Confirmations and Contradictions

Social Security and Private Saving: New Time-Series Evidence

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Introduction

In an important article in the *Journal of Political Economy,* Martin Feldstein (1974) estimated that the introduction of the social security system had reduced personal saving by 50 percent, with serious consequences for capital formation and output. His conclusion was based on a consumer-expenditure function estimated with U.S. time-series data and incorporating a social security wealth variable of his construction.

This paper presents new evidence that casts considerable doubt on Feldstein's conclusion. First, the social security wealth variable used by Feldstein was seriously flawed as a result of a computer-programming error. Simply correcting this error substantially changes the estimated effect of social security on saving. Second, the statistical evidence depends upon assumptions which are embedded in the construction of the social security wealth variable—assumptions that are not demonstrably preferable, and are in some cases inferior, to alternative assumptions. These assumptions relate, first, to how individuals form their expectations about the social security benefits they expect to receive and the social security taxes they expect to pay and, second, to estimates of the number of workers, dependent wives, and surviving

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widows who will receive benefits. Adopting reasonable alternative assumptions leads to generally weaker estimates of the relationship between social security and saving. Finally, the estimated relationship between social security and saving is acutely sensitive to the period of estimation examined.

Review of the Time-Series Evidence

Feldstein (1976) refers to the theoretical basis of his analysis as the "extended life-cycle model." Private voluntary intergenerational transfers are excluded, as is saving for contingencies. All saving during the working years is for the purpose of providing consumption during the period of retirement.

Given these assumptions, Feldstein (1974) argues that social security affects an individual's saving through two opposing forces. (1) Saving is reduced because the availability of benefits reduces the need to accumulate assets for the retirement period—the "asset-substitution effect." (2) Saving is increased because the social security benefit, in conjunction with the earnings test, induces earlier retirement. Earlier retirement means a shorter span of years of earnings and a longer period of retirement. This, in turn, requires a higher saving rate during the earning years to realize any given level of retirement income—the "retirement effect."

The net effect on an individual's saving depends upon the relative strengths of these offsetting forces. If the asset-substitution effect is stronger than the retirement effect, individual saving will be reduced; if, on the other hand, the retirement effect is stronger, saving will be increased. Feldstein turns to an econometric analysis to resolve this a priori ambiguity concerning the net effect on saving.

The heart of Feldstein's study is the specification and estimation of an aggregate consumption function which includes a social security wealth (*SSW*) variable. The model is adapted from the life-cycle consumption function developed by Ando and Modigliani (1963). Feldstein introduces two new variables. The key variable is an estimate of social security wealth. Two definitions are used: Gross social security wealth is the present value of the retirement benefits anticipated by individuals; net social security wealth is gross social security wealth minus the present value of the social security taxes anticipated by current workers. These series are constructed by estimating future benefits and taxes under alternative assumptions about real interest rates and growth rates of real per capita income. The other novel variable used by Feldstein is corporate retained earnings. In essence, this is a proxy for the permanent component of capital gains.

The basic equation estimated is therefore

$$C_t = \beta_0 + \beta_1 YP_t + \beta_2 RE_t + \beta_3 W_t + \beta_4 SSW_t, \quad (1)$$

where C_t is consumer expenditures, YP_t is permanent income, RE_t is corporate retained earnings, W_t is the stock of household wealth (real and financial assets less liabilities) at the beginning of period t, and SSW_t is social security wealth at the beginning of period t. The equation does not include a variable that measures the retirement effect of social security. Feldstein argues that the SSW variable indirectly incorporates this effect.

The equation is estimated using aggregate U.S. data, deflated to constant 1958 dollars and divided by population. Equations are estimated for two periods: 1929–71 excluding 1941–46, and 1947–71. The method of estimation is ordinary least squares.

Although several alternative models are presented, Feldstein prefers the following equation estimated for the period 1929–71 (excluding 1941–46):

$$\underset{(7.3)}{C = 228} + \underset{(11.3)}{.530YD} + \underset{(3.4)}{.120YD_{-1}} + \underset{(4.8)}{.356RE} + \underset{(3.4)}{.014W} + \underset{(3.4)}{.021SSWG}, \quad (2)$$

$$\bar{R}^2 = .99, \qquad \text{D-W} = 1.82$$

where C is consumer expenditures, YD is disposable income, RE is gross retained earnings, W is household wealth, and $SSWG$ is gross social security wealth estimated at a real discount rate of 3 percent. Permanent income is measured by current and lagged disposable income. The figures in parentheses are t-statistics.

In separate replies to Barro (1978) and to Esposito (1978), Feldstein (1978, 1979) reestimated the equation for the period 1930–74 (excluding the years 1941–46) using different (net) retained earnings and household wealth variables. The resulting estimated consumer-expenditure function,

$$\underset{(4.2)}{C = 338} + \underset{(9.9)}{.604YD} + \underset{(2.8)}{.111YD_{-1}} + \underset{(2.6)}{.194RE} + \underset{(1.2)}{.006W} + \underset{(2.7)}{.024SSWG}, \quad (3)$$

$$\bar{R}^2 = .99, \qquad \text{D-W} = 1.45$$

is consistent with his earlier findings with respect to SSW.

The publication of Feldstein's article precipitated a research controversy that is still ongoing. Munnell (1974) adopted a similar analytic framework, estimating a saving function whose specification included Feldstein's SSW variable and a variable to measure explicitly the retirement effect of social security.[1] Munnell's empirical results,

[1] Munnell's study differs from the other studies noted in using as the dependent variable a saving variable based on SEC-Goldsmith data. All of the other studies cited used consumer expenditures as the dependent variable and are based on NIPA data.

although weaker than Feldstein's, are generally consistent with his findings.

The strongest theoretical challenge has come from Barro (1974, 1978). He argues that the introduction of social security is likely to lead to offsetting changes in private intergenerational transfers so that the effect of social security on private saving is reduced or eliminated. His empirical evidence consists of a consumer-expenditure function similar to that of Feldstein but with additional variables included in the specification (the government surplus, the unemployment rate, and the stock of durable goods). Barro finds that the coefficient of social security wealth is not significantly different from zero.

In another major contribution, Darby (1979) argues that life-cycle saving provides only a partial explanation of individual saving behavior. He extends his earlier research (Darby 1975, 1978) on the permanent-income consumption function by incorporating Feldstein's social security wealth variable in the specification. Although his results vary, depending upon the specification used and the periods covered, he concludes that the effect is probably smaller than that estimated by Feldstein.

Replicating the Feldstein Variable

The first step in our analysis was to replicate Feldstein's social security wealth series. A detailed description of the algorithm for constructing this variable is given in Leimer and Lesnoy (1980). Briefly, gross social security wealth is an estimate of the actuarial value of the social security benefits which individuals expect to receive. Net social security wealth is equal to gross social security wealth less an estimate of the actuarial value of the social security taxes which individuals expect to pay. As such, these measures should reflect changes over time in such factors as the population age structure, social security coverage, and benefit and tax rules.

A number of important assumptions are embedded in Feldstein's algorithm for computing social security wealth. He assumes that people expect the ratio of benefits per beneficiary to per capita disposable income to be constant over time. The number of persons expecting future social security retirement benefits is estimated by the number of current covered workers adjusted for differences in labor force participation by age. The number of women who expect to receive dependent wife or widow benefits is based on the number of current male covered workers and retirees. The sensitivity of Feldstein's conclusions to these key assumptions is examined in subsequent sections.

TABLE 1

ORIGINAL AND REPLICA FELDSTEIN GROSS SOCIAL SECURITY WEALTH SERIES, SELECTED YEARS

Year	Feldstein *SSWG*	Replica *SSWG*	Ratio
1937	156.1	151.5	1.03
1942	427.1	426.1	1.00
1947	432.4	431.0	1.00
1952	612.9	608.2	1.01
1957	860.1	849.3	1.01
1962	1134.9	1004.0	1.13
1967	1728.7	1406.1	1.23
1972	2331.3	1762.3	1.32
1974	2615.6	1912.5	1.37

The result of our replication attempt for the gross social security wealth series is shown in table 1 for selected years. The replica series tracks the original Feldstein series quite well until 1956; beginning in 1957, the Feldstein series grows much more rapidly until, by 1974, it is almost 40 percent larger than the replica series.

The divergence is the result of a computer-programming error. This error, acknowledged by Feldstein, results in a cumulatively growing overestimate of the value of social security wealth for surviving widows. Correction of this error yields a series which is quite close to our replica series.[2]

Regression results comparing the Feldstein specification using our replica series with those using the original Feldstein series are presented in Appendix table A1 and summarized in table 2.[3] The specification of the consumer-expenditure function is the same as Feldstein (1978). The difference in results is dramatic. For the full period, 1930–74 (excluding the war years), the coefficient for gross social security wealth falls from .026 to .011 and becomes insignificant. For net wealth, the coefficient drops from .037 to .009, and the *t*-ratio plummets to .5. The results for the postwar period, 1947–74, are also striking.[4] When the replica variable is used, the

[2] This comparison is based on Feldstein's initial corrected series for 1937–74 as reported in Leimer and Lesnoy (1980). Feldstein (1980; this issue) reports a revised series for 1937–76.

[3] The results for the equation based on Feldstein's original gross wealth series for the period 1930–74 (which Feldstein refers to as 1929–74) differ slightly from the results reported in eq. (3) above since we use slightly different data for the other variables. Regression results using Feldstein's own corrected series are essentially the same as those using our replica series.

[4] The results for the postwar period using Feldstein's original series through 1974 differ markedly from his first published results (Feldstein 1974) which used data only

TABLE 2

ESTIMATED COEFFICIENTS OF SOCIAL SECURITY WEALTH VARIABLE IN CONSUMER-EXPENDITURE FUNCTIONS USING ORIGINAL AND REPLICA FELDSTEIN SERIES

	1930–74		1947–74	
SSW CONCEPT	Original	Replica	Original	Replica
Gross	.026	.011	.004	−.060
	(2.82)	(1.06)	(.10)	(−2.96)
Net	.037	.009	.059	−.095
	(2.78)	(.50)	(1.32)	(−3.13)

NOTE.—Figures in parentheses are *t*-statistics. The 1930–74 regressions exclude the war years 1941–46.

coefficients on both gross and net social security wealth become negative and significant.

It should be noted that a negative coefficient is consistent with the extended life-cycle hypothesis. That is, for this specification, the coefficient of *SSW* is intended to measure both the asset-substitution and retirement effects of social security. If the retirement effect is larger than the asset-substitution effect, then the *SSW* coefficient should be negative.

The absolute sizes of the estimated negative coefficients in table 2 are, however, implausible. The coefficient of gross *SSW* implies that, in the absence of social security, real personal saving in 1974 would be $114.8 billion lower (in 1972 dollars); the net wealth coefficient implies that saving would be reduced by $89.9 billion. Since actual personal saving in 1974 was $61.3 billion, both coefficients imply the absurd result that personal saving would have been negative in the absence of social security. More likely, the *SSW* variable is measuring the effect of some omitted variable or a structural change in the postwar period. But clearly, the results based on the Feldstein replica variables do not provide statistically significant support for the hypothesis that social security decreased personal saving.

Alternative Perceptions

We now examine how the estimated effect of social security wealth on consumer expenditures is affected by substituting alternative benefit assumptions in the Feldstein algorithm. Feldstein (1974, p. 911) explains his benefit perception assumption: "In estimating the average

through 1971. In particular, the coefficient of gross social security wealth for the period 1947–71, although insignificant, was only slightly smaller, .014, than the coefficient for the period 1929–71, .021. As shown in table A1, retained earnings are also no longer significant for either period when data through 1974 are used.

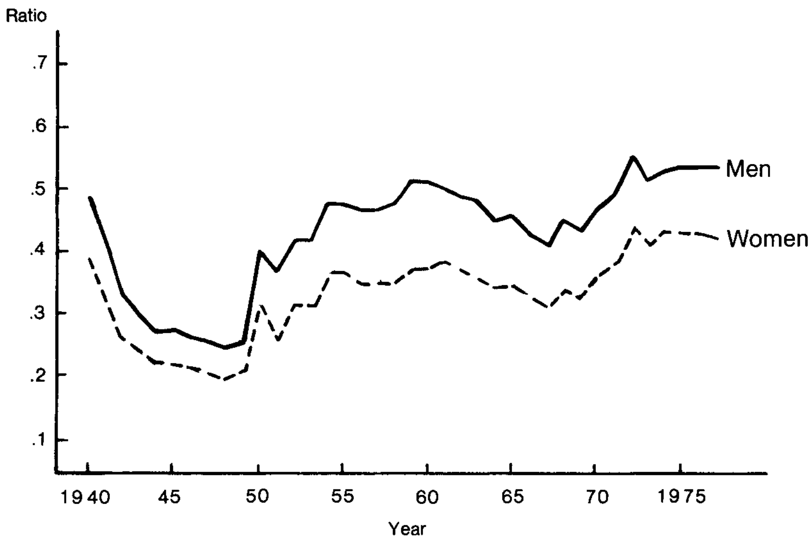

FIG. 1.—Ratio of benefits per beneficiary to disposable income per capita

value of future benefits for a single surviving annuitant, it would be wrong to assume that the schedule of benefits provided by law in year *t* would remain in effect. The history of social security shows continually rising benefit levels, a fact that individuals no doubt perceive when they contemplate the order of magnitude of their own benefits at retirement age. The ratio of annual benefits for retired workers (excluding dependents' benefits) to per capita disposable income has varied without any trend around a mean level of 0.41."

Figure 1 plots the ratio of average benefits in current payment status to disposable income per capita for men and for women over the period 1940–77. Whether or not one perceives a trend in the data, it is clear that the ratio shows considerable variation. This variation reflects changes in disposable income per capita during periods when the benefit structure was unchanged as well as a number of ad hoc and, in the later years, automatic benefit increases legislated by Congress. Whether individuals adapted their benefit expectations to this variation, ignored it, or formed their expectations in entirely different ways is clearly open to speculation. Thus, it is important to examine the sensitivity of estimated social security wealth effects to the underlying perception assumptions.

Since we do not know how people form their perceptions of expected future benefits, we consider a number of reasonable ways in which individuals might form their estimates of the expected ratio of benefit per recipient to disposable income per capita.[5] At one extreme, as Feldstein assumes, individuals might expect that a constant ratio of benefits to disposable income will be maintained over time. At the other extreme, individuals might expect that the current benefit ratio will be maintained. Or individuals might form their expectations adaptively, considering the history of past benefit ratios as well as the current ratio. Another perception assumes that individuals use published actuarial projections to estimate future changes in the current benefit ratio. The final perception we consider assumes that the individual is able to forecast perfectly the future course of the benefit ratio. This "perfect-foresight" assumption corresponds to the tax perception adopted by Feldstein (1974).[6] For the Feldstein constant-ratio perception, we adopt the same assumption that Feldstein (1978, 1979) used in extending his *SSW* series to 1974; that is, the average benefit ratio for the period 1940–71 is used for the entire period 1937–74. All of the other perceptions assume that individuals continually adjust their benefit expectations in response both to changing income levels and to amendments to the social security law, including the major amendments in 1950 and 1972. In addition to these perceptions, we also considered variants which assume that benefits remain constant in real terms after retirement rather than increasing at the same rate as per capita income. The results for these variants do not differ substantially from the results reported below.

The gross and net social security wealth series constructed using these alternative perceptions are presented in Appendix tables A4 and A5. The benefit and tax ratio perception assumption was the only assumption in the Feldstein replica algorithm which was modified in computing these series.

Consumer-expenditure functions estimated for the period 1930–74 using these alternative variables appear in table A2 of the Appendix. Results using the gross social security wealth variable are summarized in the upper portion of column 1 in table 3.[7] The most important inference is that, regardless of which benefit perception is used, the coefficient of social security wealth is insignificant. For the

[5] These perception assumptions, along with a number of other variants with similar results, are described in detail in Leimer and Lesnoy (1980).

[6] Individuals are assumed to anticipate correctly benefit ratios at retirement through 1977 (the last year for which data are available) and, after 1977, anticipate that benefit ratios remain at 1977 levels. After retirement, individuals are assumed to anticipate correctly actual changes in benefit levels through 1980 and, after 1980, anticipate constant real benefit levels.

[7] Table 3 summarizes regression results using the gross social security wealth variable only. Results using the net social security wealth variable are similar and are presented in the Appendix for the full period 1930–74.

TABLE 3

ESTIMATED COEFFICIENTS OF GROSS SOCIAL SECURITY WEALTH VARIABLE IN CONSUMER-EXPENDITURE FUNCTIONS: ALTERNATIVE PERCEPTIONS, ALGORITHMS, AND ESTIMATION PERIODS

	ESTIMATION PERIOD		
SSWG VARIABLE (Algorithm and Perception)	1930–74 (1)	1947–74 (2)	1931–74 (3)
Feldstein replica algorithm:			
1. Constant ratio	.011	−.060	−.005
(Feldstein perception)	(1.06)	(−2.96)	(−.35)
2. Current ratio	.0002	−.007	−.002
	(.04)	(−1.32)	(−.54)
3. Adaptive expectations	.0006	−.008	−.003
	(.11)	(−1.44)	(−.58)
4. Perfect foresight	.011	−.038	−.0008
	(1.25)	(−2.38)	(−.08)
5. Actuarial projection	.0007	−.004	−.001
	(.18)	(−.99)	(−.33)
Leimer-Lesnoy algorithm:			
1. Constant ratio	−.002	−.019	−.009
	(−.26)	(−2.70)	(−1.52)
2. Current ratio	−.001	−.007	−.003
	(−.13)	(−1.37)	(−.68)
3. Adaptive expectations	−.0001	−.007	−.003
	(−.02)	(−1.43)	(−.70)
4. Perfect foresight	−.0004	−.016	−.007
	(−.07)	(−2.47)	(−1.29)
5. Actuarial projection	−.0000	−.005	−.002
	(−.01)	(−1.12)	(−.50)

NOTE.—Figures in parentheses are *t*-statistics. The 1930–74 and 1931–74 regressions exclude the war years 1941–46.

constant-ratio and perfect-foresight perceptions, the coefficients of *SSW* are about .01 with *t*-ratios slightly larger than one. The remaining perceptions yield coefficients close to zero with minuscule *t*-ratios.

If we ignore the fact that all the social security wealth coefficients are statistically insignificant, these coefficients imply decreases in saving in 1974 ranging from $0.7 to $28.0 billion. Actual real saving in 1974 was $61.3 billion.

An Alternative Algorithm

In trying to replicate the Feldstein social security wealth variable, we became aware of several shortcomings in the underlying assumptions and felt it important to test whether the estimated results were sensitive to a more careful construction of the variable. A major weakness of the Feldstein construction involves his estimate of the number of persons who will become eligible for the various types of social security benefits. In particular, his construction algorithm (i) fails to adjust for the substantial changes which have occurred over time in the conditional probability of becoming insured for benefits given the individual's current covered employment status, (ii) ignores the important changes which have occurred over time in the proportion of women eligible for retired worker benefits compared with those eligible only for dependent wife and surviving widow benefits, (iii) substantially overestimates the number of aged nonbeneficiary social security wealth holders, and (iv) fails to count many current female beneficiaries. Our algorithm corrects these shortcomings and, in addition, incorporates the changes in life expectancy which have occurred since 1930 and adjusts the social security wealth series for consistency with NIPA population data.[8] A detailed description of the algorithm used to construct our social security wealth variables is given in Leimer and Lesnoy (1980).[9]

Consumer-expenditure functions estimated for the period 1930–74 using the Leimer-Lesnoy social security wealth variables appear in Appendix table A3 and are summarized in the bottom half of column 1 in table 3. The coefficients of social security wealth for all perceptions are close to zero with very small *t*-ratios and imply little or no effect on saving. Clearly, the improved algorithm provides no evidence to support the view that social security has reduced saving.

The Period of Estimation

The estimated relationship between consumer expenditures and social security wealth is extremely sensitive to the period of estimation. Thus far, we have considered the full period, 1930–74, excluding the years around World War II, 1941–46. When the Feldstein replica algorithm is used, the social security wealth coefficients for this period are essentially zero except for the constant-ratio and perfect-foresight perceptions, which have positive, but insignificant, coefficients. Similarly, the coefficients of the Leimer-Lesnoy variables are essentially zero for all perceptions.

If we restrict the analysis to the postwar period 1947–74 a somewhat different relationship is suggested. The estimated coefficients of the social security wealth variables for this period are summarized in column 2 of table 3.[10] Whether we use the Feldstein replica algorithm or the Leimer-Lesnoy algorithm for this period, the coefficient of

[8] Feldstein assumes constant life expectancies based on the 1959–61 life table.

[9] Leimer and Lesnoy (1980) also describe a number of other shortcomings of the Feldstein algorithm which are addressed by our algorithm.

[10] Complete regression results for the periods summarized in table 3 are available from the authors.

social security wealth is now negative. The coefficients are significant only for the constant-ratio and perfect-foresight perceptions, however, and the absolute values of these coefficients appear unreasonably large.[11] In any event, the postwar evidence is clearly inconsistent with the hypothesis that social security reduces saving.[12]

To explain the small t-ratios he obtains for the postwar period, Feldstein argues that there is insufficient variation in the variables over that period to obtain precise estimates of the coefficients (see, e.g., Feldstein 1979, pp. 37, 39). The results reported in table 3 do not support this argument. On the other hand, inclusion of the prewar period has its own problems. This period was one of extraordinary trauma and change. The social security program was in its infancy. Estimates of social security wealth are particularly suspect during this period since no benefits were paid until 1940, and these were based on a benefit formula radically different from that passed in 1935. The social security wealth series begin in 1937, the first year for which coverage data are available. But workers may well have formed some perceptions of social security wealth as early as 1935, when the original law was passed.

There are many reasons for maintaining a degree of skepticism about results based on data including the prewar period. Perhaps the most important is the sensitivity of the results to the specific years included. For example, suppose that we simply drop 1930 from the estimation period and use 1931 as the initial year. Results for this period are summarized in column 3 of table 3. Simply dropping 1930 from the data set has the effect that all coefficient estimates for social security wealth become negative, including those calculated when the Feldstein replica algorithm is used. Again, while none of the social security wealth coefficients estimated for this period is significant, there is certainly no evidence of a negative relationship between social security and saving.

It is important to note that our conclusions do not depend on whether the terminal year of the time periods is 1971, as in Feldstein (1974), or 1974, as in Feldstein (1978, 1979). The only variable in

[11] When the Feldstein replica algorithm is used, both of the significant coefficients for the postwar period imply that personal saving would have been negative in 1974 in the absence of the social security program. The significant coefficients for the Leimer-Lesnoy variable imply that roughly two-thirds of personal saving in 1974 was induced by the social security program.

[12] Tests for stability of coefficients for the subperiods 1930–40 and 1947–74 yielded mixed results. (Tests were run only for regressions using gross social security wealth.) For the constant-ratio and perfect-foresight perceptions, the hypothesis that coefficients were the same in both periods was rejected at conventional significance levels. For the current-ratio, adaptive-expectations, and actuarial projection perceptions, the hypothesis that coefficients were the same was accepted. These results held for SSW variables constructed using both the Feldstein replica and Leimer-Lesnoy algorithms.

table 3 whose coefficient and *t*-ratio show any appreciable change when 1971 is substituted as the terminal year is the (Feldstein) constant-ratio perception using the Feldstein replica algorithm with 1930 as the initial year; its coefficient increases to .017 but remains insignificant with a *t*-ratio of 1.59.[13] The coefficients and *t*-ratios of all the other variables in table 3 remain essentially unchanged when 1971 is substituted as the terminal year.

Concluding Comments

The evidence considered in this paper encompasses a wide variety of social security wealth perception assumptions, construction algorithms, and time periods of analysis.[14] The time-series evidence which we have examined using Feldstein's specification of the consumer-expenditure function does not support the hypothesis that social security has substantially reduced personal saving in the United States. If anything, the postwar evidence suggests that social security may have increased saving.

Although Feldstein's extended life-cycle model allows for the latter result if the retirement effect exceeds the asset-substitution effect, we are personally skeptical that social security has increased saving. Most of our results provide no statistically significant support for the hypothesis that social security has had an effect on saving, either positive or negative. This interpretation is narrowly consistent with Feldstein's extended life-cycle theory if, historically, the retirement effect has approximately balanced the asset-substitution effect. It is also consistent with the Barro hypothesis that the introduction of social security simply induced offsetting reductions in private voluntary transfers. It is also consistent with the view that the life-cycle model provides an inadequate explanation of individual saving behavior, a view that is receiving increased attention (see, e.g., Darby 1979; Kotlikoff and Summers 1981).

Feldstein (1980; this issue) now contends that our conclusions result from a failure to correctly model how individuals' perceptions of their social security wealth were altered by the 1972 Social Security amendments. He argues that if the analysis is limited to 1930–71, the results (although not significant by conventional standards) support

[13] For 1931–71, the coefficient of this variable is .0006 with a *t*-ratio of .05; for 1947–71, the coefficient is −.056 with a *t*-ratio of −3.09. Complete results for table 3 with 1971 as the terminal year are available from the authors.

[14] A complete documentation of the Feldstein replica and Leimer-Lesnoy algorithms is available on request. This documentation includes assumptions, equations, data sources, input data, and tables of output for each perception. Listings of the gross wealth and tax liability series disaggregated by sex and age group are also available.

his original conclusions. Alternatively, he argues that if the years after 1971 are included, the best way to incorporate the 1972 amendments is to compute a "revised" gross *SSW* series by simply increasing his corrected series by 20 percent beginning in 1972. When this revised variable is used, he finds that his original conclusion is supported for the period 1930–74. He dismisses our algorithm on the basis that our modifications are inappropriate if not perceived by workers. He similarly dismisses all of our alternative perception assumptions as introducing errors-in-variables biases if his perception assumption is correct.

Space does not permit a detailed rejoinder to Feldstein. A few comments are required, however (for greater detail, see Leimer and Lesnoy [1981] and Lesnoy and Leimer [1981]). First, we reemphasize that our conclusions do not depend on whether the terminal year of the period of analysis is 1971 or 1974. The results presented in this paper would be essentially the same if only data preceding the 1972 amendments were considered.

Second, Feldstein's assertion that we failed to incorporate the 1972 amendments is misleading. All of our perception assumptions, with the exception of the Feldstein constant-ratio perception, incorporate the effect of the 1972 amendments. (We differ in also incorporating the effect of all other amendments.) The Feldstein constant-ratio assumption is the same assumption Feldstein adopted when he first extended his *SSW* series and estimates to 1974 (see Feldstein 1978, 1979). He now rejects this assumption.

Third, Feldstein's characterization of the 1972 amendments is incorrect, and his 20 percent adjustment procedure is inconsistent with the actual postretirement, price-indexing provision of that legislation.[15] Correctly modeling this provision yields weaker and insignificant results.

Fourth, Feldstein's new results are hardly robust. If we use Feldstein's revised variable but consider only the postwar period, or if we drop early Depression years from the sample, we obtain small, insignificant results. If we simply use the recently revised national income data, Feldstein's results are weaker and no longer significant even for the full period.

Fifth, our alternative algorithm for constructing social security

[15] Feldstein suggests that the 1972 amendments not only introduced the price indexing of benefits after retirement but also changed the determination of benefit awards from a nominal earnings basis to a "wage-indexed" earnings basis. In fact, the "wage indexing" of earnings to achieve constant benefit-to-earnings ratios was not introduced until the 1977 amendments. Further, although Feldstein points to the importance of the provision that postretirement benefits would grow at the same rate as prices, his revised series implicitly assumes that postretirement benefits grow at the same rate as income per capita.

wealth provides better estimates of the number of persons likely to receive benefits. Whether or not this provides better estimates of those expecting to receive benefits is not known, of course. But clearly, coefficient estimates based on this algorithm cannot simply be dismissed. Not only does the evidence presented in table 3 contradict Feldstein's results but also, if we use our algorithm to develop a variable parallel to Feldstein's revised variable, we obtain small, insignificant estimates of the *SSW* coefficient. Thus, Feldstein's conclusion depends not only on his revised perception assumption but also on his algorithm for computing social security wealth.

Sixth, Feldstein assumes that beginning in 1937 workers somehow formed a perception of the benefit ratio over the period 1940–71, ignored all amendments through 1971 including the fundamental changes in the benefit structure enacted in 1939 and 1950, and then immediately and permanently reacted to the 1972 amendments. We are skeptical that individuals' perceptions of the benefit ratio were not altered by changes in legislation, or by the decline in benefit ratios during the periods between legislation (as long as 11 years). Since no one knows how individuals' perceptions are altered by such information, we considered a range of alternative adjustment mechanisms including myopia, adaptive expectations, incorporation of actuarial benefit projections, and perfect foresight. None of these alternative assumptions about how individuals adjust their estimates of social security wealth in response to new information provides any statistically significant evidence that social security reduces saving.

Finally, appeal to an errors-in-variables bias requires knowledge of the conceptually appropriate variable. Despite Feldstein's arguments, we simply do not know how—or even whether—individuals form perceptions of social security wealth. Thus, even if we were to accept Feldstein's new evidence as reasonable—and we do not—the time-series evidence as a whole would have to be viewed as inconclusive, since we do not know which assumption describing individuals' perceptions of social security wealth, if any, is most appropriate.

We again emphasize that our empirical investigation has been limited in this paper to the Feldstein specification of the consumer-expenditure function. It is possible that the results will differ under alternative specifications or different variable constructions.[16] It is unlikely, however, that additional time-series estimates will provide a definitive answer—in part because we simply do not know how individuals perceive their social security wealth and in part because of the inherent difficulties of using time-series data.

[16] Lesnoy and Leimer (1981) reexamine the specifications of Munnell (1974), Barro (1978), and Darby (1979). These latter studies all used the incorrect Feldstein *SSW* variable. Our reexamination supports the findings of this paper.

Appendix

TABLE A1

CONSUMER-EXPENDITURE FUNCTIONS USING ORIGINAL AND REPLICATED FELDSTEIN SOCIAL SECURITY WEALTH VARIABLES

Equation	Period of Estimation	*SSW* Concept	Source	*YD*	YD_{-1}	*RE*	*W*	*SSW*	Constant	$\bar{R}^2$	Durbin-Watson Statistic	Sum of Squared Residuals
(A.1.1)	1930–74	Gross	Feldstein	.600	.114	.184	.005	.026	354	.999	1.56	14,290
				(9.84)	(2.83)	(2.45)	(.83)	(2.82)	(4.29)			
(A.1.2)	1930–74	Gross	Replication	.688	.098	.057	.010	.011	186	.999	1.39	17,140
				(12.17)	(2.15)	(.72)	(1.77)	(1.06)	(3.20)			
(A.1.3)	1930–74	Net	Feldstein	.611	.126	.213	.003	.037	337	.999	1.57	14,370
				(10.37)	(3.11)	(2.64)	(.51)	(2.78)	(4.33)			
(A.1.4)	1930–74	Net	Replication	.707	.104	.067	.010	.009	151	.999	1.38	17,590
				(13.08)	(2.24)	(.79)	(1.72)	(.50)	(3.13)			
(A.1.5)	1947–74	Gross	Feldstein	.635	.163	.151	.012	.004	154	.998	1.46	11,880
				(4.31)	(1.48)	(.94)	(1.01)	(.10)	(.38)			
(A.1.6)	1947–74	Gross	Replication	.765	.208	.118	.025	−.060	−166	.998	1.94	8,495
				(9.64)	(2.92)	(.88)	(2.91)	(−2.96)	(−1.68)			
(A.1.7)	1947–74	Net	Feldstein	.551	.094	.145	.007	.059	482	.998	1.71	11,010
				(5.14)	(.95)	(.95)	(.73)	(1.32)	(1.72)			
(A.1.8)	1947–74	Net	Replication	.729	.200	.151	.024	−.095	−79	.998	1.88	8,226
				(10.06)	(2.87)	(1.15)	(2.86)	(−3.13)	(−1.17)			

NOTE.—1930–74 regressions exclude the years 1941–46. The Durbin-Watson statistic is adjusted for this gap. Figures in parentheses are *t*-statistics.

TABLE A2

CONSUMER-EXPENDITURE FUNCTIONS ESTIMATED USING *SSW* VARIABLES WITH ALTERNATIVE PERCEPTIONS: FELDSTEIN ALGORITHM

Equation	*SSW* Concept	Perception	*YD*	YD_{-1}	*RE*	*W*	*SSW*	Constant	$\bar{R}^2$	Durbin-Watson Statistic	Sum of Squared Residuals
(A.2.1)	Gross	Constant ratio	.688	.098	.057	.010	.011	186	.999	1.39	17,140
		(Feldstein replication)	(12.17)	(2.15)	(.72)	(1.77)	(1.06)	(3.20)			
(A.2.2)	Gross	Current ratio	.717	.110	.090	.010	.0002	132	.999	1.37	17,730
			(13.11)	(2.46)	(1.13)	(1.63)	(.04)	(2.57)			
(A.2.3)	Gross	Adaptive expectations	.715	.110	.091	.010	.0006	136	.999	1.37	17,720
			(13.42)	(2.46)	(1.18)	(1.54)	(.11)	(2.50)			
(A.2.4)	Gross	Perfect foresight	.679	.096	.063	.010	.011	203	.999	1.37	16,920
			(11.85)	(2.14)	(.84)	(1.75)	(1.25)	(3.21)			
(A.2.5)	Gross	Actuarial projection	.714	.110	.092	.010	.0007	137	.999	1.35	17,710
			(13.17)	(2.46)	(1.20)	(1.65)	(.18)	(3.08)			
(A.2.6)	Net	Benefits: constant ratio	.710	.106	.079	.009	.005	150	.999	1.37	17,670
		Taxes: constant ratio	(13.04)	(2.33)	(1.00)	(1.56)	(.34)	(2.34)			
(A.2.7)	Net	Benefits: current ratio	.725	.111	.084	.010	−.002	120	.999	1.40	17,620
		Taxes: current ratio	(13.95)	(2.49)	(1.11)	(1.62)	(−.45)	(3.51)			
(A.2.8)	Net	Benefits: adaptive expectations	.721	.111	.089	.010	−.001	123	.999	1.38	17,680
		Taxes: adaptive expectations	(14.16)	(2.48)	(1.19)	(1.68)	(−.28)	(3.39)			
(A.2.9)	Net	Benefits: perfect foresight	.692	.099	.065	.010	.012	181	.999	1.37	17,250
		Taxes: perfect foresight	(12.34)	(2.17)	(.84)	(1.73)	(.95)	(3.07)			
(A.2.10)	Net	Benefits: actuarial projection	.722	.110	.084	.010	−.001	125	.999	1.40	17,700
		Taxes: legislated	(13.32)	(2.45)	(1.07)	(1.62)	(−.23)	(3.52)			
(A.2.11)	Net	Benefits: constant ratio	.707	.104	.067	.010	.009	151	.999	1.38	17,590
		Taxes: perfect foresight	(13.08)	(2.24)	(.79)	(1.72)	(.50)	(3.13)			
		(Feldstein replication)									

NOTE.—1930–74 excluding 1941–46; the Durbin-Watson statistic is adjusted for this gap. Figures in parentheses are *t*-statistics.

TABLE A3

CONSUMER-EXPENDITURE FUNCTIONS ESTIMATED USING *SSW* VARIABLES WITH ALTERNATIVE PERCEPTIONS: LEIMER-LESNOY ALGORITHM

Equation	*SSW* Concept	Perception	*YD*	YD_{-1}	*RE*	*W*	*SSW*	Constant	$\overline{R}^2$	Durbin-Watson Statistic	Sum of Squared Residuals
(A.3.1)	Gross	Constant ratio	.720	.112	.098	.010	−.002	120	.999	1.38	17,690
			(14.20)	(2.47)	(1.19)	(1.68)	(−.26)	(2.65)			
(A.3.2)	Gross	Current ratio	.720	.110	.085	.010	−.001	125	.999	1.38	17,720
			(13.45)	(2.46)	(1.07)	(1.64)	(−.13)	(2.40)			
(A.3.3)	Gross	Adaptive expectations	.718	.110	.088	.010	−.0001	130	.999	1.37	17,730
			(13.79)	(2.46)	(1.16)	(1.56)	(−.02)	(2.44)			
(A.3.4)	Gross	Perfect foresight	.718	.110	.090	.010	−.0004	127	.999	1.37	17,720
			(13.97)	(2.44)	(1.14)	(1.60)	(−.07)	(2.44)			
(A.3.5)	Gross	Actuarial projection	.718	.110	.089	.010	−.0000	130	.999	1.37	17,730
			(13.41)	(2.46)	(1.15)	(1.64)	(−.01)	(2.82)			
(A.3.6)	Net	Benefits: constant ratio	.722	.113	.105	.011	−.004	109	.999	1.39	17,570
		Taxes: constant ratio	(14.39)	(2.52)	(1.31)	(1.75)	(−.54)	(2.28)			
(A.3.7)	Net	Benefits: current ratio	.725	.111	.080	.010	−.003	117	.999	1.40	17,570
		Taxes: current ratio	(14.09)	(2.50)	(1.06)	(1.67)	(−.54)	(3.25)			
(A.3.8)	Net	Benefits: adaptive expectations	.721	.111	.088	.010	−.002	121	.999	1.39	17,660
		Taxes: adaptive expectations	(14.28)	(2.48)	(1.18)	(1.70)	(−.35)	(3.28)			
(A.3.9)	Net	Benefits: perfect foresight	.720	.111	.095	.010	−.002	122	.999	1.38	17,700
		Taxes: perfect foresight	(14.10)	(2.46)	(1.19)	(1.67)	(−.22)	(2.57)			
(A.3.10)	Net	Benefits: actuarial projection	.725	.109	.079	.010	−.002	121	.999	1.42	17,660
		Taxes: legislated	(13.47)	(2.45)	(1.00)	(1.64)	(−.35)	(3.24)			
(A.3.11)	Net	Benefits: constant ratio	.721	.114	.110	.010	−.005	116	.999	1.38	17,580
		Taxes: perfect foresight	(14.42)	(2.52)	(1.30)	(1.72)	(−.53)	(3.12)			

NOTE.—1930–74 excluding 1941–46; the Durbin-Watson statistic is adjusted for this gap. Figures in parentheses are *t*-statistics.

TABLE A4

GROSS SOCIAL SECURITY WEALTH FOR ALTERNATIVE PERCEPTIONS: FELDSTEIN ALGORITHM
(in Billions of 1972 $)

Year	Constant Ratio	Current Ratio	Adaptive Expectations	Perfect Foresight	Actuarial Projection
1937	151.5	192.9	192.9	189.3	253.1
1938	135.8	173.2	173.2	166.8	228.1
1939	152.0	193.9	193.9	190.4	258.4
1940	255.8	319.6	319.6	308.3	386.9
1941	334.4	346.2	382.1	411.1	418.0
1942	426.1	369.3	429.4	518.3	393.1
1943	446.8	360.5	407.5	534.0	377.7
1944	444.1	334.1	370.5	539.6	346.7
1945	438.0	327.6	346.0	538.5	340.5
1946	452.5	322.4	338.8	570.5	381.1
1947	431.0	305.4	313.7	540.0	358.4
1948	450.7	302.2	315.0	559.3	351.8
1949	429.1	306.3	303.0	536.9	353.5
1950	474.6	367.0	350.9	604.8	419.5
1951	583.1	492.5	462.4	744.9	553.9
1952	608.2	674.7	578.9	777.8	752.0
1953	642.4	758.4	685.1	816.6	874.8
1954	635.5	806.7	742.0	811.0	913.4
1955	733.8	1,013.9	935.0	936.1	1,302.0
1956	788.8	1,043.4	1,024.2	1,015.7	1,283.6
1957	849.3	1,089.9	1,095.1	1,095.4	1,288.0
1958	847.0	1,167.1	1,129.1	1,093.0	1,328.6
1959	893.3	1,297.0	1,244.0	1,150.0	1,463.2
1960	908.0	1,303.4	1,283.9	1,173.2	1,457.6
1961	933.8	1,261.1	1,290.0	1,221.6	1,399.6
1962	1,004.0	1,349.8	1,367.5	1,305.8	1,417.9
1963	1,043.8	1,399.6	1,410.8	1,359.5	1,486.0
1964	1,129.6	1,445.3	1,486.4	1,456.3	1,550.9
1965	1,229.6	1,571.2	1,595.1	1,584.5	1,704.3
1966	1,331.3	1,701.3	1,715.4	1,731.8	2,004.1
1967	1,406.1	1,678.6	1,746.0	1,832.0	1,959.7
1968	1,479.5	1,917.6	1,878.1	1,933.0	2,219.3
1969	1,539.5	1,923.9	1,940.0	2,012.7	2,315.6
1970	1,606.4	2,177.2	2,100.9	2,106.2	2,607.9
1971	1,659.4	2,372.0	2,270.7	2,195.6	2,828.7
1972	1,762.3	2,553.1	2,482.8	2,367.8	3,027.2
1973	1,929.4	2,865.0	2,792.4	2,537.1	2,851.2
1974	1,912.5	3,026.9	2,898.3	2,546.7	3,054.2
1975	1,927.1	3,070.9	2,995.2	2,569.3	3,139.6
1976	2,031.5	3,215.3	3,187.6	2,711.5	3,334.6
1977	2,150.8	3,387.8	3,381.3	2,862.4	3,570.7

TABLE A5

NET SOCIAL SECURITY WEALTH FOR ALTERNATIVE PERCEPTIONS: FELDSTEIN ALGORITHM (in Billions of 1972 $)

Year	Constant Ratio	Current Ratio	Adaptive Expectations	Perfect Foresight	Actuarial Projection/ Legislated	Constant Ratio/ Perfect Foresight
1937	47.3	150.7	150.7	106.4	150.2	68.6
1938	44.2	137.6	136.8	92.0	139.4	61.0
1939	49.0	153.5	153.2	102.8	154.5	64.4
1940	142.4	275.8	275.3	208.4	273.9	156.0
1941	185.6	292.8	326.4	274.3	275.7	197.6
1942	242.3	309.4	364.9	343.1	228.9	251.0
1943	264.5	293.0	341.8	355.1	190.9	267.8
1944	271.1	266.0	305.3	364.7	155.6	269.3
1945	267.9	266.0	283.1	360.4	165.3	260.0
1946	268.7	258.6	272.9	369.4	197.9	251.4
1947	256.8	234.3	247.0	342.3	152.7	233.3
1948	270.4	226.7	242.7	347.6	210.5	239.0
1949	261.8	233.5	233.0	334.5	214.3	226.6
1950	291.5	249.0	253.7	375.7	265.6	245.4
1951	371.1	351.7	335.7	474.1	312.8	312.3
1952	391.4	525.2	439.3	493.7	490.4	324.1
1953	417.4	598.9	533.0	514.5	589.2	340.3

1954	419.1	602.6	566.8	513.4	632.9	338.0
1955	490.0	793.1	725.9	595.6	965.7	393.2
1956	531.5	804.8	794.5	649.5	912.8	422.6
1957	573.2	840.2	847.0	694.8	890.6	448.7
1958	577.4	927.0	887.9	694.6	938.5	448.5
1959	609.4	1,006.0	971.5	721.9	974.1	465.1
1960	621.6	942.2	965.8	734.3	950.1	469.1
1961	643.9	896.3	946.6	773.3	879.2	485.6
1962	700.2	947.9	986.7	831.7	840.5	529.8
1963	728.5	911.1	968.9	863.7	878.6	548.0
1964	787.1	925.0	986.2	917.3	897.3	590.6
1965	853.3	1,013.7	1,041.6	991.5	996.7	636.6
1966	919.8	1,071.0	1,097.6	1,081.4	1,229.9	680.9
1967	970.5	1,006.2	1,082.9	1,142.7	1,137.4	716.8
1968	1,018.8	1,252.4	1,194.8	1,203.3	1,345.3	749.8
1969	1,055.7	1,136.7	1,187.6	1,243.2	1,381.3	770.0
1970	1,103.1	1,397.9	1,319.9	1,307.0	1,673.0	807.1
1971	1,139.6	1,497.8	1,430.3	1,369.5	1,875.8	833.2
1972	1,204.9	1,622.8	1,567.0	1,484.3	1,980.4	878.8
1973	1,312.3	1,813.6	1,759.8	1,561.5	1,804.3	953.8
1974	1,299.0	1,975.1	1,859.1	1,580.1	2,011.0	945.9
1975	1,314.4	2,065.9	1,973.8	1,607.7	2,142.1	965.5
1976	1,380.8	2,149.7	2,112.5	1,692.3	2,275.8	1,012.3
1977	1,443.2	2,281.8	2,243.7	1,756.4	2,470.3	1,044.9

TABLE A6

GROSS SOCIAL SECURITY WEALTH FOR ALTERNATIVE PERCEPTIONS: LEIMER-LESNOY ALGORITHM (in Billions of 1972 $)

Year	Constant Ratio	Current Ratio	Adaptive Expectations	Perfect Foresight	Actuarial Projection
1937	134.9	136.6	136.6	148.0	180.8
1938	130.9	132.6	132.6	141.5	176.9
1939	146.2	148.1	148.1	160.4	199.1
1940	245.5	248.1	248.1	263.8	301.2
1941	263.9	243.1	255.0	287.0	293.8
1942	284.6	241.7	258.4	309.1	262.2
1943	319.2	241.6	265.7	343.2	260.8
1944	343.3	240.5	263.1	372.8	258.2
1945	336.4	245.3	251.6	368.5	262.4
1946	340.8	238.8	246.9	377.3	284.0
1947	369.6	230.9	249.4	409.9	272.3
1948	395.3	231.8	249.3	439.7	271.2
1949	416.6	249.5	256.2	461.5	289.4
1950	445.3	294.0	284.0	505.8	337.5
1951	643.5	441.6	425.8	722.1	498.1
1952	684.1	607.9	530.5	768.5	679.4
1953	734.9	684.2	627.4	823.5	790.7
1954	769.3	760.9	708.7	866.8	861.9
1955	871.4	946.3	874.5	981.7	1,216.9
1956	948.2	967.2	959.2	1,078.5	1,190.5
1957	998.3	991.9	1,001.0	1,135.0	1,171.0
1958	1,035.1	1,097.4	1,067.5	1,183.0	1,244.3
1959	1,099.6	1,219.8	1,176.7	1,254.7	1,369.1
1960	1,149.6	1,248.4	1,239.1	1,316.3	1,388.1
1961	1,187.5	1,222.4	1,250.8	1,379.9	1,345.5
1962	1,280.0	1,306.9	1,327.5	1,488.7	1,366.9
1963	1,329.0	1,359.5	1,368.9	1,543.9	1,436.8
1964	1,405.0	1,401.4	1,424.3	1,633.6	1,496.0
1965	1,468.3	1,499.3	1,493.9	1,711.5	1,617.0
1966	1,547.7	1,594.8	1,584.6	1,819.7	1,868.5
1967	1,623.7	1,566.6	1,614.5	1,912.9	1,819.6
1968	1,693.7	1,787.9	1,736.0	1,998.3	2,059.2
1969	1,755.9	1,785.4	1,792.6	2,082.9	2,134.3
1970	1,799.4	2,040.5	1,939.0	2,153.8	2,424.9
1971	1,849.2	2,258.1	2,125.3	2,224.0	2,671.5
1972	1,957.8	2,410.2	2,330.0	2,394.2	2,835.0
1973	2,057.9	2,719.5	2,584.3	2,485.7	2,705.6
1974	2,030.1	2,891.2	2,720.4	2,485.8	2,916.7
1975	2,018.9	2,982.2	2,843.1	2,482.4	3,050.6
1976	2,126.0	3,094.5	3,044.1	2,606.8	3,210.0
1977	2,215.0	3,237.8	3,204.4	2,717.0	3,407.3

TABLE A7

NET SOCIAL SECURITY WEALTH FOR ALTERNATIVE PERCEPTIONS: LEIMER-LESNOY ALGORITHM (in Billions of 1972 $)

Year	Constant Ratio	Current Ratio	Adaptive Expectations	Perfect Foresight	Actuarial Projection/ Legislated	Constant Ratio/ Perfect Foresight
1937	49.3	103.4	103.4	88.5	103.9	75.4
1938	51.9	103.4	102.6	84.0	106.6	73.4
1939	58.4	115.3	115.1	93.9	117.5	79.7
1940	149.1	212.2	212.0	187.6	211.2	169.3
1941	151.8	200.1	212.5	194.7	182.3	171.5
1942	156.5	192.0	209.2	197.3	127.9	172.8
1943	179.7	182.1	209.2	213.4	97.3	189.3
1944	202.9	176.9	203.0	235.3	80.5	205.8
1945	204.5	189.0	195.2	235.5	102.6	203.4
1946	208.5	184.3	191.4	241.9	128.7	205.4
1947	229.9	170.2	189.7	261.4	97.9	221.0
1948	249.1	167.4	185.9	278.1	151.6	233.7
1949	271.2	185.8	192.8	294.4	168.2	249.5
1950	290.4	191.9	199.2	321.0	204.6	260.6
1951	450.4	316.0	310.2	477.9	285.3	399.3
1952	482.1	473.4	402.7	505.1	445.9	420.7
1953	521.2	540.2	487.8	536.4	534.1	447.9
1954	556.3	572.3	544.8	571.8	603.3	474.3
1955	629.4	738.7	677.6	638.7	901.0	528.4
1956	686.1	741.4	739.7	698.1	839.3	567.8
1957	726.0	762.9	772.4	731.6	808.4	594.9

TABLE A7 (*Continued*)

Year	Constant Ratio	Current Ratio	Adaptive Expectations	Perfect Foresight	Actuarial Projection/ Legislated	Constant Ratio/ Perfect Foresight
1958	760.6	871.8	839.5	766.0	878.2	618.0
1959	809.7	947.0	920.0	803.2	911.3	648.0
1960	851.8	906.7	936.4	842.2	908.3	675.5
1961	885.9	875.6	924.1	892.4	850.8	700.0
1962	959.3	921.0	960.8	961.9	812.1	753.2
1963	996.5	888.8	943.5	990.0	851.0	775.1
1964	1,052.3	900.7	948.3	1,040.9	866.8	812.3
1965	1,095.0	969.0	976.8	1,079.1	943.6	835.9
1966	1,148.1	1,003.0	1,012.1	1,137.0	1,141.8	864.9
1967	1,202.7	935.6	997.4	1,188.5	1,048.4	899.3
1968	1,255.3	1,168.6	1,105.1	1,239.0	1,245.9	934.4
1969	1,299.8	1,058.8	1,101.1	1,285.7	1,272.4	958.7
1970	1,334.4	1,315.3	1,224.0	1,337.8	1,554.8	983.3
1971	1,377.8	1,442.9	1,355.2	1,392.3	1,783.0	1,017.5
1972	1,458.9	1,554.5	1,494.6	1,513.3	1,872.5	1,076.8
1973	1,538.3	1,770.9	1,675.0	1,566.9	1,761.4	1,139.0
1974	1,521.1	1,945.0	1,801.9	1,586.8	1,978.6	1,131.1
1975	1,518.7	2,069.3	1,935.4	1,601.1	2,144.9	1,137.7
1976	1,597.6	2,134.5	2,084.7	1,677.3	2,257.0	1,196.6
1977	1,671.3	2,282.8	2,233.3	1,762.0	2,459.1	1,260.0

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