

Generational Accounting

by Laurence J. Kotlikoff

Generational Accounting

Generational accounting is a method of long-term fiscal analysis and planning developed by myself, Alan Auerbach, and Jagadeesh Gokhale.¹ Its goals are to assess the sustainability of fiscal policy and to measure the fiscal burdens facing current and future generations.

Although generational accounting is only five years old, it has already been applied to the United States, Germany, Italy, Norway, Sweden, Canada, New Zealand, Australia, and Thailand. In addition, generational accounting projects are under way for Japan, Portugal, and Argentina. Interest in generational accounting is not just academic. In Italy, Norway, New Zealand, Japan, and Argentina, generational accounting was, or is, being done by governmental bodies such as the Bank of Japan and the New Zealand Treasury. The generational accounts for Sweden and Thailand were produced by the International Monetary Fund and The World Bank. Finally, the U.S. government has included U.S. generational accounts in past editions of the *Federal Budget*.

This article briefly describes generational accounting, compares it to deficit accounting, applies it to U.S. fiscal policy, considers its shortcomings, and suggests areas for future research.

How it Works and What it Does

Generational accounting is based on the government's intertemporal budget constraint which requires that either current or future generations pay the government's bills. The government's bills refer to the present value of the government's projected future purchases of goods and services plus its official net financial liabilities. Subtracting from these bills the present value of projected future net tax payments of current generations gives the present value net tax burden facing future generations implied by

current policy. Net tax payments are taxes paid less Social Security, Medicare, and other transfer payments received.²

The net tax burden facing future generations can be divided by the present value of their projected labor earnings to produce a lifetime net tax rate. By comparing the lifetime net tax rates facing future generations with that facing current newborns (who are assumed to pay, over their lifetimes, only the net taxes implied by current policy), one can assess the sustainability of current fiscal policies. For example, if the lifetime net tax rate facing future generations is higher than that facing newborns, maintaining current policy through time, which means taxing successive new generations at the same rate as current generations, is not sustainable because it won't suffice to pay for the government's bills.

Besides comparing the lifetime net tax rates facing future generations with that of newborns, generational accounting calculates the present value changes in net taxes of generations, both living and future, resulting from changes in fiscal policies. Take an expansion of pay-as-you-go-financed Social Security retirement benefits. Generational accounting shows that this policy helps current older generations and harms current younger and future generations. Specifically, it records the reduction in the present value net tax payments of older generations arising under the policy and the increase in the present value net tax payments of young and future generations (whose increased payroll taxes have a larger present value than do their increased Social Security retirement benefits).³

Finally, generational accounting can identify the set of sustainable policies available to the government. For example, generational accounting can calculate the immediate and permanent annual percentage increase

in income tax revenues (relative to the baseline projected time path of these revenues) needed to achieve intertemporal budget balance. This calculation takes the government's projected expenditures and non-income tax receipts as given and asks: "By what percentage would one need to immediately and permanently raise income taxes so as to be able (in conjunction with other tax receipts) to pay for the government's projected future expenditures and its current net financial liabilities and never have to raise taxes again?"

This sustainability calculation is, by the way, essentially identical to that undertaken annually by the Social Security trustees when they calculate the immediate and permanent percentage increase in payroll taxes needed to equate the present value of projected future Social Security expenditures to the present value of projected future taxes plus the current Social Security trust fund. Indeed, if one were to include only Social Security benefits and taxes in the construction of generational accounts, one would end up with, essentially, the *Trustee's Report of the Social Security Administration*.

Scope and Construction of Generational Accounts

Like the *Trustee's Report*, generational accounting incorporates fiscal, demographic, and growth projections. But unlike the *Trustee's Report*, which considers only Social Security taxes, transfers, and assets, generational accounting provides a comprehensive analysis of the United States' and other countries' fiscal situations. It does so by considering all taxes, transfers, and net financial liabilities, as well as all government spending at all levels of government (federal, state, and local).

The projections used in U.S. generational accounting are provided by the government, including the Office of Management and Budget,

the Social Security Administration, and the Health Care Financing Administration. Projected totals of taxes and transfers (on a national income account basis) are distributed by age and sex to existing generations based on age-sex profiles derived from cross-section surveys and other information. Generational accounting simply applies arithmetic to these data. So generational accounting is not a complicated "black box." Instead, it is a straightforward means of drawing out the collective implications of the government's separate fiscal, demographic, and growth projections.

U.S. Generational Accounts

Chart 1 presents lifetime net tax rates of generations born in this century and future generations.⁴ The light bars show the net tax rates under baseline policy—U.S. fiscal policy as of 1995. The dark bars show net tax rates under the Republican budget passed by Congress and rejected by the President in the late Fall of 1995—a budget which promised to reduce the deficit to zero by 2002.

Under baseline policy, lifetime net tax rates increase from 24 percent for the generation born at the turn of the century to 34 percent for children who have just been born. In other words, over the course of this century the net tax rate of successive living generations rises by over 40 percent. This growth in net taxation notwithstanding, future generations face a dramatically higher lifetime net tax rate—one equal to 84 percent!⁵ Note that this is a net, not a gross, tax rate. Since future generations would receive positive transfer payments, their gross tax rate would exceed 84 percent.

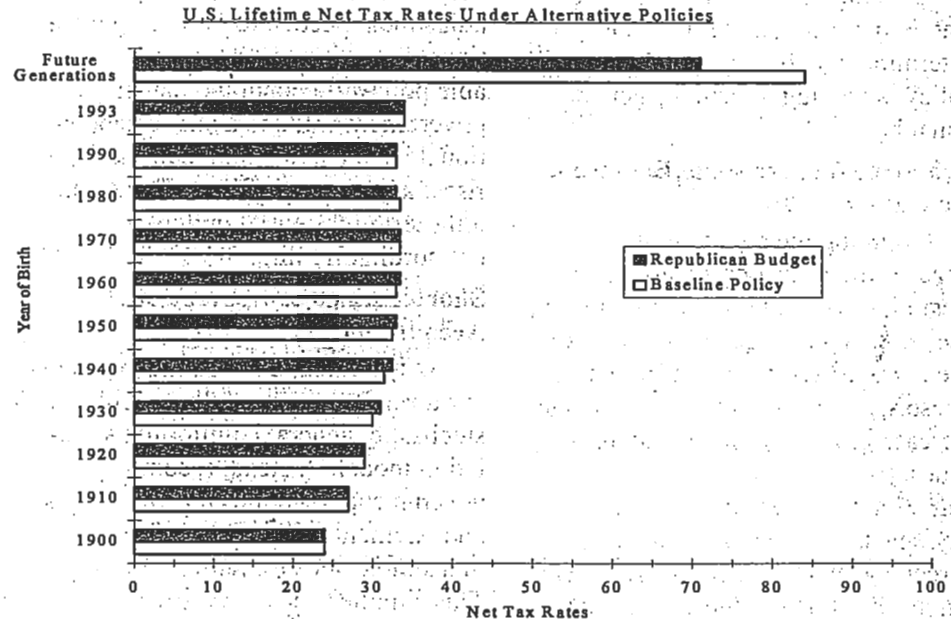
Next, consider the Republican budget plan. This plan raises the net tax rates of current generations primarily by slowing the growth of Medicare and Medicaid transfers. The higher net taxation of current generations, coupled with reduced levels of future government purchases,

lowers the net tax rate facing future generations; but not by much. The rate declines from 84 percent to only 71 percent, whereas the 34 percent net tax rate facing newborn increases only marginally.⁶ Thus, Chart 1 tells us that waiting until 2002 to balance the budget is doing too little too late to stabilize the net tax burden facing future Americans.

Generational Accounting Versus Deficit Accounting

As just illustrated, budget balance and generational balance bear no necessary relationship. Nor should they. Notwithstanding its ubiquitous use in the analysis of fiscal affairs, the deficit is neither a well-defined economic concept nor the answer to a well-posed economic question. Rather,

Chart 1



Should one be surprised that the Republican budget doesn't come close to achieving generational balance, defined as equal lifetime net tax rates facing newborn and future generations? Not really. The plan doesn't reduce government debt. Instead, it lets it grow by hundreds of billions of dollars for seven more years and provides no guarantee that it won't grow at record rates thereafter. The plan doesn't stabilize the growth of Medicare and Medicaid benefits. These benefits continue to grow year after year at roughly twice the rate of the economy. And the plan doesn't change America's demographic/fiscal dilemma—the fact that the enormous cohort of baby boomers starts collecting Social Security benefits in just twelve years and Medicare benefits in just fifteen years.

it is a reflection of economically arbitrary decisions by the government with respect to the labeling of government receipts and payments.⁷ This is not the case for generational accounting, since the answers to the key economic questions addressed by generational accounting are invariant to the choice of fiscal labels.⁸

Take, for example, the view of many members of Congress that "the" federal deficit should be defined to exclude Social Security's surplus. Under such a definition, the Administration's 1995 plan to balance "the" budget in 2005 produces a \$120 billion deficit in that year rather than a zero deficit.⁹ If the deficit is defined to exclude all Social Security contributions (not simply those in excess of outlays) on the grounds that each

dollar contributed purchases an implicit I.O.U. for future benefits from the government, the 2005 deficit under the Administration's policy is over \$1 trillion rather than zero!

Given that the deficit's definition is arbitrary, it's not clear what fundamental policy objective, if any, is being pursued by balancing "the" budget. What is clear, however, is that generational accounting, rather than deficit accounting, is needed to determine whether any particular policy is helping to achieve generational balance.

Achieving Generational Balance in the United States

Assuming the adoption of the Republican budget or a reasonable facsimile, what additional policies are needed to achieve generation balance? We assessed three types of policies. These are (a) a permanent percentage increase in federal income tax revenues, (b) a permanent percentage reduction in all federal transfer payments, and (c) a permanent percentage cut in federal government purchases. Each of these policies is sustainable in that, once undertaken, no additional adjustments are projected to be needed to satisfy the government's intertemporal budget constraint.

Achieving generational balance by raising federal income taxes requires a 41 percent increase in revenues if taxes are raised starting in 1996 and a 61 percent increase if they are raised starting in 2006.¹⁰ The equalized lifetime net tax rates facing current and future newborns are, in these two cases, 41 and 44 percent, respectively. If cuts in Social Security, Medicare, and other federal transfer payments are used instead to achieve generational balance, a 30 percent cut is needed starting in 1996 and a 43 percent cut is needed starting in 2006.¹¹ For these two policies, the equalized lifetime net tax rates are 38 and 40 percent, respectively. Finally, generational balance could be

achieved by cutting federal purchases by 71 percent starting in 1996 or by an infeasible 109 percent starting in 2006. In both of these cases, the equalized lifetime net tax rate is 34 percent.¹²

These findings tell us three things: First, the 1995 Republican budget and, by extension, the Administration's 1995 budget, fall very far short of the kinds of fiscal adjustment needed to produce generational balance and achieve a sustainable policy. Second, the longer the government waits to achieve generational balance, the more painful the fiscal adjustment will be. Third, the long-term U.S. fiscal outlook is extraordinarily dire.

Shortcomings of Generational Accounting

As indicated, generational accounting doesn't rely on a fully articulated, stochastic, general equilibrium simulation model. Instead, it combines government's own forecasts of receipts and payments with other information in a simple and straightforward way. This simplicity is both a strength and a weakness. I would much prefer policymakers to consider general equilibrium models, indeed a range of such models, in formulating their policies. But, as a practical matter, generational accounting may be the best, long-term fiscal planning tool that policymakers would actually use.

Because generational accounting does not consider general equilibrium feedbacks, it only provides an approximation to the true generational welfare effects (incidence) of changes in fiscal policy.¹³ The quality of this approximation depends on the extent to which the actual incidence of fiscal changes is distributed across generations in accordance with generational accounting procedures for allocating aggregate changes in taxes and transfers to specific generations.

Hans Fehr and I studied the size of the approximation error in using generational accounting to assess

generational incidence.¹⁴ We simulated a variety of fiscal policies in closed- and open-economy versions of the Auerbach-Kotlikoff Dynamic Life-Cycle Simulation Model and compared the dollar value of the actual change in utility of particular generations with the change in their generational accounts. We found that changes in generational accounts generally provide fairly good approximations to generations' actual utility changes. The approximations are better for living generations. They are worse for policies that involve significant changes in fiscal distortions, and they are worse in economies with sizable capital-adjustment costs.

Using a life-cycle model automatically rules out the possibility, raised by Robert Barro and Gary Becker, that private intergenerational transfers offset government intergenerational redistribution. Were such the case, there would be much less need for generational accounting. However, recent coauthored studies of mine sharply reject such models. At the cohort level, postwar U.S. intergenerational redistribution from young and future generations to older generations has been associated with dramatic increases in the relative consumption of older Americans.¹⁵ The data speak quite clearly: Older generations are spending the transfers they receive; they aren't giving them to their children via larger inter vivos transfers or leaving them to their children via larger bequests. Indeed, the U.S. government's past and ongoing policy of transferring from young savers to old spenders appears to be the major cause for the greater than two-thirds decline in the U.S. national saving rate since 1950.¹⁶ This cohort-level rejection of intergenerational altruism is very strongly confirmed by studies of the consumption and inter vivos transfers of individual extended American families.¹⁷

Perhaps the most important concern about generational accounting

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is the choice of the proper discount rate to use in an uncertain world featuring multiple assets and incomplete markets. The key question is how to properly discount future tax payments and transfer receipts in light of the riskiness of these payments and receipts. This is an important area for future research on generational accounting.

Conclusion

Notwithstanding all the attention they receive, fiscal deficits are largely besides the point when it comes to considering either the sustainability of fiscal policy or the fiscal burdens being foisted on young and future generations. In contrast to deficit accounting, generational accounting represents a direct attempt to assess the sustainability of fiscal policy and to determine which generations will pay for the government's bill. Application of general accounting to the United States shows that current U.S. fiscal policy is unsustainable and that recent budget proposals fall far short of what is needed to prevent placing enormous fiscal burdens on today's and tomorrow's children.

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¹ See Auerbach, Alan J., Jagadeesh Gokhale, and Laurence J. Kotlikoff, "Generational Accounts: A Meaningful Alternative to Deficit Accounting," in D. Bradford, ed., *NBER Volume, Tax Policy and the Economy*, vol. 5, Cambridge, MIT Press, 1991, pp. 55-110 and Kotlikoff, Laurence J., *Generational Accounting*, New York, N.Y.: The Free Press, 1992.

² The fact that the government's bills left unpaid by current generations must be paid by future generations does not mean that future generations must pay-off (retire) official government debt at some finite future date. They do, however, have to service the debt.

³ This statement assumes that the return to capital exceeds the growth rate of the economy.

⁴ A generation's lifetime net rate is defined as the ratio of its lifetime net tax payment to its lifetime labor earnings, both of which are

measured as present values discounted to the year the generation is born.

⁵ Again, this figure is high, in part, because it is based on a counterfactual experiment in which currently living generations are assumed to pay, over the remainder of their lives, only the net taxes implied by current policy.

⁶ The net tax rate facing current newborns is increased because of the reduced growth in Medicare and Medicaid, but reduced because of the Republicans' plan to cut income taxes. These calculations incorporate a 6 percent real discount rate. The corresponding net tax rates for current newborns and future generations based on a 3 percent real discount rate are 23 and 51 percent under baseline policy and 27 and 45 percent under the Republican budget plan. Note that the *generational imbalance* in baseline policy, defined as the ratio of the net tax rate facing future generations to that facing newborns, is quite similar whether one uses a 6 or 3 percent discount rate. With a 6 percent discount rate, the ratio is 2.5, with a 3 percent rate, the ratio is 2.2. Under the Republican plan, generational imbalance is 2.1 with a 6 percent discount rate and 1.7 percent with a 3 percent discount rate.

⁷ Martin Feldstein's study, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," *Journal of Political Economy*, vol. 82, 1974, made a seminal contribution in pointing out not only that pay-as-you-go Social Security programs could reduce national saving, but also that the government's measure of debt excludes unfunded Social Security liabilities. In so doing, Feldstein implicitly raised the question of whether the debt and it changes over time were well-defined concepts.

⁸ These questions are (a) how the fiscal burden facing newborns compares with that facing future generations, and (b) how changes in policy alter the fiscal burdens of living and future generations.

⁹ Under intermediate assumptions, the Social Security Trustees project a surplus of \$134.9 billion in 2005 (see 1995 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors' Insurance and Disability Insurance Trust Funds*, p. 181).

¹⁰ These tax increases are calculated assuming a 6 percent real discount rate. If one uses a 3 percent real discount rate, the requisite federal income tax increases are 54 percent starting in 1996 and 62 percent starting in 2006.

¹¹ These transfer cuts are calculated assuming a 6 percent real discount rate. If one uses a 3 percent real discount rate, the requisite cut in transfer payments is 35 percent starting

in 1996 and 74 percent starting in 2006.

¹² This cut in federal spending is calculated assuming a 6 percent real discount rate. If one uses a 3 percent real discount rate, the requisite spending cut is 95 percent starting in 1996 and above 100 percent starting in 2006.

¹³ For a critique of generational accounting and a reply, see Robert Haveman, "Should Generational Accounts Replace Public Budgets and Deficits?" and Auerbach, Alan J., Jagadeesh Gokhale, and Laurence J. Kotlikoff, "Generational Accounting: A Meaningful Way to Evaluate Fiscal Policy." Both articles appear in *The Journal of Economic Perspectives*, Vol. 8, no. 1, Winter 1994.

¹⁴ See Fehr, Hans, and Laurence J. Kotlikoff, "Generational Accounting in General Equilibrium," NBER working paper no. 5090, April 1995.

¹⁵ See Abel, Andrew, and Laurence J. Kotlikoff, "Intergenerational Altruism and the Effectiveness of Fiscal Policy—New Tests Based on Cohort Data," in *Savings and Bequests*, Toshiaki Tachibanaki, ed., Ann Arbor, Michigan: The University of Michigan Press, 1994, pp. 167-196 (NBER Reprint 1928).

¹⁶ Gokhale, Jagadeesh, Laurence J. Kotlikoff, and John Sabelhaus, "Understanding the Postwar Decline in U.S. Saving: A Cohort Analysis," forthcoming in *The Brookings Papers on Economic Activity*, 1996 shows that the government's intergenerational redistribution from young and future generations to the elderly is responsible for the postwar decline in U.S. saving. In addition, Auerbach, Alan J., Jagadeesh Gokhale, David N. Weil, "The Annuitization of Americans' Resources: A Cohort Analysis," NBER working paper no. 5089, April 1995, shows that, as a share of their resources, older Americans have reduced their life insurance holdings, not increased them, in response to an increase in the annuitization of their resources.

¹⁷ See Altonji, Joseph, Fumio Hayashi, and Laurence J. Kotlikoff, "Is the Extended Family Altruistically Linked? New Tests Based on Micro Data," *The American Economic Review*, December 1992 (NBER Reprint 1811), Hayashi, Fumio, Joseph Altonji, and Laurence J. Kotlikoff, "Risk Sharing Between and Within Families," NBER working paper no. 3834, forthcoming in *Econometrica*, 1996, and "Parental Altruism and Intergenerational Transfers: Theory and Evidence," forthcoming NBER working paper, Boston University Institute for Economic Development working paper no. 65, Oct. 1995.