

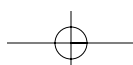
Replacement Ratio Study™

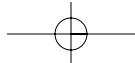
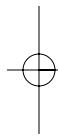
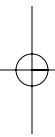
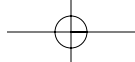
A Measurement Tool For Retirement Planning



Aon Consulting

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Preface

The Aon Consulting/
Georgia State University
2004 Retirement Income
Replacement Ratio Study

Retirement Income Needs in a Defined Contribution World

Since 1988, the Aon Consulting/Georgia State University study on benchmarking retirement income needs has been a premier source of information for retirement planning. Building on the *Interim Report of the President's Commission on Pension Policy* published in 1980, this booklet presents the results of our 2004 analysis, the sixth update to the study.

In this most recent iteration, we recognize changes that are occurring in the retirement income delivery system in the United States. With the continued movement to a defined contribution approach and reductions in medical coverage after retirement, we begin to look at replacement income in a somewhat different way.

As in prior studies, this 2004 update was completed under the direction of Dr. Bruce Palmer, Professor and Chair Emeritus of the Department of Risk Management and Insurance, Robinson College of Business, Georgia State University. Funding and technical assistance were provided by Aon Consulting. Aon Consulting's Ron DeStefano, E.A., Michael Schachet, F.S.A., and Jeff Paciero, F.S.A. worked closely with Dr. Palmer to complete the study.

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Introduction

Planning for retirement has never been more important or more difficult. The baby boomer generation enters its retirement years as stock market volatility makes 401(k) plan account balances less certain, employers reassess the entire structure of the private retirement system, Congress and the courts review the legality of cash balance plans, and medical inflation causes the reduction or elimination of employer-sponsored post-retirement medical plans.

The environment of the 1970s and 1980s — a time when employers felt an obligation to provide for each employee's retirement (and pay for a significant part of it) — is long gone. The 1990s were a time of change — substantial stock market gains made everyone feel confident about being able to afford a comfortable retirement. 401(k) plans became more attractive than defined benefit plans because employees got to “play the market” and everyone was a winner.

The turn of the millennium introduced a new dose of reality. Over the past four years, we have seen three poor investment years, only partly offset by returns during 2003. Employees who had enjoyed the “reward” of investing in stocks learned the hard way just what the “risk” meant.

For many employees, planning for retirement has become an urgent and immediate concern — as of January 1, 2004, the oldest baby boomers turned 58 years of age, and another boomer turns 55 every eight seconds.

Aon Consulting's sixth report on the level of income needed by an employee in retirement again answers the basic question “*How much income will I need in retirement to maintain my standard of living?*” In this iteration of the Replacement Ratio Study™, we attempt to reflect new realities resulting from the changes of the past decade by providing alternative answers to this basic question. For example, we include tables that convert the retirement income need to an equivalent lump sum. That way, employees whose primary retirement source is a 401(k) or other defined contribution plan can more easily determine if they are on track. The employee who receives a lump sum settlement of their defined benefit pension plan may also find this approach valuable.

The availability of medical benefits in retirement has a big effect on income needs. So we also include a way to adjust retirement income to reflect changes in retiree employer-provided medical benefits.

With the updated information in this report, we believe employers will be better able to provide employee education, and employees will be better armed to plan their individual retirements.

If you have any questions about how to apply this study as a planning tool (either as a plan sponsor or individual), you can contact your local Aon Consulting office. Alternatively, you may contact us by telephone at +1.800.438.6487 or at our Web address: www.aon.com/bcc.

Replacement Ratio Defined

A replacement ratio is a person's gross income after retirement, divided by his or her gross income before retirement. For example, assume someone earns \$60,000 per year before retirement. Further, assume he or she retires and receives \$45,000 of Social Security and other retirement income. This person's replacement ratio is 75% ($\$45,000/\$60,000$).

This study analyzes the replacement ratios employees need to maintain their pre-retirement standard of living after retirement. Generally, a person needs less gross income after retiring, primarily due to five factors:

1. Income taxes go down after retirement. This is because extra deductions are available for those over age 65, and taxable income usually decreases at retirement.
2. Social Security taxes (FICA deductions from wages) end completely at retirement.
3. Social Security benefits are partially or fully tax-free. This reduces taxable income and, therefore, the amount of income needed to pay taxes.
4. Saving for retirement is no longer a goal.
5. Age- and work-related expenses generally decrease at retirement primarily because shelter and transportation expenses decrease. This factor outweighs an expected increase in health care costs.

The chart to the right shows that a 75% replacement ratio is enough to allow an employee earning \$60,000 to retire at age 65 in 2004 without reducing his or her standard of living.

Because taxes, need to save, and age- and work-related expenses all decrease at retirement, this person is just as well off after retirement with a gross income of \$45,299.

Appendix I describes the methodology used to determine needed replacement ratios. Appendix II shows the calculation details for our baseline cases, and Appendix III summarizes the expenditure data used for the calculations.

The primary data source for this information is the U.S. Department of Labor's Bureau of Labor Statistics' *Consumer Expenditure Survey (CES)*. This is essentially the same database used to construct the Consumer Price Index. The CES is done annually, and we used data from the most recent years available — 1999, 2000, and 2001. CES data provided information on 9,738 "working" consumer units and 5,642 "retired" consumer units. In total, this represents approximately 80% more consumer units than have been available in prior years.

Replacement Ratio Example

	Annual Income		Replacement Ratio (2)/(1)
	Before Retirement (1)	After Retirement (2)	
Gross Income	\$ 60,000	\$ 45,299	75%
Taxes	(11,574)	(334)	
Savings	(1,945)	0*	
Age- & Work-Related Expenditures	(34,194)	(32,678)**	
Remaining Income	12,287	12,287	

* Replacement ratios assume savings stop at the time of retirement.

** The study isolates changes in age- and work-related expenditures (see Appendix III). Expenditures not age- or work-related are assumed to be the same before and after retirement.

2004 Baseline Case Results

The table to the right shows the 2004 study baseline case results. The baseline case assumes a family situation in which there is one wage earner who retires at age 65 with a spouse age 62. Thus, the family unit is eligible for family Social Security benefits, which are 1.362 times the wage earner's benefit. The baseline case also takes into account age- and work-related expenditure changes after retirement, in addition to pre-retirement savings patterns and changes in taxes after retirement.

2004 Replacement Ratio Findings

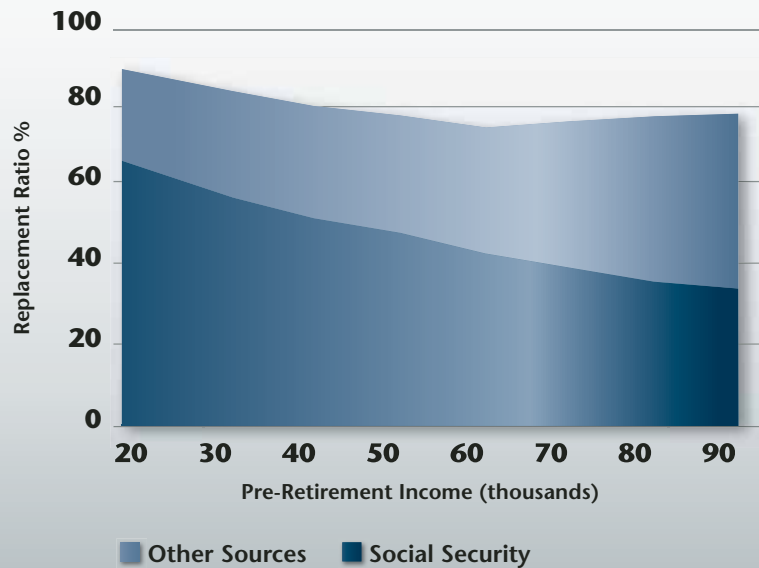
Pre-Retirement Income (\$000)	Replacement Ratios		
	Social Security (%)	Private and Employer Sources (%)	Total (%)
\$20	65	24	89
30	56	28	84
40	51	29	80
50	48	29	77
60	43	32	75
70	39	37	76
80	35	42	77
90	33	45	78

The table and the graph on the following page illustrate three significant points about the replacement ratio calculations:

1. Social Security replaces a larger portion of pre-retirement income at lower wage levels. This is by design and has the effect of redistributing income from higher paid employees to lower paid.
2. Total replacement ratios are highest for the very lowest paid employees. This is because these employees save the least and pay the least in taxes (as a percentage of income) before retirement. Thus, they spend a higher percentage of their income and need higher replacement ratios to maintain that level of expenditures.
3. After reaching an income level of \$60,000, total replacement ratios begin to increase slowly. This is primarily because post-retirement taxes increase as income levels increase. Post-retirement taxes increase from .7% of post-retirement income for a \$60,000 person to 9.3% for a \$90,000 person. To pay the additional taxes, higher paid employees need more retirement income.

One reason the highest income employees pay more tax after retirement is that as much as 85% of a married couple's Social Security benefit is taxable when retirement income (including 50% of Social Security) goes above \$44,000. It is important to note the \$44,000 threshold is not indexed like other tax breakpoints. As time goes on, automatic indexing of Social Security benefits will continue to increase the dollar amount of those benefits. In relative terms, more and more of a person's Social Security benefit will be taxed.

Replacement Ratios Broken Down by Social Security and Other Sources



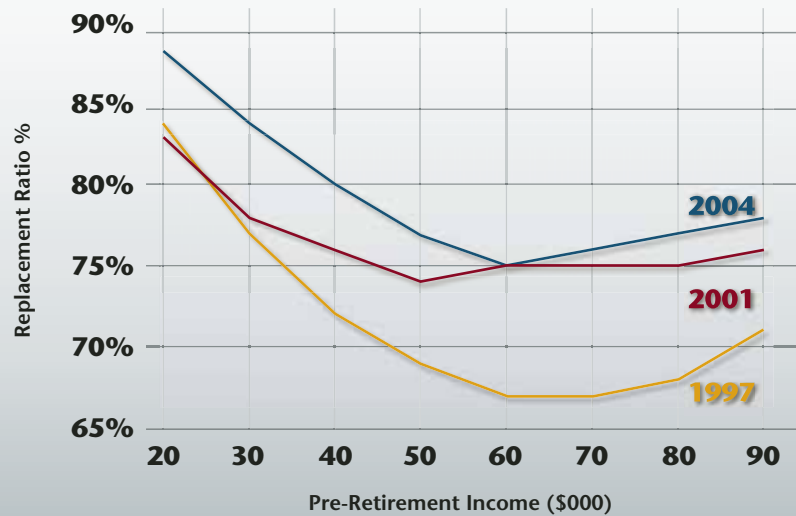
2004 Baseline Results Compared to Prior Studies

The graph below compares the 2004 baseline results (blue line) with the 2001 (red line) and 1997 (yellow line) results. The needed replacement ratios increased from 1997 to 2001, and again from 2001 to 2004. The increase from 2001 to 2004 occurred primarily because people are paying less pre-retirement income tax in 2004 than they did in 2001. A \$20,000 wage earner pays 28% less in taxes in 2004 than in 2001, and a \$90,000 earner pays 15% less. Paying less tax

increases a person's pre-retirement disposable income, which increases the amount of post-retirement income he or she needs to maintain the same level of disposable income after retirement.

It should be noted that inflation creates a slight distortion in the comparisons. For example, a \$50,000 wage earner in 2004 may have been earning \$46,000-\$47,000 in 2001, and \$41,000-\$43,000 in 1997.

Replacement Ratios from the Current and Prior Studies



Replacement Ratios from the Current and Prior Studies

Pre-Retirement Income (\$000s)	2001 Study			2004 Study		
	Social Security (%)	Private and Employer Sources (%)	Total (%)	Social Security (%)	Private and Employer Sources (%)	Total (%)
\$20	61	22	83	65	24	89
30	53	25	78	56	28	84
40	49	27	76	51	29	80
50	44	30	74	48	29	77
60	39	36	75	43	32	75
70	35	40	75	39	37	76
80	31	44	75	35	42	77
90	28	48	76	33	45	78

The table above compares the 2004 and 2001 results, including the percentage of income expected to be replaced by Social Security. The table shows that even though the total amount of income needed at retirement is as much as 6% higher in 2004 than in 2001, the

amount to be provided by private sources increases by no more than 3%, and it actually decreases at all income levels over \$40,000. This is because Social Security is expected to replace a larger percentage of pre-retirement income in 2004 than in 2001.

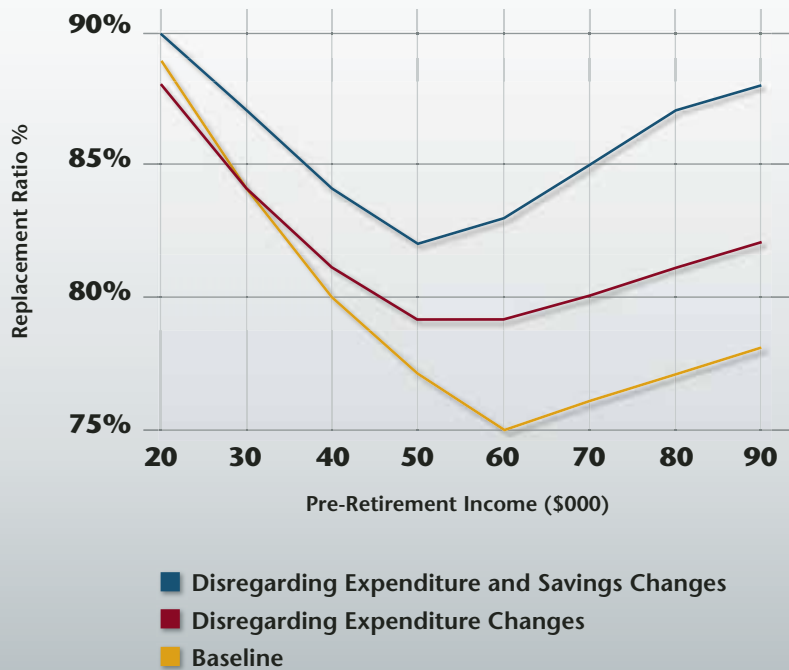
Baseline Compared to Tax Only and Tax and Savings Models

Savings and expenditure changes can vary significantly by individual. Thus, it may be appropriate to start with a replacement ratio calculation that disregards these changes and to adjust for them individually. The graph to the right shows the baseline replacement ratios (yellow line), and the comparable replacement ratios disregarding expenditure changes (red line), and disregarding both expenditure and savings changes (blue line).

If a person's savings and expenditures do not change at retirement, the replacement ratios needed to maintain the person's standard of living are shown by the top blue line. To the extent the person saved before retirement and stopped saving at retirement, the replacement ratios decrease. If the person was an average saver, the replacement ratios would decrease to the middle red line. If the person saved more than average, the replacement ratios would decrease below the red line.

After adjusting for savings, the next step is to adjust for decreases in the person's age- and work-related expenditures at retirement. If these expenditures decrease by an average amount at retirement, the replacement ratios would decrease to the bottom yellow "baseline" line. If, however, age- and work-related expenditures decrease by more than average, the replacement ratios would decrease below the yellow line.

Replacement Ratios With and Without Savings and Expenditure Changes



Important observations from this analysis include:

- If an individual's expenditure and savings amounts do not change at retirement, needed replacement ratios (top blue line in the graph) will range from 82%-90%, versus the baseline of 75%-89%. The largest increase is for people at the highest income levels. This is because they saved the most and are also expected to have the largest reduction in expenditures at retirement, as a percentage of income.
- Replacement ratios for lower income employees do not change much when expenditure changes and/or savings changes are disregarded. This is because most lower income employees do not save much and do not reduce their expenditures as much at retirement as those with higher incomes. In fact, the \$20,000 person is actually expected to spend more after retirement than before.

Baseline Case and Adjustments for Other Family Situations

The baseline family situation for this study is one wage earner retiring at age 65 with a spouse three years younger. The table below shows replacement ratio targets for this baseline case and for three other family situations. In all cases, the replacement ratios are driven by three factors:

1. Income tax tables and tax exemptions that apply in different situations.
2. The amount of Social Security taxes paid (e.g., a two-worker family may pay higher aggregate Social Security taxes at a given pre-retirement income level).
3. The amount of Social Security benefit, which influences how much of the total retirement income is subject to tax.

Single Compared to Married Baseline

At the lowest income levels, pre-retirement taxes are higher for singles than for married couples. As a result, the single worker has less to spend before retirement and, therefore, has less to replace after retirement. The replacement ratios at lower income levels are, therefore, smaller than for the married family unit (baseline or others). At higher income levels, pre-retirement taxes are also higher for singles. However, post-retirement taxes are also far greater at the higher income levels for singles. The net effect is that single people at higher income levels actually need higher replacement ratios than married couples. Also, at a given level of pre-retirement income, the effect of taxation of Social Security benefits is more

pronounced for the single worker. The retirement income thresholds at which Social Security benefits become subject to income tax are lower for a single taxpayer. The threshold at which 50% of Social Security becomes taxable is \$25,000 for a single taxpayer (compared to \$32,000 for married taxpayers), and the threshold at which 85% becomes taxable is \$34,000 for a single taxpayer (compared to \$44,000 for married taxpayers).

Replacement Ratio Targets for Other Family Situations

Pre-Retirement Income (\$000)	Replacement Ratio Targets			
	Baseline Couple 65/62 One Working (%)	Other Family Situations		
		Single Age 65 (%)	Couple 65/65 One Working (%)	Couple 65/62 Both Working (%)
\$20	89	82	89	89
30	84	79	84	84
40	80	76	80	80
50	77	74	77	77
60	75	74	75	76
70	76	78	75	77
80	77	81	75	77
90	78	82	76	78

One Wage Earner, Both Age 65

The table on the preceding page compares two other married situations to the baseline replacement ratios. The first is a married couple, one wage earner, both age 65. Since the age 65 spouse gets an increased standard deduction, post-retirement taxes are reduced somewhat when compared to the baseline case (where the spouse is age 62). Also, the family Social Security benefits are 1.497 times the wage earner's primary benefit (compared to 1.362 when the spouse is age 62).

At the \$60,000 gross pre-retirement income level and below, retirees do not pay any significant income taxes, so there is no difference in the replacement ratios due to taxes. The combination of the increased standard deduction and the increased family Social Security benefits makes a slight difference in the replacement ratios at the \$70,000 and higher income levels.

Two Wage Earners, Ages 65 and 62

Another family situation focuses on two wage earners, one age 65 and one age 62. We assumed that the primary wage earner brings in 60% of the family unit's income and the spouse brings in 40%. Results for this family situation are virtually the same as for the baseline case.

Replacement Ratios at Higher Income Levels

Since *Consumer Expenditure Survey* (CES) data are not available at income levels above \$100,000, replacement ratios above that income level are not part of the Aon Consulting/Georgia State University formal study. Aon Consulting has, however, extended the replacement ratio calculations to income levels of \$150,000, \$200,000, and \$250,000. As with prior studies, we wanted to determine whether the replacement ratios continue to trend upward above the \$90,000 income level, the top level in the formal study.

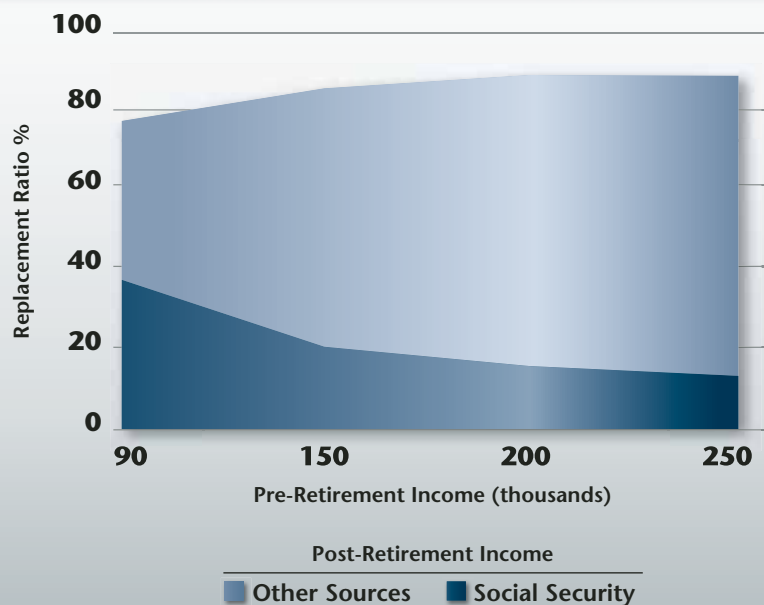
The table and graph to the right show that the ratios do continue to trend upward. Although the higher pre-retirement taxes paid by higher income individuals have a decreasing effect on replacement ratios, higher post-retirement taxes have an even more powerful effect and drive the ratios upward. The net effect is that higher replacement ratios are needed as income increases.

It should be noted that the calculations for higher income employees are based on an extrapolation of the savings rate data used for the baseline study — we assumed employees at all levels over \$90,000 would save 5.24% of disposable income. If savings rates turn out to be higher at these income levels than a simple extrapolation would indicate, the needed replacement ratios would be somewhat lower. Other assumptions, such as expenditure changes, were also projected beyond the \$90,000 group.

Replacement Ratios: Higher Income Levels

Pre-Retirement Income (\$000)	Replacement Ratios		
	Social Security (%)	Other Sources (%)	Total (%)
\$80	35	42	77
90	33	45	78
150	20	65	85
200	15	73	88
250	12	76	88

Baseline and Projected Higher Income Replacement Ratios



It would be difficult for high-income individuals to generate sufficient retirement income solely from Social Security and an employer's qualified plans. These individuals generally need to receive a substantial portion of their retirement income from personal savings, a non-qualified arrangement, or both.

Savings as a Percentage of Gross Pre-Retirement Income

Savings rates are one of the three major components (along with taxes and expenditure changes) in the replacement ratio equation. Higher savings rates both reduce the needed replacement percentages (employees are assumed to cease their savings plans once retired) and provide the employee with the ability to develop the needed savings accounts.

For this and each prior study, we developed savings rates using recent *CES* data. Savings was defined as the sum of:

1. Net acquisition of stocks and bonds.
2. Net investment in farm or business.
3. Net change in savings and checking accounts.
4. Net change in money owed.
5. Net change in U.S. savings bond holdings.
6. Contributions to retirement plans.

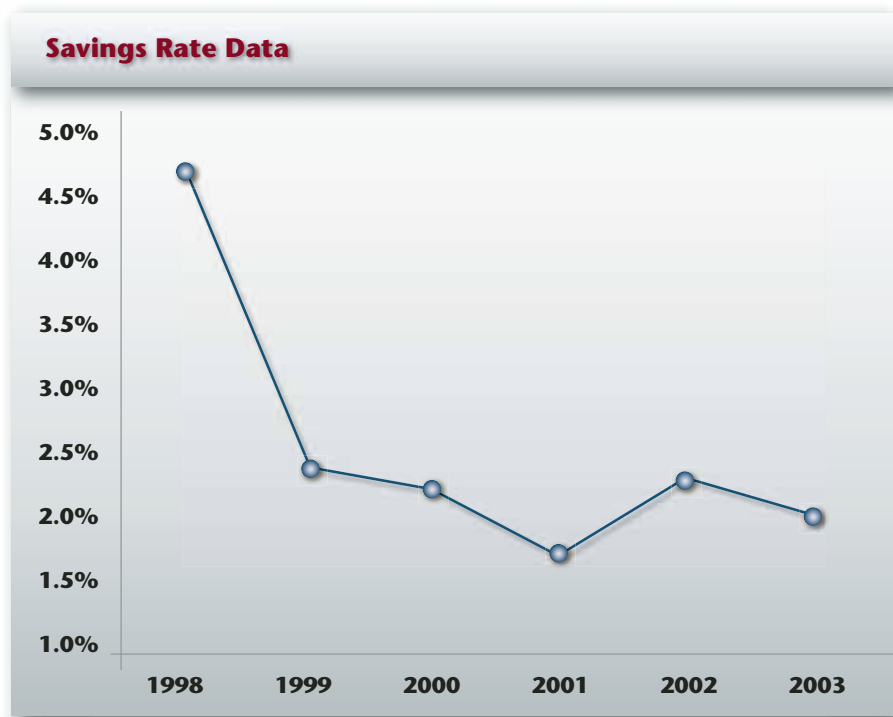
This definition includes an element of investment return as well as a pure savings element. Combining this definition with the recent stock market decline results in a very low savings rate, relative to the savings rates from prior studies.

Savings Rates				
Pre-Retirement Income (\$000)	Savings Rates at Ages 50-65 as a Percentage of Gross Pre-Retirement Income (%)			
	2004	2001	1997	Average
\$20	0.7	1.4	4.4	2.2
30	0.3	2.3	4.8	2.5
40	0.1	3.0	5.0	2.7
50	0.2	3.7	5.1	3.0
60	0.4	4.2	5.1	3.2
70	0.9	4.5	5.0	3.5
80	1.5	4.7	5.0	3.7
90	2.1	5.0	5.0	4.0

Since the stock market decline that occurred in 2000-2002 is not expected to continue indefinitely, and the economy is already in the beginning stages of a recovery, we averaged savings rates from the last three studies for purposes of this study. This technique extends the period over which savings rates are measured and better reflects future, expected savings rates. The table above details the savings rates from the last two studies and the average savings rates that were used for this study.

Savings rates from the *Federal Reserve* in its *Flow of Funds Accounts of the United States* are shown in the chart to the right. The rapid decline in savings rates appears to have stopped in 2001. However, even the recent stock market decline and the realization that retirement looms for many in the baby boom generation has not yet encouraged significantly increased savings rates among working employees.

Higher savings rates would lead to lower required replacement ratios. This is because people who save more before retirement spend less. Thus, they are used to a lower standard of living, and they need less income after retirement to maintain that reduced standard of living.



Source: Federal Reserve statistical release *Flow of Funds Accounts of the United States, Flows and Outstandings, Third Quarter 2003*, March 4, 2004

How to Use Replacement Ratios

The numbers included in prior reports have been extensively used to determine retirement adequacy. Users include employers reviewing plan design, financial planners, and employees looking to see how prepared they are for retirement.

When applying replacement ratios, it is important to keep certain things in mind. Even though replacement ratios are precise percentages of pay, they are determined based on “average” employees. Some employees have high pre-retirement costs that end at retirement — for example, older parents who work until their children complete their college educations or someone with a high mortgage payment who moves into a much less costly living situation just prior to retirement. Employees in these situations will need less retirement income to maintain their standard of living. Others, such as employees beginning to care for an elderly parent, might find a need for a higher replacement ratio.

The answers in this study are based on many different assumptions. Two assumptions that have significant effects are savings rates and the loss of medical benefits. An employee who saves a larger percentage of income than we assume will need less replacement income. An employee who has active medical benefits but none in retirement will need a greater replacement ratio. In subsequent sections, we give the user some sense of how the resulting replacement ratios might be adjusted to fit these situations.

Outside factors also come into play. Social Security has been under review for many years, and revisions are likely at some point. Medicare benefits are also subject to change and will alter the need for retirement income to pay for medical benefits. And with the workforce aging, many older employees will find that income from work will supplement retirement plan income for many years.

Compounding this picture is the movement to defined contribution accounts in retirement. Whether arising directly from a sponsor’s move to a defined contribution or cash balance plan, or because a traditional pension plan’s benefits are paid as a lump sum based on a variable interest rate, the determination of “*whether I have enough money to retire*” is becoming more complicated.

When providing retirement projections, employers who are dedicated to having employees properly plan for retirement will also want to provide financial planning tools along with strong educational materials. Employers who meet this challenge creatively and proactively will gain a clear competitive advantage.

Replacement Ratios as Lump Sums

Throughout this report, we define “replacement ratio” as a percentage of an employee’s pay just prior to retirement. The goal of a retirement planning program is to replace income that is lost at retirement.

With the strong movement to defined contribution plans and a significant number of defined benefit plans paying out the value of all benefits in a single lump sum, it is also becoming important to define how large a lump sum is necessary to provide the targeted income levels. The answer depends on a number of factors, such as:

1. How long will a person live after retirement?

Those with more retirement years need larger lump sums. People retiring at younger ages generally need more than people retiring at older ages, because they have longer remaining lifetimes. Also, females generally need more than males because they live longer. An average male retiring at age 65 lives another 17.3 years, while the average female lives another 20.7 years. Lifestyle, health, and other factors also influence one’s lifespan.

2. How much will inflation increase a retiree’s cost of living after retirement? The higher the rate of inflation, the larger the lump sum needed.

3. What rate of investment return will the lump sum produce? The higher the rate, the smaller the lump sum needed at retirement. Examples of how different rates of investment return affect the lump sum needed are shown in the table below. This table shows the lump sum amount needed at retirement to provide an income of \$100 per month for life to an average male or female retiring at age 65. While invested, the lump sum is assumed to return 5%, 7%, or 9% per year. In all cases, inflation is assumed to increase the retiree’s cost of living by 3% per year.

As you can see from the table, the lump sum needed at retirement is about 40% more if investments return only 5% rather than 9%. Also, on average, women need about 15% more than men because they live longer.

Lump Sum Needed at Retirement (Age 65) to Provide a \$100 Monthly Income

	Investment Earnings		
	5%	7%	9%
Male	\$16,850	\$14,167	\$12,143
Female	\$19,655	\$16,159	\$13,596

Using a 7% rate of investment return, we can convert needed replacement ratios into needed lump sum amounts, expressed as a multiple of the person's salary at retirement. (See the chart to the right). Since Social Security is not payable as a lump sum, we will do this only for the non-Social Security portion of the benefit.

Those employees with a defined benefit plan may have a portion of the need provided through that program and will need a lower lump sum.

Replacement Ratio/Lump Sum Needed from Private and Employer Sources

Pre-Retirement Income (\$000)	Baseline Replacement Ratio Needed (% of final pay)	Equivalent Lump Sum Needed (as a multiple of final pay)	
		Male	Female
\$20	24	2.8	3.2
30	28	3.3	3.8
40	29	3.4	3.9
50	29	3.4	3.9
60	32	3.8	4.3
70	37	4.4	5.0
80	42	5.0	5.7
90	45	5.3	6.1

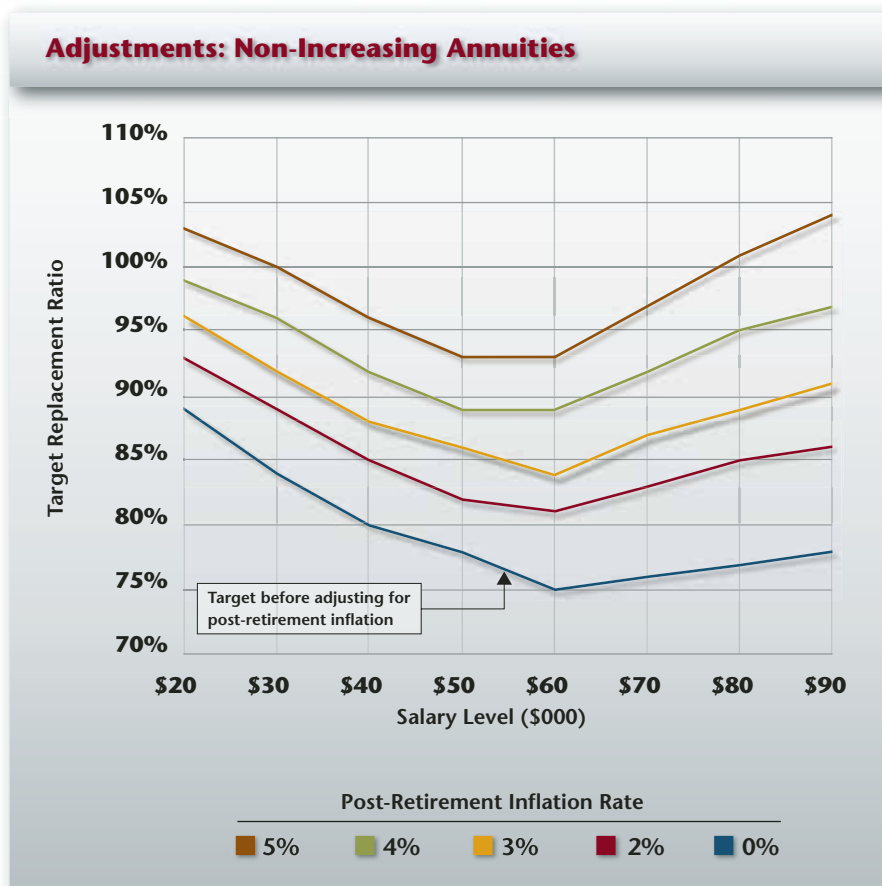
Adjustments for Non-Increasing Annuities

The baseline replacement ratios developed in this report indicate how much income is needed at the start of retirement to maintain a person's pre-retirement standard of living. To maintain that standard of living during retirement, we assume that all income will increase in proportion to inflation. Social Security benefits will do that automatically, as will some governmental pension plans.

However, most corporate defined benefit plans are fixed and do not increase each year, though some employers periodically grant ad hoc cost-of-living increases. If retirement income is paid as a non-increasing or fixed annuity, an income that is adequate at the beginning of retirement won't stay adequate very long. Each year, inflation eats away at the buying power of fixed income.

One way to offset this effect is to have a higher fixed income amount. A higher starting income will allow the retiree to save some income from the early retirement years for the later years. The graph below shows adjusted targets that can be used for this purpose.

The adjusted targets assume all of a retiree's income other than Social Security is paid as a non-increasing or fixed annuity. For example, if inflation is 3% and all income other than Social Security is provided in the form of a level lifetime annuity, the needed replacement income increases from 75% (the baseline at \$60,000) to 84%.



Effect of Medical Benefits on Replacement Ratios

Since our 2001 study, many employers have made changes to their post-retirement medical programs. Many employees have lost their post-retirement medical benefits or have had significant costs shifted to them. The baseline replacement ratios provided in this report are based on the average benefits of a large population according to CES data. Some sources have suggested that retiree medical benefits are important enough to be handled separately.

To calculate the effect of retiree medical benefits on replacement ratios, we estimate the cost for an “average” Social Security supplemental benefit to be \$2,750 annually. Add to that the cost of Medicare Part B premiums (just under \$800 in 2004) for a total of \$3,550 annually. The replacement need is based on the relationship of benefits before retirement compared to those just after retirement. Therefore:

- If we remove the effect of any change in medical benefits from our results, we get the replacement ratios shown in the “No Change” column in the table above.

Replacement Ratios Reflecting Post-Retirement Changes in Medical Benefits

Pre-Retirement Income (\$000)	Replacement Ratio		
	Baseline (% of final pay)	No Change in Medical (%)	Worst Case Medical (%)
\$20	89	83	101
30	84	80	91
40	80	76	85
50	77	74	81
60	75	73	79
70	76	74	79
80	77	76	80
90	78	77	81

- If, on the other hand, an employee had fully-paid employer health care just prior to retirement and no coverage after retirement, income would be needed to replace the total medical benefit. The column marked “Worst Case Medical” adjusts our baseline result to show the replacement ratio needed in this situation.

Obviously, the level of post-retirement medical benefits provided before and after retirement will have a significant effect on post-retirement needs. Most employees will be somewhere between the “no change” and “worst case” scenarios.

Accumulating Wealth

It is axiomatic that the earlier one starts saving for retirement, the easier it is to meet a needed replacement income. With the income replacement needs presented in this report, we can estimate the level of annual saving needed to meet the income targets.

The following charts assume that benefits will be paid at age 65 and full Social Security benefits will be available. The salary shown is the current salary and assumes that salary will increase at 3% per year until retirement. Finally, we assumed a 7% rate of return on savings.

Annual Savings Estimate: Males

Goal as a Multiple of Pay at Retirement		% of Pay that Needs to Be Saved if Starting at Age:			
Salary (\$000)	Multiple of Pay	25	35	45	55
\$20	2.8	3.1%	5.2%	9.8%	24.2%
30	3.3	3.7	6.2	11.6	28.5
40	3.4	3.8	6.4	11.9	29.3
50	3.4	3.8	6.4	11.9	29.3
60	3.8	4.2	7.1	13.3	32.8
70	4.4	4.9	8.2	15.4	38.0
80	5.0	5.6	9.4	17.5	43.1
90	5.3	5.9	9.9	18.6	45.7

Annual Savings Estimate: Females

Goal as a Multiple of Pay at Retirement		% of Pay that Needs to Be Saved if Starting at Age:			
Salary (\$000)	Multiple of Pay	25	35	45	55
\$20	3.2	3.6%	6.0%	11.2%	27.6%
30	3.8	4.2	7.1	13.3	32.8
40	3.9	4.3	7.3	13.7	33.6
50	3.9	4.3	7.3	13.7	33.6
60	4.3	4.8	8.1	15.1	37.1
70	5.0	5.6	9.4	17.5	43.1
80	5.7	6.4	10.7	20.0	49.2
90	6.1	6.8	11.4	21.4	52.6

Conclusion

Compared to prior studies, this 2004 update shows an increase in the amount of income people need at retirement to maintain their pre-retirement standard of living. However, in comparison to the earlier studies, the increase is small (no more than two percentage points) for people with pre-retirement incomes of \$60,000 or more, but is 3-6 percentage points greater for people with pre-retirement incomes of \$20,000-\$50,000. Required replacement ratios now range from 75%-89%, compared to 74%-83% in 2001.

Even though the age for full Social Security benefits has increased to 65 years and four months for people reaching age 65 in 2004, Social Security benefits for

an age 65 retiree are actually greater in 2004 as a percentage of income than they were in 2001. This helps compensate for employer-sponsored plans and individual savings, which are replacing less than they have historically due to the depressed investment returns of the early 2000s.

As the baby boomer generation approaches retirement and those new to the workforce begin their lifetime journey in a defined contribution world, the need for retirement planning has never been greater. The results of this study will provide the employee and the plan sponsor with quantitative information needed to begin that planning effectively.

Appendix I — Determining Replacement Ratios

The data in the U.S. Department of Labor's Bureau of Labor Statistics' *Consumer Expenditure Survey (CES)* allow us to quantify key items in the replacement ratio formulas shown here.

The first formula (expenditure, tax, and savings model) takes into account changes in age- and work-related expenditures after retirement, in addition to taking into account savings patterns and changes in taxes after retirement. The second formula (tax and savings model) disregards changes in age- and work-related expenditures, and the third formula (tax only model)

disregards both savings and changes in age- and work-related expenditures. The symbols used in the formulas are defined as follows:

PrRPG: Gross pre-retirement income

PrRT: Pre-retirement taxes

PrRS: Pre-retirement savings

NCCR: Change in age- and work-related expenditures

PoRT: Post-retirement taxes

The Expenditure, Tax, and Savings Model

Replacement Ratio = f(Taxes, Savings, Expenditure Changes)

$$\frac{\text{PrRPG} - \text{PrRT} - \text{PrRS} \pm \text{NCCR} + \text{PoRT}}{\text{PrRPG}}$$

The Tax and Savings Model

Replacement Ratio = f(Taxes, Savings)

$$\frac{\text{PrRPG} - \text{PrRT} - \text{PrRS} + \text{PoRT}}{\text{PrRPG}}$$

The Tax Only Model

Replacement Ratio = f(Taxes)

$$\frac{\text{PrRPG} - \text{PrRT} + \text{PoRT}}{\text{PrRPG}}$$

Replacement Ratio Example

PrRPG	=	Gross pre-retirement income	=	\$60,000
PrRT	-	Pre-retirement taxes	-	11,574
PrRS	-	Pre-retirement savings	-	1,945
NCCR	±	Change in expenditures at retirement	-	1,516
PORT	+	Post-retirement taxes	+	334
	=	Retirement income needed	=	\$45,299
PrRPG	÷	Gross pre-retirement income	÷	\$60,000
		Replacement Ratio	=	75%

The development of the replacement ratios for each gross pre-retirement income level is shown in Appendix II.

Appendix II — Results of 2004 Study

1. Gross Pre-Retirement Income	<u>\$20,000</u>	<u>\$30,000</u>	<u>\$40,000</u>
2. Pre-Retirement Taxes			
a. Social Security	\$1,530	\$2,295	\$3,060
b. Federal Income	370	1,338	2,737
c. State Income	<u>102</u>	<u>358</u>	<u>711</u>
d. Total Pre-Retirement Taxes	\$2,002	\$3,991	\$6,508
3. Disposable Income After Taxes			
[(1) - (2)(d)]	\$17,998	\$26,009	\$33,492
4. Pre-Retirement Savings			
a. As a % of Disposable Income	<u>2.417%</u>	<u>2.838%</u>	<u>3.234%</u>
b. Amount Saved [(3) x (4)(a)]	\$435	\$738	\$1,083
5. Spendable Income [(3) - (4)(b)]	\$17,563	\$25,271	\$32,409
6. Increase (Decrease) in Age- and Work-Related Expenses at Retirement	\$235	\$59	(\$385)
7. Post-Retirement Taxes			
a. Federal Income	\$0	\$0	\$0
b. State Income	<u>0</u>	<u>0</u>	<u>0</u>
c. Total Post-Retirement Taxes	\$0	\$0	\$0
8. Gross Post-Retirement Income Needed			
[(5) + (6) + (7)(c)]	\$17,798	\$25,330	\$32,024
9. Needed Replacement Ratio [(8) / (1)]	89%	84%	80%

<u>\$50,000</u>	<u>\$60,000</u>	<u>\$70,000</u>	<u>\$80,000</u>	<u>\$90,000</u>
\$3,825	\$4,590	\$5,355	\$6,120	\$6,755
4,175	5,608	7,040	8,784	11,172
<u>1,054</u>	<u>1,376</u>	<u>1,678</u>	<u>2,035</u>	<u>2,515</u>
\$9,054	\$11,574	\$14,073	\$16,939	\$20,442
\$40,946	\$48,426	\$55,927	\$63,061	\$69,558
<u>3.651%</u>	<u>4.016%</u>	<u>4.329%</u>	<u>4.724%</u>	<u>5.236%</u>
\$1,495	\$1,945	\$2,421	\$2,979	\$3,642
\$39,451	\$46,481	\$53,506	\$60,082	\$65,916
(\$961)	(\$1,516)	(\$1,975)	(\$2,258)	(\$2,272)
\$0	\$279	\$1,264	\$3,022	\$5,163
<u>0</u>	<u>55</u>	<u>278</u>	<u>726</u>	<u>1,335</u>
\$0	\$334	\$1,542	\$3,748	\$6,498
\$38,490	\$45,299	\$53,073	\$61,572	\$70,142
77%	75%	76%	77%	78%

Appendix III — Analysis of Expenditure Changes

Pre-Retirement Income Level	<u>\$20,000</u>	<u>\$30,000</u>	<u>\$40,000</u>
1. Reading and Education			
a. Working	\$262	\$365	\$457
b. Retired	\$217	\$291	\$357
c. Increase (Decrease) [(b) - (a)]	(\$45)	(\$74)	(\$100)
2. Health Care			
a. Working	\$1,513	\$1,779	\$1,974
b. Retired	\$2,677	\$3,124	\$3,409
c. Increase (Decrease) [(b) - (a)]	\$1,164	\$1,345	\$1,435
3. Utilities			
a. Working	\$2,219	\$2,524	\$2,733
b. Retired	\$2,269	\$2,575	\$2,819
c. Increase (Decrease) [(b) - (a)]	\$50	\$51	\$86
4. Household Operations			
a. Working	\$204	\$268	\$323
b. Retired	\$321	\$405	\$477
c. Increase (Decrease) [(b) - (a)]	\$117	\$137	\$154
5. Shelter			
a. Working	\$5,774	\$6,982	\$7,961
b. Retired	\$4,628	\$5,429	\$6,103
c. Increase (Decrease) [(b) - (a)]	(\$1,146)	(\$1,553)	(\$1,858)
6. Entertainment			
a. Working	\$1,037	\$1,317	\$1,548
b. Retired	\$1,191	\$1,507	\$1,769
c. Increase (Decrease) [(b) - (a)]	\$154	\$190	\$221
7. Total Increase (Decrease) in Age-Related Expenses	\$294	\$96	(\$62)
8. Food			
a. Working	\$3,677	\$4,179	\$4,556
b. Retired	\$3,811	\$4,537	\$5,005
c. Increase (Decrease) [(b) - (a)]	\$134	\$358	\$449
9. Apparel and Services			
a. Working	\$674	\$847	\$994
b. Retired	\$607	\$785	\$924
c. Increase (Decrease) [(b) - (a)]	(\$67)	(\$62)	(\$70)
10. Transportation			
a. Working	\$5,137	\$6,512	\$7,653
b. Retired	\$5,011	\$6,179	\$6,951
c. Increase (Decrease) [(b) - (a)]	(\$126)	(\$333)	(\$702)
11. Total Increase (Decrease) in Work-Related Expenses	(\$59)	(\$37)	(\$323)
12. Total Increase (Decrease) in Age- and Work-Related Expenses	\$235	\$59	(\$385)

<u>\$50,000</u>	<u>\$60,000</u>	<u>\$70,000</u>	<u>\$80,000</u>	<u>\$90,000</u>
\$545	\$634	\$725	\$814	\$897
\$418	\$474	\$521	\$552	\$567
(\$127)	(\$160)	(\$204)	(\$262)	(\$330)
\$2,141	\$2,290	\$2,433	\$2,554	\$2,648
\$3,592	\$3,698	\$3,751	\$3,739	\$3,694
\$1,451	\$1,408	\$1,318	\$1,185	\$1,046
\$2,905	\$3,059	\$3,209	\$3,322	\$3,398
\$3,043	\$3,232	\$3,375	\$3,420	\$3,359
\$138	\$173	\$166	\$98	(\$39)
\$379	\$438	\$501	\$570	\$642
\$546	\$617	\$691	\$768	\$842
\$167	\$179	\$190	\$198	\$200
\$8,853	\$9,683	\$10,477	\$11,156	\$11,704
\$6,781	\$7,525	\$8,382	\$9,296	\$10,212
(\$2,072)	(\$2,158)	(\$2,095)	(\$1,860)	(\$1,492)
\$1,755	\$1,945	\$2,122	\$2,274	\$2,395
\$2,003	\$2,201	\$2,354	\$2,442	\$2,465
\$248	\$256	\$232	\$168	\$70
(\$195)	(\$302)	(\$393)	(\$473)	(\$545)
\$4,891	\$5,205	\$5,520	\$5,787	\$5,998
\$5,338	\$5,585	\$5,786	\$5,902	\$5,946
\$447	\$380	\$266	\$115	(\$52)
\$1,132	\$1,263	\$1,391	\$1,507	\$1,606
\$1,045	\$1,159	\$1,271	\$1,376	\$1,476
(\$87)	(\$104)	(\$120)	(\$131)	(\$130)
\$8,696	\$9,677	\$10,605	\$11,420	\$12,092
\$7,570	\$8,187	\$8,877	\$9,651	\$10,547
(\$1,126)	(\$1,490)	(\$1,728)	(\$1,769)	(\$1,545)
(\$766)	(\$1,214)	(\$1,582)	(\$1,785)	(\$1,727)
(\$961)	(\$1,516)	(\$1,975)	(\$2,258)	(\$2,272)

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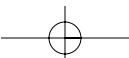
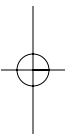
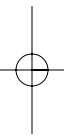
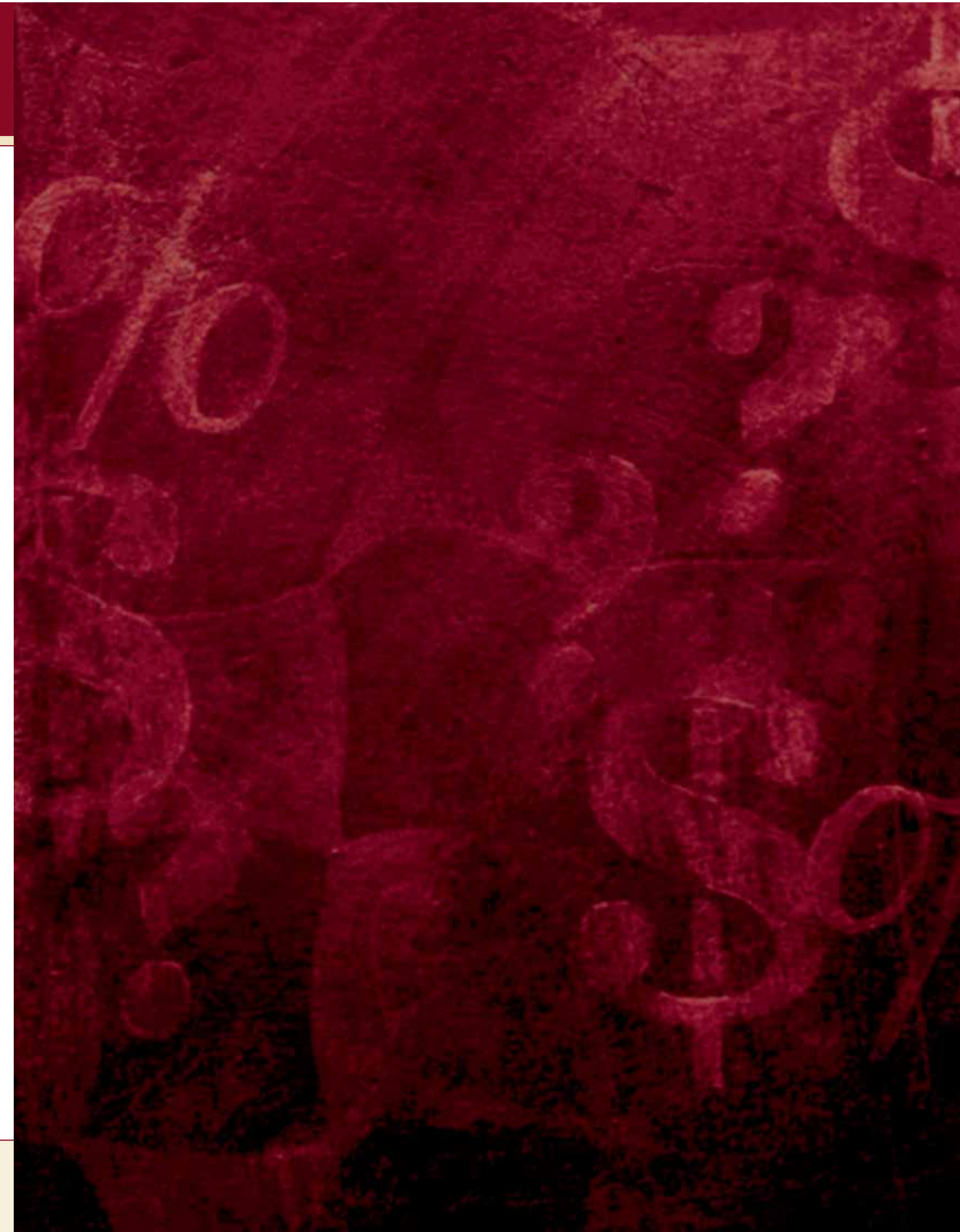
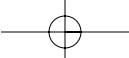
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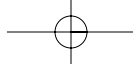
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