Earnings & Wages--General

The declining middle-class thesis: a sensitivity analysis

New study supports the hypothesis of a shrinking middle; the declining proportion of families in the middle has largely moved to the upper class, although the share of income held by the lower class has declined

MICHAEL W. HORRIGAN AND STEVEN E. HAUGEN

In recent years, there has been considerable interest in the changing distribution of income in the United States. The consensus within the literature is that the distribution has become more unequal over the past one or two decades, as evidenced by several measures of income inequality.[1] In addition, a number of studies point to increasing proportions of the population in the lower and upper income classes, and thus a decreasing share in the middle class, as evidence of this trend.

Across these studies, however, opinions differ as to the extent to which the middle class has declined and how this decline has been divided between the lower and upper classes. The lack of agreement among findings can be attributed to variations in both the definition and measurement of the middle. Indeed, most studies fail to test the sensitivity of the results to alternative specifications of the middle class and to different techniques for measuring its size over time.

This article describes the nature and results of such a sensitivity analysis. Data on family income from the March Current Population Survey are used to track changes in the proportions of families in the lower, middle, and upper income classes over the 1969–86 period. By choosing alternative income intervals for defining the three classes, evaluating different methods for measuring changes in class size over time, and examining these changes from both a secular and cyclical perspective, the sensitivity of the findings is assessed. Through such sensitivity analysis, we attempt to reconcile the divergent views on secular changes in the size of the three classes over time. Although the underlying causes of the shifts are important, we do not attempt to identify them.

Consistent with the results found in the literature, we find that the proportion of families in the middle class has declined substantially over time. However, in contrast to many studies, we conclude that the majority of the decline in the middle is offset by an increase in the upper class. It is important to note that our findings do not run counter to arguments of growing inequality in the distribution of income. Indeed, in terms of its share of aggregate income, there has been a growing disparity between the lower class and the remainder of the distribution.

Overview of the literature

A brief review of a few examples from the literature demonstrates some of the differences between studies, both in terms of overall approach and conclusions drawn.[2] For instance, Lester Thurow defined the middle class as including households with income between 75 and 125 percent of median household income, and found that the middle shrank from 28 percent of all households in 1967, a business cycle recovery year, to 24 percent by

Michael W. Horrigan and Steven E. Haugen are economists in the Division of Labor Force Statistics, Bureau of Labor Statistics.

1982, a trough year. The loss was evenly distributed between the lower and upper tiers.[3]

A study by Robert Lawrence concentrated on the weekly earnings of wage and salary workers who usually work full time. Lawrence set the middle-class bracket at roughly two-thirds and four-thirds of men's median weekly earnings in 1983. Under this concept, the proportion of all workers in the middle fell from 50 percent to 46 percent between 1969, a peak year, and 1983, the first year of a recovery. Most of the loss was accounted for by a widening of the lower class, which expanded to 33 percent of all persons.[4]

Katharine Bradbury, using family income to define the middle class, suggested that a reasonable definition of the middle class includes all families with incomes between $20,000 and $49,999, in 1984 dollars. After deflating this interval back to 1973, a peak year, she found that the middle class declined from 53 percent to 48 percent of all families by 1984, the second year of a recovery. Once again, the vast majority of the loss showed up as a widening of the lower class.[5]

Determining the 'middle class'—the choices

Certain critical choices are made in studies of the middle class.[6] First, researchers choose among three sampling units—individuals, families, and households—and between two measures of compensation—wage and salary earnings and total income.[7] Second, one must select a method for measuring the size of the middle class in each year over the relevant time period. Analysts generally adopt one of two methods: they either use dollar intervals adjusted to represent constant purchasing power over time, or they use an interval representing fixed percentages above and below median income. Finally, a technique must be chosen for uncovering the long-run trends in the size of the middle class. Some analysts simply make year-to-year comparisons of class sizes. An alternative approach often employed is to use regression analysis to establish long-run trends.

Selection of a sampling distribution. In this study, the middle class is identified on the basis of family income. This choice is based on both economic and cultural considerations. For instance, it is widely accepted that by virtue of family membership, individuals in families experience significant economies of scale in consumption that do not exist for single individuals, or even for most households comprised of two or more unrelated individuals. For example, suppose that a husband and wife each has average or slightly below-average income. By combining both incomes, they can sustain a level of consumption, such as homeownership, which they could not sustain individually. Each spouse is thus able to enjoy a somewhat higher "standard of living" than he or she would attain alone. Because the vast majority of persons live in families (about four-fifths in 1987), these economies of scale figure importantly in our choice of sampling unit.

In addition, the cultural view of the middle class seems to be one in which the family is the typical income unit. Significant changes have taken place among families over the last two decades, including the very large inflow of wives (and mothers) into the labor force and increases in the percentage of families maintained by single parents (mostly women). This increased heterogeneity among family types gives added impetus to using the family unit in examining changes in the size of the lower, middle, and upper income classes.

None of these reasons, however, diminishes the importance of examining other sampling units, such as the household or the individual; rather, it is simply the lack of agreement across studies as to which group is the most appropriate for analysis of the declining middle-class thesis which invites researchers to explore the issue from different perspectives.[8]

Total money income is chosen as the measure of compensation for the family unit. This measure includes before-tax income from all sources (yearly totals of wage and salary earnings, self-employment earnings, Social Security, public assistance, interest, dividends, rent, and all other sources of money income regularly received) and thus is a comprehensive measure of a family's financial resources.[9]

In addition to economic criteria, numerous social characteristics are also frequently associated with the middle class. These include educational and occupational standards for the earners in the family, as well as certain political and moral values, goals and aspirations, and so forth. At best, these variables can only be imperfectly proxied. Certainly, they cannot be easily quantified. As a result, studies of the middle class, including this one, define the concept in terms of income alone.

Selecting middle-class income intervals. Given the selection of the family and total income as the focus of this study, the income intervals used to define the middle class in any given year need to be determined (in effect, splitting the distribution of incomes into three classes). Most studies do not explicitly identify the criteria by which the choice of a middle-class income interval is made. Although this is understandable given the arbitrary and intuitive nature of the middle-class concept, such an approach does not permit systematic examination of the sensitivity of findings to the choice of a middle-class income interval. To address this shortcoming, two criteria are selected which determine a range of middle-class income intervals used in this study. These criteria impose reasonable bounds on the income intervals defining the middle class, and, at the same time, provide a large number for use in sensitivity analysis.

First, the lower endpoint of the 1986 middle-class income interval is required to be somewhere in the 60- to 90-percent range of median family income in that year ($29,460). Hence, a range of lower endpoints between $17,676 (60 percent of the 1986 median) and $26,514 (90 percent) is chosen. The lower bound of 60 percent reflects an intent to ensure that the lower endpoint of the middle class represents an income *significantly above the poverty level*, which was about a third of median family income in 1986.[10]

Second, in any given year, a middle-class interval is admissible only if the percentage of families in the middle class is between 40 and 60 percent. While some may intuitively view the middle as consisting of the middle third of families, our choice reflects a desire to create a middle class with a larger proportion of all families. However, the upper end of each middle-class income interval is restricted so that the resulting percentage of families in the upper class is always equal to or greater than 5 percent.

Adhering to these criteria, the procedure for arriving at the set of middle-class income intervals involved two steps. First, the income intervals which represent the boundaries or limits of the two criteria were determined. Second, a range of intervals within these limits was selected. As discussed below, the admissible intervals vary according to the method used to measure the size of the middle class over time.

Comparisons over time

There are essentially two approaches in the literature used to make comparisons of the three classes over time. First, many studies use an interval deflator approach, in which a price index is used to deflate income intervals, thereby maintaining the purchasing power of the middle class over time. The second technique defines the middle class in each year as consisting of those families whose incomes are within given percentages of median family income for that year, thus preserving the relative position of the middle class in the overall distribution of incomes over time.

Interval deflator approach. In this method, we use 1986 as the base year and deflate each chosen middle-class interval back to each year between 1969 and 1986. In deflating incomes, however, there are several price indexes from which to choose, and they often indicate different rates of inflation over any given period. The choice of a price index can affect the cutoff points for the middle interval, and, consequently, the number of families falling into the lower, middle, and upper intervals.

Most studies use the Bureau of Labor Statistics' Consumer Price Index for All Urban Consumers (CPI-U) to measure inflation. However, the methodology used in constructing the CPI-U changed in 1983. Prior to 1983, the measurement of homeowner costs included changes in the asset value of homes. Recognizing that this approach mixed the investment and consumption aspects of homeownership, the BLS conducted extensive research and testing which led to the introduction of the rental equivalence methodology in 1983. The BLS also developed, for research purposes, an index which links the period before and after 1983, thereby treating homeownership costs in a manner consistent with the new approach. (See appendix.) This study uses the research index titled Consumer Price Index for All Urban Consumers, Experimental Measure 1 (REBASED)—hereafter referred to as the CPI-U-X1—because it provides a continuous series with no major change in methodology. However, to test the sensitivity of our results to the choice of a price index, two alternative price indexes, the CPI-U and the Bureau of Economic Analysis' Fixed Weight Personal Consumption Expenditure (FW-PCE) index, are also applied.[11]

Fixed percentage of median income approach. In this method, the middle class in each year consists of families whose incomes are within given percentages of median family income for that year.[12] The purchasing power of the middle-class income intervals produced by this method depends on the behavior of median family income. For example, if median family income is increasing in real value over time, so too will the real value of the associated middle-class income intervals. Indeed, when the CPI-U-X1 is used to calculate the real value of median family income over the 1969–86 period (in 1986 dollars), the real value of median family income has increased, albeit modestly.[13] (See chart 1.)

Secular comparisons

Many studies in the literature compare pairs of years to infer long-run trends in the relative size of income classes. However, we demonstrate that such inferences are very sensitive to the years chosen. As one might expect, results obtained from comparing a peak and trough year differ markedly from a comparison of similar points in successive business cycles. We use regression analysis to uncover the secular nature of changes in the size of each of the three classes over the 1969–86 period. This eliminates the sensitivity of the findings to the choice of years. Regression analysis essentially involves estimating trend lines for each of the lower, middle, and upper class income intervals selected for this study. The procedure first isolates cyclical movements and then estimates the remaining secular trend.[14] However, to demonstrate the sensitive nature of conclusions drawn from making year-to-year comparisons, numerous peak-to-peak and peak-to-trough comparisons are also conducted.

The sensitivity results

Interval deflator approach. The results of applying regression analysis to estimate the trends in the size of the lower, middle, and upper classes over the 1969–86 period are summarized in table 1. (The values of the estimated parameters and their associated levels of statistical significance are shown in appendix table A-1.) In this case, the income intervals created using the CPI-U-X1 are examined. There is a substantial range of income intervals for which the relative size of the middle class declined secularly over the 1969–86 period; in particular, this result holds for all middle-class intervals with starting incomes ranging from $17,676, the lower limit of our first criterion, to $22,000. As income requirements for membership in the middle class are made more stringent, however, changes in the distribution around the $24,000–$26,000 mark help to create an upper limit on the range of intervals over which the declining middle-class thesis holds.

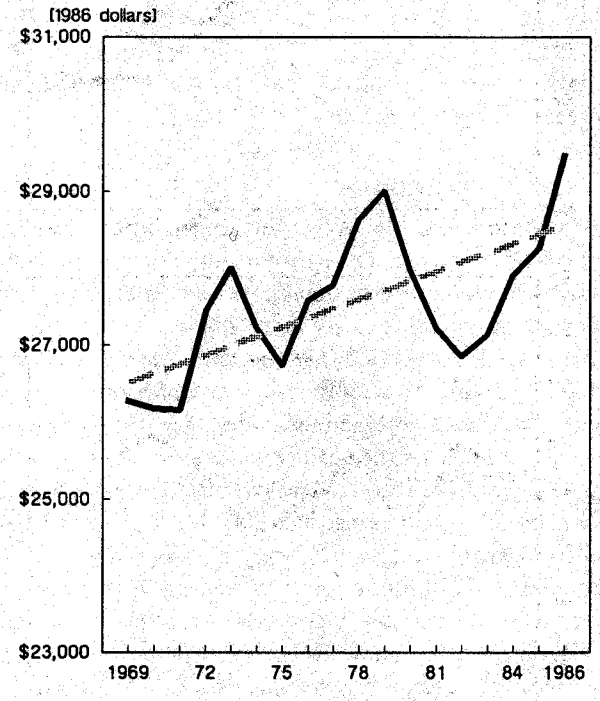
These results support the declining middle-class thesis. There is a consistent decline in the middle class across a substantial range of alternative income intervals. The key question however is, *where did the middle go*? Across virtually all the intervals for which the declining middle-class thesis holds, one fact consistently emerges—the relative size of the lower class has been secularly stable over time. Hence, as table 1 indicates, the upper class has experienced secular increases in relative size over the period being considered. Chart 2 uses the $20,000–$55,999 interval definition of the middle class to depict the changes in the size of the lower, middle, and upper classes and the estimated secular trends.

Table 1. Interval deflator approach (CPI-U-X1): direction of secular change in the relative size of the lower, middle, and upper classes, using selective middle-class income intervals (in 1986 dollars), 1969–86

Middle-class income interval	Lower class	Middle class	Upper class
$17,676 to –			
$39,999	0	–	+
$48,999	0	–	+
$18,000 to –			
$39,999	0	–	+
$41,999	0	–	+
$49,999	0	–	+
$20,000 to –			
$42,999	0	–	+
$49,999	0	–	+
$55,999	0	–	+
$59,999	0	–	+
$22,000 to –			
$45,999	0	–	+
$49,999	0	–	+
$51,999	0	–	+
$59,999	0	–	+
$61,999	0	–	+
$63,999	0	–	+
$24,000 to –			
$49,999	–	–	+
$51,999	–	–	+
$59,999	–	–	+
$61,999	–	0	+
$63,999	–	0	+
$26,000 to –			
$54,999	–	–	+
$59,999	–	0	+
$61,999	–	0	+
$63,999	–	0	+
$26,514 to –			
$55,999	–	0	+
$63,999	–	0	+

NOTE: 0 = trend that is not statistically different from zero,
– = statistically significant negative trend, and
+ = statistically significant positive trend.

Chart 1. Median family income, 1969-86



NOTE: Broken line represents secular trend from which cyclical movements have been removed.

What has happened to the *share of income held by the lower class*? The secularly stable trend in the size of the lower class has been accompanied by a secular *decline* in the share of aggregate income held.[15] Using the $20,000–$55,999 interval to define the middle class, chart 3 shows the secular decline in the proportion of income held by the lower class. Thus, the picture which emerges is one of a lower class that, although stable in size, is receiving a *declining share of the pie over time.*

Choice of a price index. The preceding analysis was conducted using the CPI-U-X1. To test the sensitivity of findings to the choice of an index, regression analysis was conducted to estimate the secular behavior of the three classes using two alternative price indexes, the Consumer Price Index for All Urban Consumers (CPI-U) and the

Fixed Weight Personal Consumption Expenditure (FW-PCE) index. Again, the $20,000–$55,999 income interval is used. As was the case for the CPI-U-X1, the coefficients of the regressions indicate a secular decline in the relative size of the middle class for both of these alternative price indexes. However, in contrast to the stability in the size of the lower class when the CPI-U-X1 was used, the lower class exhibited a secular *increase* when the CPI-U was employed, and a secular *decline* when the FW-PCE index was used.[16]

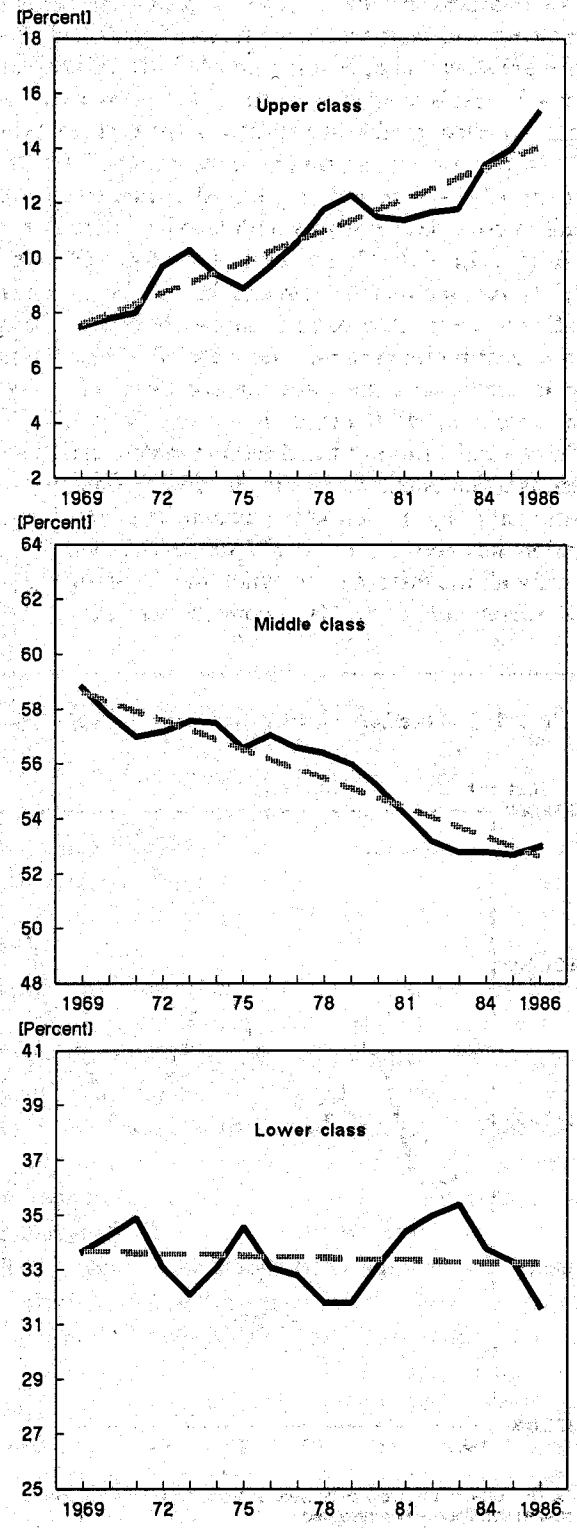
Given these overall secular trends, it is informative to compare class size over time using alternative price indexes. To do so, the distribution of family incomes in 1969 is compared to that of 1986.[17] Results using all three price indexes show a decline in the relative size of the middle class between 1969 and 1986. (See table 2.) With the CPI-U, this decline in the middle was accompanied by an increase in the relative size of the lower class. In contrast, the decline in the middle class associated with the CPI-U-X1 was accompanied by a decline in the proportion of families in the lower class. Finally, the FW-PCE index shows a substantial decline in the relative size of both the middle and lower classes. Clearly, any examination of the declining middle-class thesis using an interval deflator approach is quite sensitive to the choice of a price index.

Fixed percentage of median income approach. The results of the fixed percentage around median family income approach to examining secular trends are shown in table 3. Here, the middle class declined over the 1969–86 period for an even broader range of income intervals than for the interval deflator approach.[18] In terms of where the decline has gone, the results differ from those associated with the interval deflator method. For each interval, as the middle declines in relative size, both the lower and upper classes experience secular *increases* in relative size. (See appendix table A-2.)

Using 68–190 percent as the fixed percentage interval to define the middle class (equivalent to $20,000–$55,999 in 1986), the proportions of the decline in the middle going to the lower and upper classes between 1969 and 1986 are about 40 and 60 percent, respectively. Across the entire range of intervals, the proportion of the decline in the middle going to the lower class varies from roughly 20 percent to 50 percent.[19] The proportion of families in each of the three classes over the 1969–86 period is depicted in chart 4.

It is important to note that while these findings suggest that the lower class has increased in relative size over the 1969–86 period, the share of aggregate income held by this group has either remained the same or declined secularly.[20] Hence, despite differences between the fixed percentage and interval deflator methods in measured

Chart 2. Interval deflator approach: proportions of families in the upper, middle, and lower classes, 1969-86, using the $20,000-$55,999 income interval (in 1986 dollars)



NOTE: Broken line represents secular trend from which cyclical movements have been removed.

Table 2. Percent distribution of families in the lower, middle, and upper classes, using alternative price indexes, 1969 and 1986

Price index and year	Middle-class income interval	Percent distribution of families		
		Lower class	Middle class	Upper class
CPI-U-X1:				
1986	$20,000–$55,999	31.7	53.0	15.3
1969	7,180 – 20,104	33.7	58.8	7.5
CPI-U:				
1986	20,000–55,999	31.7	53.0	15.3
1969	6,680 – 18,704	30.4	60.0	9.7
FW-PCE:				
1986	20,000–55,999	31.7	53.0	15.3
1969	7,440 – 20,832	35.6	57.8	6.7

effects, *both* point to a fundamental *decline* in the lower class per-family share of total aggregate income.

Differences between the two approaches. What accounts for the differences in the findings of these two approaches? Using the CPI-U-X1 to deflate both endpoints of the $20,000–$55,999 income interval produces a 1969 income interval of $7,180–$20,104. This interval represents the same level of purchasing power as the $20,000–$55,999 interval in 1986. In the fixed percentage of the median approach, the endpoints $20,000 and $55,999 represent roughly 68 percent and 190 percent of 1986 median family income, respectively. When applied to the value of median family income in 1969, these percentages yield a middle-class income interval of $6,404–$17,931.

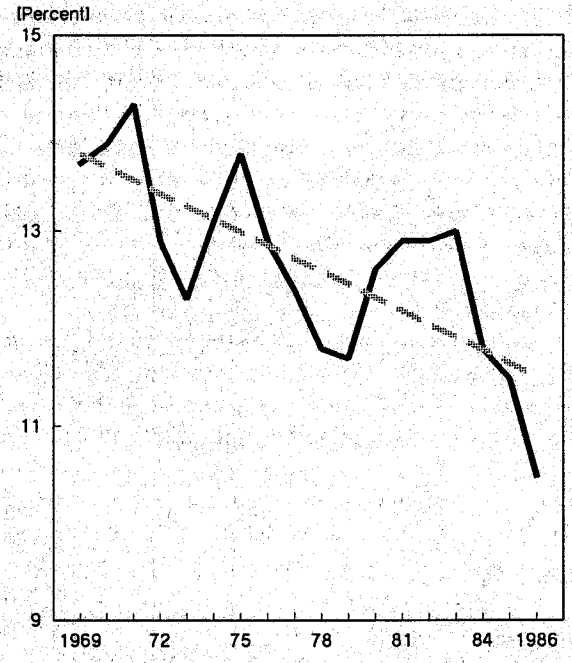
Because the real value of median family income increased over the 1969–86 period, the middle class associated with the fixed percentage approach has a lower level of purchasing power in 1969 than the one associated with the interval deflator approach. Moreover, by simply comparing the lower endpoints of the two income intervals, it is evident that the size of the lower class in 1969 was smaller for the fixed percentage approach than for the interval deflator approach. Hence, because the income intervals in both approaches grow to the same value in 1986, $20,000–$55,999, the fixed percentage approach shows a greater growth in the lower class between 1969 and 1986 than does the interval deflator approach.

The following tabulation shows the distribution of families in the lower, middle, and upper classes in 1969 and 1986, using both the interval deflator and the fixed percentage of median family income approaches:

	Middle-class income interval	*Percent distribution of families*		
		Lower class	*Middle class*	*Upper class*
Interval deflator (CPI-U-X1)				
1986	$20,000 – $55,999	31.7	53.0	15.3
1969	7,180 – 20,104	33.7	58.8	7.5
Fixed percentage interval of median income [68–190]:				
1986	$20,000 – $55,999	31.7	53.0	15.3
1969	6,404 – 17,931	28.7	60.2	11.1

Which of the two approaches is preferred? The answer depends on one's view of what constitutes middle-class income. If one takes the position that the middle should represent a particular standard of living that is maintained over time, then the interval deflator approach is preferred. However, it is also compelling to argue that the middle-class concept is more reflective of where one stands in the relative profile of family incomes, and using the current median or "representative" level of family

Chart 3. Proportion of aggregate income held by the lower class, 1969-86, using the interval deflator approach



NOTE: Broken line represents secular trend from which cyclical movements have been removed.

Table 3. Fixed percentage of median family income approach: direction of secular trend in the relative size of the lower, middle, and upper classes for selective middle-class income intervals, 1969–86

Middle-class income interval	Lower class	Middle class	Upper class
60 to –			
136	+	–	+
166	+	–	+
61 to –			
136	+	–	+
170	+	–	+
68 to –			
146	+	–	+
190	+	–	+
75 to –			
156	+	–	+
217	+	–	+
81 to –			
170	+	–	+
217	+	–	+
244	+	–	+
88 to –			
187	+	–	+
217	+	–	+
244	+	–	+
90 to –			
190	+	–	+
217	+	–	+
244	+	–	+
Symmetric income interval:			
60–140	+	–	+

NOTE: + = statistically significant positive trend, and
– = statistically significant negative trend.

income as a fulcrum is quite reasonable. This study does not make a choice in this debate.

Year-to-year comparisons

In this study, we use regression analysis to evaluate secular trends in the relative size of the lower, middle, and upper classes. Many middle-class studies, however, infer long-run trends in the distribution of incomes by making comparisons between two points in time. To demonstrate the sensitivity of such inferences to the particular choice of years, several year-to-year comparisons are made using the interval deflator approach (although the fixed percentage approach could just as easily been used).

The proportions of families in the lower, middle, and upper classes are very cyclically sensitive. (See chart 2; see also table 4 which provides the percent distribution of families in the lower, middle, and upper classes from 1969 to 1986.) Consequently, if year-to-year comparisons are made, it is inappropriate to choose years at cyclically dissimilar points in business cycles. For example, compare the distribution in 1969, a peak year, with that in 1982, a trough year. It is reasonable to expect that the proportion of families in the lower class will increase from a peak to a trough year. Indeed, the decline in the middle class over this period, 5.6 percentage points, coincides with a 1.3-percentage point increase in the lower class. By 1985, however, after 3 years of economic recovery, the lower class had fallen slightly below its 1969 proportion of 33.7 percent, and by 1986 had declined even further to 31.7 percent. Indeed, a comparison of each recession with its subsequent recovery gives evidence of a definite cyclical pattern in the shift in the distribution of family incomes, with the lower class growing during recessions, but then recovering its prerecession share in the subsequent economic expansion.

Next, compare two cyclically similar years. Between peak years 1969 and 1979, the middle-class decline of 2.8 percentage points was accompanied by a decline in the lower class of 1.9 percentage points; the upper class absorbed these declines, thereby increasing in size by nearly 5 points. Alternatively, comparing 1973 and 1985, both representing the third year of a recovery, the 4.9-percentage point decline in the middle was accompanied by a 1.2-point *rise* in the size of the lower class. Thus, even if care is taken to compare cyclically similar years, the findings may misrepresent the underlying secular trends.

Conclusion

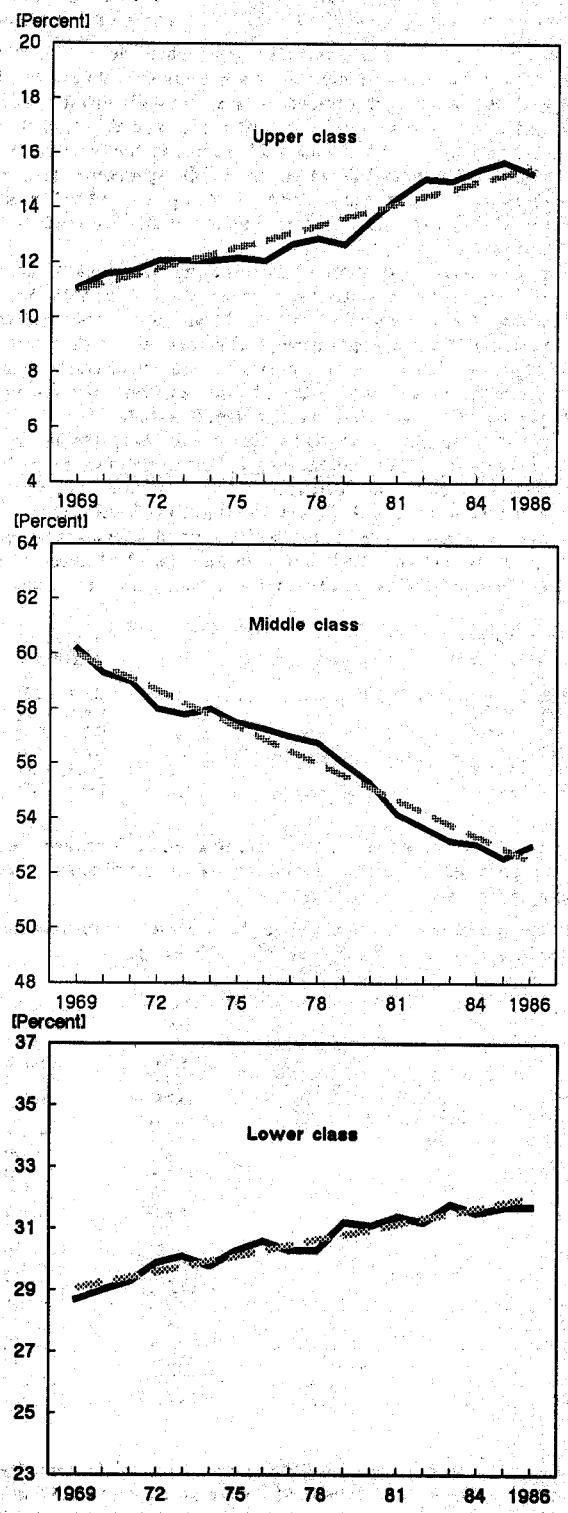
This study suggests that the consensus view of a declining middle class is correct. However, unlike some studies, this one finds that most of the decline in the proportion of families in the middle has gone to the upper class, not the lower. However, the size of this effect varies with the method used to measure the middle class. If the CPI-U-X1 is used to deflate middle-class income intervals (thereby maintaining the purchasing power of the middle class over time), virtually all of the decline in the middle goes to the upper class. Alternatively, if the middle is based on a fixed percentage around median income for each year, the decline in the middle is split between the

Table 4. Distribution of families in the lower, middle, and upper classes, 1969–86, using the interval deflator approach (CPI-U-X1) to adjust the 1986 income interval, $20,000–$55,999

[In percent]

Year	Lower class	Middle class	Upper class
1969	33.7	58.8	7.5
1970	34.3	57.8	7.8
1971	34.9	57.0	8.0
1972	33.1	57.2	9.7
1973	32.1	57.6	10.3
1974	33.1	57.5	9.4
1975	34.6	56.6	8.9
1976	33.1	57.1	9.7
1977	32.8	56.6	10.6
1978	31.8	56.4	11.8
1979	31.8	56.0	12.3
1980	33.2	55.2	11.5
1981	34.4	54.2	11.4
1982	35.0	53.2	11.7
1983	35.4	52.8	11.8
1984	33.8	52.8	13.4
1985	33.3	52.7	14.0
1986	31.7	53.0	15.3

Chart 4. Fixed percentage approach: proportions of families in the upper, middle, and lower classes, 1969-86



NOTE: Broken line represents secular trend from which cyclical movements have been removed.

The percentages of median family income used to define the endpoints of the middle class are roughly 68 and 190; in 1986, this produced a middle-class income interval of $20,000 to $55,999.

lower and upper classes, although the majority of the decline shows up as an increase in the upper class.

Despite these differences, however, it is clear that in both the interval deflator and the fixed percentage approaches, the behavior of the share of aggregate income held by the lower class indicates a growing disparity between the lower class and the rest of the distribution. This result is consistent with other studies which show an increase in income inequality over the past couple of decades.

In seeking to further explain the sensitive nature of findings to analytical choices, we examined the influence of two factors: (1) the choice of a price index in studies which use the interval deflator approach to measure changes in the size of the three classes, and (2) the practice in some studies of making secular inferences from comparisons of two years, rather than using a regression method such as the one employed in this paper.

This study employs a research price index developed by the BLS which, unlike the CPI-U, provides a continuous series with no major changes in methodology. Use of this research index, the CPI-U-X1, suggests that virtually all of the decline in the middle goes to the upper class, whereas the CPI-U indicates that a significant proportion of the decline goes to the lower class.

Finally, several middle-class studies compare pairs of years in order to infer long-run trends in the distribution of incomes, often selecting years for comparison that are at cyclically dissimilar points. Because there is a substantial cyclical pattern to the distribution of family incomes—the size of the lower class widens dramatically in recessions, and shrinks during expansions—such comparisons can give very different results than studies making secular comparisons. Moreover, even comparing similar points in different business cycles can, depending on the points chosen, give very different indications of long-run trends. □

——FOOTNOTES——

ACKNOWLEDGMENTS: The authors thank Robert J. McIntire and Bernard R. Altschuler, Office of Employment and Unemployment Statistics, Bureau of Labor Statistics, for constructing the computer programs used in this study.

[1]Several studies, using measures of income inequality such as the Gini coefficient and the log-variance approach, have found evidence of increased inequality over the past two decades. See, for example, McKinley L. Blackburn and David E. Bloom, "Family Income Inequality in the United States, 1967–84," *Proceedings of the 39th Annual Meetings* (Industrial Relations Research Association, 1986), pp. 349–58; W. Norton Grubb and Robert H. Wilson, "The Distribution of Wages and Salaries, 1960–1980: The Contributions of Gender, Race, Sectoral Shifts and Regional Shifts," Working Paper 39 (University of Texas, 1987); and Chris Tilly, Barry Bluestone, and Bennett Harrison, "What is Making American Wages More Unequal?" *Proceedings of the 39th Annual Meetings* (Industrial Relations Research Association, 1986), pp. 338–48.

[2]The list of articles on the declining middle-class thesis is quite extensive. See, for example, Barry Bluestone and Bennett Harrison, *The Deindustrialization of America* (New York, Basic Books, Inc., 1982); Bob Kuttner, "The Declining Middle," *The Atlantic Monthly*, July 1983, pp. 60–72; McKinley L. Blackburn and David E. Bloom, "What is happening to the middle class?" *American Demographics*, January 1985, pp. 19–25; Neal H. Rosenthal, "The shrinking middle class: myth or reality?" *Monthly Labor Review*, March 1985, pp. 3–10; Patrick J. McMahon and John H. Tschetter, "The declining middle class: a further analysis," *Monthly Labor Review*, September 1986, pp. 22–27; David Wessel, "U.S. Rich and Poor Increase in Numbers, Middle Loses Ground," *The Wall Street Journal*, Sept. 22, 1986; "Is the Middle Class Shrinking?" *Time*, Nov. 3, 1986, pp. 54–56; Barry Bluestone and Bennett Harrison, "The Great American Job Machine: The Proliferation of Low Wage Employment in the U.S. Economy," a study prepared for the U.S. Congress, Joint Economic Committee, December 1986; and Marvin H. Kosters and Murray N. Ross, "The Distribution of Earnings and Employment Opportunities: a Re-examination of the Evidence," *Studies in Economic Policy* (Washington, American Enterprise Institute, 1987).

[3]See Lester C. Thurow, "The Disappearance of the Middle Class," *The New York Times*, Feb. 5, 1984, p. F3.

[4]See Robert Z. Lawrence, "Sectoral Shifts and the Size of the Middle Class," *The Brookings Review*, Fall 1984, pp. 3–11.

[5]See Katharine L. Bradbury, "The Shrinking Middle Class," *New England Economic Review*, September/October 1986, pp. 41–55.

[6]For a review of the analytical choices made in studies of income distributions, as well as a comprehensive literature review, see Gary W. Loveman and Chris Tilly, "Good jobs or bad jobs—What does the evidence say?" *New England Economic Review*, January/February 1988, pp. 46–65.

[7]A household is defined by the Bureau of the Census as consisting of all persons who occupy a housing unit. A household includes the related family members and all the unrelated persons, if any, who share the housing unit. The term "family" is defined as a group of two persons or more (one of whom is the householder) related by birth, marriage, or adoption and residing together.

Total income is defined as yearly totals (before taxes) of wage and salary earnings plus all other reported sources of money income, such as interest, transfer payments, and so forth. Although a few studies focus on weekly earnings, annual measures are usually preferred because they take into account the number of weeks worked per year.

[8]While the family is chosen for this study, it is important at some point to consider the consistency of findings between studies using individuals or households, and studies using families as the unit of analysis.

[9]Note that the ideal data, after-tax income, are not available from the March Current Population Survey. Also, we exclude families reporting negative income from our universe.

[10]Poverty levels of income are determined by the Bureau of the Census and vary with the size of the family. The poverty level of income for a three-person family in 1986 was $8,737, 28 percent of median family income for a three-person family in that year; that for a four-person family was $11,203, or 32 percent of the median. The average family size in 1986 was 3.2 persons.

[11]What is the potential effect of using alternative choices of price indexes? To illustrate, let the 1986 income interval, $20,000–$55,999, represent the middle class in that year. Using the price index approach, we derive nominal values for these two endpoints over the 1969–85 period which represent the same amount of purchasing power as the $20,000–$55,999 interval in 1986.

Consider the effect of using the CPI-U, which shows a greater rate of inflation over the time period than the CPI-U-X1. Under the CPI-U-X1 the nominal value of the $20,000 endpoint in 1969 dollars is $7,180. Using the CPI-U, this value is $6,680, lower because of the relatively higher rate of inflation associated with this index. In other words, the relative size of the lower class in 1969 will automatically be smaller from using the CPI-U than from using the CPI-U-X1. Hence, because both values grow to $20,000 by 1986, the change in the size of the lower class between 1969 and 1986 will necessarily be larger for the CPI-U than for the CPI-U-X1.

In contrast, consider the use of the Fixed Weight Personal Consumption Expenditure (FW-PCE) index. Because this index indicates a slower rate of inflation than the CPI-U-X1, the nominal value of the $20,000 endpoint in 1969 dollars will be higher than the figure from the CPI-U-X1. Accordingly, the change in the size of the lower class over the period in question will be smaller for the FW-PCE than for the CPI-U-X1.

[12]Note that, using a fixed percentage approach to define the middle class in any given year, the intervals representing the limits of our two criteria are asymmetric with respect to median family income in 1986. Most symmetric intervals violate our criteria for interval selection. For example, choosing $26,000 (roughly 88 percent of the median) as our left endpoint of the middle class, to satisfy symmetry our upper endpoint becomes $32,920 (approximately 112 percent of the median). However, in this case, only 12.9 percent of families are found in the middle class.

By applying our two criteria, the resulting qualifying symmetric intervals vary within a small range of each other. Specifically, the narrowest and widest represent 62 to 138 and 60 to 140 percent of median family income, respectively. However, to further test the sensitivity of our findings to the variety of choices which can be made in this type of study, we incorporate into our approach the symmetric interval 60 to 140 percent of median family income.

In addition, it should be noted that while many studies in the literature use symmetric intervals, such a choice is inconsistent with the asymmetric nature of the distribution. For example, consider the interval representing 50 and 150 percent of median family income. The percentage of families found in the 50-100 percent interval is not equal to the percentage in the 100-150 percent interval. The former interval contains 28.6 percent of families and the latter, 23.3 percent:

Percentage interval of median family income	*Percentage of families*
[80–100, 100-120]	[11.2, 10.5]
[70–100, 100-130]	[16.8, 15.2]
[60–100, 100-140]	[22.7, 19.6]
[50–100, 100-150]	[28.6, 23.3]
[40–100, 100-160]	[34.5, 26.6]
[30–100, 100-170]	[39.8, 29.5]

The data also indicate that, as the symmetric intervals around median family income get larger, the asymmetry of the distribution becomes more pronounced.

[13]As the tabulation below indicates, the real value of median family income has increased slightly over the 1969–86 period:

Year	*Current dollars*	*Constant (1986) dollars*
1969	$ 9,433	$26,276
1970	9,867	26,172
1971	10,285	26,170
1972	11,116	27,447
1973	12,051	28,026
1974	12,902	27,219
1975	13,719	26,743
1976	14,958	27,598
1977	16,009	27,793
1978	17,640	28,636
1979	19,587	29,018
1980	21,023	27,993
1981	22,388	27,236
1982	23,433	26,873
1983	24,674	27,144
1984	26,433	27,912
1985	27,735	28,272
1986	29,458	29,458

Current-dollar data were taken from various issues of *Current Population Reports*, Series P-60 (Bureau of the Census). Constant-dollar data were derived by inflating the current-dollar figures by the CPI-U-X1, a price index developed by the Bureau of Labor Statistics for research purposes.

[14]In order to isolate the secular trend in the time series behavior of the class size associated with any income interval, we estimated three separate equations. The first equation regresses real values of gross

national product against a linear function of time. The error terms from this regression represent the cyclical portion of real gross national product.

These error terms are then used as an independent variable in a regression with the proportion of families in a given income class (lower, middle, or upper) as the dependent variable (also a simple linear form). The error terms from this regression represent the secular behavior of the dependent variable; that is, the secular trend associated with the time series behavior of the proportion of families in the class.

We then fit a linear regression of the error terms from the second equation against time. The coefficient on time can be tested to determine if it is statistically different from zero. Because the error terms represent the secular behavior of the proportion of families in a given class, this provides a test of whether this trend is positive, negative, or zero.

[15]Results are available from the authors.

[16]Results are available from the authors.

[17]The reader should be cautioned against inferring long-run trends from year-to-year comparisons. However, given the results of our regression analysis (and hence, *a priori* knowledge of long-run trends in the distribution), the example presented in the text is an acceptable way of demonstrating the sensitivity of findings to the choice of a price index.

[18]The conclusions we have drawn under the fixed percentage of median income approach remain unchanged when we specifically consider symmetric percentage intervals. As noted earlier, the range of symmetric intervals which satisfy our criteria is very small. We present results of one such interval which represents 60 percent and 140 percent of median family income in each year. The regression results show that the long-run trend in the size of the three classes is the same as for the other fixed percentage intervals. (See appendix table A-2.)

[19]Results are available from the authors.

[20]Results are available from the authors.

APPENDIX: Comparison of price indexes

In 1983, a new methodology using a rental equivalence approach was incorporated into the CPI-U. (For a discussion of methods used to estimate changes in housing prices, see the following *Monthly Labor Review* articles: Janet L. Norwood, "Two Consumer Price Index issues: weighting and homeownership," March 1981, pp. 58–59; "Indexing Federal programs: the CPI and other indexes," March 1981, pp. 60–65; and "The effect of rental equivalence on the Consumer Price Index, 1967–82," February 1985, pp. 53–55. Also see, "Changing the Homeownership Component of the Consumer Price Index to Rental Equivalence," *CPI Detailed Report*, January 1983, pp. 7–13.) Before adopting this change in method, the Bureau developed several experimental price indexes. One such index, the CPI-U-X1, became the model for the changes that were incorporated into the CPI-U in 1983.

In this paper, we employ a price index developed by the BLS for research purposes which links the pre-1983 CPI-U-X1 to the post-1982 CPI-U series. This results in a research price index which is consistent with the current treatment of housing in the CPI-U. The tabulation below presents figures for the CPI-U, CPI-U-X1, and the Bureau of Economic Analysis' Fixed Weight Personal Consumption Expenditure (FW-PCE) index, which is also used in this study:

	Price indexes (1986=100)		
Year	*CPI-U*	*CPI-U-X1 (REBASED)*	*FW-PCE*
1969	33.4	35.9	37.2
1970	35.4	37.7	38.8
1971	36.9	39.3	40.5
1972	38.2	40.5	41.9
1973	40.5	43.0	44.3
1974	45.0	47.4	48.4
1975	49.1	51.3	52.2
1976	51.9	54.2	55.1
1977	55.3	57.6	58.6
1978	59.5	61.6	62.7
1979	66.2	67.5	68.2
1980	75.2	75.1	75.3
1981	82.9	82.2	82.1
1982	88.0	87.2	86.8
1983	90.9	90.9	90.5
1984	94.7	94.7	94.1
1985	98.1	98.1	97.5
1986	100.0	100.0	100.0

Summary of regression results

Table A-1. Interval deflator approach: secular trend coefficients on the relative size of the lower, middle, and upper classes for alternative middle-class income intervals (in 1986 dollars), 1969–86

Middle - class income interval	Lower class	Middle class	Upper class
$17,676 to –			
$39,999	.020	–.548**	.529**
$48,999	.....	–.502**	.465**
$18,000 to –			
$39,999	.018	–.548**	.529**
$41,999	.....	–.537**	.519**
$49,999	.....	–.496**	.461**
$20,000 to –			
$42,999	–.028	–.493**	.514**
$49,999	.....	–.448**	.461**
$55,999	.....	–.353**	.380**
$59,999	.....	–.302**	.328**
$22,000 to –			
$45,999	–.083	–.430**	.494**
$49,999	.....	–.393**	.461**
$51,999	.....	–.358**	.432**
$59,999	.....	–.247**	.328**
$61,999	.....	–.215**	.299**
$63,999	.....	–.190**	.276**
$24,000 to –			
$49,999	–.182**	–.293**	.461**
$51,999	.....	–.256**	.432**
$59,999	.....	–.145*	.328**
$61,999	.....	–.113	.299**
$63,999	.....	–.087	.276**
$26,000 to –			
$54,999	–.249**	–.148*	.394**
$59,999	.....	–.081	.328**
$61,999	.....	–.049	.299**
$63,999	.....	–.024	.276**
$26,514 to –			
$55,999	–.249**	–.132	.379**
$63,999	.....	–.096	.313**

NOTE: *indicates coefficient is statistically different from zero at the 95-percent level of confidence.
**indicates coefficient is statistically different from zero at the 99-percent level of confidence.

Table A-2. Fixed percentage of median family income approach: secular trend coefficients on the relative size of the lower, middle, and upper classes for alternative middle-class income intervals, 1969–86

Middle - class income interval	Lower class	Middle class	Upper class
60 to –			
136	.187**	–.447**	.260**
166	.....	–.492**	.301**
61 to –			
136	.184**	–.444**	.260**
170	.....	–.497**	.307**
68 to –			
146	.173**	–.452**	.278**
190	.....	–.442**	.265**
75 to –			
156	.159**	–.452**	.291**
217	.....	–.380**	.215**
81 to –			
170	.118**	–.430**	.307**
217	.....	–.339**	.215**
244	.....	–.290**	.168**
88 to –			
187	.068**	–.351**	.278**
217	.....	–.292**	.215**
244	.....	–.242**	.168**
90 to –			
190	.063**	–.338**	.265**
217	.....	–.335**	.272**
244	.....	–.238**	.168**
Symmetric income interval:			
60–140	.187**	–.456**	.268**

NOTE: **indicates that the coefficient is statistically different from zero at the 99-percent level of confidence.