

# Change in Household Financial Ratios Between 1983 and 1986: Were American Households Improving Their Financial Status?

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This study examines changes in family financial status from 1982 to 1985, using data collected in 1983 and 1986 by the Survey of Consumer Finance. Financial ratios are used as indicators of progress to answer the question of whether households improved their financial status during the three year period.

KEY WORDS: *financial ratios*

A financial ratio is an index which relates two items of financial data to each other. To help families measure their financial progress at a reference point or over a period of time, several investigators have suggested the use of financial ratio analysis (Griffith, 1985; Lytton, Garman & Porter, 1991; Mason & Griffith, 1988; Prather, 1987, 1990). Griffith (1985) noted that financial planners and counselors typically advised clients to prepare an annual financial statement but seldom explained how to judge the implications of the financial statement. Although Griffith (1985) suggested 16 ratios and offered guidelines for interpretation, he did not provide empirical results. Mason and Griffith (1988) observed the lack of a theoretical framework which would provide a rationale for using certain data to analyze a client's financial situation. They commented, "Despite the absence of sound theory, the authors still believe it is useful to develop ratios . . . Empirical research is needed to test these ratios, and those ratios that are good predictors of financial problems and performance should be retained" (Mason & Griffith, 1988, p. 73).

## *Empirical Analysis of Ratios*

Prather (1987, 1990) examined the 16 ratios suggested by Griffith using data from the 1983 Survey of Consumer Finances and suggested

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household norms for most of the ratios. She suggested some restructuring to make the ratios more intuitively meaningful. In a study of perceived household financial security, Iwuagwu (1989) used seven ratios including the five ratios which Prather found to be most meaningful as predictor variables. Although the number of cases varied due to missing data, Iwuagwu identified three ratios as being predictors of perceived financial security: liquid assets/monthly expenditures, liquid assets/consumer debt, and inflationary assets/total assets.

Despite limited research, authors of financial planning texts continue to recommend the use of financial ratios as "yardsticks to measure financial progress" (Winger & Frasca, 1993, p. 72) and "to better manage financial resources and develop spending and credit-use patterns consistent with goals" (Garman & Fogue, 1991, p. 92). Although Prather (1987, 1990) analyzed the distribution of financial ratios in 1983, no research has been done to assess the trend in distribution of household financial ratios over time. This study using data from the Survey of Consumer Finance interviews with U.S. households in 1983 and 1986 analyzes changes in household financial ratios from 1983 to 1986. The trends presented in this article are assessed in the context of overall economic trends during the period, which are described below.

#### *U.S. Economic Trends in the 1980s*

The U.S. economy suffered a recession from January to July of 1980. After a brief period of growth, the economy entered another recession in July 1981 that lasted until November 1982. This recession was unusually severe with unemployment rates climbing above 10% for the first time since 1941. In late 1982, an expansion began which is described as the longest peacetime expansion in modern U.S. history. By the end of 1984, many of the previously idle resources had been brought back into use; real output expanded at a rate of about 3% from 1985 to 1989. Job growth in the 1982-89 period was remarkable. While real output and employment grew steadily following the 1981-82 recession, the rate of inflation remained relatively stable. Core inflation (which excludes the volatile food and energy components) hovered around the 4% to 5% percent range from 1982 to 1988 (**Economic Report of the President**, 1993, pp. 82-84).

According to the Census Bureau, median family income moved ahead of inflation each year from 1983 to 1985---the three years that are the focus of this study. Median family income went from \$26,430 in 1984 to \$27,740 in 1985. After adjusting for the 3.6% increase in consumer prices between 1984 and 1985, real median family income increased by 1.3%. The 1.3%

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real increase in family income between 1984 and 1985 followed increases of 2.6% for 1983-84 and 1.6% for 1982-83 (U.S. Bureau of the Census, 1987, p. 1).

Canner and Lockett (1991) noted that home mortgage and consumer debt rose more rapidly than disposable income during the 1980s. "The sum of home mortgage and consumer debt outstanding rose from \$1.3 trillion at the end of 1980 to just under \$3.4 trillion at year-end 1990. This increase averaged out to a rate of 10 percent per year, which was one-third again as large as the average growth in after-tax income over the same period" (Canner & Lockett, 1991, p. 218).

Canner and Lockett (1991) use the ratio of household debt to income as a measure of debt payment with an increasing ratio meaning debt level is increasing. Canner and Lockett (1991) note that in 1980, total mortgage and consumer debt as a percentage of income was 65.4%. The ratio dropped to 63% in 1982, rose to 68.5% in 1985, and soared to 83.5% in 1990 (p. 219). They warn, however, that interpretation of debt to income ratios is complex. First, the question of what types of debt to include must be addressed. Secondly, the ratio does not indicate whether the holder of debt has the assets or employment prospects to handle it comfortably and, finally, shifts in the content of consumer credit over time make long-term comparisons difficult.

### Financial Ratios as Measures of Change

In the business world, financial ratio analysis is frequently used to compare: (a) a present ratio with past and expected future ratios for the same company or firm, and (b) one firm with those of similar firms or with industry averages at some point in time (Brandt, Danos & Brasseaux, 1989; Byrne, 1992; Ketz, Doogar & Jensen, 1990; Pressel, 1991). Financial ratios may help investors and others evaluate the prospects for a company with a few simple numbers and guidelines. Ideally, financial ratios can reduce the amount of time needed for evaluation of investments, and provide a good method of predicting the likelihood of success or failure of a business.

### *Criteria for Useful Ratios*

In both household and business applications, for ratios to be useful, they must be easily interpreted and provide meaningful information for comparisons. For example, comparing assets to liabilities to reflect solvency is generally understood. An appropriate number of ratios is also important. Confusion could result if too many ratios are recommended, but

inflexibility could be imposed if a single ratio is used to describe the household's financial status.

#### Purpose of This Study

This study measures change in family well being, using financial ratios suggested by Lytton et al. (1991), with data from the Survey of Consumer Finance (SCF) for 1983 and 1986. The guidelines or cutoffs for the ratios used in this study are those suggested by Lytton et al. (1991) and authors of two personal finance texts (Garman & Fogue, 1991; Winger & Frasca, 1993). With the exception of guidelines demanded by lenders, the guidelines cited in textbooks seem to be derived from intuitive rules of thumb, with no empirical or theoretical basis.

#### Financial Ratios for Household Application

The following ratios are particularly applicable for studying family financial well being.

##### *Solvency Ratio: Total Assets/Total Liabilities*

The Solvency Ratio compares total assets with total liabilities, and is a broad measure of a household's overall financial position. Households are "technically insolvent" when the solvency ratio, (Total Assets/Total Liabilities), is less than one. The time necessary to liquidate assets is generally ignored, as is the reduction in value which may occur if assets are liquidated at an inopportune time, such as with the sale of a home. Personal property for which there is no market value should not be included in the assets.

##### *Investment Assets/Net Worth*

The Investment Assets to Net Worth Ratio compares the value of investment assets (excluding home ownership) to Net Worth. Lytton et al. (1991, p. 21) suggest that at least 25% of a household's assets should be monetary, with an increase as the family nears retirement.

##### *Liquidity Ratio: Liquid Assets/Disposable Income*

The Liquidity Ratio compares liquid assets to monthly expenses. However, monthly expenditure data were not available in the data set and disposable income was used as a proxy for monthly expenditures. Mason and Griffith (1988, p. 76) and Winger and Frasca (1993, p. 74) suggest that a reasonable value for this ratio would be 3 to 4, i.e., liquid assets should be equal to 3 to 4 months of disposable income.

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### *Annual Consumer Debt Payments/Disposable Income*

The Consumer Debt Ratio indicates the portion of disposable income committed to the payment of debt and, therefore, not available for savings or other purposes. Mortgage debt is not usually included in this ratio because the mortgage is financing an investment. Garman and Forgue (1991, p. 237) suggest that a safe debt limit is 10% of disposable income, and consider a borrower to be fully extended when 16 to 20% of disposable income is used to make credit payments.

Setting a guideline such as 15% is not intended to encourage families to carry this level of debt to income. Instead, the guideline is provided as a caution against being continually over extended. In addition, financial institutions use a variation of the debt-to-income ratio to determine qualification for mortgage eligibility (Mortgage Bankers Association of America). Developing a pattern of a safe level of debt-to-income can assist prospective home buyers.

### *Annual Shelter Costs/Total Income*

The Shelter Expenses Ratio indicates the portion of income going to housing. According to the Federal Home Loan Mortgage Corporation, Shelter Expenses should not exceed 28% of Gross monthly Income (Winger & Frasca, 1993, p. 257). Lytton et al. (1991, p. 14) compare housing expenditure to disposable income and suggest that a housing expense ratio in the range of 30-40% should be manageable.

### *Gross Annual Debt Payments/Disposable Income*

The Gross Annual Debt Ratio compares the portion of Disposable income going towards debt payment. According to Garman and Forgue (1991, p. 95), the ratio of Gross Annual Debt Payments (Shelter plus Consumer Debt) to Disposable Income should not exceed 40%.

## Measurement of Variables

### *Total Assets and Total Liabilities*

Total Assets were defined as "Real" Assets plus "Paper" Assets. Real assets included the current market value of the home, gross value of other properties, business assets and gross market value of vehicles. Paper Assets consisted of stocks, mutual funds, bonds, checking and savings accounts, money market accounts, dollar cash value of life insurance, IRAs and Keogh accounts.

Total Liabilities consisted of Total Real Estate Debt and Total Other Debt. Real Estate Debt includes first and second mortgages on the primary residence and other outstanding mortgages. Other Debt includes credit card debt, consumer loans, and non-regular payment outstanding debt.

*Investment Assets and Net Worth*

Investment Assets were defined as Paper Assets, Other Property, and Business Assets. Net Worth was defined as Total Assets minus Total Liabilities.

*Liquid Assets and Disposable Income*

All Paper Assets except IRAs and Keogh accounts were included in Liquid Assets. Disposable Income was calculated by deducting amounts for Social Security and federal income tax from adjusted gross income. Federal income tax was calculated by the author, using marital status, age of children, and household size, based on the assumption that all households used the appropriate standard deduction. Because of this method, disposable income is underestimated for most households using itemized deductions. About 39% of individual income tax returns in 1985 had itemized deductions (**U.S. Bureau of the Census**, 1992, p. 326). Social Security was calculated using earned income of the respondent and spouse. Estimates of state income tax were not calculated due to the unavailability of data.

*Annual Consumer Debt Payments*

Annual Consumer Debt Payments consisted of credit card debt, outstanding installment loan balances, and line of credit loans. The present value of the payment on the total credit card balance owed was calculated using the interest rate provided by the head of the household. Outstanding loan balances consisted of loans for home additions and repairs, vehicles, furniture, recreation or hobby, and education, travel, medical or investment loans. Yearly payment was calculated using the amount of payment and the period provided by the head of the household. Yearly payment for lines of credit was calculated using the balance provided by the household and annual percentage rates in effect in 1982 and 1985 (Secured Personal Credit Line, 1992).

*Annual Shelter Costs*

Annual Shelter Costs include rent or mortgage and a maintenance fee for homeowners. Rent or mortgage payments and frequency of payment were available in the data. An amount for annual maintenance for homeowners was calculated by multiplying the current market value of the

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home by three percent (Lindamood & Hanna, 1979, p. 302). Although the cost of maintenance of the home can vary from year to year, inclusion of an estimate for maintenance insures that the true cost of home ownership is taken into consideration.

### *Gross Annual Debt Payments*

Annual Shelter Costs and Annual Consumer Debt Payments were summed to yield Gross Annual Debt Payments.

## Methodology

### *The Dataset*

Data for the study were drawn from the Survey of Consumer Finances (SCF). The Federal Reserve Board was the sponsor of the Survey which was collected by the Survey Research Center at the University of Michigan (Avery & Elliehausen, 1988). This center collected data in 1983 on the assets and liabilities of a nationally representative sample of U.S. households through in-person household interviews. In 1986, respondents were re-interviewed by telephone (Avery & Kennickell, 1988). A total of 2,822 interviews were completed in 1986 with respondents who had been interviewed in 1983.

For this study, respondents who had been part of a non-probability sample of high-income households in 1983 were deleted. Because heads of households who have retired may have begun to withdraw from their retirement savings, this study does not include respondents who had retired from full-time employment. Avery, Elliehausen and Kennickell (1987) recommend that households headed by a person aged 24 or less should be excluded from most analyses. The justification for exclusion was that the 1986 survey under sampled new households in the under-25 age group (Avery et al., 1987, p. 775). After deleting the non-probability high income sample, the retirees, and those households headed by a person aged 24 or less, a sample of 1,934 respondents remained.

### *Sample Weighting*

Data were weighted to adjust for changes in the sample which occurred between the two surveys. For example, the base weight was halved for all households who separated or divorced between 1983 and 1986 (Avery & Kennickell, 1988).

*Calculation of Ratios with Zero Denominators*

It is impossible to calculate a ratio if the denominator is equal to zero. For instance, Net Worth which is used as a denominator may be equal to zero. The technique used in this analysis was to change the zero to one. The numerical difference between zero and one is minimal and a calculation can then be accomplished. Because the distribution of the ratios, not the mean, was needed for the analysis, negative values in the denominator were left unchanged.

Findings and Conclusions

Table 1 presents selected descriptive statistics of the sample's demographic characteristics (DeVaney, 1993). In both years, the most common household form was the married couple household. There was a slight decrease in the proportion of married couple households and a slight increase in the proportion of divorced households. The homeownership rate increased from 73% to 78%.

Changes in Balance Sheet Items and Income

Table 2 shows the distribution of selected financial variables (DeVaney, 1993). The results are presented in constant dollars as the Consumer Price Index was used to adjust 1983 dollars to 1986 values (Avery & Kennickell, 1988, p. 79). The mean and median levels of nearly all asset categories were higher in 1986 than in 1983. The pattern for liability categories was mixed, with mortgage debt, credit card balance, and total debt having somewhat higher levels in 1986 than in 1983.

*Changes in Income*

Between 1983 and 1986, mean real annual income increased. However, at the median there was a decrease in real total income of \$78. One-fourth of all households had a drop in real total income of at least \$6,812.

*Changes in Assets and Liabilities.*

The pattern of change in total assets was somewhat similar to the pattern of change in total income with the mean and median levels of change being positive. However, a substantial minority of households experienced real decreases in asset levels. The median level of change in debt was zero, but the mean level of change was \$2,215. Twenty five



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percent of the households increased the real level of total debt by \$5,960 or more.

Table 1.  
Frequency Distributions of Selected Demographic Variables for 1983 and 1986. (Without High-Income Sample, Retirees, and Household Heads under 24).

Characteristic	Frequency		Percent	
	1983	1986	1983	1986
<b>Marital Status of Respondent</b>				
Married	1,320	1,311	68.3	67.8
Separated	68	52	3.5	2.7
Divorced	232	268	12.0	13.9
Widowed	126	128	6.5	8.2
Never Married	143	128	7.4	6.6
Partner	45	16	2.3	0.8
<b>Gender of Head of Household</b>				
Male	1,545	1,503	79.9	77.7
Female	389	431	20.1	22.3
<b>Home Ownership</b>				
Own	1,420	1,506	73.4	77.9
Other than Own	514	428	26.6	22.1

n = 1,934

Over one-third (37.5%) of the households in the sample experienced negative changes in net worth. The change in median net worth (\$5,527) was about one-third of the change in mean net worth (\$14,742). The increase in income at the mean was 6.5% while, at the median there was a decrease in income of less than 1/4 of 1%. Net Worth increased by 17% at the mean and 12% at the median. Total Assets increased by 16% at the mean and by 7.5% at the median.

*Overview of Changes in Balance Sheet Items and Income.*

Overall, the patterns shown in Table 2 suggest a slight improvement in the financial status of the households in the sample. An exception to the pattern

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Table 2.  
Selected Balance Sheet and Income Items at Mean, Median, 25th and 75th Percentiles, (Weighted)

Item	Mean	25th %	Median	75th %
<b>1983 (Adjusted to 1986 dollars)</b>				
Total Income	30,009	17,146	28,304	43,136
Disposable Income*	26,758	12,297	23,262	36,651
Net Worth	86,964	11,343	44,950	108,876
Total Assets	106,461	19,005	67,819	137,877
Real Assets	84,364	9,504	55,967	106,266
Home Value	44,903	0	44,200	78,036
Total Mortgage	12,150	0	0	22,693
Autos	5,171	2,134	4,727	8,055
Investment Assets	61,386	1,998	13,306	60,384
Paper Assets	22,097	1,032	6,167	25,579
IRAs & Keoghs	1,224	0	0	0
Liquid Assets	22,591	1,117	6,553	26,132
Real Estate Debt	15,743	0	1,224	26,400
Annual Shelter Cost**	2,733	1,341	2,243	3,663
Credit Balance	423	0	0	529
Total Other Debt	3,753	0	1,445	5,341
Total Debt	19,497	503	9,054	32,292
<b>1986</b>				
Total Income	31,333	16,000	28,000	44,000
Disposable Income*	24,879	14,437	23,812	34,284
Net Worth	109,352	21,528	59,767	142,173
Total Assets	132,247	36,045	86,275	177,168
Real Assets	98,218	26,787	66,764	132,053
Home Value	54,269	15,000	50,000	85,000
Total Mortgage	15,272	0	2,434	27,935
Autos	7,286	2,159	5,622	11,275
Investment Assets	70,691	3,000	18,290	72,955
Paper Assets	34,029	2,045	11,188	36,949
IRAs & Keoghs	3,849	0	0	4,000
Liquid Assets	30,180	1,962	9,000	30,763
Real Estate Debt	19,317	0	7,739	31,940
Annual Shelter Cost**	4,662	1,980	3,783	6,414
Credit Balance	759	0	60	1,000
Total Other Debt	3,576	0	1,000	5,210
Total Debt	22,894	500	11,022	36,569
<b>Change (1986 Dollars - 1983 Dollars adjusted to \$1986)</b>				
Total Income	1,324	-6,812	-78	6,884
Net Worth	14,742	-5,945	5,527	31,860
Total Assets	16,957	-7,080	5,087	39,108
Total Debt	2,215	-5,960	0	4,562
n = 1,934				

\*Calculated by author. Federal income tax was estimated based on using a standard deduction, and is an overestimate for most households that itemized. Therefore, disposable income is underestimated for many middle and upper income households.

\*\*Calculated by author using amounts provided for rent and housing payments and frequency of payment. A maintenance fee is calculated for homeowners.

of improvement is the average increase in real debt levels. Some improvement in the household financial situation is not unexpected for a period of generally increasing prosperity, as described in the first part of this article. It is possible, however, that consideration of separate items from the households' financial situation may not give as complete a picture as financial ratios could.

#### Changes in Household Financial Ratios Between 1983 and 1986

##### *Changes in Percent Meeting Guidelines*

Table 3 presents the distribution of values obtained for the ratios and shows how the actual ratios compare to suggested guidelines. The characteristic "Better", "Worse", or "No Change" was assigned to each ratio using an arbitrarily selected value of two percentage points to represent a change in the proportion of the sample meeting the guideline from 1983 to 1986. Figure 1 shows the percentage of households who met the suggested guideline for each ratio. Table 4 presents values of the ratios at selected percentiles for 1983 and 1986.

Table 3.  
Median Values for 1983 and 1986 Ratios Compared to Suggested Ratio Values

Ratio	Guideline % Meeting	Median		Change		
		1983	1986	1983	1986	
Assets/Liabilities	>1.00	9.59	15.05	90.6	92.2	Better
Investment Assets/Net Worth	>0.25	0.39	0.41	62.0	64.4	Better
Liquid Assets/Disposable Income	>0.25 Better	0.29	0.39	52.7	59.5	
Consumer Debt/Disposable Income	<0.15 Worse	0.05	0.05	78.3	75.1	
Annual Shelter/Total Income	<0.28	0.07	0.14	92.3	84.5	Worse
Annual Debt/Disposable Income	<0.35	0.17	0.26	78.3	67.7	Worse

(n = 1,934)

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### Summary and Implications

#### *Mixed Results*

The comparison of the financial ratios suggests that gains made by American households from 1983 to 1986 were mixed. Of the six ratios which were analyzed, the results show an increase in the proportion meeting guidelines for three ratios and a decrease in the proportion meeting guidelines for three ratios. The ratios which showed gains were Assets/Liabilities, Investment Assets/Net Worth, and Liquid Assets/Disposable Income. However, interpretation of the gains should be viewed with caution. The Asset/Liability

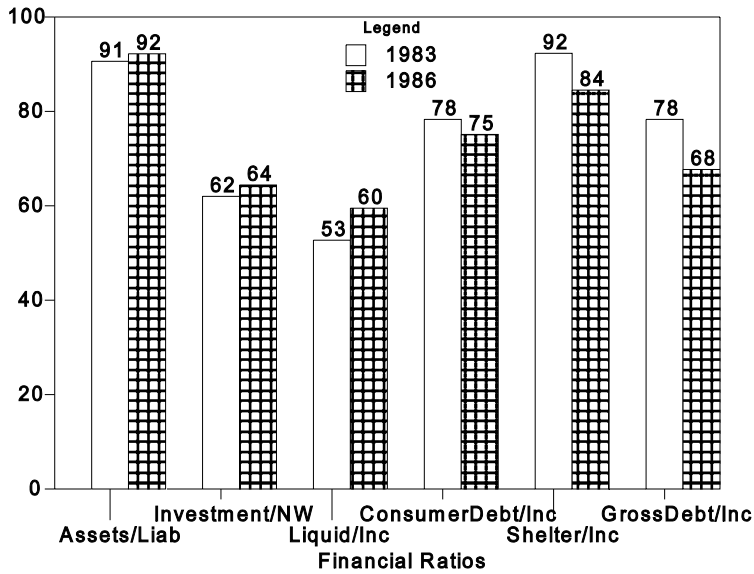
Table 4.  
Ratio Values obtained at Selected Percentiles for 1983 and 1986

Ratio	5%	25%	Median	75%	95%
<b>Assets/Liabilities</b>					
1983	0.54	2.40	9.59	300.00	791230.00
1986	0.81	3.08	15.05	1300.00	131246.00
<b>Investment Assets/Net Worth</b>					
1983	0.00	0.10	0.40	0.75	1.11
1986	0.00	0.13	0.41	0.73	1.09
<b>Liquid Assets/Disposable Income</b>					
1983	0.00	0.06	0.29	1.07	5.16
1986	0.00	0.10	0.39	1.11	5.10
<b>Consumer Debt/Disposable Income</b>					
1983	0.00	0.00	0.05	0.14	0.40
1986	0.00	0.00	0.05	0.15	0.37
<b>Annual Shelter/Total Income</b>					
1983	0.02	0.05	0.07	0.14	0.34
1986	0.03	0.08	0.14	0.22	0.50
<b>Annual Debt/Disposable Income</b>					
1983	0.04	0.09	0.17	0.31	1.06
1986	0.05	0.15	0.26	0.40	0.80

(n = 1,934)

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Figure 1.  
Changes in Percent Meeting Financial Ratio Guidelines Between 1983 and 1986.



ratio revealed that 9.4% of households were technically insolvent (had a ratio less than 1.0). Although the proportion of households who held 3 months' worth of Liquid Assets to Disposable Income improved by seven percentage points, 40% of households still did not have access to Liquid Assets worth 3 months of Disposable Income. Such households might have severe difficulty in meeting expenses if a total loss of income from illness, disability, or unemployment occurred.

As shown in Table 3 and Figure 1, the level of debt as compared to income increased. The following ratios showed decreases in the proportion of families meeting the suggested guidelines: Annual Consumer Debt Payments/Disposable Income, Annual Shelter Costs/Total Income, and Gross Annual Debt/Disposable Income. The decrease in percentage points of families meeting the guideline was as follows: Consumer Debt payments, a decrease of 3 percentage points; Annual Shelter Costs, a decrease of 7 percentage points; and Gross Annual Debt Payments, a

decrease of almost 11 percentage points. It appears that the changes in percentage of households meeting the guidelines for the financial ratios reflect the changing economy: income increased slightly while consumer debt increased more rapidly. The rise in consumer debt and shelter costs for the period are consistent with Canner and Lueckert's (1991) findings that home mortgage and consumer debt rose more rapidly than disposable income during the 1980s.

*Implications for Financial Counselors*

Financial counselors and planners may wish to compare ratio values of the families with whom they work to these empirical results. Comparison with both the suggested guidelines and these empirical results could provide a starting point for discussion of a family's financial status. If it were possible to calculate changes in the ratio values for a family over a three or four year period, additional insight might be derived. However, it is likely that a mixed pattern of results will be obtained for many families. Some families may meet some, but not all of the suggested guidelines.

*Implications for Refinement of Guidelines*

As indicators of progress, the financial ratios appear to function reasonably well. The picture which emerged of household financial status for the period 1983 to 1986 was mixed. To fully understand the changes, it may be essential to determine the characteristics of the households who made gains and those who did not. A next step in the analysis could be an examination of the financial ratios of the various age groups. The life cycle hypothesis suggests that dissaving occurs disproportionately in younger households as incomes are rising and the need for durable goods is great (Ando & Modigliani, 1963). Such an analysis may point to a revision of the financial ratio guidelines. At present, the guidelines indicate that "one size fits all". Although many writers suggest that families in different stages of the life cycle are not expected to meet the guidelines, findings from empirical studies such as this give strong support to the development of new values for some of the financial ratio guidelines.

*Implications for Future Research*

Analysis of these financial ratios with other datasets, and with the 1989 wave of the Survey of Consumer Finance, would provide additional insights. It would be especially useful to analyze changes in financial ratios during a time period when overall economic conditions are worsening rather than improving, as was the case for the time period analyzed in this article.



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Analysis of factors related to whether households moved from not meeting ratio guidelines to meeting them, or vice versa, would provide valuable insights. It would also be useful to analyze the predictive value of financial ratios. For instance, do any of the financial ratios described in this article add to a counselor's ability to predict a tendency toward insolvency?

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