

Measuring Unemployment Benefit
Reciprocity in New Zealand

by

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This is a paper about measurement. It originated within a project that is examining the performance of unemployment compensation (UC) programs from a cross-national perspective. At the current time the larger project has assembled data on the UC programs of more than 20 countries along with supporting labor market data. Within the set of OECD countries, the project has singled out for particular attention six English speaking countries: Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. An analysis of the unemployment protection systems in these six countries was recently completed by Brusentsev (2002).

In developing time series to describe the evolution of New Zealand's UC program since the late 1950s, several problems were encountered. This paper discusses various measurement issues and presents a summary overview of relevant series from 1959 to 2001. The primary purpose of the paper is to explicitly document the decisions made in developing summary measures of New Zealand's labor market and its UC program.

I. Summary Data on New Zealand

Table 1 displays selected fiscal year data extending from 1959 to 2001. Similar tables have been developed for several countries, presenting key series for making a summary assessment of the effectiveness of UC programs. In particular they allow one to assess macro aspects of UC programs such as: 1) aggregate expenditures for UC, 2) the share of the unemployed who receive UC benefits, 3) average UC benefit levels, 4) replacement rates (average benefits relative average wages) and 5) the benefit cost rate (benefit payments measured as a percent total payrolls covered by the UC program).

The horizontal lines in Table 1 identify important breaks in the data series. First, New Zealand changed the timing of its fiscal year in 1990 from April-March to July-June. All series incorporate this change in timing. Second, New Zealand instituted a quarterly labor force survey in 1986. For earlier years, the estimates of the unemployment rate and total unemployment (columns (1) and (2)) relied on registrations by job seekers at employment offices. From the data in Table 1, however, no obvious break in the unemployment series before and after 1986 is observed. Third, the procedure used to measure the number of beneficiaries and weekly benefits

(columns (3) and (6)) changed between 1977 and 1978. Alternative measurement procedures are described in the next section.

Several features of Table 1 are noteworthy. Prior to 1978 New Zealand enjoyed an exceptionally low unemployment rate. Observe how unemployment rate (TUR%) remained below one percent of the labor force in every year between 1960 and 1977. For all but one of these years the unemployment rate fell below 0.5 percent.

This string of remarkably low unemployment rates ended in the late 1970s. During the 1980s the unemployment rate averaged 4.2 percent, and then in the 1990s it averaged 7.9 percent. Prior to 2001 the last year unemployment fell below 6.0 percent was 1988. Over the full span of years covered by Table 1, the level of unemployment changed from less than 5,000 in 17 of 18 years before 1978 to an average consistently in excess of 100,000 in all years since 1990.

Prior to 1978 annual data on the operation of the country's unemployment assistance (UA) program appeared in annual issues of the New Zealand Statistical Yearbook. These summaries covered UA along with the other individual social insurance contingencies such as sickness and old age. For each contingency, a description of program experiences during the year was provided along with supporting data. The data for the UA program showed end-of-year counts of beneficiaries and annual cash expenditures for the fiscal year. Data on UA expenditures appear in column (5) of the table. The estimates of UA beneficiaries (column (3)) through FY 1977 are also based on the Yearbook. To approximate a fiscal year average, the counts as of March at the start and end of each fiscal year were averaged. The Yearbook was the source of the estimates of average weekly wages appearing in column (7).

For several years starting in 1978 the Statistical Yearbook also showed the annual average of UA beneficiaries based on monthly data. These estimates were published for ten of twelve years between 1978 and 1989 (all but 1985 and 1988). Since 1989, however, the annual averages have not been published in the Statistical Yearbook. Between 1996 and 2001 quarterly estimates of beneficiaries appear in the "Quarterly Profile" published by Work and Income New Zealand. One issue of the "Quarterly Profile" also displayed a graph of monthly UI beneficiaries from January 1977 to June 2001. The "Quarterly Profile" was the source for estimates of UA beneficiaries in Table 1 for 1985, 1988 and the years between 1990 and 2001.

The other series in Table 1 were derived from the series already introduced. Weekly UA benefits (column (6)) was derived by formula from columns (3) and (5), e.g., [column (5)/(52*column (3))]. The replacement rate (column (8)) is the ratio of column (6) to column (7). Column (9) is a generosity index, the product of columns (4) and (8). Finally, column (10) shows an estimate of UA benefit costs relative to covered payroll and expressed as a percentage. Indicative of the consequences of increased unemployment, the ten year average of costs was 0.17 percent of payroll during the 1970s but 2.83 percent of payroll during the 1990s.

While the basic trend of UA benefit costs depicted in Table 1 is reasonable, there are some obvious instances of “noise” in individual series, particularly for the years before 1978. The estimated UA recipiency rate in column (4) was very high in 1976 and 1977 (ratios above 1.0) when compared to the immediately preceding and succeeding years. The estimated replacement rates in column (8) were unusually high from 1973 to 1975. Since the time series for weekly wages in column (7) was reasonably smooth, the explanation seemed to reside in the estimates of weekly UA benefits. When information on average statutory payment levels was examined, questions about the accuracy of the estimates of weekly benefits were heightened.

These questions are explored in the following pages.

II. Measuring UA Recipiency Rates and Payment Levels

In pursuing questions about data measurement, it should first be noted that several important time series were treated as fully accurate and thus outside the scope of the investigation. In particular, published data on unemployment, the unemployment rate and weekly wages were taken as given or subjected to only small modifications. Note in Table 1 that these series for fiscal years extend back to 1960. Some smoothing of underlying data on hourly wages and weekly hours worked was undertaken to overcome a few obvious seams in the basic series. Otherwise these series were not modified.

The data on total UA benefit payments in column (5) of Table 1 were taken directly from various issues of the Yearbook except for the most recent years when estimates were supplied by Work and Income New Zealand. A second source for years since 1980 was the OECD data base

on Social Expenditures (series 10.1 - Unemployment Compensation). For the years 1980 to 1991 the two series matched exactly, but then the OECD series was lower by about NZ\$100 million during 1992-1993 and by about NZ\$200 million during 1994-1997. The two series then nearly matched during fiscal years 1998-2000.

Deriving estimates of the average number of UA beneficiaries presented important challenges and no single procedure could be used for the full period covered by Table 1. Columns (1) - (6) of Table 2 display five time series for the number of beneficiaries. Column (1) presents end-of-year (EOY) estimates that extend back continuously to fiscal year 1965. These data bracket the start and end of each fiscal year. Averaging these endpoints yields a crude estimate of average beneficiary levels for each fiscal year. These averages (N Ben) which appear in column (2) of Table 2 extend continuously from 1966 through 2001. Of course, to the extent that the monthly pattern of reciprocity departs from the implied linear interpolation between these fiscal year endpoints, the NBen estimates will deviate from the true annual average.

As noted in Section I, annual averages of beneficiaries based on monthly data are available for ten of the twelve fiscal years between 1978 and 1989. These averages (NBen2) appear explicitly in column (3) of the table. For these ten years, comparisons with the average of the EOY estimates in column (2) can be made.

Within the larger comparative project on UC systems, one objective is to estimate the costs of providing unemployment compensation protection in several individual countries. The cost framework used in the project is illustrated with the New Zealand data displayed in Table 1. The total cost rate (as a percent of payroll) in column (10) of Table 1 is the product of the underlying unemployment rate, the UC reciprocity rate and the replacement rate, i.e., the triple product of columns (1), (4) and (8).

In deriving estimates of the three underlying cost factors, the approach followed (to the extent possible) was to utilize published data on the unemployment rate and the UC reciprocity rate and to derive estimates of weekly benefits from data on the average number of beneficiaries and annual expenditures for UC benefits. With data available at this time, the weekly benefit estimates for New Zealand can be derived for ten years between 1978 and 1989. These estimates appear explicitly in column (9) of Table 2..

Three other estimates of weekly benefits are also shown. The series in column (8) was derived using the column (2) estimates of annual beneficiaries. For the ten years where columns (8) and (9) can be compared note that the evolution of the estimates in column (9) is smoother than the estimates in column (8). This is exactly as would be expected in comparing two series where one has the more accurate estimates of average monthly beneficiaries.

Average weekly UA benefits reflect statutory provisions. The project tracked time series developments in monthly benefit payments. Series for statutory UA payments were traced back to January 1969 for different types of beneficiaries classified by age, marital status and number of children. The fiscal year monthly averages of weekly payments for single adults appear in column (7) of Table 2.

As would be expected, average weekly benefits are closely associated with the statutory (or scale) payment level. The relationship was explored using regressions. For fifteen years where the weekly benefit and the average weekly scale were available, the R^2 exceeded 0.98 when the weekly benefit was regressed upon the weekly scale payment for a single adult.¹ After some experimentation, a homogeneous relationship was then used to project the weekly benefit in years when weekly benefit data were not available. The slope on the weekly scale used to make the projections was 1.255. The series on weekly benefits in column (10) used this equation for the years 1970 to 1977, 1985, 1988 and 1990 to 1995. For other years, the column (10) estimates are the same as in column (9), i.e., based on annual averages of beneficiaries.

For years where the weekly benefit was estimated by the regression equation, an estimate of average weekly beneficiaries could be derived from information on total benefit payments and the estimated average weekly benefit. The estimates of beneficiaries appearing in column (4) (NBen3) were derived in this manner for the years 1970 to 1977, 1985, 1988 and 1990 to 1995.

The final data series used to measuring beneficiaries and average benefits was derived from a graph appearing in a 2001 issue of the “Quarterly Profile” from Work and Income New Zealand. The graph shows monthly counts of UA beneficiaries from January 1977 to June 2001. Quarterly estimates for this entire period were transcribed from the graph and averages appear in

¹The years were 1978-1984, 1986-1987, 1989 and 1996-2000. The regression analysis of the weekly UA benefit appears in Table 3 below. Equation (12) was used to make projections of weekly UA benefits.

column (6) of Table 2. Note that the data in column (6) closely match the quarterly averages appearing in column (5) for years when the two series can be compared, e.g., 1996 to 2000.

The series NBen4 appearing in column (5) utilizes actual averages for ten of twelve years between 1978 and 1989 and again between 1996 and 2000. For the years 1985 and 1988 the column (5) estimates were derived as 1.039 times the estimates in column (6). The inflation by 1.039 was based on the average ratio of column (5) to column (6) for the other ten years of the 1978-1989 period. For the years 1990 to 1995 the annual average for column (5) was assumed to be the same as for column (6). The resulting series for NBen4 thus spans the 23 years from 1978 to 2000. It in turn was used to derive the estimates of weekly benefits (Weekly UA Ben4) appearing in column (11).

To summarize, three pairwise time series sets of estimates of beneficiaries and weekly benefits were derived. The estimates in columns (2) and (8) utilized two points (start of year and end of year) to estimate average beneficiaries and then derived weekly benefits as a residual. Estimates in columns (4) and (10) were developed assuming weekly benefits could be derived knowing the average scale benefit for a single adult. After estimating the weekly benefit, the number of beneficiaries was derived as a residual. Estimates in columns (5) and (11) assumed weekly beneficiaries could be derived from a graphic display of monthly data on beneficiaries and weekly benefits were then derived as a residual. The latter two pairings used the actual average numbers of beneficiaries in years when such data were available (ten of twelve years between 1978 and 1989 and the five years from 1996 to 2000).

When the latter two pairs are compared, the estimates that start with the scale wage to estimate the weekly benefit (columns (4) and (10)) have more beneficiaries but lower weekly benefits vis-a-vis the series derived using the estimated annual averages of beneficiaries (columns (5) and (11)). Absent actual data on annual averages of beneficiaries, it is difficult to know which pair provides more accurate estimates of beneficiaries and average weekly benefits.

III. Comparisons of Series

Chart 1 displays three time series estimates of the average number of UA beneficiaries. The three, NBen, NBen3 and NBen4, were taken from columns (2), (4) and (5) of Table 2. Recall that for that years when actual annual average data were available the series NBen3 and NBen4 are identical, i.e., ten of twelve years between 1978 and 1989.

In broad terms the three series trace very similar patterns for years when the individual series can be compared, i.e., from 1978. Reciprocity was consistently low before 1978, and it then grew steadily between from 1978 to 1984. After decreases in 1985 and 1986, a second period of strong growth in reciprocity occurred between 1987 and 1993 with particularly large annual increases observed between 1987 and 1990. Reciprocity then decreased between 1993 and 1996 followed by growth between 1996 and 2000. After 1978, all three series have local maximums in 1984, 1993 and 2000 and local minimums in 1986 and 1996. Illustrative of the strong similarities in these series, the lowest of their three pairwise correlations for the 1978-2000 period was 0.992.²

Chart 2 traces developments in average weekly benefits over the same period. The series, WUABen, WUABen3 and WUABen4, are based respectively on columns (8), (10) and (11) of Table 2. To emphasize the use of the scale payment for single adults in the derivation of the WUABen3 series, this scale (WUAScale) is also included in the chart.

The individual series in Chart 2 show similar time series patterns but their association is not as close as for the beneficiary series depicted in Chart 1.³ Between 1970 and 1977 observe that WUABen is generally higher than WUABen3. Observe also that WUABen4 is consistently highest from 1990 to 2000. All series are closely linked with WUAScale from 1970 to 2000. The decrease in WUAScale between 1991 and 1992 is reflected in each of the other three series. Thus while there are observable differences in the individual series, all four trace a similar pattern for years when they can be compared.

²The correlation were as follows: NBen and NBen2 - 0.999, NBen and NBen4 - 0.992 and NBen3 and NBen4 - 0.994.

³ The range of the six pairwise correlations for the years 1978 to 2000 was from 0.975 to 0.995.

IV. Analysis of Reciprocity Rates and Replacement Rates

As noted above, the costs of UC benefits (as a percent of payroll) depends on three factors: the unemployment rate, the reciprocity rate and the replacement rate. While the evolution of the unemployment rate mainly reflects macroeconomic developments, the reciprocity rate and replacement rate can be influenced by administrative procedures and statutory UC provisions. To this point, the paper has been concerned with measuring numbers of beneficiaries and weekly benefits, variables that enter the numerators of the reciprocity rate and the replacement rate respectively. This section briefly explores the determinants of these two ratios.

Table 3 displays twelve regressions, five for the reciprocity rate (PBen), four for the replacement rate (Rep Rate) and three that examine the weekly UA benefit. The reciprocity rate equations test for the effects of unemployment (current and lagged) and two linear trends (one from 1960 and one from 1990). The numerator of the reciprocity rate is measured in three ways: a simple average of two end-of-year estimates (PBen), an estimate derived from an estimate of the weekly benefit (PBen3) and an estimate based on estimated annual averages of beneficiaries (PBen4). The relevant underlying data have appeared previously in Tables 1 and 2.

The effects of unemployment on the reciprocity rate is negative in each of equations (1) through (5) but none of the individual coefficients is significant, e.g., with a t ratio of 2.0 or larger. The Trend 1960 variable is significant in four equations. In equations fitted for the 1978-2000 period Trend 1960 has a positive coefficient while Trend 1990 has a negative (but insignificant) coefficient. This provides some evidence that the trend towards increased reciprocity slowed during the 1990s. Positive serial correlation in the residuals is indicated for all equations so that estimated standard errors may be too low (and t ratios too high). Besides a long run tendency for reciprocity to increase by roughly 0.02-0.04 per year, no other aspect of these equations seems noteworthy. Between 1978 and 2000 the reciprocity rate increased for all three measures of reciprocity.

The replacement rate regressions, equations (6)-(9), suggest some positive effect of the lagged unemployment rate, but again the effects of unemployment are small. There is a strong positive effect of the scale payment for a single adult (measured relative to AWW) in three of four

equations. Since scale payments are directly controlled by Work and Income New Zealand, these regressions show that the replacement rate can be directly influenced, and significant effects are present in equations for all three measures of the replacement rate.

Equations (10)-(12) are included to show the direct effect of the weekly scale wage on weekly UA benefits. All three regressions have adjusted R^2 s above 0.980. Equation (12) was used to project weekly benefits in most years for the WUABen3 series shown in column (10) of Table 2.⁴ The high R^2 s indicate there is a very close relationship between these statutory benefit provisions and average weekly benefits.

The patterns of the standard errors in Table 3 help to highlight the most serious problems in measuring reciprocity rates and replacement rates. Because both PBen and PBen3 have greater measurement problems in the early years, i.e., pre 1978, the standard errors in equations (1) and (3) are much larger than their counterparts in equations (2) and (4). Similarly, the problems in measuring the replacement rate based on just March averages (Rep. Rate) were much more serious before 1978 than later. In measuring both cost factors, errors were much larger in early years when New Zealand's UA beneficiary population was very small.

⁴ These regression-based projections were used for the years 1970 to 1977, 1985, 1988 and 1990 to 1995.

Table 1. New Zealand Unemployment Assistance Payments - June 28, 2002

| Fiscal Year | Unemp. Rate TUR% (1) | Ann Unemp. (2) | Num. UA Ben.-a (3) | N Ben/ Unemp. (3)/(2) (4) | UA Benefits (5) | Weekly UA Ben (6) | Weekly Wage (7) | Rep. Rate (6)/(7) (8) | Generosity G (4)*(8) (9) | Cost Rate B% (1)*(9) (10) |
|-------------|----------------------|----------------|--------------------|---------------------------|-----------------|-------------------|-----------------|-----------------------|--------------------------|---------------------------|
| 1959 | | | 0.2 | | 0.1 | | | | | |
| 1960 | 0.1 | 1.0 | 0.3 | | 0.4 | | 26.45 | | | |
| 1961 | 0.1 | 1.0 | | | | | 27.86 | | | |
| 1962 | 0.1 | 1.0 | | | | | 28.93 | | | |
| 1963 | 0.1 | 1.0 | | | | | 30.21 | | | |
| 1964 | 0.1 | 1.0 | | | | | 31.21 | | | |
| 1965 | 0.1 | 1.0 | | | | | 32.64 | | | |
| 1966 | 0.1 | 1.0 | 0.2 | 0.214 | 0.1 | 12.70 | 34.59 | 0.367 | 0.078 | 0.008 |
| 1967 | 0.1 | 1.0 | 0.2 | 0.225 | 0.1 | 12.08 | 35.92 | 0.336 | 0.075 | 0.007 |
| 1968 | 0.4 | 4.5 | 2.3 | 0.517 | 2.2 | 17.98 | 38.01 | 0.473 | 0.245 | 0.107 |
| 1969 | 0.5 | 5.5 | 3.3 | 0.591 | 3.3 | 19.52 | 40.17 | 0.486 | 0.287 | 0.153 |
| 1970 | 0.2 | 2.0 | 1.5 | 0.766 | 1.5 | 18.38 | 42.34 | 0.434 | 0.333 | 0.063 |
| 1971 | 0.1 | 1.5 | 0.8 | 0.566 | 1.0 | 22.74 | 46.36 | 0.491 | 0.278 | 0.038 |
| 1972 | 0.3 | 3.5 | 1.8 | 0.521 | 2.7 | 28.27 | 58.17 | 0.486 | 0.253 | 0.080 |
| 1973 | 0.3 | 3.5 | 2.4 | 0.674 | 5.0 | 41.05 | 61.80 | 0.664 | 0.448 | 0.140 |
| 1974 | 0.1 | 1.5 | 1.1 | 0.755 | 3.5 | 58.79 | 69.85 | 0.842 | 0.635 | 0.082 |
| 1975 | 0.2 | 2.0 | 1.7 | 0.844 | 5.2 | 58.71 | 81.35 | 0.722 | 0.609 | 0.101 |
| 1976 | 0.3 | 3.5 | 4.0 | 1.146 | 8.5 | 40.72 | 93.63 | 0.435 | 0.498 | 0.142 |
| 1977 | 0.3 | 4.0 | 4.4 | 1.097 | 13.4 | 58.84 | 106.29 | 0.554 | 0.607 | 0.195 |
| 1978 | 1.0 | 12.5 | 8.4 | 0.670 | 19.9 | 45.61 | 121.08 | 0.377 | 0.252 | 0.249 |
| 1979 | 1.8 | 23.0 | 19.7 | 0.857 | 54.2 | 52.90 | 136.42 | 0.388 | 0.332 | 0.598 |
| 1980 | 2.1 | 27.0 | 20.5 | 0.759 | 66.1 | 61.99 | 160.45 | 0.386 | 0.293 | 0.614 |
| 1981 | 2.9 | 38.0 | 31.5 | 0.828 | 118.8 | 72.57 | 199.33 | 0.364 | 0.302 | 0.881 |
| 1982 | 3.6 | 47.0 | 35.5 | 0.756 | 156.4 | 84.70 | 239.50 | 0.354 | 0.267 | 0.954 |
| 1983 | 4.6 | 61.5 | 41.0 | 0.666 | 195.2 | 91.60 | 268.81 | 0.341 | 0.227 | 1.045 |
| 1984 | 5.7 | 77.0 | 55.5 | 0.721 | 315.8 | 109.39 | 275.45 | 0.397 | 0.286 | 1.633 |
| 1985 | 5.0 | 68.0 | 42.0 | 0.617 | 274.7 | 125.89 | 287.87 | 0.437 | 0.270 | 1.339 |
| 1986 | 4.1 | 65.6 | 39.9 | 0.608 | 290.5 | 140.00 | 321.96 | 0.435 | 0.264 | 1.079 |
| 1987 | 4.0 | 65.3 | 58.1 | 0.890 | 459.7 | 152.07 | 383.41 | 0.397 | 0.353 | 1.421 |
| 1988 | 4.3 | 68.7 | 78.5 | 1.143 | 672.7 | 164.87 | 424.26 | 0.389 | 0.444 | 1.909 |
| Mar1989 | 6.2 | 98.0 | 112.5 | 1.148 | 987.3 | 168.71 | 464.67 | 0.363 | 0.417 | 2.584 |
| Jun1990 | 7.1 | 113.50 | 127.4 | 1.122 | 1235.1 | 186.47 | 498.85 | 0.374 | 0.419 | 2.993 |
| 1991 | 9.1 | 146.75 | 139.5 | 0.951 | 1401.6 | 193.22 | 524.40 | 0.368 | 0.350 | 3.172 |
| 1992 | 10.6 | 172.25 | 152.5 | 0.885 | 1445.2 | 182.25 | 537.72 | 0.339 | 0.300 | 3.167 |
| 1993 | 10.0 | 164.75 | 158.5 | 0.962 | 1540.2 | 186.87 | 544.97 | 0.343 | 0.330 | 3.315 |
| 1994 | 9.0 | 150.00 | 145.3 | 0.968 | 1498.5 | 198.40 | 551.88 | 0.360 | 0.348 | 3.118 |
| 1995 | 7.0 | 120.25 | 125.6 | 1.045 | 1313.7 | 201.10 | 567.17 | 0.355 | 0.370 | 2.593 |
| 1996 | 6.1 | 109.75 | 114.6 | 1.044 | 1276.5 | 214.28 | 582.02 | 0.368 | 0.384 | 2.352 |
| 1997 | 6.3 | 117.50 | 118.4 | 1.008 | 1370.9 | 222.65 | 601.83 | 0.370 | 0.373 | 2.363 |
| 1998 | 7.1 | 132.00 | 125.3 | 0.950 | 1496.7 | 229.65 | 612.08 | 0.375 | 0.356 | 2.524 |
| 1999 | 7.3 | 136.75 | 145.7 | 1.065 | 1593.4 | 210.32 | 617.20 | 0.341 | 0.363 | 2.656 |
| 2000 | 6.4 | 120.25 | 145.6 | 1.210 | 1634.5 | 215.96 | 628.12 | 0.344 | 0.416 | 2.661 |
| 2001 | 5.5 | 105.50 | 132.8 | 1.259 | | | | | | |

Source: Unemployment rate and unemployment from quarterly data published by the OECD. Total UA benefits and weekly wage from the New Zealand Statistical Yearbook. Data from 1998 onward partly from Work and Income New Zealand. Unemployment and UA beneficiaries in thousands. UA benefit payments in millions.

a - Estimates are annual averages from 1978 to 2002, March averages before 1978.

Table 2. Alternative Estimates of UA Beneficiaries and Average Weekly Benefits.

| Fiscal Year | Num. UA Ben. EOY | N Ben Avg. EOY | N Ben2 Ann Avg | N Ben3 Based on Avg. Scale | N Ben4 Based on Qtly Avg. | N Ben5 Based on WINZ Graph | Weekly Scale Single Adult | Weekly UA Benefits | Weekly UA Ben2 | Weekly UA Ben3 | Weekly UA Ben4 |
|-------------|------------------|----------------|----------------|----------------------------|---------------------------|----------------------------|---------------------------|--------------------|----------------|----------------|----------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| 1959 | 0.34 | 0.23 | | | | | | | | | |
| 1960 | 0.31 | 0.33 | | | | | | | | | |
| 1961 | | | | | | | | | | | |
| 1962 | | | | | | | | | | | |
| 1963 | | | | | | | | | | | |
| 1964 | | | | | | | | | | | |
| 1965 | 0.21 | | | | | | | | | | |
| 1966 | 0.22 | 0.21 | | | | | | 12.70 | | | |
| 1967 | 0.23 | 0.22 | | | | | | 12.08 | | | |
| 1968 | 4.42 | 2.33 | | | | | | 17.98 | | | |
| 1969 | 2.08 | 3.25 | | | | | | 19.52 | | | |
| 1970 | 0.98 | 1.53 | | 1.71 | | | 13.17 | 18.38 | | 16.52 | |
| 1971 | 0.72 | 0.85 | | 1.07 | | | 14.33 | 22.74 | | 17.98 | |
| 1972 | 2.94 | 1.83 | | 2.59 | | | 15.88 | 28.27 | | 19.93 | |
| 1973 | 1.78 | 2.36 | | 3.85 | | | 20.03 | 41.05 | | 25.12 | |
| 1974 | 0.48 | 1.13 | | 2.28 | | | 23.27 | 58.79 | | 29.19 | |
| 1975 | 2.89 | 1.69 | | 2.93 | | | 26.99 | 58.71 | | 33.86 | |
| 1976 | 5.13 | 4.01 | | 4.22 | | | 30.86 | 40.72 | | 38.72 | |
| 1977 | 3.65 | 4.39 | | 5.79 | | | 35.58 | 58.84 | | 44.63 | |
| 1978 | 17.48 | 10.57 | 8.38 | 8.38 | 8.38 | 9.50 | 41.08 | 36.15 | 45.61 | 45.61 | 45.61 |
| 1979 | 17.89 | 17.69 | 19.72 | 19.72 | 19.72 | 17.63 | 46.27 | 58.96 | 52.90 | 52.90 | 52.90 |
| 1980 | 20.85 | 19.37 | 20.50 | 20.50 | 20.50 | 18.63 | 51.79 | 65.60 | 61.99 | 61.99 | 61.99 |
| 1981 | 35.67 | 28.26 | 31.47 | 31.47 | 31.47 | 31.50 | 61.06 | 80.82 | 72.57 | 72.57 | 72.57 |
| 1982 | 32.60 | 34.13 | 35.52 | 35.52 | 35.52 | 33.50 | 70.10 | 88.14 | 84.70 | 84.70 | 84.70 |
| 1983 | 50.74 | 41.67 | 40.99 | 40.99 | 40.99 | 39.38 | 81.52 | 90.09 | 91.60 | 91.60 | 91.60 |
| 1984 | 50.14 | 50.44 | 55.53 | 55.53 | 55.53 | 51.75 | 89.38 | 120.42 | 109.39 | 109.39 | 109.39 |
| 1985 | 38.42 | 44.28 | | 44.70 | 41.96 | 40.38 | 94.19 | 119.30 | | 118.17 | 125.89 |
| 1986 | 42.41 | 40.41 | 39.90 | 39.90 | 39.90 | 37.50 | 99.16 | 138.22 | 140.00 | 140.00 | 140.00 |
| 1987 | 63.92 | 53.16 | 58.13 | 58.13 | 58.13 | 58.25 | 110.10 | 166.28 | 152.07 | 152.07 | 152.07 |
| 1988 | 86.78 | 75.35 | | 82.47 | 78.46 | 75.50 | 125.04 | 171.68 | | 156.86 | 164.87 |
| Mar1989 | 123.57 | 105.17 | 112.54 | 112.54 | 112.54 | 108.25 | 134.02 | 180.52 | 168.71 | 168.71 | 168.71 |
| Jun1990 | 139.63 | 131.60 | | 135.30 | 127.38 | 127.38 | 139.93 | 180.49 | | 175.54 | 186.47 |
| 1991 | 153.26 | 146.44 | | 153.35 | 139.50 | 139.50 | 140.11 | 184.06 | | 175.77 | 193.22 |
| 1992 | 170.37 | 161.81 | | 170.36 | 152.50 | 152.50 | 130.04 | 171.76 | | 163.15 | 182.25 |
| 1993 | 170.34 | 170.35 | | 179.58 | 158.50 | 158.50 | 131.47 | 173.87 | | 164.93 | 186.87 |
| 1994 | 157.18 | 163.76 | | 172.32 | 145.25 | 145.25 | 133.30 | 175.98 | | 167.23 | 198.40 |
| 1995 | 139.39 | 148.28 | | 148.48 | 125.63 | 125.63 | 135.63 | 170.37 | | 170.15 | 201.10 |
| 1996 | 134.13 | 136.76 | 142.35 | 140.31 | 114.56 | 114.88 | 139.46 | 179.50 | 172.46 | 172.46 | 214.28 |
| 1997 | 140.63 | 137.38 | 148.53 | 146.54 | 118.41 | 117.88 | 143.40 | 191.90 | 177.50 | 177.50 | 222.65 |
| 1998 | 154.77 | 147.70 | 158.28 | 156.68 | 125.34 | 125.63 | 146.43 | 194.87 | 181.85 | 181.85 | 229.65 |
| 1999 | 164.53 | 159.65 | 168.20 | 165.62 | 145.70 | 149.13 | 147.48 | 191.93 | 182.18 | 182.18 | 210.32 |
| 2000 | 155.41 | 159.97 | 166.45 | 169.20 | 145.55 | 143.50 | 148.08 | 196.50 | 188.84 | 188.84 | 215.96 |
| 2001 | 141.19 | 148.30 | 154.36 | | | 132.13 | 150.12 | | | 188.34 | |

Table 3. Regression Equations for the Reciprocity Rate and the Replacement Rate.

| Equation | Dep. Variable | Constant | U Rate | U Rate Lagged | Trend 1960 | Trend 1990 | Scale/AWW | Adult Scale | Adj. R2 | Std Error | Durbin Watson | Mean | Sample Period |
|----------|----------------|-----------------|------------------|------------------|-----------------|------------------|----------------|-----------------|---------|-----------|---------------|--------|-------------------------|
| (1) | PBen | 0.170 (1.4) | -0.0353 (0.9) | -0.0116 (0.3) | 0.0358 (4.5) | 0.0004 (0.0) | | | 0.664 | 0.164 | 0.63 | 0.851 | 1966-2000 |
| (2) | PBen | -0.052 (0.2) | -0.0034 (0.1) | -0.0211 (0.7) | 0.0383 (2.7) | -0.0044 (0.2) | | | 0.683 | 0.127 | 0.73 | 0.951 | 1978-2000 |
| (3) | PBen3 | 0.865 (3.1) | -0.0308 (0.5) | -0.0031 (0.1) | 0.0088 (0.5) | 0.0363 (1.4) | | | 0.141 | 0.251 | 0.81 | 1.027 | 1970-2000 |
| (4) | PBen3 | -0.244 (0.8) | 0.0047 (0.1) | -0.0341 (1.1) | 0.0478 (3.2) | -0.0136 (0.7) | | | 0.712 | 0.131 | 0.97 | 0.991 | 1978-2000 |
| (5) | PBen4 | -0.174 (0.6) | 0.0106 (0.3) | -0.0449 (1.5) | 0.0449 (3.2) | -0.0281 (1.5) | | | 0.523 | 0.124 | 0.97 | 0.907 | 1978-2000 |
| (6) | Rep. Rate | 0.238 (0.8) | -0.0262 (1.3) | 0.0082 (0.4) | | | 0.888 (1.0) | | 0.422 | 0.097 | 1.03 | 0.417 | 1970-2000 |
| (7) | Rep. Rate | -0.001 (0.0) | 0.0012 (0.1) | 0.0028 (0.3) | | | 1.212 (3.1) | | 0.461 | 0.037 | 1.24 | 0.361 | 1978-2000 |
| (8) | Rep. Rate3 | -0.169 (1.4) | -0.0106 (1.3) | 0.0214 (2.4) | | | 1.671 (5.0) | | 0.784 | 0.021 | 0.60 | 0.352 | 78-84, 86-87, 89, 96-00 |
| (9) | Rep. Rate4 | 0.037 (0.5) | -0.0042 (0.9) | 0.0076 (1.6) | | | 1.307 (6.4) | | 0.803 | 0.020 | 0.85 | 0.346 | 1978-2000 |
| (10) | Weekly Benefit | -3.686 (0.7) | -6.113 (2.3) | 2.467 (1.0) | | | | 1.460 (9.7) | 0.986 | 6.21 | 0.53 | 125.49 | 78-84, 86-87, 89, 96-00 |
| (11) | Weekly Benefit | -5.685 (1.1) | | | | | | 1.304 (28.5) | 0.983 | 6.94 | 0.33 | 125.49 | 78-84, 86-87, 89, 96-00 |
| (12) | Weekly Benefit | | | | | | | 1.255 (74.7) | 0.983 | 7.02 | 0.30 | 125.49 | 78-84, 86-87, 89, 96-00 |

Chart 1. Number of UA Beneficiaries, 1966 to 2000

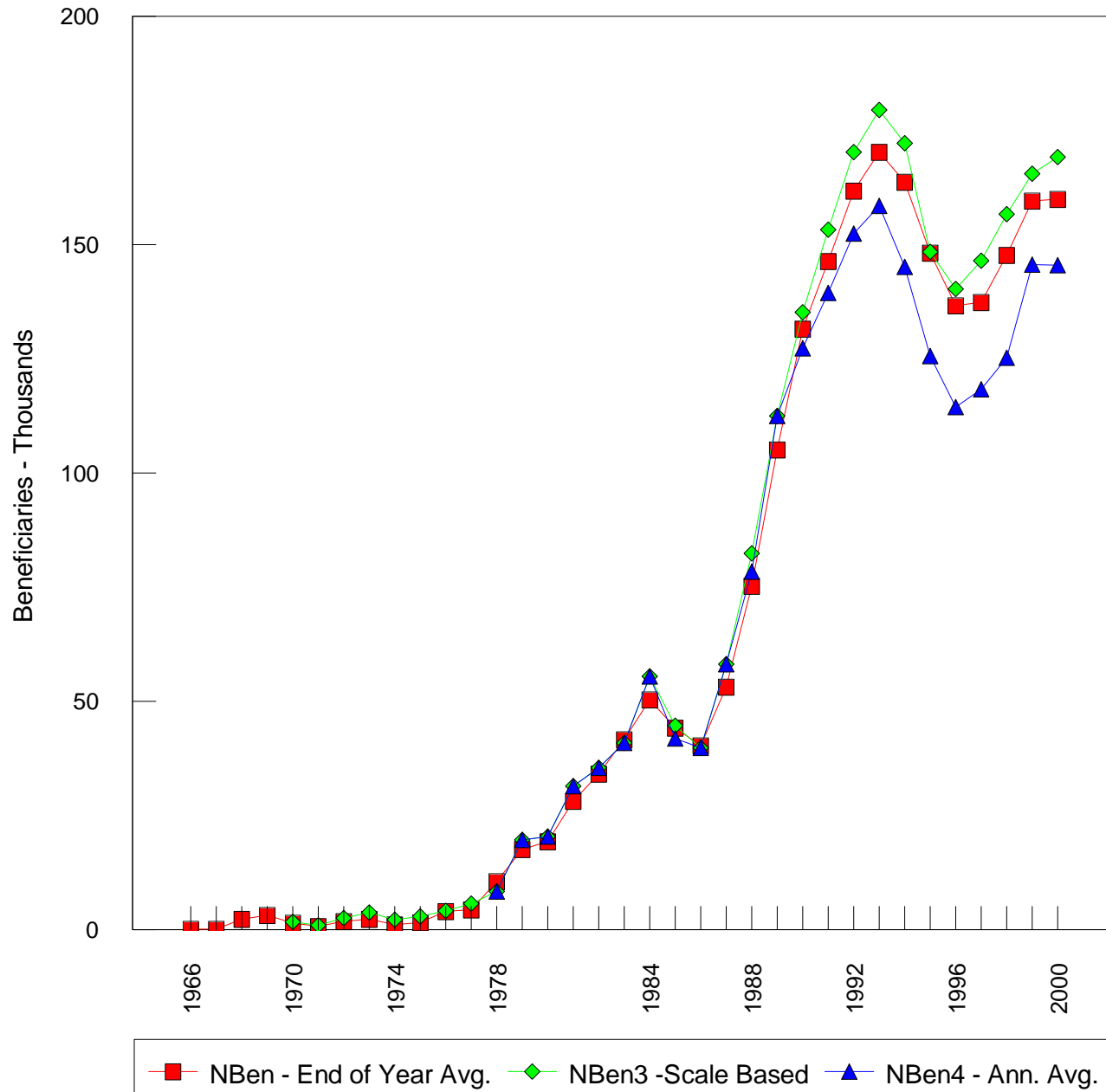


Chart 2. Weekly UA Benefits, 1966 to 2000.

