Individual Accounts and Social Security:

Does Social Security Really Provide a Lower Rate of Return?

Peter R. Orszag

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Author

Dr. Peter R. Orszag is President of Sebago Associates, Inc., an economics consulting firm, and lecturer in economics at the University of California, Berkeley. He previously served as Special Assistant to the President for Economic Policy and as Senior Economist on the Council of Economic Advisers from 1995 to 1998. He is conducting work for the Center on Budget and Policy Priorities on Social Security issues.

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Center on Budget and Policy Priorities
820 First Street, N.E., Suite 510
Washington, DC 20002
(202) 408-1080

E-mail:center@cbpp.org
HandsNet: HN0026
Web: www.cbpp.org

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Proponents of individual accounts often compare the potential rate of return on such accounts to the rate of return on Social Security contributions. They conclude that workers would enjoy a higher rate of return under a system of individual accounts.

For example, the commentator James Glassman has noted, "Returns to the investment portion of Social Security are extremely low. For persons born in 1960, returns are estimated at between 1 percent and 2 percent in real (inflation-adjusted) terms...By contrast with Social Security, the real returns to large-capitalization stocks between 1926 and 1997 have averaged 7.2 percent."[1]

Despite its apparent plausibility and widespread use by many proponents of individual accounts, this simple rate-of-return comparison is misleading. In a recent and important set of papers, economists John Geanakoplos, Olivia Mitchell, and Stephen Zeldes demonstrate that the comparison is fundamentally flawed because these two rates of return are not comparable.[2] Their papers demonstrate that when analytically accurate comparisons are undertaken, the widely trumpeted gaps between

[1] James Glassman, "Can Americans Handle Their Own Retirement Investing Choices?" Testimony before the Committee on Commerce, U.S. House of Representatives, July 24, 1998, page 1.

[2] John Geanakoplos, Olivia S. Mitchell, and Stephen P. Zeldes, "Would a Privatized Social Security System Really Pay a Higher Rate of Return?" in R. Douglas Arnold, Michael J. Graetz, and Alicia H. Munnell, eds., *Framing the Social Security Debate: Values, Politics, and Economics (*Brookings Institution Press: Washington, 1998), also available as NBER Working Paper Number 6713, August 1998; and John Geanakoplos, Olivia Mitchell, and Stephen P. Zeldes, "Social Security Money's Worth," available as NBER Working Paper Number 6722, September 1998, and in Olivia S. Mitchell, Robert J. Myers, and Howard Young, *Prospects for Social Security Reform* (University of PA Press: Philadelphia, 1999)

rates of return for individual accounts and returns for Social Security contributions essentially disappear. They write: "A popular argument suggests that if Social Security were privatized, everyone could earn higher returns. We show that this is false...the net advantages of privatization and diversification are substantially less than popularly perceived."[3]

This conclusion is not ideologically motivated. At least one of the co-authors of these papers, Olivia Mitchell, is a supporter of individual accounts. The papers are not a product written by individuals who oppose such accounts and set out to weaken the case for them. Furthermore, other economists — including quite conservative ones — have reached the same analytic conclusions as Geanakoplos, Mitchell, and Zeldes.[4]

The Geanakoplos, Mitchell, and Zeldes papers highlight the flaws in the simple rate of return comparison. The findings and implications of their analysis include:

- If individual accounts are financed from revenue currently devoted to Social Security, computations of the rate of return under individual accounts need to include the cost of continuing to pay the Social Security benefits promised to retirees and older workers. The vast majority of current Social Security revenue is dedicated to paying current benefits. Redirecting revenue away from Social Security does not reduce the costs of paying these benefits.

  Simple rate-of-return comparisons such as those Glassman and many other individual-accounts proponents use fail to take into account the costs of continuing to pay for the benefits of current beneficiaries (as well as the benefits that current workers have accrued) when computing rates of returns for individual accounts, while including these costs in the rate of return computed for Social Security. The costs remain, however, even if Social Security is eliminated for new workers and replaced entirely by individual accounts. As a result, such comparisons are inherently biased. Since the payments to current beneficiaries (and the benefits that current workers have accrued) are not avoided by setting up individual accounts, the returns on individual accounts should not be artificially inflated by excluding the cost of these payments.

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[3] Geanakoplos, Mitchell, and Zeldes, "Social Security Money's Worth," *op.cit.*, pages 2-3.

[4] As one example, Kevin Murphy and Finis Welch argue that "many of the touted gains to privatization are more apparent than real, and any gains have more to do with the details of what is done (whether private or public) than with privatization per se." Kevin Murphy and Finis Welch, "Perspectives on the Social Security Crisis and Proposed Solutions," *American Economic Review*, May 1998, page 142.

- If the individual accounts are financed from the unified budget surplus (or from additional payroll contributions), analyses should compare the expected rate of return on such accounts to the rate of return that would be expected on an equivalent amount of *additional* funding added to the Social Security system. Such an analysis should *not* compare returns on individual accounts financed with *new* funding to returns under the Social Security system financed with *existing* payroll contributions. If additional funds were provided to the Social Security system and invested in the same manner as under individual accounts, the rate of return on the additional funds provided would be essentially the same under either approach — and would be higher under *both* approaches than the rate of return on existing Social Security contributions.

  In this case, it is the additional funding that would accumulate in *either* the Social Security trust funds or individual accounts that raises the rate of return. The higher rate of return would result regardless of whether the additional funding is routed through individual accounts or the Social Security trust fund, as long as the trust fund is allowed to hold the same type of assets as individual accounts. (Currently, the trust fund is not allowed to hold equities and thus could not replicate the types of investments likely to be held in individual accounts. If this restriction were maintained, however, the resulting difference in rates of return would be due to this restriction on how trust fund reserves may be invested, not to individual accounts *per se*.)

  The provision of funding that exceeds what is needed to pay current benefits, often termed "partial advance funding" when referring to Social Security, raises the rate of return on contributions because such funding can be invested at the market rate of interest; by definition, none of it is needed to pay current benefits. Since the market rate of return is higher than the rate of return on existing Social Security contributions, and since each dollar of additional funding can earn the market rate of return, additional funding secures a higher rate of return than existing contributions do. This higher rate of return can be captured by channeling the additional funding through either the trust fund or individual accounts.

  A corollary of this point is that creating individual accounts out of existing Social Security payroll tax contributions, without any additional advance funding, does not raise the rate of return in this manner. As noted above, if individual accounts are created out of existing funding, the benefits that

current workers and retirees have accrued under Social Security must still be paid. That drives the overall rate of return back toward its current level under Social Security. It is the additional funding, not the individual accounts themselves, that is crucial to producing the higher rate of return.

- Analytically correct comparisons also should reflect risk and administrative costs. Individuals generally dislike risk; a much riskier asset with a slightly higher rate of return is not necessarily preferable to a much safer asset with a slightly lower rate of return. Administrative costs are also important; all else being equal, higher administrative costs reduce the net rate of return an individual receives. When these factors are taken into account, the supposed advantage of individual accounts in providing higher rates of return diminishes further and may even be reversed, given the higher administrative costs associated with individual accounts than with Social Security.

In summary, the simple rate-of-return argument that many proponents of individual accounts use is biased. It either mistakenly counts the cost of Social Security benefits that must be paid to current retirees as costs only under Social Security and not under a system of individual accounts or it inappropriately compares the return on *additional* funding for individual accounts to the return on *existing* contributions to Social Security (or commits both errors). Such arguments also usually ignore differences in administrative cost and risk, both of which are higher under individual accounts than under Social Security.

As an example of how the rate-of-return differential between Social Security and individual accounts is more apparent than real, consider the report of the 1994-1996 Advisory Council on Social Security. The members of the Advisory Council were unable to reach agreement on the role of individual accounts. The Council split into three factions, each with a significantly different set of recommendations regarding individual accounts:

- One set of recommendations, known as the *Maintain Benefits* proposal, did not include individual accounts. Instead, it called for consideration of investing a portion of the Social Security Trust Fund reserves in the stock market.

- Another recommendation, the *Individual Accounts* proposal, included individual accounts on top of Social Security. The accounts would be financed by payroll contributions equal to 1.6 percent of wages, in addition to the current payroll taxes devoted to Social Security. To reduce administrative costs and for other reasons, the accounts would be centrally managed by an entity governed by federal appointees, based on

the investment model used in the Thrift Savings Plan for federal employees.

- Under the final proposal, the *Personal Security Accounts* proposal, individual accounts would be financed by diverting a portion of the current payroll tax equal to five percent of wages from the Social Security Trust Funds to the accounts. In other words, the current 12.4 percent Social Security payroll tax would effectively be reduced to 7.4 percent, and the 5 percent-of-payroll difference would be deposited in individual accounts. The accounts would be managed by the private sector.

The three plans thus adopted very different approaches to individual accounts, from no individual accounts (under the Maintain Benefits plan) to relatively large individual accounts (under the Personal Security Accounts plan). The simple rate-of-return comparison — which emphasizes that the historical rate of return on the stock market is substantially higher than current and future rates of return on Social Security contributions — would suggest that these plans should produce significantly different rates of return.

But despite the sharply different treatment of individual accounts in the three proposals, their estimated rates of return are very similar. Consider, for example, an average two-earner couple born in 1997. According to projections made by the Social Security actuaries and published in the Advisory Council report, the real rate of return for such a couple would be:

- Between 2.2 percent and 2.7 percent per year under the Maintain Benefits plan, depending on the share of the Social Security Trust Fund invested in equities;

- 2.2 percent per year under the Individual Accounts plan; and

- 2.6 percent per year under the Personal Security Accounts plan.

To those who are accustomed to using the simple rate-of-return comparison and who assume individual-accounts plans produce a much higher rate of return, these results must come as a shock. Yet the similar rates of return across plans with very different approaches to individual accounts, especially when the returns are adjusted for differences in risk, is precisely what one *should* expect when the analysis is undertaken in a rigorous manner.

Individual accounts have a wide variety of costs and benefits, all of which deserve careful scrutiny in the current debate. But the simple rate-of-return comparison promoted by some advocates of individual accounts confuses rather than informs the debate.

I. Introduction

Proponents of individual accounts often compare the potential rate of return on such accounts to the rate of return on Social Security contributions. They conclude that workers would enjoy a substantially higher rate of return under a system of individual accounts.

For example, the commentator James Glassman has noted, "Returns to the investment portion of Social Security are extremely low. For persons born in 1960, returns are estimated at between 1 percent and 2 percent in real (inflation-adjusted) terms...By contrast with Social Security, the real returns to large-capitalization stocks between 1926 and 1997 have averaged 7.2 percent."[5] Similarly, former Vice President Dan Quayle has written that, "With real Social Security 'investment' returns in the range of 1 percent to 3 percent, it is imperative that we allow Americans the opportunity to invest some of their own money in the private sector with real returns that can reasonably be expected to range from 5 percent to 7 percent a year."[6]

Newspaper articles on Social Security often reflect this view. Thus, an article in the *Financial Times* last spring reported that the "rate of return [on individual accounts]

[5] James Glassman, "Can Americans Handle Their Own Retirement Investing Choices?" Testimony before the Committee on Commerce, U.S. House of Representatives, July 24, 1998, page 1.

[6] Dan Quayle, "Time for a 30% Tax Cut," *Wall Street Journal*, January 25, 1999, page A18.

would be higher — perhaps 6 to 8 per cent on past stock market performance, against the roughly 2 per cent the social security system will produce."[7]

Despite its apparent plausibility and widespread use by many proponents of individual accounts, this simple rate-of-return comparison is misleading. In a recent and important set of papers, economists John Geanakoplos, Olivia Mitchell, and Stephen Zeldes show that the comparison is fundamentally flawed because these two rates of return are not comparable.[8] Their papers demonstrate that when analytically accurate comparisons are undertaken, the widely trumpeted gaps between rates of return for individual accounts and returns for Social Security contributions essentially disappear.[9] As they write, "A popular argument suggests that if Social Security were privatized, everyone could earn higher returns. We show that this is false...the net advantage of privatization and diversification are substantially less than popularly perceived."[10]

This conclusion is clearly not ideologically motivated. At least one of the co-authors of these papers, Olivia Mitchell, is a supporter of individual accounts. The papers are not a product written by individuals who oppose such accounts and set out to weaken the case for them. Furthermore, other economists — including quite

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[7] Nicholas Timmins, "The biggest question in town: America faces critical choices over the future of its most popular spending programme," *Financial Times,* March 20, 1998, page 23.

[8] John Geanakoplos, Olivia S. Mitchell, and Stephen P. Zeldes, "Would a Privatized Social Security System Really Pay a Higher Rate of Return?" in R. Douglas Arnold, Michael J. Graetz, and Alicia H. Munnell, eds., *Framing the Social Security Debate: Values, Politics, and Economics (*Brookings Institution Press: Washington, 1998), also available as NBER Working Paper Number 6713, August 1998; and John Geanakoplos, Olivia Mitchell, and Stephen P. Zeldes, "Social Security Money's Worth," available as NBER Working Paper Number 6722, September 1998, and in Olivia S. Mitchell, Robert J. Myers, and Howard Young, *Prospects for Social Security Reform* (University of Pennsylvania Press: Philadelphia, 1999).

[9] The "rate of return" is the real (i.e., inflation-adjusted) internal rate of return. If inflation-adjusted contributions are thought of as deposits into a bank account, and inflation-adjusted benefits are thought of as withdrawals from that account, the internal rate of return is the interest rate the deposits have earned when all funds have been withdrawn from the account. The rate of return on Social Security contributions will depend on precisely what contributions (deposits) and benefits (withdrawals) are reflected in the analysis. In this paper, we generally include all contributions (including both the employee and employer share of payroll tax revenues) and all retirement and survivor's benefits in the rate-of-return computations. For a discussion of these issues, along with an examination of other measures of the returns to Social Security, see Dean Leimer, "A Guide to Social Security Money's Worth Issues," *Social Security Bulletin* (Summer 1995), pages 3-20.

[10] Geanakoplos, Mitchell, and Zeldes, "Social Security Money's Worth," *op.cit.*, pages 2-3.

conservative ones — have reached the same analytic conclusions as Geanakoplos, Mitchell, and Zeldes.[11]

Individual accounts have many costs and benefits, a full examination of which is beyond the scope of this analysis. But as the Geanakoplos, Mitchell, and Zeldes papers show, arguments in favor of individual accounts on the basis of their ostensibly higher rates of return — often cited as the most important benefit of such accounts — confuse rather than inform the debate.

The purpose of this paper is relatively narrow. It seeks to explain the conclusions reached by Geanakoplos, Mitchell, and Zeldes to a broader audience. It is not intended to evaluate the overall costs and benefits of such accounts. The remainder of the paper is organized into seven chapters:

- Chapters II and III present examples illustrating the flaws in the simple rate-of-return comparison.

- Chapters IV and V examine rates of return on Social Security contributions and the Social Security Trust Fund, which provides needed background for evaluating the simple rate-of-return comparison in more depth.

The final Chapters (Chapters VI, VII, and VIII) explore the problems with the simple rate-of- return comparison in more detail.

[11] As one example, Kevin Murphy and Finis Welch argue that "many of the touted gains to privatization are more apparent than real, and any gains have more to do with the details of what is done (whether private or public) than with privatization per se." Kevin Murphy and Finis Welch, "Perspectives on the Social Security Crisis and Proposed Solutions," *American Economic Review*, May 1998, page 142.

II. Rates of Return and the Proposals of the Advisory Council on Social Security

As an example of how the rate-of-return differential between Social Security and individual accounts is more apparent than real, consider the report of the 1994-1996 Advisory Council on Social Security, chaired by Edward Gramlich (then an economics professor at the University of Michigan and now a governor of the Federal Reserve Board). The Advisory Council was unable to reach agreement on the role of individual accounts in Social Security reform. It split into three factions, each with a significantly different set of recommendations regarding individual accounts:[12]

- One of the three sets of recommendations, the *Maintain Benefits* proposal, did not include individual accounts. Instead, it called for consideration of investing a portion of the Social Security Trust Fund reserves in the stock market. Robert Ball, a former Commissioner of Social Security under Presidents Kennedy, Johnson, and Nixon, was the most prominent supporter of the Maintain Benefits plan.

- Another set of recommendations, known as the *Individual Accounts* proposal, included individual accounts on top of Social Security. The accounts would be financed by payroll contributions equal to 1.6 percent of wages, in addition to the current payroll taxes devoted to Social Security. To reduce administrative costs and for other reasons, the accounts would be centrally managed by an entity governed by Federal appointees. Edward Gramlich, chairman of the Advisory Council, was the leading supporter of the Individual Accounts plan.

[12] The Advisory Council report is available on-line at www.ssa.gov/policy/adcouncil.

- Under the final proposal, the *Personal Security Accounts* proposal, individual accounts would be financed by diverting a portion of the current payroll tax equal to 5 percent of wages from the Social Security Trust Funds to the accounts. In other words, the current 12.4 percent Social Security payroll tax (employers and employees each pay tax equal to 6.2 percent of an employee's covered wages) would effectively be reduced to 7.4 percent, and the 5 percent-of-payroll difference would be deposited in individual accounts. The accounts would be managed by the private sector. Carolyn Weaver of the American Enterprise Institute and Sylvester Schieber of Watson Wyatt Worldwide, among others, supported the Personal Security Accounts plan.

The three plans thus adopted very different approaches to individual accounts. The Maintain Benefits plan had no such accounts. The Individual Accounts plan had relatively modest accounts financed by additional contributions on top of the existing funding for the traditional Social Security program. The Personal Security Accounts plan had larger individual accounts, financed out of the existing Social Security payroll tax. The simple rate-of-return comparison — which compares the historical rate of return on the stock market to the rate of return on Social Security contributions and emphasizes that the stock market return is higher — would therefore suggest that these plans should produce significantly different rates of return.[13]

Despite the dramatically different treatment of individual accounts in the three proposals, however, *their estimated rates of return are very similar*. Consider, for example, an average two-earner couple born in 1997. According to projections made by the Social Security actuaries and published in the Advisory Council report, the real rate of return for such a couple would be:

- Between 2.2 percent and 2.7 percent per year under the Maintain Benefits plan, depending on the share of the Social Security Trust Fund invested in equities;

- 2.2 percent per year under the Individual Accounts plan; and

[13] The three proposals varied along other dimensions in addition to their approaches to individual accounts. The proposals also contained some common features. The logic of the simple comparison, however, would suggest that differences in the rates of return among the three plans would be dominated by the dramatically different approaches the plans take regarding individual accounts.

- 2.6 percent per year under the Personal Security Accounts plan.[14]

The results for other birth years and other types of beneficiaries are broadly similar — the differences in returns are minimal. Furthermore, these minimal differences are explained mostly by the differing levels of risk the three approaches embody.

To those who are accustomed to using the simple rate-of-return comparison and who assume individual accounts plans produce a much higher rate of return, these results must come as a shock. Yet the similar rates of return across plans with very different approaches to individual accounts, especially when the returns are adjusted for differences in risk, is precisely what one *should* expect when the analysis is undertaken in a rigorous manner.[15]

[14] The figures for the Individual Accounts and Personal Security Accounts plans assume that workers invest their individual accounts in equities in the same proportion as 401(k) portfolios are held. Workers under age 40 are assumed to hold 55 percent of their account in equities, workers aged 40 to 49 to hold 50 percent in equities, workers aged 50 to 59 to hold 40 percent in equities, and workers aged 60 and older to hold 20 percent in equities. Office of the Actuary, Social Security Administration, October 9, 1996, as printed in *Report of the 1994-1996 Advisory Council on Social Security* (Government Printing Office: Washington, 1997), Appendix II, Table IRR4.

[15] Most economists believe the internal rate of return calculation should include the value of all contributions, including the employer-provided portion of payroll taxes and any transition taxes that must be paid as a result of diversion of funds from the Social Security pay-as-you-go system, as well as all benefits, including spousal and survivor benefits. The rate-of-return analysis the actuaries conducted for the Advisory Council does so. The actuaries' analyses do not adjust for risk because their purpose was not to undertake a full economic analysis and because of underlying conceptual differences between the goals of actuarial analyses and economic analyses.

III. An Example of Why the Simple Rate-of-Return Comparison Is Misleading

The similarity of the rates of returns for the three Advisory Council plans underscores the point that the simple rate-of-return comparison is misleading. It does not, however, explain *why* the comparison is misleading. This chapter provides a simplified example that may help readers understand the apparently puzzling results on rates of return from the Advisory Council report and why the simple rate-of-return comparison is problematic.

Imagine a simple pay-as-you-go system, under which one generation pays $1 while it is young and receives $1 while old. Generation A is old in period 1 and therefore receives $1. That $1 is paid for by Generation B, which is young in period 1. Then in period 2, Generation B is old and receives $1, paid for by Generation C, which is young in period 2, and so on. The table below presents the operation of the system.

The Simplified Pay-as-you-go System

	Generation			
Period	**A**	**B**	**C**	**D**
1	+$1	-$1		
2		+$1	-$1	
3			+$1	-$1
4				+$1

Assume further that the market interest rate is 10 percent per period. Now consider the system from the perspective of Generation C during period 2:

- Under the pay-as-you-go system, Generation C pays $1 during period 2 and receives $1 back during period 3. The pay-as-you-go system's rate of return is zero.

- Under an individual accounts system, Generation C would invest the $1 contribution and receive $1.10 in period 3. The rate of return would appear to be 10 percent.

The commentators and journalists quoted in the introduction to this paper would therefore suggest that a switch from the pay-as-you-go system to individual accounts would produce substantially higher returns for Generation C — 10 percent rather than 0 percent. But would it?

If Generation C put $1 into individual accounts during period 2, that $1 could not be used to finance the benefits for Generation B. Yet Generation B's benefits must be paid for somehow, unless society is willing to allow Generation B to go without benefits.

Assume that Generation B's benefits are financed through borrowing and that the interest costs are paid for by the older generation in each period. With an interest rate of 10 percent, the interest payments would cost 10 cents per period. The net benefit to Generation C during period 3, therefore, would be $1. Generation C would get $1.10 back from its individual accounts but would have to pay 10 cents in interest costs, leaving it with a net benefit of $1. Thus, Generation C would earn a zero rate of return, just as under the pay-as-you-go system, once the interest costs are included — it would pay $1 and receive a net benefit of $1. Indeed, for Generation C and each generation thereafter, *the extra return from the individual account is more apparent than real — it is exactly offset by the cost of the debt that financed Generation B's benefits*.

Other assumptions about financing the benefits do not alter the basic conclusion that the simple rate-of-return comparison is misleading.[16] For example, if benefits were financed by borrowing but the interest costs were paid for by the younger generation

[16] The situation is slightly different if the benefits for Generation B were financed through an additional tax on Generation C rather than through borrowing. In that case, Generation D and all subsequent generations would enjoy a 10 percent rate of return. But Generation C would earn a *negative* rate of return: it would pay $2 ($1 in contributions to its own accounts and $1 in taxes to finance Generation B's benefits) to earn $1.10, rather than paying $1 to earn $1 as under the pay-as-you-go system. In effect, Generation C would earn a lower rate of return, whereas later generations would enjoy a higher rate of return. This example is thus consistent with the basic point that the simple rate-of-return comparison is misleading. In this case, it is misleading because it does not include the negative rate of return for Generation C.

rather than the older generation in each period, Generation C would enjoy a 10 percent rate of return.

It would pay $1 and get $1.10 back. But Generation D and all subsequent generations would receive a zero rate of return; these generations would pay $1.10 while young and receive $1.10 when old. (The $1.10 paid when young would consist of $1 in deposits into the individual accounts and $0.10 in interest costs on the funds borrowed. The $1 in deposits, at a 10 percent interest rate, would produce $1.10 in benefits for this generation when it is old.) The higher return for Generation C would in effect be paid for by requiring all future generations to earn a zero rate of return on a larger contribution base ($1.10, rather than $1).

The method of financing the benefits to Generation B does not affect the fundamental point that other generations must pay for them. Simple rate-of-return comparisons obscure this reality.

Individual Accounts Financed from the Unified Budget Surplus

The simplified example outlined on pages 9 and 10 also can be used to clarify the effects of proposals to use the unified budget surplus to fund individual accounts. Assume that starting in period 2, the government runs a unified budget surplus of $0.50 in each period and uses that surplus to fund individual accounts for the young in each period thereafter. The pay-as-you-go system is left untouched.

The total benefits accruing to Generation C in period 3 and to every subsequent generation will be $1.55 — $1.00 from the pay-as-you-go system and $0.55 from the individual account. (The $0.50 deposit in the individual account earns a 10 percent rate of return and produces $0.55 the next period.) The *overall* rate of return on the pay-as-you-go system plus the individual accounts increases from zero to 3.3 percent: total deposits are $1.50 ($1.00 from payroll taxes and $0.50 from the budget surplus), and total subsequent benefits are $1.55 ($1.00 from the pay-as-you-go system and $0.55 from the individual account). The total rate of return thus is 3.3 percent — $1.50 at 3.3 percent interest accrues to $1.55 the next period. (In other words, five cents divided by $1.50 equals 3.3 percent.)

It is important to note, however, that the 3.3 percent return also could be achieved by investing the $0.50 from the surplus each period into a trust fund for use in the public pay-as-you-go system. In other words, the surplus could be used to partially "advance fund" the pay-as-you-go system. In particular, assume the government uses $0.50 of the surplus each period to partially advance fund the pay-as-you-go system,

starting in period 2.[17] In period 2, the $0.50 is put into a trust fund that earns 10 percent.[18] By period 3, the trust fund has grown to $0.55. The $0.55 would allow the system to give $0.55 in extra benefits to Generation C. Meanwhile, the trust fund would receive an additional $0.50 from the surplus in period 3, allowing $0.55 more in benefits during period 4, and so on.

The rate of return under such a partially advance-funded system would be 3.3 percent. Once again, total benefits in each period would be $1.55, while total contributions in the previous period (including the budget surplus) would be $1.50. The result is a 3.3 percent overall rate of return (again, $1.50 invested at 3.3 percent interest yields $1.55 in the next period). This approach yields the same rate of return as achieved with individual accounts financed by the surplus.

The conclusion is that *it is the additional contributions from the surplus — the partial advance funding of the retirement system — that raises the rate of return, not the individual accounts per se*. The overall rate of return is raised from zero to 3.3 percent regardless of whether the surplus is used to fund individual accounts or to partially advance fund the trust fund.[19] The simple rate-of-return comparison is misleading in this case because it obscures the fact that partial advance funding raises the rate of return regardless of whether the additional funding is invested in individual accounts or in the traditional system through a trust fund.

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[17] Partial advance funding means that the $0.50 is *not* used to finance additional benefits for Generation B (which remain $1) but is instead saved to provide future benefits to Generation C.

[18] In this simplified example, we have assumed only one "market interest rate," which we assumed that both the trust fund and the individual account would earn. In the real world, there are many types of financial assets (e.g., equities and bonds), which carry different interest rates or rates of return. As discussed below, much — if not all — of such differences in rates of return result from differences in the riskiness of the assets. The simplified example used here is therefore predicated on one of two assumptions. The first possible assumption is that the trust fund is invested in the same types of assets as individual accounts would be, thus producing the same gross rate of return. The second possibility is that the trust fund is not invested in the same manner as individual accounts but that differences in rates of return reflect only differences in risk and that the analysis relies on a *risk-adjusted* interest rate, which adjusts for these differences. Either assumption would produce the results noted in the text above. Similarly, the example assumes that the administrative costs of the individual accounts and of the Trust Fund were both zero. In reality, the administrative costs of individual accounts, especially if they are privately managed, are likely to be significantly higher than the administrative costs of the Trust Fund. These issues are examined in more detail below.

[19] It should be noted that the increase in the rate of return from partial advance funding comes at the price of devoting more funds to the retirement system. If those funds also could have earned a market rate of return in some other use, mandating that they be devoted to the retirement system raises the rate of return within Social Security but reduces the total return earned elsewhere.

Summary of Lessons from the Simplified Example

The simplified example described here provides lessons for rate-of-return comparisons in the real world:

- If individual accounts are financed from revenue currently devoted to Social Security, analysis of rates of return needs to include the cost of continuing to pay for promised Social Security benefits. The vast majority of current Social Security revenue is dedicated to paying current benefits. Redirecting revenue away from Social Security does not reduce those costs.

  Simple rate-of-return comparisons ignore the costs of paying the benefits of current beneficiaries when computing rates of returns for individual accounts, while embedding these costs in the rate of return computed for Social Security. Yet the costs remain even if Social Security is eliminated for new workers and replaced entirely by individual accounts. As a result, such comparisons are inherently biased, just as the comparison between the apparent 10 percent return on individual accounts and the zero percent return on the pay-as-you go system in the simplified example above was biased. Since the payments to current beneficiaries are not avoided by setting up individual accounts, the returns on individual accounts should not be artificially inflated by excluding their cost. The Advisory Council results, reported above, incorporated the costs of providing benefits to current beneficiaries — which is why the rate of return under the Personal Security Accounts proposal (with large individual accounts) was not significantly different from the rate of return under the Maintain Benefits proposal (with no individual accounts).

- If the individual accounts are financed from the unified budget surplus (or from additional payroll contributions), an analysis should compare the expected return on such accounts to the return that would be expected on an equivalent amount of *additional* funding added to the Social Security system. Such an analysis should *not* compare returns on individual accounts financed with *new* funding to returns under the Social Security system funded with *existing* payroll contributions. If additional funds were provided to the Social Security system and invested in the same manner as they would be invested under individual accounts, the rate of return on the additional funds provided would be the same under either

approach — and would be higher under *both* approaches than the rate of return on existing Social Security contributions.[20]

The provision of funding that exceeds what is needed to pay current benefits, which is termed "partial advance funding" when referring to Social Security, raises the rate of return on contributions because the full amount of such additional funding can be invested at the market rate of interest; by definition, none of if it is needed to pay for current benefits. Since the market rate of return is higher than the rate of return on existing Social Security contributions, and since each dollar of additional funding can earn the market rate of return, additional funding secures a higher rate of return than existing contributions do. This higher rate of return can be captured by channeling the additional funding through either the trust fund or individual accounts.

A corollary of this point is that creating individual accounts out of existing Social Security payroll tax contributions, without any additional advance funding, does not raise rates of return in this manner. As noted above, if individual accounts are created out of existing funding, the benefits that current workers and retirees have accrued under Social Security must still be paid. That drives the overall rate of return back toward its current level under Social Security. It is the additional funding, not the individual accounts themselves, that is crucial to producing the higher rate of return.

- Analytically correct comparisons also should reflect risk and administrative costs. When these factors are taken into account, the supposed advantage of individual accounts in providing higher rates of return diminishes further and may even be reversed, given the higher administrative costs under individual accounts than under the trust fund.

As these examples illustrate, the simple rate-of-return argument is significantly biased. It either ignores the cost of benefits promised under the current system or

[20] The rate of return on investing the funds through the trust fund may actually be *higher* than through individual accounts, since the trust fund is likely to have lower administrative costs. As discussed below, however, the rules governing the Social Security Trust Fund currently would not allow it to mimic the portfolio likely to be held in individual accounts. These rules allow trust fund assets to be invested solely in government bonds. That artificial constraint reduces the apparent return on additional financing for Social Security relative to individual accounts. But it is not clear this constraint should remain. It also is not clear the apparent difference in rates of return that results from the current limitation on the investment of trust fund assets would remain if rates of return were risk-adjusted.

Robert Reischauer on Social Security and the Simple Rate-of-Return Comparison

"[One] reason why future retirees can expect low returns arises because most payroll tax dollars we send in for retirement purposes — some $13 out of every $15 — are used immediately to pay benefits to current retirees, our parents and grandparents. This practice dates back to 1939 when Congress decided to pay relatively generous benefits to those who had contributed payroll taxes for only a portion of their working lives. Not until 1982 did workers who were 20 when the payroll tax was first imposed and, therefore, paid the tax during their entire careers, turn 65.

"The decision to provide adequate retirement benefits to those who had not contributed to Social Security over their full careers was a fair and sensible one. Many of these workers had fought in World War I and had their careers blighted by the Great Depression. Congress's decision greatly reduced the appalling incidence of poverty among the elderly....But it also meant that workers' contributions were not building up as reserves that could support them when they retired. The result is the so-called unfunded liability — that is, the current promises Social Security has made to pay benefits in the future that are unmatched by reserves. Whether we retain the existing system or privatize it, this unfunded liability will have to be met unless we renege on the benefits promised to today's elderly and near elderly. Dealing with the unfunded liability inescapably will reduce the returns workers can expect on their contributions.

"[Another] reason for relatively low returns is the restriction that Social Security reserves be invested in safe, but low-yielding, government bonds...the reserves must be invested in government bonds that are expected to earn about 2.8 percent more than the rate of inflation. Investments in a prudently diversified portfolio of common stocks, corporate bonds, and government guaranteed securities could double that yield.

"...investing a portion of the growing Social Security reserves in private sector securities would give participants in the program a more equitable share of the benefit that increased Social Security reserves provide for the overall economy. Such a change would improve the return today's workers will get on their Social Security contributions without exposing them to the market risks and high administrative costs that would come if such investments were made through individual retirement accounts."

- from statement of Robert Reischauer, Senior Fellow, The Brookings Institution, at the White House Forum on Social Security, Albuquerque, July 27,1998.

inappropriately compares the rate of return on *additional* funding for individual accounts to the rate of return on *current* contributions to Social Security. It also ignores risk and administrative cost differences. Robert Reischauer, a senior fellow at the Brookings Institution and a former director of the Congressional Budget Office, highlighted these issues during the White House forum on Social Security held in Albuquerque, New Mexico, in July 1998 (see box).

The remainder of this paper explores the simple rate-of-return comparison in more detail. We first examine the rate of return on Social Security contributions (Chapter IV) and the Social Security Trust Fund (Chapter V) and then examine further the simple rate-of-return comparison in different contexts (Chapters VI-VIII).

IV. Rates of Return Under Social Security

The current Social Security program is primarily a mature pay-as-you-go system. "Mature" means that new beneficiaries have been covered by the system throughout their working lives. "Pay-as-you-go" means that benefits are paid out of contributions from current workers, with each generation paying for the previous generation's benefits and then receiving benefits paid for by the next generation (as in the simplified example above). Since almost 90 percent of Social Security revenue is devoted to paying current benefits, the Social Security system is primarily a pay-as-you-go system.[21]

As the noted economist Paul Samuelson showed 40 years ago, the real rate of return in a mature pay-as-you-go system is equal to the sum of the rate of growth in the labor force and the rate of growth in productivity (see appendix).[22] In the decades ahead, fertility rates are expected to remain relatively low, and the population is

[21] According to the intermediate projection of the Social Security actuaries, the system will receive $449.9 billion in non-interest revenue in 1999 and pay $396.3 billion in benefits. Thus, 88 percent of current revenue is expected to be devoted to paying benefits. See *1998 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and the Federal Disability Insurance Trust Funds* (Government Printing Office: Washington, 1998), Table III.B3.

[22] Paul Samuelson, "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money," *Journal of Political Economy*, December 1958, pages 219-234. Economists assume that over a sufficiently long period of time, productivity growth is equal to real wage growth. Thus, the Samuelson formula can equivalently be expressed as the sum of labor force growth and real wage growth, or the sum of labor force growth and productivity growth.

expected to age. As a result, the Social Security actuaries project that labor force growth will slow from roughly 1 percent per year to 0.1 percent per year over the next 75 years. The economy's underlying rate of productivity growth is estimated to be roughly 1 percent per year.[23] The inflation-adjusted rate of return on Social Security contributions for current and future cohorts of workers is therefore somewhere between 1 percent and 2 percent in real (i.e., inflation-adjusted) terms. (These computations ignore the earnings of the Social Security Trust fund, an added factor discussed below that increases somewhat Social Security's rate of return.)

The Samuelson formula assumes that benefit payments each year are equal to payroll tax contributions. By contrast, the projections for the Social Security system suggest that projected revenue will fall below projected benefits as the baby boomers retire. The 1 percent to 2 percent real rate of return on Social Security contributions is affected only slightly, however, by the projected 75-year actuarial imbalance in the Social Security system.

Analyses the Social Security actuaries conducted for the Social Security Advisory Council shed light on the impact the actuarial imbalance has on the rate of return. The actuaries computed an alternative rate of return that ignores the actuarial imbalance and simply assumes that benefits under current law continue to be paid without changes to the Social Security system. They also computed an alternative rate of return that assumes payroll taxes are raised to match projected benefits each year, thereby eliminating the imbalance.

For a single male with average earnings who was born in 1985, the rate of return if current-law benefits are simply assumed to be paid, without closing the actuarial imbalance, is 1.6 percent per year; the rate of return if payroll taxes are raised to pay for future benefits is 1.1 percent per year. Similarly, for an average two-earner couple born in 1985, the rate of return is 2.2 percent per year if current-law benefits are paid despite the actuarial imbalance and 1.7 percent per year if payroll taxes are raised to close the imbalance.

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[23] Between 1973 and 1990, productivity growth (measured as output per hour in the nonfarm business sector) averaged 1.1 percent per year. More recently, productivity growth has been higher: 2.4 percent in 1996, 1.2 percent in 1997, and 2.2 percent in 1998. Most economists believe it is still too soon to know whether this recent performance heralds a higher rate of productivity growth over the long run. In particular, measurement issues and the cyclical nature of productivity growth make it difficult to determine whether the recent strong growth will persist. For a discussion of these issues, see Council of Economic Advisers, *Economic Report of the President 1999* (Government Printing Office: Washington, 1999),pages 85-91.

While these differences in rates of return are noticeable, they are not dramatic.[24] Therefore, while the 75-year actuarial imbalance affects the rate of return, the effect is not as large as some may have assumed. (The reason is that the primary determinant of the rate of return for Social Security at this point continues to be the sum of the productivity growth rate and the labor force growth rate — the Samuelson formula. The projected actuarial imbalance does not substantially alter that result because the imbalance, although large in absolute dollar terms, is modest relative to the Social Security contribution rate.[25])

Returns for Early Beneficiaries Under a Pay-as-you-go System

The preceding chapter discussed the rate of return on a pay-as-you-go system, as projected under the Samuelson formula. In the early years of such a system, however, beneficiaries receive a substantially higher rate of return than this formula would suggest. Consider Generation A from the example on pages 9 and 10. That first generation in the pay-as-you-go system received $1 in benefits but had not contributed anything to the system. Generation A's rate of return thus was infinite.

In a similar vein, early beneficiaries under the Social Security system received extremely high rates of return because they received benefits disproportionate to their contributions. They contributed for only a limited number of years, since much of their working lives had passed before Social Security payroll contributions began to be collected. The earliest beneficiaries under Social Security — those born in the 1870s — enjoyed real rates of return approaching 40 percent.

Table 3

Average annual rate of return for Social Security retirement and survivors benefits for those born in selected years	
Year of Birth	**Average annual rate of return**
1876	36.5%
1900	11.9%
1925	4.8%
1950	2.2%

Source: Dean Leimer, "A Guide to Social Security Money's Worth Issues," *Social Security Bulletin*, Summer 1995, Table 3.

[24] Office of Actuary, Social Security Administration, October 9, 1996, as printed in *Report of the 1994-1996 Advisory Council on Social Security*, Appendix II, Table IRR.

[25] The current contribution rate — the percentage of covered payroll contributed in Social Security taxes — is 12.4 percent. The Social Security actuaries project that the 75-year funding shortfall in the Social Security surplus equals 2.19 percent of covered payroll.

This decline in rates of return from the earliest groups of beneficiaries is a feature of any pay-as-you-go system, under which the early beneficiaries receive very high rates of return because they contributed little during their working years. The rate of return for subsequent beneficiaries necessarily declines. As the system matures, that decline in rates of return may be attenuated or exacerbated by changes in productivity and labor force growth rates.

V. The Social Security Trust Fund

The discussion in the previous chapter did not take account of the fact that Social Security is *not* purely a pay-as-you-go system. It is now a partially advance-funded system, as the presence of the Trust Fund signifies. The Social Security Trust Fund is expected to hold reserves of more than $850 billion by the end of this year.[26] Consequently, Social Security's rate of return diverges from the pure pay-as-you-go rate that Samuelson identified.

Let us return momentarily to our simplified example from pages 9 and 10. Remember that in that simplified example, the rate of return on the pay-as-you-go system was assumed to be zero, not the 1 percent to 2 percent expected on the Social Security system in the United States. (The zero return resulted because, to keep things simple, our simplified example did not assume any labor force or productivity growth.) Nonetheless, the simplified example provides insight into the effect of a trust fund on the rate of return. In that example, the presence of a trust fund raised the rate of return from zero (for a pure pay-as-you-go system) to 3.3 percent (for the partially advance-funded system).

With a trust fund, the overall rate of return is equal to the weighted average of the rate of return on the pure pay-as-you-go system (as identified by Samuelson) and the rate of return on the trust fund, with the weights reflecting the degree to which the system is a pure pay-as-you-go system. In the simplified example, the trust fund represented one-third of the total contribution ($1 was provided in payroll tax

[26] *1998 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and the Federal Disability Insurance Trust Funds* (GPO: Washington, 1998), Table III.B3. The $850 billion figure includes both the Old-Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund.

contributions, while 50 cents was contributed from surplus funds deposited in the trust fund). The overall rate of return was therefore equal to one-third times the rate of return on the trust fund (which was 10 percent in our example) plus two-thirds times the rate of return on a pure pay-as-you-go system (which was zero in the example), or 0.33x(10%)+0.67x(0%) = 3.3 percent.

The smaller the size of the trust fund as a share of the total program, the more the overall rate of return approaches the return for the pure pay-as-you-go system. Similarly, the larger the size of the trust fund relative to the overall program, the closer the overall rate of return becomes to the rate of the return on the trust fund. That lesson holds not just in our simplified example, but in the real world as well.

The Assets Held by the Social Security Trust Fund

Under the Social Security Act, the Social Security Trust Fund holds assets for which the U.S. government guarantees both principal and interest. The vast majority of the Trust Fund's assets are special-purpose Treasury securities, which are not tradeable.[27]

Some proposals, including those the Clinton administration has put forth, would allow Trust Fund assets to be invested in private-sector securities. The investments would be managed by an independent board, which would select private-sector fund managers through competitive bidding to do the actual investing. Similarly, Canada has recently changed the regulations governing its Social Security system to allow that system to invest a portion of its reserves in private securities.[28]

Allowing investment of a portion of Social Security Trust Fund reserves in private securities would raise the measured rate of return on Social Security contributions. Between 1959 and 1996, the special-purpose Treasury securities held by the Trust Fund earned 3.84 percent per year less than a broad market index of equities. Allowing the Trust Fund to invest in private securities also would affect the risk associated with the Trust Fund's assets, since the special-purpose Treasure securities to which the Trust Fund is now limited have essentially no risk. (Whether the rate of

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[27] Special-purpose Treasury securities issued on a specific date carry a yield equal to the average market yield on that date for all marketable Treasury bonds with an outstanding maturity of four years or more. They are always redeemable at par, which means that their value does not vary with movements in market interest rates (unlike tradeable bonds).

[28] For a discussion of the Canadian program, see David Slater, "Prudence and Performance: Managing the CPP Investment Board," C.D. Howe Institute Commentary, Toronto.

return would increase if measured on a risk-adjusted basis is less clear. That issue is discussed in more detail below.[29])

[29] If a risk-adjusted gain exists, allowing the Trust Fund to invest in private-sector securities is critical for the results of the simplified example above to hold. In such a case, diversification into equities raises the risk-adjusted rate of return (see discussion in Chapter VIII below). If such diversification were available only under individual accounts but not under the Trust Fund, the rate-of-return comparison would suggest a gain to individual accounts, but this gain would occur only because the Trust Fund was artificially restricted from capturing the risk-adjusted benefit to investing in equities.

VI. The Simple Rate-of-Return Comparison and "Carve-Out" Individual Accounts

The foregoing discussion of the rate of return under Social Security provides background for this chapter, which explores the simple rate-of-return comparison when individual accounts are financed out of revenue that would otherwise flow into the Social Security program. Such accounts are often referred to as "carve-out" individual accounts, since they finance contributions by carving out part of current Social Security payroll revenue.

The simple rate-of-return comparison would suggest that carve-out individual accounts would yield more than Social Security contributions. The difficulty with such a comparison, as Geanakoplos, Mitchell, and Zeldes emphasize, is related to the high returns earned by early participants in the Social Security system (see page 19). In effect, all later generations must pay for those high returns. We do not avoid the burden of paying for the high rates of return enjoyed by early participants through the creation of individual accounts. That is the fundamental problem in the simple rate-of-return comparison involving "carve-out" individual accounts.

To understand the logic, return again to the example presented on pages 9 and 10. The excess return enjoyed by Generation A equaled $1. As the example explains, allowing Generation C to divert its payroll taxes into individual accounts would require some other source of financing for the benefits due to Generation B. That financing diminishes the ostensibly higher returns on individual accounts. In other words, once the $1 has been given away to Generation A, future generations must bear the burden regardless of whether individual accounts are created.

Alan Greenspan has made the same point in a slightly different way. He has noted, "Any move toward privatization will confront the problem of how to finance previously promised benefits. That would presumably involve making the implicit accrued unfunded liability of the current social security system to beneficiaries explicit."[30] In other words, moving toward a system of individual accounts would force us to recognize explicitly the benefits that we have promised under the current system but have not paid for in advance (the unfunded liability). The cost of financing that unfunded liability would reduce the net return to individual accounts.

Chairman Greenspan phrased his point in terms of the unfunded liability, while Geanakoplos, Mitchell, and Zeldes phrase theirs in terms of the excess returns that early Social Security beneficiaries received. But their point is precisely the same — the unfunded liability is the result of the earlier excess returns. To see why, again consider the simplified example from pages 9 and 10. The excess return to Generation A was $1, precisely the amount that would have to be raised to finance the benefits due to Generation B if Generation C were allowed to invest its $1 in individual accounts rather than contribute its $1 to the Social Security trust fund.

The conclusion, in the words of MIT economist Peter Diamond, is that "the reason the rate-of-return [for Social Security] remains below the market return is the presence of an unfunded liability...current workers must receive a lower return from Social Security to pay for the higher returns received by earlier generations. The same analysis holds for individual accounts. The creation of individual accounts does not change the history that leaves Social Security with unfunded liability. The rate-of-return [under such a retirement system], including both individual accounts and the financing of the transition, is not increased by the creation of individual accounts per se."[31]

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[30] United States Senate, November 20, 1997, page 4.

[31] Peter Diamond, Testimony before the Committee on Ways and Means, Subcommittee on Social Security, U.S. House of Representatives, June 18, 1998, available at www.house.gov/ways_means.

VII. The Simple Rate-of-Return Comparison and "Add-On" Individual Accounts

An alternative to financing individual accounts from funds diverted from the Social Security payroll tax is to finance individual accounts from other resources — either from an increase in the payroll tax rate or from the budget surplus. Individual accounts financed in this manner can be referred to as "add-on" individual accounts, since they are created on top of the existing funding for the Social Security program. In the Social Security Advisory Council's deliberations, Edward Gramlich put forward a proposal to finance add-on individual accounts from additional contributions; Martin Feldstein has proposed financing such accounts out of the projected budget surplus.

As the simplified example above shows, add-on individual accounts would raise the rate of return to Social Security. ("Social Security" is defined here to include the accounts.) But providing equivalent additional financing to the regular Social Security program also would raise the rate of return to that program, by increasing the size of the Trust Fund. (Such added funding would raise the overall rate of return on Social Security payroll contributions by increasing the relative size of the Trust Fund and reducing the relative size of the pure pay-as-you-go system.)

The simple rate-of-return comparison that many proponents of individual accounts use is misleading in this case; it compares the rate of return on the *additional* financing through add-on individual accounts to the rate of return on *existing* Social Security contributions, rather than to the rate of return on additional contributions to the traditional Social Security program. The difference is important.

Assume, for example, that the rules governing the Trust Fund were modified to allow investments in equities. Then consider $100 placed in individual accounts, with

the $100 invested half in equities and half in bonds. An extra $100 put in the Trust Fund and similarly invested would earn the same rate of return. (In fact, as discussed below, the extra funds placed in the trust fund would likely earn a *higher* rate of return net of administrative costs, since the Trust Fund almost certainly would enjoy lower administrative costs than individual accounts.) In short, the return on existing contributions is lower than the return on additional contributions, *regardless of whether the additional contributions are invested in the Trust Fund or individual accounts.* The simple rate-of-return comparison fails to recognize this effect.

The conclusion is clear — regardless of how individual accounts are financed, a comparison of the historical return on funds invested in the financial markets and the rate of return on *current* Social Security contributions is misleading in evaluating whether individual accounts are beneficial.

VIII. Other Problems with the Simple Comparison

The chapters above have highlighted the basic flaws in the simple rate-of-return comparison, regardless of how individual accounts are financed. This chapter briefly explores two other potential problems with such a comparison — risk and administrative costs.

Risk

Most individuals do not like risk. To compensate for higher risk and induce individuals to place money in investments with risk, riskier assets carry higher expected average returns. Risk is one of the principal reasons that stocks tend to have a relatively higher expected average rate of return than other financial assets.

By many common measures, stocks are relatively risky. The S&P 500 index has declined (in nominal terms) by more than 10 percent in eight of the past 70 years.[32] (In inflation-adjusted terms, the number of years of substantial decline is larger.) Moreover, individual stocks are considerably riskier than broad portfolios such as the S&P 500; many stocks decline even in years when the market rises overall. Economists also note that stock returns tend to be high during strong economic periods but can fall during bad times.

[32] Council of Economic Advisers, *Economic Report of the President 1997* (Government Printing Office: Washington, 1997), page 113. It should be noted that bonds also have risk in real terms. Bonds held to maturity have little or no risk in nominal terms, but they do have risk in real (inflation-adjusted) terms: If inflation turns out to be higher than expected, the real value of the bond's principal is reduced. That means that unexpected inflation poses a risk to bondholders. The Treasury Department has recently begun issuing inflation-indexed bonds that protect investors against such risk.

The risks embodied in stocks are highlighted by analysis that Gary Burtless of the Brookings Institution has conducted. Burtless studied the replacement rates that workers would have achieved (i.e., the percentage of their previous wages that their retirement incomes would equal) if they had invested two percent of their earnings in stock index funds each year over a 40-year work career and converted the accumulated balance to a retirement annuity upon reaching age 62. Workers reaching age 62 in 1968 would have enjoyed a 39 percent replacement rate from those investments (i.e., the monthly benefit from their retirement annuity would equal 39 percent of prior wages). By contrast, the replacement rate for workers retiring in 1974 — only six years later — would have been only 17 percent, or less than half as much.[33] While these precise estimates can be criticized, the central point that emerges from them cannot be: stock returns embody substantial variation from year to year.[34]

Since individuals are averse to risk, comparing average rates of return on assets with different risk characteristics is misleading. An asset with a higher average return but substantially more risk may *not* be preferable to a lower-yielding, lower-risk asset. While the *average* return for the riskier asset will be higher, the risk also is higher; some who invest in the asset will receive low returns, while others receive high returns. To analyze the relative attractiveness of different assets, most economists believe it is necessary to adjust for risk.

To evaluate assets with different risks on a comparable basis, economists use a *risk-adjusted* rate of return. Such a risk-adjusted rate of return takes the measured rate of return and adjusts it for the risk embodied in the asset. If the measured rate of return on an asset is high only because it is riskier than other assets, its risk-adjusted rate of return would not be high — the risk adjustment would eliminate the differential in the measured rate of return. The risk-adjusted rate of return thus allows us to evaluate measured rates of return on a comparable basis. Only to the extent that the risk-adjusted rate of return is higher on one asset than another would that asset necessarily be preferable to individuals.

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[33] Gary Burtless, Testimony before the Committee on Ways and Means, Subcommittee on Social Security, U.S. House of Representatives, June 18, 1998, available at www.house.gov/ways_means/.

[34] For a discussion of these calculations and their potential biases, see Henry J. Aaron and Robert D. Reischauer, *Countdown to Reform* (Century Foundation Press: New York, 1998), pages 32-36. Aaron and Reischauer discuss a version of the calculations that assumes that six percent of earnings are invested in the stock market rather than the 2 percent contribution rate assumed in the figures given above. With a six percent contribution rate, the replacement rates are higher but the large gap between the benefits of those who reach age 62 and retire in 1968 and those who reach 62 and retire in 1974 remains.

Economists have developed a variety of tools for measuring and correcting for risk to allow them to compute risk-adjusted rates of return. The task, however, is difficult. For example, it is hard to know precisely how risk adverse individuals are. "Risk" also may depend on a wide variety of factors. For example, some economists believe that over long enough periods, stocks are not particularly risky.[35]

These measurement problems complicate risk adjustments but do not reduce their importance. One critical question is whether the higher returns to stocks can be explained solely by their riskiness. Some economists have concluded they cannot — in other words, that the rate of return on stocks is higher than can be explained solely by their riskiness.[36] The complexities of risk adjustment make it difficult to reach a definitive conclusion.

If investing in stocks produces a gain after adjusting for risk, that would make such investments attractive. In such a case, permitting diversification into stocks — either through individual accounts or by allowing the Trust Fund to invest in private-sector securities — would raise the risk-adjusted rate of return. But the increase would not be as large as suggested by the *unadjusted* rate of return on stocks. Moreover, the increase in the rate of return would result from diversification into stocks, not from individual accounts *per se*, since the diversification could be accomplished either through the Trust Fund or through individual accounts.[37]

A full risk analysis of the Social Security system relative to a system of individual accounts would entail analyzing a wide variety of other risks in addition to equity risks. For example, the Social Security system is progressive and therefore provides a form of lifetime earnings insurance. If lifetime earnings are lower than expected, the

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[35] Jeremy Siegel, *Stocks for the Long Run* (McGraw Hill: New York, 1998).

[36] Rajnish Mehra and Edward Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics*, March 1985, pages 145-161.

[37] Investing in stocks through the Trust Fund, unlike investing through individual accounts, allows risk to be spread across generations. If the market turns down in a specific year, all generations can bear some of the burden if the investments are undertaken through the Trust Fund. But under a system of individual accounts, specific generations and individuals will bear the entire burden of the market downturn. The Trust Fund may therefore be a more effective means of absorbing risk than individual accounts.

The relative costs and benefits of investing in stocks through the Trust Fund or through individual accounts present an important policy issue. If the current statutory prohibition on trust fund investment in equities is maintained and stocks do produce a risk-adjusted gain, the risk-adjusted improvement in returns under individual accounts would be the result of the restrictions imposed on the Trust Fund rather than a result of the movement to individual accounts *per se*.

replacement rate from Social Security benefits is higher than expected, at least partially cushioning the blow in retirement of the lower-than-expected earnings. Furthermore, Social Security provides an annuity that is fully adjusted for inflation, ensuring that beneficiaries never outlive their funds or see them eroded by inflation. In addition, the Social Security system provides disability and survivors insurance in addition to retirement benefits. Individual accounts generally cannot match these features of the Social Security system. On the other hand, the Social Security system is subject to a variety of demographic and other risks that may be less significant under individual accounts. A comprehensive risk analysis is beyond the scope of this paper. The need for such a comprehensive risk analysis, however, provides yet another reason to be somewhat wary of the simple rate-of-return comparison.

In summary, the simple rate-of-return comparison ignores a variety of complicated risk issues. A higher rate of return that results purely from assuming more risk does not necessarily make individuals better off.

Administrative Costs

Another factor absent from the simple rate-of-return comparison is administrative costs. The simple rate-of-return comparison implicitly assumes that administrative costs are similar under Social Security and individual accounts. If administrative costs differ, however, the simple rate-of-return comparison is misleading for another reason. For any given gross rate of return, higher administrative costs reduce the net benefit to investors, which is the bottom line for them. The simple rate-of-return comparison does not adjust the market rate of return for differences in administrative costs between Social Security and individual accounts, providing another reason it does not accurately reflect the relative attractiveness of individual accounts.

The administrative costs of running the Social Security system are very low. The costs of administering the retirement and survivor's insurance programs amount to only 0.7 percent of benefit payments.[38]

Individual accounts would necessarily involve significantly higher administrative costs than the Social Security system, with the structure of the accounts determining how much higher the costs would be. One approach to individual accounts would be to have central management, similar to the Thrift Savings Plan for federal employees, with restricted investment options. The Advisory Council on Social

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[38] Henry J. Aaron and Robert D. Reischauer, *Countdown to Reform* (Century Foundation Press: New York, 1998), page 86. Note also that these administrative costs are already reflected in the rate of return on existing Social Security contributions.

Security estimated that administrative costs under such a system would amount to roughly 10 basis points per year. (A basis point equals one-hundredth of one percent of the account's balance.) Such costs, accumulated over 40 years of work, would reduce the ultimate value of an individual account by about two percent. More recent estimates suggest that under a Thrift Saving Plan-type approach, costs may be somewhat higher.[39]

An alternative approach would be a decentralized system of individual accounts, in which workers held their accounts with various financial firms and were allowed a broad array of investment options. Under such an approach, the costs would be much higher because of advertising expenses, the loss of economies-of-scale, financial company profits, and various other additional costs. The Advisory Council estimated that administrative costs under such a system would amount to roughly 100 basis points per year (or 1 percent of the account balance per year). Such costs would, over a 40-year work career, consume about 20 percent of the value of the account accumulated over the career.

Furthermore, the Advisory Council's estimate of the administrative costs for decentralized, or privately managed, individual accounts was an estimate for accounts funded by diverting five percent of the wages from the Social Security Trust Fund to individual accounts. Some administrative costs are fixed and do not relate to the size of an account. Such fixed administrative costs would therefore consume a larger percentage of amounts accumulated in smaller accounts. Most current proposals that involve converting a portion of Social Security to privately managed individual accounts envision accounts considerably smaller than those the Advisory Council examined. Most such proposals would establish accounts funded by two percent or three percent of wages, rather than five percent. The administrative costs could therefore consume more than 20 percent of the account's value over a typical working career.

Experience from both Chile and the United Kingdom supports these observations and indicates that a decentralized system of individual accounts would involve far higher administrative costs than Social Security.[40] Both Chile and the United

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[39] See, for example, Peter Diamond, "Administrative Costs and Equilibrium Charges with Individual Accounts," presented at NBER Conference on Administrative Costs of Individual Accounts, December 4, 1998.

[40] For more extensive discussions of the likely administrative costs under individual accounts, see National Academy of Social Insurance, "Report of the Panel on Privatization of Social Security," available at www.nasi.org; Peter Diamond, "Administrative Costs and Equilibrium Charges with Individual Accounts," presented at NBER Conference on Administrative Costs of Individual Accounts, December 4, 1998; Estelle James, Gary Ferrier, James Smalhout, and Dimitri Vittas, "Mutual Funds and Institutional

(continued...)

Kingdom have decentralized, privately managed accounts, and administrative costs in both countries have proven to be surprisingly high.[41]

Individual accounts thus are almost certain to be more expensive to administer than the current Social Security system. The cost differential would depend on how such accounts were designed. The existence of any administrative cost differential provides another reason to be wary of the simple rate-of-return comparison.

[40] (...continued)
Investments: What is the Most Efficient Way to Set Up Individual Accounts in a Social Security System?" NBER Conference on Administrative Costs of Individual Accounts, December 4, 1998; and Olivia Mitchell, "Administrative Costs in Public and Private Retirement Systems," in Martin Feldstein, ed., *Privatizing Social Security* (University of Chicago Press: Chicago, 1998).

[41] See, for example, Peter Diamond, "The Economics of Social Security Reform," in R. Douglas Arnold, Michael J. Graetz, and Alicia H. Munnell, eds., *Framing the Social Security Debate: Values, Politics, and Economics* (Brookings Institution Press: Washington, 1998), pages 38-64; Congressional Budget Office, *Social Security Privatization: Experiences Abroad*, January 1999, available at www.cbo.gov.; and Mamti Murthi, J. Michael Orszag, and Peter R. Orszag, "The Charge Ratio on Individual Accounts: Lessons from the U.K. experience," Birkbeck College Working Paper 99-2, March 1999 (University of London), available at http://econ.bbk.ac.uk/ukcosts.

IX. Conclusion

Many proponents of individual accounts cite the higher rate of return on the stock market relative to Social Security contributions as the most important benefit of individual accounts. Such a comparison is misguided — it either neglects the costs of paying for current benefits or the fact that *additional* funding for Social Security also would earn a higher rate of return than *existing* contributions. In addition, it ignores potential differences in risk and administrative costs.

Individual accounts have a wide variety of costs and benefits, all of which deserve careful scrutiny in the current debate. But the simple rate-of-return comparison promoted by some advocates of individual accounts confuses rather than informs the debate.

Technical Appendix: The Arithmetic of Samuelson's Formula for Rates of Return Under Pay-As-You-Go Systems

Paul Samuelson has shown that the real rate of return to a pay-as-you-go system is equal to the growth rate in productivity plus the growth rate in the labor force. This result may be most easily understood by realizing that under a pay-as-you-go system, total benefits are equal to total taxes. Furthermore, if a payroll tax rate is established on earnings, total taxes will be proportional to total earnings. The growth rate in total taxes is therefore equal to the growth rate in total earnings, which itself is equal to the growth rate in productivity plus the growth rate in the labor force.[42]

Consider a generation that pays taxes in one period (which fund benefits for current retirees) and that subsequently receives benefits when it retires (which are paid for by subsequent generations of workers). The increase in total taxes between the period in which the generation is working and the period in which it retires will equal the growth rate in productivity plus the growth rate in the labor force, as explained above. Since the system is a pay-as-you-go one, the taxes in the second period equal the benefits paid in that period. Therefore, the benefits in the second period (which again are equal to the taxes in the second period) will be equal to the taxes paid in the first period scaled up by productivity and labor force growth. In other words, the

[42] This statement assumes either that all earnings are taxable (unlike in the U.S. system, under which earnings above the maximum taxable limit are not taxed), or that taxable earnings grow at the same rate as total earnings. The statement will not be true if the system includes a maximum taxable earnings amount (as in the U.S.), and earnings inequality widens (in particular, if wage growth above the maximum taxable earnings exceeds wage growth beneath it).

generation under scrutiny will earn a rate of return equal to the rate of growth in productivity plus the rate of growth in the labor force. The same logic applies to all future generations as well.

The point can be expressed in algebra. Assume there are N workers in the first period and that the workforce grows by g percent per period. Then there will be N(1+g) workers in the second period. Also assume that output per worker is y in the first period and that it grows by k percent per period.[43] Then output per worker will be equal to y(1+k) in the second period. If benefits under the pay-as-you-go system are financed by a tax at constant rate t, the rate of return to the first group of workers is approximately g+k, or the sum of the labor force growth rate and the productivity growth rate.[44]

Contribution per worker in first period = ty

Benefit per retiree in second period

$$= \frac{\text{Total taxes}}{\text{Retirees}} = \frac{\text{Tax rate x output per worker x number of workers in period 2}}{\text{Number of workers in period 1}} = \frac{ty(1+k)N(1+g)}{N} = ty(1+k)(1+g)$$

$$\text{Rate of return} = \frac{Benefits}{Taxes} - 1 = \frac{(ty)(1+k)(1+g)}{ty} - 1 = (1+k)(1+g) - 1 \approx k + g$$

[43] As noted in a footnote in the text above, economists assume that over the long run, k will represent both productivity growth and real wage growth.

[44] Most economists believe that this rate of return (g+k) is below the market interest rate (r). That assumption is implicitly applied throughout this paper.