

The Ratio Analysis Technique Applied to Personal Financial Statements: Development of Household Norms

Carole G. Prather¹

Application of the ratio analysis technique to personal financial statements offers potential in expanding insight into specific strengths and weaknesses of a family's financial situation. Norms for 16 ratios, based on data from the 1983 Survey of Consumer Finances (SCF), are presented with indications of how each ratio might be used to assess liquidity, solvency, or the general financial position of a particular family. The norms may be used as a basis for comparison in assessing specific components of a client's net worth.

KEY WORDS: *net worth, ratios*

As families seek to improve the management of their economic resources and develop plans for strengthening their financial position in the future, a logical first step is to determine their present financial position. A common tool used to determine financial well-being is the net worth statement, a personal balance sheet itemizing the assets and liabilities of the household, with total net worth being the difference between the two. Traditionally, net worth analysis has focused on the magnitude of family wealth as exemplified by the total net worth figure. Families have been encouraged to do an annual balance sheet to ascertain their financial progress, or the lack of it, by comparing the current year's net worth total to that found on previous year's balance sheets (Lang, 1988). However, Griffith (1985) suggested there was much more information to be gleaned from a personal financial statement than just the bottom line. Following the lead of corporate analysts in evaluating corporate financial statements, Griffith proposed 16 ratios using various components of net worth to provide detail concerning specific strengths and weaknesses of a family's financial situation. These ratios could provide the family with information about the liquidity of their net worth, their solvency, and their financial position in relation to a number of personal financial goals.

Financial planners might make use of the net worth statement as a means of clarifying a client's current financial situation. Calculation of net worth ratios using components from the balance sheet should provide more specific direction in assisting the client to develop financial goals. Both client and planner are provided with greater depth of information on which to base future financial decisions. The financial planner might compare the ratio values of clients with the norms (averages) generated in this study to provide

¹Carole G. Prather is an Assistant Professor at Kansas State University, Justin 323, Manhattan, KS 66502. (913) 532-5510.

insight into each client's financial standing in relation to other families with comparable net worth accumulation. In a few cases, objective standards for a specific ratio have been suggested and the client's ratio values can be evaluated in light of those guidelines. Yet another method of evaluation would be to compare ratio values from future net worth statements and those derived from the original balance sheet to assess the progress of clients in achieving certain financial goals.

The use of ratios in studying various components of net worth is preferable to focusing on isolated values from the balance sheet because the latter may have little meaning to the financial planner or client when expressed simply as arithmetical magnitudes (Tamari, 1978). A ratio, which expresses a relationship between two or more segments of the financial statement, provides a context in which to evaluate various aspects of net worth. For instance, in evaluating the debt level of a particular family it may not be meaningful to focus only on the total liability figure from the net worth statement. A ratio relating total liabilities to another relevant figure from the balance sheet, perhaps total assets or total net worth, would provide a better framework for evaluating the debt obligations of that family.

While Griffith (1985) proposed a number of ratios, he did not conduct any empirical analysis at that time to test the validity of those ratios. Johnson and Widdows (1985) calculated a liquidity ratio (emergency funds as a percentage of annual pretax income) but little other empirical work has been done employing the use of ratios in the study of household financial data. Part of the reason for this is that the collection of data on family net worth has itself always presented tremendous challenge to researchers. As relevant as net worth data is to understanding the financial position of families, "because of their cost and complexity, and the generally cool receptivity of the public to such inquiries, studies of wealth and net worth are among the less frequent of our survey undertakings" (Pearl, 1982). The 1986 SCF is the most recent attempt to collect comprehensive data through surveying a representative sample of U.S. households. This survey collected detailed information concerning assets and liabilities for 3,824 randomly selected American households. The survey further provided a profile of the socioeconomic and demographic characteristics of the survey respondents and their families.

Purpose

Given the importance of net worth in assessing the financial strength and well-being of families, two objectives were set for this study. The first was to analyze the composition of net worth of American families by calculating the 16 financial ratios suggested by Griffith (1985). These ratios were applied to the net worth data from the 1983 SCF and the results provide a set of norms with potential for comparison by financial counselors and financial planners in evaluating the financial status of individual families. Because past studies showed age and income to be significant factors in explaining the differences in magnitude of net worth, the relationship between these same two factors and each of the net worth ratios was also tested through the use of correlation analysis.

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Each of the 16 ratios suggested by Griffith (1985) provides a somewhat different view of the same piece of reality--a family's financial situation. If concern is directed at the liquidity characteristics of a family's financial holdings, the following ratios might be used.

Liquid assets/monthly expenditures (Ratio 1). Liquid assets are those assets which are in spendable form or easily and quickly converted to cash. This ratio provides insight into the adequacy of liquid asset holdings to cover monthly expenses if the family experienced a sudden loss of income due to interruption of employment. Family economists and financial counselors are not always in agreement as to what represents an adequate savings fund to meet emergencies, with recommendations varying from 2 to 6 months of expenses in liquid form. A reasonable standard for a specific family might vary by the number of earners in the family, the availability of credit to handle emergency situations, and the stability of employment of family members in their present occupations.

Liquid and other financial assets/monthly expenditures (Ratio 2). While similar to the previous ratio, this index provides a broader definition of assets which could be used to cover monthly expenditures. Though some financial assets are not in liquid form, they could be converted to spendable form with little or no loss in value, provided enough time is allowed for the conversion. Griffith (1985) recommended a ratio value of 6.0 for this index.

Liquid assets/total debt (Ratio 3). This ratio examines the relationship between liquid assets and the total debt obligation of the family. It is reasonable to evaluate the financial capability of a family to retire some of its outstanding debt using liquid assets should unexpected financial situations arise. Another use of this ratio, perhaps just as important, is its use along with the other debt related ratios in determining whether the family has overextended itself or has maintained a debt level within reasonable limits given the family's level of liquid assets. Griffith (1985) noted difficulty in setting a standard for this ratio but considered that a value above 0.1 should provide a "comfortable" liquidity cushion.

Liquid assets and other financial assets/total debt (Ratio 4). Similar to Ratio 3, this index includes other financial assets in the numerator which could be used to handle debt if the need arose. Griffith (1985) suggested that 0.2 to 0.3 be considered a minimum level for this ratio which would indicate a healthy financial situation.

Liquid assets/non-mortgage debt (Ratio 5). Mortgage loans generally fall into the category of long-term debt, yet it would seem more realistic to view liquid assets as a cushion for handling short-term debt. For this reason Ratio 5 measures the relationship between liquid assets and a family's debt load excluding those liabilities linked to acquisition of real property. Griffith (1985) recommended a value of 1.0 or more for Ratio 5.

Liquid Assets/Net Worth (Ratio 6). Ratio 6 measures the proportion of total net worth held in liquid form. This type of net worth component ratio should be evaluated in light of the family's specific financial goals rather than against an objective standard. The same standard could not be reasonably applied to a family with predominantly short-term savings goals, such as a vacation or new furniture, and to a family with mainly long-term savings goals, such as the children's education or a comfortable retirement. It should be noted that this ratio may also be used to determine if a family is holding too much of their total net worth in liquid form. Liquid assets tend to be held in ways which offer a low rate of return, therefore a very high value for this ratio might indicate a need to shift some assets into financial vehicles with higher earning potential.

Liquid and other financial assets/net worth (Ratio 7). Ratio 7 was designed to assess the total financial assets portion of net worth. It focuses on the savings component of a family's net worth. Because family savings goals vary considerably, no objective standard was suggested for evaluating this ratio.

The debt level of a family is an important consideration in evaluating its overall financial well-being. A comprehensive look at the characteristics of a family's debt load provides important information concerning the family's solvency and is revealed in the following ratios:

Liquid assets/one year's payment on debt (Ratio 8). This index provides one view of a complicated financial issue, the debt obligation of the family, by comparing liquid asset holdings to one year's worth of payment on all debt. Since consumers themselves often evaluate their debt level by their ability to meet debt payments, this ratio may serve an important function from their perspective. Griffith (1985) acknowledged difficulty in setting a goal for this ratio but considered a minimum of 0.5 as reasonable.

Liquid and other financial assets/one year's payment on debt (Ratio 9). This index relates family debt payments to all financial assets, both liquid and those which would take more time to convert. Ratio 9 assesses a family's commitment to debt payment in relation to its total level of savings. Griffith (1985) allowed a value of 1.0 as adequate for this ratio.

Total debt/net worth (Ratio 10). The debt position of a family is not easily evaluated unless it is extreme. Ratio 10 expands the perspective of the evaluator in assessing the debt position of the family by relating total liabilities to total net worth value. Griffith (1985) recommended families keep this measure below 1.0 but noted this would be difficult if a family had recently purchased a home.

Non-mortgage debt/net worth (Ratio 11). Because mortgage debt is generally long-term and has special implications for net worth, it may be enlightening to also index the family's consumer debt in relation to total net worth. The recommended maximum for this ratio was 0.4.

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In addition to those ratios discussed under the heading of solvency, Ratios 3, 4, and 5, discussed under the heading of liquidity, provide information about debt level. These ratios describe the relationship between a family's level of liabilities and liquid assets available to meet debt responsibilities.

The third group of ratios encourages a family to evaluate their net worth in relation to financial goals common to many families:

Net equity + net tangible assets/net worth (Ratio 12). Equity and tangible assets may increase in value with inflation. Therefore, the intent of Ratio 12 was to assess the inflation protection aspect of net worth. While not all assets included in the numerator tend to increase in value as inflation increases, they at least have potential for doing so while fixed dollar assets do not. Some personal assets such as automobiles are not likely to appreciate in value, but as Griffith (1985, p.130) noted, such assets still act somewhat as a hedge against inflation since their services are available without any need to buy them at higher prices resulting from inflation. Griffith (1985) emphasized the difficulty in setting a standard for this ratio because it depended largely on society's inflation expectation. He did consider a value of 1.0 as reasonable in periods of high inflation expectation.

Net equity + net tangible assets minus home/net worth (Ratio 13). Since the family home has seldom been purchased primarily for its investment value, Griffith (1985, p.130) suggested Ratio 13 to provide information on the "investment aspect" of tangible and equity assets. When this ratio value is compared with that of Ratio 12, there is a clearer picture of the impact of home ownership on the inflation protection component of net worth. A value of 0.2 would be reasonable for Ratio 13.

Net equity + net tangible assets/ fixed dollar assets (Ratio 14). Families might want to evaluate their net worth holdings by comparing the portion invested in inflation protection assets to the portion in fixed dollar assets. The standard recommended for Ratio 14 was a minimum value of 2.0, perhaps even higher if high inflation is anticipated.

Net tangible assets/net worth (Ratio 15). Ratio 15 provides information about what proportion of the family's wealth was acquired mainly for its use value. The implications of a high proportion of tangible assets in net worth can only be evaluated in light of the family's financial goals. Younger families just setting up their home may have financial goals directed mainly toward acquisition of tangible assets. As families approach retirement, net worth composed primarily of tangible assets may need some serious reconsideration.

Income generating assets/net worth (Ratio 16). Ratio 16 encourages a family to look at the proportion of total net worth invested in assets which themselves earn income. Those assets which earn interest, dividends, profits, etc. generate income which could be reinvested to increase future net worth. Such income might also be used to supplement earned income in providing

a higher level of living than would be possible on earned income alone. Again, no objective measure was recommended for this ratio. Families planning for their retirement might be especially interested in the implications of this ratio since potential retirement income could be generated from assets.

Methodology

The sample used for the analysis in this study is from a public use tape of financial data collected for the 1983 SCF. This survey was sponsored by the Board of Governors of the Federal Reserve System and other federal agencies.

The interviewing for SCF was conducted by the University of Michigan's Institute for Social Research, Survey Research Center. The Survey Research Center employed a multistage probability sampling design to derive a sample of dwelling units and their occupants which was representative of all families in the continental United States, exclusive of military installations.

In total, 3,824 families voluntarily completed the personal interview process. The interviews were conducted from February through July, 1983 (Avery, Elliehausen, Canner, & Guftafson, 1984a). Any survey of this size may contain some error due to non-response, or the inability to interview a family originally selected for participation. A 71% response rate was achieved for the SCF. Nothing is known about the characteristics of the non-respondent group (Avery et al., 1984a).

In addressing the question of characteristics of non-respondents, Pearl (1982) noted that while evidence is not conclusive, evaluation studies have been undertaken on this issue. Evaluation studies, where objective information was available on specific asset holdings, indicate that non-respondents in net worth inquiries have generally held larger assets than did those who cooperated with the survey. To the degree that this is true of non-respondents for the SCF, it would underestimate net worth.

Survey Design

Within each family interviewed, the individual selected as the respondent was either the head of the family unit, or in the case of a married couple, the spouse most knowledgeable about the family's financial situation. Respondents were encouraged to consult other family members or any financial records necessary to provide answers which were both complete and accurate (Avery, Elliehausen, Canner, & Guftafson, 1984b).

The values of assets and liabilities were estimated by the respondent as of the date of the interview (Avery et al., 1984a). The one exception to this procedure concerns the value of automobiles. The data provided the make, model, and year of each family vehicle to a maximum of three. Respondents were not asked to place a value on their automobiles. Rather a value was assigned to each automobile at the data processing stage on the basis of the

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1983 N.A.D.A. *Official Used Car Guide's* average retail value for each make, model, and year of vehicle. This provided a consistent and reasonable approach to valuing automobiles since the guide is based on the average retail prices from actual sales reports of used automobiles. The N.A.D.A. *Official Used Car Guide*, often called the blue book, is a standard trade manual used by dealers, lenders, and insurance companies to establish a value for automobiles.

Subset of Sample Used for Analysis

All survey results are subject to response error which is defined as "any of a variety of factors arising between an interviewer and a respondent which result in or contribute to deviations from the so-called 'true' answers" (Pearl, 1982). Indeed, Pearl asserts surveys related to measurement of personal wealth or net worth are especially susceptible to such "aberrations." While much of the response effect cannot be corrected at the data processing stage of a study, to minimize that portion of response error due to lack of information, the analysis in this study was limited to a subset of the original sample where the informant was either the head of the household or the spouse of the head of household. This eliminated cases where the informant was the child, parent, grandparent, sibling, or roommate of the head of the family. Thus the original sample of 3,824 was restricted to 3,583 cases.

Calculation of the Ratios

The ratios selected for calculation in this analysis were limited to the 16 suggested by Griffith (1985). For the most part, calculation of the ratio values was accomplished by dividing the numerator by the denominator to provide a number indicative of the relationship being indexed.

Because it is not possible to divide by zero, exceptions were necessary to the general procedure when the denominator of the ratio had a value of zero. Rather than deleting all cases with a denominator of zero, such cases were handled by making the ratio value equal to the numerator, i.e. the numerator was divided by one. The rationale for this exception was that it did not make sense to retain a case with a very low value for the denominator but exclude a case with a zero value when the difference between holdings of the net worth component in the denominator would have been negligible.

Descriptive statistics were used to analyze the 16 net worth ratios. Table 1 provides information on the median value for the ratio, the suggested standard if one was recommended, and the percentage of the sample which met the recommended standard. Table 2 presents frequencies at quintile levels for each ratio and for net worth total.

Correlation of Ratios with Age and Income

A second method of analysis was used to determine if a systematic relationship existed between each ratio and the age and income variables, and the strength of that relationship. Cross tabulations were generated for each ratio-demographic variable relationship. The cross tabulations generated

both the chi-square statistic and the correlation coefficient for the bivariate relationship. To perform Pearson chi-square statistics, each cell requires a minimum of five cases. Therefore, for the purposes of the cross tabulations, the age and income variables were expressed in categories of values rather than continuously. The values for the ratios were also divided into five categories with each category representing approximately 20% of the sample.

Bivariate analysis was selected for the correlation of the ratios with age and income because many of the ratios had a high percentage of cases with a zero value. According to Greene (1981), when the dependent variable has a limiting value of zero and a sizeable proportion of values are found at that value there would be substantial bias to regression coefficients obtained through use of the OLS procedure.

A nonparametric correlation was computed for the relationship between each ratio and the age and income variables since the ratio values did not exhibit the normal distribution assumed for parametric correlation. The Kendall tau b coefficient was selected for analysis of the strength of the relationship between each ratio and the age and income variables. The tau b was preferred to other correlation coefficients because the data contained a large number of tied values (Blaylock, 1960; Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Description of Variables

Net worth was operationalized as the sum of the estimated dollar value of all family assets minus the estimated dollar value of the family's liabilities as of the date of the interview. Assets and liabilities by necessity were limited to those for which information was obtained from respondents. The variables used to compute the ratios were essentially the same as proposed by Griffith (1985) with the exception of monthly expenditures. Since no expenditure data were available from the 1983 SCF, monthly expenditures were estimated using a multiple regression prediction technique employing income, family size, and age predictor variables applied to the 1980-81 Bureau of Labor Statistics expenditure data.

In operationalizing the liquid assets variable, cash was not included as SCF contained no information on that variable. Checking accounts, money market funds, savings and call accounts were counted as liquid assets as were 40% of all stocks and bonds, and 30% of mutual funds. Only a portion of the face value of stocks, bonds, and mutual funds was recommended by Griffith (1985) for inclusion in liquid assets to acknowledge that there could be a loss if such assets had to be converted quickly.

Financial assets are those represented by paper certificates or bookkeeping entries. Because the ratios always referred to financial assets in the category of "liquid and other financial assets," this variable was operationalized as

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"other financial assets" accounting for the total financial assets not already included in the liquid asset variable. This included 60% of stocks and bonds, 70% of mutual funds, certificates of deposit, all-saver certificates, trust funds, cash value of life insurance, asset notes and land contracts, IRAs, Keoghs, and vested pensions and savings.

Non-mortgage debt was operationalized as all liabilities excluding debt linked to the acquisition of real property.

One year's payment on debt was operationalized as one year's minimum payment on credit card debt and lines of credit which could fluctuate above a minimum, plus 12 months of payments on all other debt having regular payments.

Tangible assets for this study were limited to the net asset values of the family home, other real property, other investments, and vehicles. The variable, net tangible and equity assets, added the following values to the tangible asset variable: net value of businesses, mutual funds, and stocks.

Fixed dollar assets are financial assets which do not tend to increase in value due to inflation. This variable included checking and savings accounts, money market funds, certificates of deposit, all-saver certificates, IRAs, Keoghs, life insurance cash value, trust values, bonds, asset notes and land contracts. Income generating assets were operationalized to include those assets which had potential to earn income in the form of interest, dividends, profits etc. These included savings accounts, money market funds, bonds, mutual funds, stocks, asset notes and land contracts, all-saver certificates, certificates of deposit, life insurance cash value, trust funds, and value of owned businesses.

Four categories were used to operationalize the age variable. These categories correspond to general life cycle stages based on the age of the household head. These categories are commonly used to study the changing financial dynamics of families (Johnson & Widdows, 1985).

- Young Family (household head under age 35)
- Growing Family (household head 35-54 years old)
- Contracting Family (household head 55-64 years old)
- Retired Family (household head 65 years of age or older)

The income figure used for the correlation analysis was 1982 total gross income from all sources. Income was specified in five categories with each category having approximately 20% of the cases:

\$ 0 - \$ 8,999
9,000 - 15,999
16,000 - 23,999
24,000 - 36,999
37,000 and above

Table 1
Median Values of Net Worth Ratios Compared to Suggested Ratio Values

Ratio	Median Value	Suggested Level	% Meeting Suggested
1. Liq.Assets/Monthly Expenses	1.0	3.0	20%
2. Liq.&Fin.Assets/Monthly Expenses	1.4	6.0	29%
3. Liq.Assets/Total Debt	0.6	0.1	71%
4. Liq.&Financial Assets/Debt	1.2	0.2	60%
5. Liq.Assets/Non-Mortgage Debt	2.2	1.0	56%
6. Liq.Assets/Net Worth	0.1	None	NA
7. Liq.&Financial Assets/Net Worth	0.2	None	NA
8. Liq.Assets/One Year Debt Pmt.	0.9	0.5	43%
9. Liq.&Fin.Assets/1 Yr.Debt Pmt.	1200.0	1.0	80%
10. Total Debt/Net Worth	0.1	1.0(Max)	71%
11. Non-mortgage Debt/Net Worth	0.0	0.4(Max)	70%
12. Tang.&Equity Assets/Net Worth	0.9	1.0	47%
13. Tang.&Equity-Mort./Net Worth	0.3	0.2	58%
14. Tang.&Equity/Fixed \$ Assets	7.7	2.0	68%
15. Tang.Assets/Net Worth	0.9	None	NA
16. Income Gen.Assets/Net Worth	0.1	None	NA

Results

Table 1 summarizes the results of the ratios in relation to the standards suggested by Griffith based on his own introspection. Table 2 contains ratio values obtained at quintile levels for each ratio. Table 3 contains the Kendall tau b correlation coefficients of each ratio with age and income. Following Table 1 are brief explanatory comments concerning some of the ratios. With the average length of unemployment in 1983 at 15.2 weeks (U.S. Dept. of Commerce, 1986), the values for Ratios 1 and 2 indicate that most families seemed inadequately prepared with emergency funds to cover an average length of job interruption. Only in the highest quintile of income and the retired age category did at least 50% of the families meet the recommendations. Ratios 3, 4, and 5 have stronger correlations with age than with income. This is likely a function of both increasing asset levels and decreasing liabilities as families age. Both liquid assets and liabilities tended to increase with increasing income but at different rates, therefore, the correlations of these three ratios with income were only moderately strong.

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Ratios 6 and 7 were moderately correlated with income because both liquid assets and net worth increased steadily with increasing income. The ratios had very weak correlations with age likely because net worth increased through the first three stages of the life cycle and then decreased sizably for the families in the retired stage.

The extreme values for Ratio 9 may be accounted for by the fact that over 1/3 of all cases had a zero value for debt payment. In those cases where the denominator was zero the ratio value is actually a reflection of the full value of the numerator.

Negative correlations for Ratios 10 and 11 and age are indicative of the pattern of decreasing liability levels of families past the growing stage of the family life cycle. Over 1/2 the cases for which this ratio was computed had a zero value for this ratio indicating an absence of non-mortgage debt.

For Ratio 14, almost 1/2 the cases had at least a value of 10. This may have been indicative of the experience of high inflation in the 5 years prior to 1983 encouraging families to build some inflation protection into their net worth holdings.

Overview

The main purpose of a financial ratio is to simplify analysis. To that purpose, ratios must be easy to interpret or they will not be helpful. While some of the ratios in this study may prove helpful in detailing the strengths and weaknesses of a family's current financial situation, others are too ambiguous to facilitate the process of financial analysis. Those ratios constructed with net worth in the denominator pose specific challenges to interpretation. Net worth values may be zero or negative which can create difficulty in both calculation and interpretation. Ratios 6, 7, 12, 15, and 16 present a particular challenge to

Table 2
Ratio Values Obtained at Selected Percentiles

Ratios	5%	25%	Median	75%	95%
1. Liq. Assets/Monthly Exp.	0.0	0.1	1.0	4.0	21.5
2. Liq.&Fin.Assets/Mon.Exp.	0.0	0.1	1.4	7.4	53.5
3. Liq.Assets/Total Debt	0.0	0.0	0.6	700.0	173 66.6
4. Liq.&Fin.Assets/Tot.Debt	0.0	0.0	1.2	895.0	38000.0
5. Liq.Assets/Non-Mort.Debt	0.0	0.0	2.2	800.0	20000.0
6. Liq.Asset/Net Worth	0.0	0.0	0.1	100.0	9100.0
7. Liq.&FinAssets/Net Worth	0.0	0.0	0.2	1.3	15048.5
8. Liq.,Assets/1YrDbt.Pmt.	0.0	0.0	0.9	203.3	145 50.0
9. Liq&FinAssets/1YrDebt	0.0	109.1	1200.0	6100.3	507 50.0
10. Total Debt/Net Worth	0.0	0.0	0.1	2.2	23050.0
11. Non-Mort.Debt/Net Worth	0.0	0.0	0.0	4.7	7549.3
12. Tang&Equity/Net Worth	0.0	0.3	0.9	1.1	69700.0
13. Tang&Equity-Home/NW	-0.1	0.0	0.3	1.0	9600.0
14. Tang&Equ./Fixed\$Assets	0.0	0.9	7.7	291.5	671 50.0
15. Tangible Assets/NW	-0.1	0.4	0.9	1273.3	94747.1
16. IncomeGenAssets/NW	0.0	0.0	0.1	0.8	15000.0
Total Net Worth	-\$650	\$1525	\$18400	\$66900	\$292750

interpretation as they need different interpretations if their values are below 1.0 versus above 1.0. A value above 1.0 indicates a high level of liabilities in net worth which was not offset by asset values. Therefore, it may be clear that 0.3 is better than 0.2 but it is less clear that 1.3 is better than 1.2. A simple adjustment in the ratios having net worth as the denominator would provide much the same insight but greatly simplify interpretation. For the net worth component ratios, Ratios 6, 7, 12, 15, and 16, the denominator of net worth should be replaced by a total assets variable. Relating a part to the whole would provide a ratio value which is more intuitively meaningful. Also Ratio 10 (total debt/net worth) might be replaced by the classic debt/asset ratio often used in an analysis of corporate financial statements. And Ratio 11 (non-

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Table 3
Kendall Tau B C Correlation Coefficients Between Ratios and Age and Income

Ratios	Age	Income
1. Liquid Assets/Monthly Expenses	.21	.34
2. Liquid&Financial Assets/Monthly Expenses	.19	.36
3. Liquid Assets/Total Debt	.20	.12
4. Liquid&FinancialAssets/Total Debt	.20	.14
5. Liquid Assets/Non-Mortgage Debt	.20	.18
6. Liquid A ssets/Net Worth	-.03*	.19
7. Liquid & Financial A ssets/Net Worth	-.02 ^{NS}	.22
8. Liquid Assets/OneYear's Debt Payment	.21	.12
9. Liquid& FinancialA ssets/1 Yr'sD bt.Pm t.	.17	.43
10. Total Debt/Net Worth	-.30	.25
11. Non-M ortgage Debt/Net Worth	-.24	.15
12. T angible&E quityA ssets/Net Worth	-.00	.11
13. T angible&E quityA ssets - Home/Net Worth	-.07	.14
14. T angible&E quityA ssets/Fixed D ollar A ssets	.08	.10
15. T angible A ssets/Net Worth	.06**	.15
16. Incom e Generatin g A ssets/Net Worth	.03*	.24

All correlations are significant at the .00005 level, except

^{NS} Not significant at the .05 level

* Significant at the .05 level

** Significant at the .01 level

mortgage debt/net worth) might be changed to non-mortgage debt/total debt to provide information about the portion of family debt obligation which could be categorized as consumer debt.

For Ratios 1-4, 6 and 7, 8 and 9, there seems little benefit to separate calculations with and without "other financial assets." Of the original ratios suggested by Griffith (1985), Ratios 1, 3, 5, 8, and 13 are likely to be the most useful in their original form. However, by restructuring the remaining ratios, a broader set of indices would be available with which to analyze household financial data.

The impact of age and income on ratio values needs consideration in evaluating the financial situation of a specific family. The strength and direction of the correlations between ratios and demographic variables should indicate how ratio values might be expected to fluctuate due to changes in age or income. Generally, younger households and those at lower income levels could be expected to appear in worse shape in relation to all ratios than older households or those with higher incomes. Financial planners who work with families over a period of years, could expect to see improvement in some ratio values by virtue of the average patterns of wealth accumulation over the family life cycle. As families move from the Growing to the Contracting stage of the family life cycle, the ratios involving debt level and those related to liquid assets should improve considerably.

Changing economic conditions may also be relevant considerations in assessing ratio values and in setting goals for ratio values. In times of high unemployment, Ratios 1 and 2 may need a different evaluation in light of the potential volatility of employment for earners in the family. In times of high inflation anticipation, Ratios 12, 13, and 14 may need a higher value for families to feel secure.

Ratio analysis applied to household financial statements is still in its infancy. The newly restructured ratios need to be calculated for a large sample such as SCF to determine if results are more intuitively meaningful or if they too present challenges to interpretation which were not anticipated. In the future much more attention needs to be directed toward developing reasonable recommendations or standards for ratios. Such recommendations may eventually be refined to include the consideration of age and income effects on patterns of wealth accumulation.

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