterprises (sign reversed)	-3.1	-0.1	—
Business transfer payments	9.4	0.4	—
Indirect business tax and nontax liability	188.4	7.8	—
Capital consumption allowances with capital consumption adjustment	253.6	10.5	—

Note: Charges against gross national product equal GNP less the statistical discrepancy.

Source: *National Income and Product Accounts, 1976-79*, Special Supplement to the July 1981 *Survey of Current Business*.

⁸Insofar as the movements of the two estimates of GNP are statistically independent, their agreement itself strengthens confidence in these series. It is true that if a large discrepancy emerges in BEA's initial estimates, BEA properly reviews and adjusts the estimates in an effort to reduce it, so changes in the final series are not wholly independent. However, persistent increases or decreases of unusual size in the initial discrepancy, such as might be expected if the underground economy were affecting the two series differentially, were not encountered after 1973.

One-third of these remaining charges—15.9 percent of GNP—consisted of three items of government receipts that are taken directly from or checked against the books of governments. (Timing adjustments that are introduced could not introduce cumulative error.) These are employer contributions for social insurance, corporate profits tax liability, and indirect business tax and nontax liability. The accuracy of these series for payments to governments is not affected by tax evasion; they are not supposed to include amounts that are not paid. The small item, subsidies less current surplus of government enterprises, is similar.

Increasing tax evasion would tend to cause *overstatement* of the increase in at least three types of charges that comprised 11.3 percent of GNP in 1979: other labor income, business transfer payments, and net interest. Other labor income (4.9 percent of GNP) consists almost entirely of employer contributions to private pension and welfare funds. Business transfer payments (0.4 percent of GNP) consist of liability payments for personal injury, corporate gifts to nonprofit organizations, and write-offs of consumers' bad debts to business. The data for other labor income and business transfer payments are, for the most part, obtained from tabulations of the deductions taken by employers on their tax returns. Any increase in tax evasion by enterprises filing tax returns would cause overstatement of the increase in these deductions and, consequently, an overstated increase in national income and product. An increase in nonfilers might, in principle, provide an offset, but it is hard to imagine illegal nonfilers making significant amounts of employer contributions to private pension and welfare funds or business transfer payments. Net interest (5.9 percent of GNP) is measured by deducting interest received by business and foreigners from interest paid by business and foreigners. Increased tax evasion would not affect some components of the calculation, but for the major components that would be affected it would mean overstatement of the increase in interest paid (an income tax deduction), an understatement of the increase in interest received (an income tax receipt), and consequently overstatement of the increase in net interest.⁹ Rental income of persons, other than imputed rent on owner-occupied nonfarm housing, is like net interest in that increasing tax evasion would mean overstatement of the increase in rent paid by business, understatement of the increase in rent received by business, and hence a tendency toward overstatement of the increase in rental income of persons and national income. Its inclusion would raise the percentage of GNP that would tend to increase too much if tax evasion increased from 11.3 to 12.0. However, the derivation of the rental income series has so many ingredients and is so complex that it may be better to consider the effect of increasing tax evasion to be neutral.

Components representing 12.3 percent of 1979 GNP are estimated by indirect methods that would not be much affected one way or the other by growth of the underground economy, including tax evasion. They include BEA estimates of capital consumption allowances with the capital consumption adjustment and of the owner-occupied nonfarm housing component of rental income,

⁹This description applies to tax filers; the direction in which an increase in enterprises illegally not filing would bias the estimates is not obvious but in any case such enterprises, presumably operating on a cash basis, are unlikely to borrow much.

and Department of Agriculture estimates of farm proprietors' income. (Omission of farm income derived from the production of marijuana is desired.)

The remaining 8.7 percent of GNP (10.7 percent of national income) consists of corporate profits after tax (4.5 percent of GNP) and nonfarm proprietors' income (4.2 percent), both with the inventory valuation and capital consumption adjustments. The underground economy is usually thought to affect these shares—especially nonfarm proprietors' income—most, but understatement of these shares would have to increase a great deal to affect the growth of national income and product very much.¹⁰ It should be understood that increasing understatement of these types of income on individual or corporate income tax returns that taxpayers file would not, in itself, mean that the NIPA estimates are increasingly understated.¹¹

3. Significant understatement of wages and salaries without corresponding understatement of the NIPA series for the number of wage and salary workers is improbable because, in almost all cases, the data are drawn from reports on which employers provide data for employment and wages side by side. If an employer failed to report at all, both the firm's employment and its wages would be missing. If an individual employee were kept off the rolls to facilitate his evading income tax or any other reason, he would be missing from both the employee count and the payroll. Almost all of the BEA annual data for private employment and earnings are drawn from reports filed under unemployment insurance laws. Understatement of average earnings on these reports seems hardly likely to be advantageous to the employer. The limit on taxable wages is only \$6,000 (the amount subject to Federal tax) in 31 states and the District of Columbia, and not over \$13,000 in any State. Understatement above the taxable wage limit does not save payroll tax. On the other hand, understatement of payrolls on income tax returns would be very expensive to the employer, and to report inconsistent figures to the IRS for the two taxes is likely to appear risky. Also, an employee's unemployment insurance benefit depends on his

¹⁰For example, if both these shares were understated by 10 percent in 1973, to lower the 1973–79 growth rate of real GNP (measured from the income side) by 0.2 percentage points understatement would have to double to 20 percent in 1979.

¹¹Tabulations from the Taxpayers Compliance Measurement Program (TCMP) provide the amount of nonfarm proprietors' income that would be disclosed if every tax return were audited by the Internal Revenue Service (IRS) as intensively as are returns in the TCMP sample. BEA adds this income to the income reported on the original returns, which is tabulated in *Statistics of Income*. For the NIPA estimates of nonfarm proprietors' income earned by tax return filers to be increasingly understated, it would be necessary for the ratio of nonfarm proprietors' income reported on the TCMP sample returns, including the income disclosed by audit, to the true nonfarm proprietors' income of these tax filers to decline over time. This ratio may easily have remained constant even if tax evasion increased, because the figures before and after audit move differently. "Blown up" to represent all tax filers, the amount added by audit was \$9.2 billion in 1973 and \$13.7 billion in 1976, amounts that were equal to 19.2 percent of the *Statistics of Income* figure for nonfarm proprietors' income in 1973 and to 24.2 percent in 1976, and to 0.69 percent of GNP in 1973 and 0.80 percent in 1976.

Similarly, corporate profits reported in *Statistics of Income* are adjusted upward to include an estimate of the additional profits that would be revealed if all corporate returns were audited. The assumption is made that (by asset size class, and separately for corporations with a profit and corporations with a loss) the addition to unaudited profits that would result from auditing all corporations is the same, per corporation, as for corporations that are actually audited by IRS.

This discussion does not consider the most recent years, for which tax data are not yet available and different sources were used.

reported wages, and understatement (as well as nonreporting) of wages risks being discovered if the employee applies for a claim. Tips not reported to employers comprise a minor exception to the previous discussion in that they may be omitted from both receipts and expenses, and thus not affect income tax. However, there is nothing new about this so it is not likely to bias the movement of payrolls. Almost one-fifth of wages and salaries, or 9.8 percent of GNP, consists of government payrolls. Their addition to the three items of government receipts enumerated above raises to 25.7 the percentage of GNP that is based directly on governments' records for their receipts and expenditures.

Although there is some statistical connection between BEA's estimates of the number of active proprietors of unincorporated nonfarm business (NIPA Table 6.10) and their income, it is not close, and the methodology makes it quite possible for the increase in the income of nonfarm proprietors to be understated or overstated even if their number is estimated correctly. Consequently, it is not maintained that accuracy of employment assures accuracy of nonfarm proprietors' income.¹²

TWO EMPLOYMENT SERIES

The preceding section concluded that expansion of the underground economy is unlikely to have caused much, if any, understatement of the growth of national income and product in recent years unless it also caused the increase in employment to be understated. The employment increase will be investigated next.

Table 2 introduces two employment series. One, shown in column 2, is the number of employed civilians 14 years of age and older as reported by the Department of Labor, based on the Current Population Survey (CPS).¹³ It is a count of persons, not jobs. To obtain it, reports from a sample of interviewed households are used to allocate the population in each demographic group among labor force categories.

The employment series whose accuracy is directly pertinent to an appraisal of the accuracy of national income and product is column 1. It is constructed by combining the NIPA series for the number of full-time and part-time civilian

¹²However, if the employment is accurate any error in nonfarm proprietors' income must appear in average income per proprietor. There is no strong reason to expect the earnings of proprietors and employees to move together systematically but a comparison may nevertheless be of some interest. The average earnings of self-employed persons in nonfarm industries ("proprietors' income with inventory valuation and capital consumption adjustments" in nonfarm sole proprietorships and partnerships, from NIPA Table 1.12, divided by persons primarily engaged in self-employment, from NIPA Table 6.10B) rose from \$3,982 in 1948 to \$10,719 in 1973 and \$14,482 in 1979 (the latest year available). Their ratio to wages and salaries per full-time equivalent employee in the whole economy (NIPA Table 6.9B) fell irregularly from 1.413 in 1948 to 1.149 in 1973 and 1.031 in 1979. The decline per year was larger (0.20 percentage points) in 1973-79 than in 1948-73 (0.10 percentage points) but continuation of the 1948-73 decline from 1973 to 1979 would have raised 1979 charges against GNP very little. Other periods would give different results. This comparison is not in any way meant to suggest that estimates of proprietors' income should be obtained by basing their movement on employee earnings instead of present procedures. Moreover, the comparison could be improved by allowing for the property component of proprietors' income.

¹³Minor adjustments of pre-1966 data are made to conform to post-1966 definitions.

TABLE 2
 COMPARISON OF TWO SERIES FOR NUMBER OF CIVILIANS
 14 YEARS OF AGE AND OLDER EMPLOYED IN THE
 UNITED STATES, 1947-79
 (Thousands of persons)

Year	Estimated from NIPA Data, Based on Establishment Reports	Reported by Households	Household Series Minus Establishment Series
	(1)	(2)	(3)
1947	57,906	57,860	-46
1948	59,014	59,166	152
1949	57,562	58,472	910
1950	59,166	59,798	632
1951	61,569	60,836	-733
1952	62,286	61,085	-1,201
1953	63,208	61,997	-1,211
1954	61,675	60,941	-734
1955	63,433	62,996	-437
1956	65,061	64,762	-299
1957	65,263	65,065	-198
1958	63,672	64,020	348
1959	65,249	65,636	387
1960	66,170	66,737	567
1961	66,118	66,852	734
1962	67,361	67,903	542
1963	68,041	68,867	826
1964	69,458	70,416	958
1965	71,688	72,239	551
1966	74,525	74,127	-398
1967	76,009	75,608	-401
1968	77,944	77,209	-735
1969	80,239	79,221	-1,018
1970	80,316	79,989	-327
1971	80,520	80,501	-19
1972	82,841	83,116	275
1973	86,202	85,886	-316
1974	87,658	87,408	-250
1975	86,160	86,172	12
1976	88,361	88,844	483
1977	91,590	92,019	429
1978	95,791	95,853	62
1979	98,951	98,317	-634
1980	NA	98,448	NA

Note: Alaska and Hawaii are included beginning in 1960.

Source: Column 1: Edward F. Denison, *Accounting for Slower Economic Growth: The United States in the 1970's*, The Brookings Institution, 1979, Table B-1, Column 8, extended and revised to incorporate bench-mark revisions in the Bureau of Economic Analysis national income and product accounts. Column 2: *Ibid.*, column 6, calculated from Bureau of Labor Statistics data. Column 3: Column 2 minus column 1.

employees (91 percent of the 1979 total), the NIPA series for the number of self-employed persons, and (for completeness and comparability with the CPS series) the small number of unpaid family workers reported by the CPS, and subtracting civilian employment overseas. This aggregate is, for the most part, a count of jobs rather than persons. To reduce its level to that of a count of persons without changing its movement, the series was multiplied throughout by the average ratio of the CPS estimate to this estimate.¹⁴ Consequently, the two series in Table 2 may be compared directly without adjustment for level differences. As I have pointed out elsewhere, there is no long-term difference in the movement of the two series but strings of years in which the household series exceeds the largely establishment-based series alternate with strings of years in which it is lower. Suppose the series are considered close when they differ by less than 100,000 or 150,000. The CPS series is then close to the largely establishment-based series in 1947, higher in 1948–50, lower in 1951–57, higher in 1958–65, lower in 1966–70, about the same in 1971, higher in 1972, lower in 1973–74, about the same in 1975, higher in 1976–77, about the same in 1978, and lower in 1979.¹⁵

The important point to observe is that no unusual discrepancy between the two series developed during the 1970s. If anything, differences were smaller than usual. From 1973 to 1979 one series increased 14.8 percent, the other 14.5 percent. The absence of any unusual divergence is of interest for two reasons.

First, it must tend to strengthen confidence in the general movement of both series, because they are almost entirely statistically independent of one another. This applies to some extent to biases that might be introduced by expansion of the underground economy, as well as to other sources of possible error. Although expansion of the underground economy might cause increasing understatement of both establishment-based and household-based employment series, the ways this could occur and, it would therefore seem likely, the magnitudes involved would be different.

Second, the absence of any unusual divergence makes it possible in the following sections to use data from the household survey to supplement those based upon the NIPA establishment-based estimates.

AGGREGATE EMPLOYMENT RATIOS

Earlier sections showed why increasing understatement of national income or product resulting from a burgeoning underground economy is unlikely in the absence of increasing understatement of employment. The data provided in Table 3 argue strongly against the hypothesis that increasing understatement

¹⁴The series is not revised whenever a year is added or a revision made. The ratio actually used, based on 1947–75 data prior to the recent NIPA bench-mark revision, is 0.96157. The ratio based on 1947–79, after the revisions is 0.96125. Use of the latter ratio would lower employment in column 1 by only 33,000 in 1979 and less in all earlier years.

¹⁵For further description of the two series and analysis of differences between them see Edward F. Denison, *Accounting for United States Economic Growth, 1929–1969*, The Brookings Institution, 1974, Appendix C, and *Accounting for Slower Economic Growth: The United States in the 1970s*, The Brookings Institution, 1979, Appendix B.

of employment has occurred. Employment in Table 3 includes members of the Armed Forces on active duty and therefore exceeds the series in Table 2.¹⁶

Column 4 of Table 3 shows the ratio of employment, estimated from NIPA data and based on establishment reports, to the population 14 and over. From 1947 through 1973 the ratio ranged from 0.536 to 0.583. From 1974 to 1977 it remained in the center of that range, fluctuating from 0.547 to 0.566. In 1978 it reached 0.580, a figure previously attained only in 1952 and 1953, the two postwar years in which the unemployment rate was lowest and the Armed Forces largest. In 1979, the latest year available, it reached 0.590, the highest in the postwar period.

Column 5 shows the ratio of employment to population for persons 14 and over based on the household data. This ratio displays the recent rise even more clearly. The 1947-73 range for this ratio was narrower, only from 0.542 to 0.571. From 1974 to 1977 the ratio remained in the center of that range, fluctuating from 0.547 to 0.565. In all three years from 1978 to 1980 the ratio, at 0.578 to 0.586, was above any postwar year before 1978.

The ratio based on household survey data for persons 16 and over, the more usual age cutoff, is shown in column 6. It shows the same pattern. The range is 0.561 to 0.591 in 1947-73, 0.567 to 0.585 in 1974-77, and 0.598 to 0.605 in 1978-80.

Employment tends to be high when unemployment is low and the Armed Forces large. Neither condition prevailed in 1978-80, making the record employment ratios reached in those years even more remarkable. My series for potential employment indicates that the increase in employment ratios was even larger and more extended on a potential basis than on an actual basis.¹⁷ The range is 0.548 to 0.574 in 1947-73, 0.580 to 0.592 in 1974-77, and 0.599 to 0.607 in 1978-79.

There is no way to prove conclusively the absence of a bias in any series, including employment. In this case, I suppose, anyone who chooses can simply assert that employment ratios should have risen even more than they did. But the movement of the employment ratio is as strong evidence against a recent downward bias in employment series as one can imagine. Detail discussed in the following section strengthens this evidence even further.

LABOR FORCE PARTICIPATION RATES BY SEX AND AGE

The rise in the employment ratio stemmed from an even larger increase in the labor force participation rate, partially offset by higher unemployment. The significance of this increase could be discounted if changes in the behavior of the labor force participation rate had resulted from shifts in the demographic composition of the population without changes in the behavior of rates for individual demographic groups. This was not the case. In the great majority of

¹⁶In addition, civilian employment overseas is not deducted from the NIPA establishment-based series in Table 3.

¹⁷This series is shown, prior to slight revisions and extension to 1979, in Edward F. Denison, *Accounting for Slower Economic Growth*, Table 2-1, column 8. It is consistent with the actual employment series shown here in Table 3, column 2.

TABLE 3
 POPULATION AND EMPLOYMENT, INCLUDING ARMED FORCES, AND RATIOS
 OF EMPLOYMENT TO POPULATION, 1947-80
 (Population and Employment in Thousands)

Year	Noninstitutional Population 14 Years of Age and Over	Number of Persons Employed 14 Years of Age and Over		Ratio of Employment to Population 14 Years of Age and Over		Employment Reported by Households as a Ratio to Population, Persons 16 Years of Age and Over
		Estimated from NIPA Data	Reported by Households	Employment Estimated from NIPA Data	Employment Reported by Households	
	(1)	(2)	(3)	(4)	(5)	(6)
1947	107,563	59,601	59,450	0.554	0.553	0.567
1948	108,585	60,578	60,622	0.558	0.558	0.572
1949	109,725	59,258	60,088	0.540	0.550	0.561
1950	110,865	60,945	61,448	0.550	0.554	0.568
1951	112,030	64,769	63,935	0.578	0.571	0.585
1952	113,221	66,000	64,679	0.583	0.571	0.587
1953	115,057	66,830	65,544	0.581	0.570	0.585
1954	116,173	65,075	64,291	0.560	0.553	0.568
1955	117,335	66,534	66,045	0.567	0.563	0.579
1956	118,661	67,986	67,619	0.573	0.570	0.586
1957	120,368	68,126	67,863	0.566	0.564	0.581
1958	121,872	66,381	66,657	0.545	0.547	0.564
1959	123,292	67,868	68,188	0.550	0.553	0.570
1960	125,287	68,750	69,251	0.549	0.553	0.570

1961	127,758	68,781	69,424	0.538	0.543	0.563
1962	129,986	70,226	70,730	0.540	0.544	0.565
1963	132,030	70,830	71,604	0.536	0.542	0.563
1964	134,054	72,242	73,154	0.539	0.546	0.566
1965	136,153	74,485	74,962	0.547	0.551	0.571
1966	138,283	77,749	77,250	0.562	0.559	0.579
1967	140,629	79,502	79,054	0.565	0.562	0.584
1968	142,905	81,532	80,744	0.571	0.565	0.586
1969	145,554	83,774	82,727	0.576	0.566	0.591
1970	147,996	83,482	83,177	0.564	0.562	0.584
1971	150,532	83,322	83,317	0.554	0.553	0.575
1972	153,862	85,306	85,565	0.554	0.556	0.577
1973	156,387	88,561	88,212	0.566	0.564	0.585
1974	159,008	89,928	89,637	0.566	0.564	0.585
1975	161,661	88,380	88,352	0.547	0.547	0.567
1976	164,238	90,548	90,988	0.551	0.554	0.574
1977	166,593	93,765	94,152	0.563	0.565	0.585
1978	168,940	97,948	97,970	0.580	0.580	0.599
1979	171,294	101,080	100,405	0.590	0.586	0.605
1980	173,828	NA	100,550	NA	0.578	0.598

Note: Alaska and Hawaii are included beginning in 1960.

Source: Column 1, Bureau of the Census. Column 2: Edward F. Denison, *Accounting for Slower Economic Growth: The United States in the 1970s*, The Brookings Institution, 1979, Table B-1, Column 11, extended and revised to incorporate benchmark revisions in the Bureau of Economic Analysis national income and product accounts. Column 3: Edward F. Denison, *Accounting for United States Economic Growth 1929-1969*, The Brookings Institution, 1974, Table C-3, column 1, extended by Department of Labor data. Column 4: column 2 divided by column 1. Column 5: column 3 divided by column 1. Column 6: computed from Labor Department data.

TABLE 4
LABOR FORCE PARTICIPATION RATES AND CHANGES IN RATES,
BY SEX AND AGE, SELECTED PERIODS

Sex and Age Group	Labor Force Participation Rate (percent)			Change per Year in Labor Force Participation Rate		Difference (5-4)
	1955-57	1972-74	1978-80	1955-57 to 1972-74	1972-74 to 1978-80	
	(1)	(2)	(3)	(4)	(5)	
Males						
14-15	25.23	22.67	21.97	-0.15	-0.12	0.03
16-17	51.07	49.93	51.47	-0.07	0.26	0.33
18-19	77.57	73.17	73.97	-0.26	0.13	0.39
20-24	90.47	86.67	87.23	-0.22	0.09	0.31
25-34	97.47	95.93	95.50	-0.09	-0.07	0.02
35-44	98.00	96.30	95.77	-0.10	-0.09	0.01
45-54	96.50	92.83	93.42	-0.22	0.10	0.32
55-64	87.97	78.73	72.93	-0.54	-0.97	-0.43
65 and over	39.03	23.20	19.87	-0.93	-0.56	0.37
Females						
14-15	12.23	17.03	18.13	0.28	0.18	-0.10
16-17	30.93	38.70	45.03	0.46	1.06	0.60
18-19	51.53	56.97	62.57	0.32	0.93	0.61
20-24	46.13	61.17	69.00	0.88	1.70	0.82
25-34	35.30	50.07	63.20	0.87	2.19	1.32
35-44	42.67	53.33	63.57	0.63	1.71	1.08
45-54	45.27	54.07	58.47	0.52	0.73	0.21
55-64	33.97	41.30	41.60	0.43	0.05	-0.38
65 and over	10.67	8.80	8.27	-0.11	-0.09	0.02
Addendum:						
Employment percentages:						
Males						
14-15	23.50	19.67	18.97	-0.23	-0.12	0.11
16-17	45.20	41.13	41.70	-0.24	0.10	0.34
18-19	71.10	64.77	64.03	-0.37	-0.12	0.25
20-24	85.67	80.27	80.30	-0.32	0.01	0.33
25-34	94.33	92.60	90.87	-0.10	-0.29	-0.10
35-44	95.27	94.00	92.73	-0.05	-0.21	-0.16
45-54	93.08	91.00	88.57	-0.12	-0.41	-0.29
55-64	84.17	76.60	70.80	-0.45	-0.97	-0.52
65 and over	37.60	22.43	19.13	-0.89	-0.55	0.34

Source: Computed from household data published by the U.S. Department of Labor, Bureau of Labor Statistics. The Armed Forces are included. Data for 1980 are from *Employment and Earnings*, January 1981, Table 3, pp. 164-165, and Table 37, p. 193. Except for 14-15 year olds labor force ratios are "total labor force" divided by the sum of "total labor force" and "not in labor force." Employment ratios are the excess of "total labor force" over "unemployed" divided by the sum of "total labor force" and "not in labor force." For 14-15 year olds (who are not present in the Armed Forces) labor force ratios are "civilian labor force" divided by "civilian noninstitutional population" and employment ratios are "employed" divided by "civilian noninstitutional population" and employment ratios are "employed" divided by "civilian noninstitutional population." Ratios for earlier years were computed in the same way from data in earlier Department of Labor publications.

demographic groups changes in the labor force participation rates reported after 1973 were more favorable than those reported in earlier years.

Table 4 shows labor force participation rates (with the Armed Forces included) for 18 age-sex groups in 1955-57, 1972-74, and 1978-80. Three-year averages are used in preference to a single year in order to reduce sampling fluctuations. Also shown are the change per year from the first date to the second and from the second to the third, and the difference between those changes. In 15 of the 18 groups, the labor force participation rate either rose in the second period after declining in the first, or increased in the second period than in the first, or declined less in the second period than in the first. Actual reversals from declines to increases occurred in participation rates for males in the age groups 16-17, 18-19, and 20-24, the demographic groups usually thought to be most affected by withdrawal to the underground economy, and in the rate for 45-54 year old males. In only 4 of these 15 groups (males 14-15, 25-34, and 35-44, and females 65 and over) were the differences between annual changes in the two periods minor (less than 0.2 percentage points); many were very large.

The remaining three groups were males 55-64, whose rate dropped faster after 1972-74 than before, and females 14-15 and 55-64, whose rates increased less. An accelerated trend toward early retirement was presumably responsible for the behavior of the rates in the 55-64 year age groups.

Employment rates for age-sex groups were computed only for males, and these are shown as an addendum in Table 4. It should be recalled that for all age groups combined, the labor force participation rate and the employment rate of males have long been declining while female rates were rising. For the middle-aged groups among males, changes in unemployment were sufficient to turn positive differences between the periods for changes in labor force participation rates into negative differences for employment rates. However, for all of the four youngest age groups, covering 14-24 year olds, and the oldest group, the positive change in trend was strong enough to persist even in employment ratios. These are the age-sex groups usually thought most likely to have moved into the underground economy.

One small subgroup, teenage nonwhite males, that is thought particularly likely to vanish into the underground economy does seem to show declining labor force and employment rates consistent with that hypothesis, though the decline did not accelerate after 1973. This group, however, has a negligible weight in total earnings.

SUMMARY

Several analysts have argued that expansion of the underground economy has led to understatement of the growth of national income and product and other measures of economic activity in recent years—Feige suggests since 1973—in comparison with earlier periods. For quantitative support, they rely upon a decline in some financial ratio. Much more pertinent is the ratio of employment to population. This ratio was in the same range during 1974-77 as in 1947-73, and in 1978-80 moved above the limits within which it had ranged in earlier years. This strongly suggests that employment is not being increasingly understated. Growth of national income and product is not likely to be understated

much as the result of growth of the underground economy unless growth of wages and salaries is understated, and any bias in wages and salaries would be matched by a bias in employment. Consequently, the conclusion that growth of employment probably is not being understated carries the implication that growth of national income and product is not being understated much as a result of growth of the underground economy. The discussion refers to possible biases in current-dollar GNP and national income. Such biases would affect constant-dollar series by about the same percentages as the current-dollar series. Deflation is not involved in the discussion.