FISCAL AND GENERATIONAL IMBALANCES: NEW BUDGET MEASURES FOR NEW BUDGET PRIORITIES

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Introduction

Traditional budget measures are becoming obsolete as federal budget priorities shift from providing "brick and mortar" public goods toward delivering social insurance services. As the share of retirees in the nation's population balloons and human life spans continue to lengthen, Social Security and Medicare transfers will increasingly dominate total federal outlays. Traditional annual cash-flow budget measures may have been sufficient when Congress could directly allocate almost all budgetary resources via the annual appropriations process. During this century, however, federal spending will be determined mostly by factors outside of short-term legislative control. Because the current structure of Social Security and Medicare involves long-term payment obligations, backward looking or short-term measures such as debt and deficits need to be complemented by long-term, forward looking ones that explicitly measure future payment obligations relative to the resources available to meet them under current laws. Such measures are needed to assess how far the federal budget is from fiscal sustainability, and the size of policy changes needed to achieve sustainability.

Many, if not most, analysts and policymakers use traditional fiscal measures such as debt held by the public, deficit projections over limited (usually five- or ten-year) horizons, or 75-year estimates of Social Security and Medicare financial

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shortfalls.[1] Some budget analysts acknowledge that short-term measures such as national debt and deficits are inadequate, as they significantly understate the financial shortfall that the federal government faces under today's fiscal policies.[2] As a consequence, the degree to which current policy is unsustainable remains hidden from policymakers. In addition, we argue here, reliance on traditional measures introduces a policy bias favoring current debt minimization at the expense of policies that are sounder from a long-term perspective. Even under 75-year budget measures, we believe the federal fiscal shortfall would be significantly understated, hindering objective fiscal policymaking. Nevertheless, official budgeting agencies continue to promote such measures: The recently published Budget of the United States Government for Fiscal Year 2004 (hereafter Budget) reports 75-year "actuarial deficiency" measures for Social Security and Medicare.

We propose that federal budget agencies such as the Office of Management and Budget and the Congressional Budget Office should begin reporting a pair of measures on a regular basis to track the true costs of current fiscal policy: Fiscal Imbalance (FI) and Generational Imbalance (GI). The FI measure for the federal government is the current federal debt held by the public plus the present value in today's dollars of all projected federal non-interest spending, minus all projected federal receipts. The FI measure indicates the amount in today's dollars by which fiscal policy must be changed in order to be sustainable: A sustainable fiscal policy requires FI to be zero.[3]

The GI measure indicates how much of this imbalance is caused, in particular, by past and current generations. The FI measure is similar to the standard perpetuity "open-group liability" concept that is sometimes used to analyze shortfalls in social insurance programs, while the GI measure is similar to the standard "closed-group liability" concept. The FI measure is also sometimes called the "fiscal gap" (see Auerbach, Gale, Orszag and Potter, 2003). We argue here that the FI and GI measures together possess several desirable properties, the most important being that they render policy decisions free of the aforementioned bias because they enable comparisons of alternative policies on a neutral footing.

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1 See Budget of the United States Government, Fiscal Year 2004, Analytical Perspectives, Chapter 3 "Stewardship".

2 "Beyond Borrowing: Meeting the Government's Financial Challenges in the 21st Century," Remarks of Under Secretary of the Treasury Peter R. Fisher to the Columbus Council on World Affairs Columbus, Ohio, 14 November 2002, available at http://www.ustreas.gov/press/releases/po3622.htm. See also the related subsequent article by Steven Cecchetti, "A Forward Looking Fiscal Policy Strategy," Financial Times, 23 December 2002, available at http://economics.sbs.ohio-state.edu/cecchetti/pdf/cpi23.pdf. Also see Howell Jackson (2002). For an even more recent discussion, see the Federal Reserve Board's Semiannual Monetary Policy Report to the Congress Before the United States Senate Committee on Banking, Housing, and Urban Affairs, 11 February 2003, available at: http://www.federalreserve.gov/boarddocs/hh/2003/february/testimony.htm

3 This requirement assumes that the economy is characterized by "dynamic efficiency." A dynamically inefficient economy is one with excessive capital relative to the labor force – one where living standards can be improved by discarding capital. Abel, Mankiw, Summers, and Zeckhauser (1989) suggest that the U.S. economy has been characterized by dynamic efficiency since 1929.

The Fiscal Imbalance associated with today's federal fiscal policy is very large. Taking present values as of fiscal year-end 2002, and interpreting the policies in the FY 2004 federal budget as "current policies," the federal government's total Fiscal Imbalance is $44.2 trillion. By "present value," we mean that all future spending and revenue are not only reduced for inflation but are additionally discounted by the government's (inflation-adjusted) long-term borrowing rate. This calculation allows us to determine how much money the government must come up with *immediately* to put fiscal policy on a sustainable course. Since the government obviously does not have an extra $44.2 trillion today, it must make cuts or increase revenue in future years that add up to $44.2 trillion in present value. Of course, for their discounted value to equal $44.2 trillion in *present value*, the cumulative value of these policies will have to be substantially *more than* $44.2 trillion. See Box 1 for a discussion of the present value concept.

Of the current federal FI of $44.2 trillion, Social Security's FI is about $7 trillion in present value. Medicare's FI is $36.6 trillion (for both Parts A and B), of which Part A (the Hospital Insurance program) contributes $20.5 trillion and Part B (the Supplementary Medical Insurance program) contributes $16.1 trillion.[4] By contrast, the rest of the federal government's FI is only $0.5 trillion, which comprises a $4.6 trillion surplus in revenues minus obligations to Social Security, Medicare, and publicly held debt of $5.1 trillion.

Our estimate of today's federal Fiscal Imbalance is more than ten times as large as today's debt held by the public that arose from *past* federal financial shortfalls. The reason is that FI also includes *prospective* financial shortfalls. Hence, policy changes that only eliminate the debt held by the public would still leave the federal government far from being financially solvent. In particular, spending must be reduced and/or taxes increased in order to put federal fiscal policy on a sustainable course. Moreover, the FI grows by about $1.6 trillion per year to about $54 trillion by just 2008 unless corrective policies are implemented before then. This rapid annual increment is also around ten times as large as the official annual deficit reported for 2002.

How much must we cut federal spending or increase federal receipts to eliminate the current $44.2 trillion FI? We estimate that an additional 16.6 per cent of annual payrolls would have to be taxed away *forever* beginning *today* to achieve long-term fiscal sustainability – implying a greater than doubling of the current payroll tax rate of 15.3 per cent that is currently paid in equal shares by employees and employers to the Social Security and Medicare systems. Alternatively, income tax revenues would have to be hiked *permanently* by another two-thirds beginning immediately – increasing their share in GDP from 9.5 to 15.9 per cent. Yet other (equally drastic) alternatives would be to cut Social Security and Medicare

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[4] As we explain later, consistent with the Social Security and Medicare trustees, we assume that health care per capita grows one percentage point faster than GDP per capita until 2080 – a very conservative assumption relative to the past two decades. Between 2080 and 2100, the one percentage point differential is gradually reduced to zero, thereby assuming that health care spending grows no faster than GDP. Even with these very cautious assumptions, very large Medicare Fiscal Imbalances exist.

Box 1

Viewing government obligations and revenue in "present value"

As most investors know, a dollar received one year from today is not worth as much as a dollar received today. The reason is that a dollar received today can be invested, say in a bank account, to earn interest income over the year. This same intuition holds for the government as well. A dollar received in revenue in the future is not as valuable to the federal government as a dollar of revenue received today. The reason is that a dollar received today would allow the government to reduce its level of federal debt held by the public and, hence, reduce the interest payments it must make to nongovernment entities. Similarly, it costs the government more to pay a dollar today than paying a dollar next year, because of larger borrowing costs.

The "present value" operation is a way of converting future dollars to current dollars. It not only adjusts for changes in inflation over time, it additionally "discounts" (*i.e.*, reduces) the value of future dollars in order to recognize that a future dollar is not worth as much as a dollar received or paid today. Naturally, dollars in the distant future are discounted by more than dollars at a nearer date since the government must pay more interest income to borrow money over many years. The present value operation, therefore, allows us to consistently compare dollars received or owed at different times by adjusting for the interest costs. Failing to discount future dollars could potentially present a very misleading picture of the government's financial position by ignoring borrowing costs.

While the government often uses the present value operation to compare different policy options, the five-year and ten-year budget tables reported by OMB and the CBO are not stated in the present-value form. Instead, when describing accumulated deficits, the CBO and OMB use an *ad hoc* approach to adjust for the government's borrowing costs: They include interest spending as part of the government's outlay and then sum *undiscounted* values over different years. But this approach facilitates attempts at "budget arbitrage" even within the short five-year and ten-year budget windows. Bazelon and Smetters (1999) discuss how the present value concept is used in the federal budget process.

benefits by 45 per cent immediately and forever or *permanently* eliminate *all* future federal discretionary spending – although the latter policy still falls short by about $1.8 trillion. Moreover, the size of the necessary corrective policies will grow larger the longer their adoption is postponed. For example, waiting until just 2008 before initiating corrective policies would require a permanent increase in wage taxes by 18.2 percentage points, rather than 16.6 percentage points if we began today.

Finally, this monograph shows that the estimated Fiscal Imbalance remains large regardless of variations in underlying economic assumptions. Calculations under alternative growth and discount rate assumptions suggest a low-side estimate of federal FI of $29 trillion and, under very conservative assumptions, a high-side estimate of $64 trillion. Although FI expressed in today's dollars is fairly sensitive to these economic assumptions, we argue below that this sensitivity only strengthens the need to focus on FI rather than on traditional shorter-term fiscal measures. Furthermore, the ratios of FI to the present value of GDP and future payrolls – and consequently, estimates of tax hikes or spending cuts required to restore fiscal sustainability – are less sensitive to alternative economic assumptions because the denominators (GDP and the payroll base, respectively) are similarly sensitive to the underlying assumptions. As discussed below, although FI is smaller ($36.9 trillion) under our low productivity growth rate assumption, it declines by less than the present value of payrolls. Consequently, the wage-tax hike needed to eliminate FI is *larger* under the low productivity growth rate assumption – 18 percentage points compared to 16.6 percentage points under baseline assumptions. Under our high growth rate assumption, a 14.8 percentage point wage-tax increase would be needed to eliminate FI.

1. The fiscal imbalance measure

The federal government provides a myriad of public goods and services. Programs such as Social Security and Medicare provide retirement and health security to American citizens and residents. Other programs include national defense, homeland security, judicial and legislative operations, international diplomacy, transportation, energy, infrastructure development, education, and income support for the needy.

Whether these programs can continue to operate indefinitely at current service levels depends upon the availability of resources to finance them. All federal purchases and debt-service payments must be financed out of future federal revenues. Sources of federal revenue include tax receipts, net income of public enterprises, fees, and other levies. Although the government can borrow money, additional debt must also be serviced out of future tax receipts. Hence, current (net)

debt held by the public plus the government's future non-interest spending must be balanced over time by its future receipts.[5]

The government's total fiscal policy may be considered balanced if today's publicly held debt plus the present value of projected non-interest spending is equal to the present value of projected government receipts. The spending and revenue projections are made under today's fiscal policies. "Present values" mean that dollars paid or received throughout the future are discounted at the government's long-term interest rate in order to reflect their true value today (see Box 1). A fiscal policy that is balanced can be sustained without changing either federal outlays or federal revenues. Hence, the Fiscal Imbalance measure as of the end of year t is defined as

$$FI_t = PVE_t - PVR_t - A_t \tag{1}$$

This definition is simply understood as the excess of total expenditures over available resources in present value. Here, PVE_t stands for the present value of projected expenditures under current policies at the end of period t. PVR_t stands for the present value of projected receipts under current policies, and A_t represents assets in hand at the end of period t.

The FI measure can be calculated for the entire federal government. It can also be calculated separately for federal programs that are financed with dedicated revenues, such as Social Security and Medicare. FI can also be calculated for the rest of the government, reflecting the government's spending obligations and tax resources outside of Social Security and Medicare.

When calculating FI for programs such as Social Security and Medicare, A_t is positive and equal in value to the program's respective trust fund, which reflects the excess of previous payroll contributions over spending by past and current generations. When calculating FI for the rest of government, however, the value of A_t is negative since it reflects monies owed to these trust funds as well as the money owed to the public that is holding government debt. The level of debt held by the public, in turn, reflects the excess of spending over revenue by past and current generations.

While the variable A_t reflects the excess of revenue over spending done by past and current generations, the difference, $PVE_t - PVR_t$, shown in equation (1) reflects the contribution to FI from all projected financial shortfalls and surpluses – those on account of living and future generations. Hence, FI measures the aggregate financial shortfall from all generations – *past, living, and future*.

For the entire federal government's policy to be sustainable, its FI must be zero. The government cannot spend and owe more than it will receive as revenue in

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[5] Because outstanding debt held by the public is included among the obligations that must be financed, projected interest outlays are excluded when calculating the present value of projected spending to avoid double counting.

present value. In other words, while the government can spend more than it collects in taxes on *some* generations, other generations must eventually "pay the piper," thereby returning the fiscal imbalance to zero.[6] Similarly, FI's for programs such as Social Security and Medicare must equal zero if they are to continue without changes to revenues or outlays. Hence, if the FI measured under current policies is positive, those policies are unsustainable and policymakers will have to change them at some future point in time.

2. The generational imbalance measure

To be useful to policymakers, any proposed measure must be able to fully reflect the fiscal impact of all possible policy changes. The FI measure alone, however, is not capable of doing so for all types of policy changes. As is obvious from equation (1), any new policy that changes projected expenditures and revenues so that their increments are exactly equal in present value will produce offsetting increases in PVE_t and/or PVR_t, leaving FI unchanged. However, such FI-neutral policies could nevertheless transfer net tax burdens from living to future generations. Therefore, we need a complementary measure to show such redistributions of fiscal burdens.

For example, suppose that Congress passes legislation to immediately reduce Social Security payroll taxes but sharply increase payroll taxes in twenty years. If the revenue loss from the immediate tax reduction is equal in present value to the magnitude of the revenue gain in twenty years, then the value of PVR_t shown in equation (1) remains unchanged. As a result, Social Security's FI remains unchanged, as does the federal government's total FI. But clearly such a policy would shift substantial amounts of resources across generations.

As another example, suppose Congress creates a new Medicare benefit and finances it by raising payroll taxes such that each year's additional outlay is matched by additional revenue. By construction, this policy has no impact on Medicare's FI and, therefore, no impact on the federal government's total FI. The reason is that the values of PVE_t and PVR_t shown in equation (1) increase by the same amount after this policy change, thereby producing no change in the value of their difference, $PVE_t - PVR_t$. Nevertheless, this policy could potentially shift a substantial amount of resources away from future generations and toward current generations, similar to the previous example. In particular, current retirees and workers about to retire at the time of the policy change would gain from the new Medicare benefit, for which they will pay little or nothing. Younger workers and future generations, however, would be worse off because they will not fully recover the value of their additional taxes via their own additional retirement benefit: The investment income that they would

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[6] Geanakoplos, Mitchell, and Zeldes (1998) discuss the implications of this type of zero-sum constraint for analyzing Social Security reform.

lose on the resources now devoted to paying additional payroll taxes will not be fully made up by their future benefits.[7]

To identify such fiscally induced redistributions, therefore, we need to augment the FI measure with another measure. Because FI exclusively reflects the sustainability of a given policy, the complementary measure should indicate how FI is distributed across population subgroups. Although it is possible to complement FI with measures of its distribution across cohorts distinguished by year of birth, gender, race, and so forth, we adopt a more modest approach and follow the standard "closed-group liability" concept – showing the component of FI that arises due to *past and living generations.* We call this measure Generational Imbalance, or GI. We define the GI measure as:

$$GI_t = PVE_t^L - PVR_t^L - A_t \tag{2}$$

PVE_t^L represents the present value of projected outlays that will be paid to current generations, PVR_t^L represents the present value of projected tax revenues from the same generations. A_t again, represents the program's current assets. Note that if the program has positive current assets, past tax payments exceeded the program's outlays to date. Therefore, GI captures the part of FI arising from all transactions with past and living generations throughout their lifetimes. The projected contribution to FI by *future* generations simply equals the difference, FI minus GI.[8]

Our proposed GI measure should not be confused with Generational Accounting – the measure developed by Auerbach, Gokhale, and Kotlikoff (1991).[9] Generational Accounting involves a hypothetical policy reform that restores FI to zero by increasing the net tax burden on unborn generations. Generational Accounting's measure equals the difference in the net tax burdens per capita on current newborns (not affected by the hypothetical reform) and future generations. Hence, Generational Accounting's measure incorporates a hypothetical and sustainable policy. In contrast, the FI and GI measures correspond to current law, making them more applicable as a budget concept. One reason why the FI and GI measures are easy to understand is that they don't incorporate any hypothetical policy change.

Returning to the previous example, a new pay-as-you-go Medicare benefit would *increase* Medicare's imbalance on account of past and living generations (GI) and *reduce* the imbalance on account of future generations (FI-GI) by the same

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7 This result, again, assumes that the economy is dynamically efficient. See footnote 3.

8 As shown in Appendix A in Gokhale and Smetters (2003), the measure for future generations, FI-GI, can be further broken down into projected net transfers to each future birth cohort under current policy. These estimates are not reported in this paper, but they are available from the authors upon request.

9 For the latest available estimates of United States' generational accounts, see Gokhale and Kotlikoff (2001).

amount, leaving the overall Fiscal Imbalance (FI) unchanged (see Box 2). In other words, past and living generations would receive a windfall that is directly offset by a reduction in the resources available to future generations. Medicare's FI does not capture this redistribution because it adds together the net Medicare transfers received by all generations – past, living, and future – under current policies. This redistribution is, however, indicated by the change in GI.

Note that the traditional focus on the publicly held debt would also not capture the redistributive impact of the Medicare policy described earlier: Outstanding debt remains unchanged for any new outlay that is financed on a strictly pay-as-you-go basis since the outlays in each year are financed with taxes collected in that year. Note, however, that the level of publicly held debt *would* increase for a lengthy amount of time in the previous example where taxes are decreased initially and then increased after twenty years. Interestingly, both policies shift a large financial burden from current generations to future generations; in fact, with only minor adjustments, it is possible to construct both policies so that *identical* burdens are shifted across generations. Yet the level of publicly held debt increases in the tax cut example but not in the Medicare benefit example. This distinction makes little sense economically – a point emphasized by Kotlikoff (2001).

So, while the Fiscal Imbalance measure properly captures many large unfunded payment obligations not included in traditional accountings of public debt, both measures fail to reveal the resource transfers across generations that some policies can cause. The GI measure does, however, capture the redistributive effect of all policies. Under the pay-as-you-go financed Medicare policy described above, the GI measure increases even though FI does not change. Of course, this implies that the imbalance on account of future generations decreases. Hence, FI and GI measures taken together comprise a powerful analytical tool for policymakers, enabling more informed decisions.

In the future, policymakers must achieve two objectives simultaneously: First, they must reduce the Fiscal Imbalance to zero by a combination of increased taxes or reduced spending. This can be accomplished in a myriad of ways, each of which will affect the burden placed on future generations differently. For example, lowering the growth of entitlement benefits – which affects current retirees and those about to retire – will be more beneficial to future generations than increasing, say, payroll taxes – which leaves today's older generations unaffected but negatively impacts today's workers and future generations. Hence, the second objective for policymakers is to choose a policy that delivers the best tradeoff in costs imposed on different generations. The GI measure offers policymakers a parsimonious approach for analyzing this issue and choosing among different sustainable paths.

Identifying the GI component of FI is feasible for programs such as Social Security and Medicare, where outlays can be easily attributed to different individuals. It cannot be easily identified, however, for the rest of the federal government because the benefits of outlays (such as spending on national defense or public infrastructure) cannot easily be allocated to different generations. For example, much of the benefit from spending on education or national defense

Box 2

Pay-as-you-go programs and the generational imbalance measure

Consider the following simple example: Divide each generation's lifespan into two parts – "work" and "retirement." For simplicity, assume that both phases require the same length of time; that there is no inflation; that the interest rate equals 3 per cent; and that productivity growth always equals zero.[10] All generations are assumed to live for exactly two periods. A new generation of workers of fixed size is born in each period. One period's workers grow to be the next period's retirees. Hence, one generation of workers and one generation of retirees are alive in any given period.

Now suppose that a new pay-as-you-go Medicare program conferring $100 benefit to retirees is introduced in Period 1 and it is financed by a payroll tax on Period 1's workers of $100. The *net* value of this benefit to Period 1's retirees is $100 – equal to the benefit they receive in Period 1. For workers in Period 1, however, the value of the new program equals the present value of next period's Medicare benefit – $100/1.03 = $97.09 – minus Period 1's payroll tax of $100. Hence, the *net* value of this program for these workers is a *loss* of $2.91. It equals the present value of the interest they could have earned in Period 2 on their $100 payroll taxes – $3/1.03 = $2.91. Hence, the GI corresponding to just this new Medicare policy is $100 – $2.91 = $97.09. This GI will be in addition to any preexisting GI.

Now consider the impact of this Medicare policy on future generations. Workers in Period 2 also pay $100 when working and receive benefits worth $100 when retired. Hence, when the present value is taken as of Period 2, they also lose $2.91. However, discounting this loss back to Period 1 reduces it to $2.91/(1 + 0.03) = $2.83. Similarly, workers in Period 3 lose $2.91 when the present value is taken as of Period 3. But this loss equals $2.91/$(1 + 0.03)^2$ = $2.74 as of Period 1. As of Period 1, therefore, the present value loss to all future generations equals the sum: [$2.91/(1 + 0.03) + $2.91/$(1 + 0.03)^2$ + $2.91/$(1 + 0.03)^3$ + …]. When taken over all future generations, this sum equals exactly $97.09. This loss to all future generations is exactly equal to the gain to past and living generations in present value as of Period 1. Hence, FI is unchanged by this policy because the gain to past and current generations (GI) is exactly offset in present value by the loss to all future generations (FI-GI).

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[10] Incorporating productivity growth makes the example complicated but does not change its basic message as long as this growth is not so large as to imply dynamic inefficiency (see footnote 3).

accrues to society in general, and to some extent, to unborn generations. Only the revenue side of the rest-of-government's budget may be so attributed.[11] Hence, for the rest of the federal government, we can only report how revenues can be distributed into the accounts of past and living generations. Although this does not fully correspond to the GI measure, it is nevertheless useful to know the generational distribution of the burden of paying for the rest-of-government's outlays under current policies.

3. The desirable properties of a fiscal measure

As we outline in Table 1, the FI and GI fiscal measures have several desirable characteristics that other fiscal measures do not. We discuss these properties in this section.

The first desirable property of a proper fiscal measure is that it should be *forward looking*. Under current budget accounting, many analysts and policymakers (as well as the general public) tend to focus on annual deficits and the level of debt held by the public.[12] For years, policymakers and public-interest groups have debated how to control deficits and debt. These measures, however, substantially understate the true magnitude of the fiscal shortfall that the federal government faces. Specifically, the large future obligations associated with Social Security and Medicare are not reported in standard budget documents, which focus primarily on the effect that current policies have on current fiscal flows. Adopting new forward-looking budget measures would reveal a very different and more accurate picture of the federal government's financial status, as well as the size and nature of needed policy adjustments. Indeed, as the results below suggest, even if we could immediately pay off the entire $3.5 trillion of outstanding debt, federal spending would nevertheless have to be reduced and/or revenues increased by about $41 trillion in present value to make the system sustainable in the long run.

A second desirable feature of a proper fiscal measure is that it should include all future years. That is, it should be *calculated in perpetuity*. Several agencies have been regularly reporting other forward-looking measures. For example, the Social Security and Medicare Trustees' measure of "actuarial balance" incorporates those programs' assets and 75-year-ahead projections of revenues and outlays. Normal cash flow budget reporting covers a span of only five or ten future years. However, the most recent Budget also reports 75-year present-value "actuarial deficiencies" for Social Security and Medicare based on information included in the Trustees

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[11] Note that we can only estimate the direct and immediate incidence of taxes on different generations but not the ultimate incidence that includes the distorting effects that taxes have on work-effort and consumption-saving decisions. Bohn (1992) discusses this type of difficulty in more detail.

[12] To be sure, alternative concepts of debt do exist in budget reports – gross debt, debt subject to ceiling, debt held in trust funds, and debt held by the public. But these measures suffer from the same problems as the debt held by the public that we identify here. We focus our attention on debt held by the public because it is the most meaningful concept for measuring overall federal indebtedness.

Table 1

Properties of Alternative Fiscal Measures

	Various Budget Measures					
Properties of Budget Measures	Annual Deficit	Debt Held by the Public	75-year actuarial deficit	Generational Accounting	Accrued Obligation Measures	FI and GI Composite Measure
Forward Looking			✓	✓	✓	✓
Comprehensive	✓	✓		✓		✓
Calculated in Perpetuity				✓		✓
Based on Current Law	✓	✓	✓			✓
Correctly Indicates Impact of All Policies				✓		✓
Easy to Communicate	✓	✓			✓	✓

Reports and prepared by the same actuaries. As is well known, however, such measures do not completely account for those programs' fiscal imbalances because of the arbitrary truncation of the projection horizon at 75 years. As the 75-year projection window moves forward over time, the cumulative inclusion of an additional year's deficit or surplus will impart instability to such measures even if the underlying revenue and outlay projections remain unchanged. If deficits (or surpluses) beyond the 75th year are especially large and growing, measures based on 75-year-ahead projections will severely understate the true magnitude of the program's Fiscal Imbalance by two-thirds or more, as we show later.[13] Moreover, 75-year measures preserve some of current policy-bias in favor of short-term fixes. That would be true, for example, if the costs of a future reform falls within the 75-year window while some of its benefits fall outside it.

Indeed, the bias created by the 75-year measure was the key reason why the maximum size of the personal accounts was limited to a $1,000 annual contribution (indexed over time with wages) in Model 2 of the President's Social Security Commission. Whereas today's Social Security benefit formula allows for growth in the real (inflation adjusted) value of successive retiree cohorts' benefits, Model 2 proposes eliminating such growth. As a result, the purchasing power of Social Security benefits received by later-retiring cohorts would remain the same (rather than increase) relative that of earlier retiring cohorts. Social Security's scheduled outlays, therefore, would decrease over time. However, much of the cost saving from such a change falls outside of the 75-year window and, therefore, is not captured by the 75-year estimate. Had Model 2 been analyzed using the FI and GI measures suggested herein, the commissioners would have had the flexibility to recommend larger personal accounts.[14]

A third desirable feature of a fiscal measure is that it be *complete* – that is, it should encompass the entire government's operations. Otherwise, the measures

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[13] Before 1965, Social Security's Trustees calculated that program's financial imbalance in perpetuity. However, because Social Security benefits were not indexed to prices, the perpetuity estimates incorporated "level-cost" benefits over time. Imbalance estimates based on level costs were not heavily influenced by the truncation of the projection horizon to 75 years. Indeed, the 1965 Advisory Council noted that truncation reduced the projected shortfall by less than 3 per cent. Not surprisingly, the 1965 Advisory Council on Social Security concluded: "It serves no useful purpose to present estimates as if they had validity in perpetuity." However, Social Security's chief actuary at the time agreed that including all future years was the appropriate choice, at least in theory. (See the Oral History Interview by Robert Myers available at http://www.ssa.gov/history/myersorl.html). Today, however, retirement benefits are indexed for price inflation. Moreover, Social Security benefit formulae take into account real wage growth over beneficiaries' working lifetimes. Therefore, the practical motivation for truncating the projection horizon to 75 years no longer exists. Indeed, such truncation underestimates Social Security's long-term imbalance by two-thirds.

[14] As we explain in the next section, the creation of personal accounts alone does not affect FI or GI when the new personal accounts are actuarially fair. However, the personal accounts in Model 2 were constructed to be more than actuarially fair. The personal accounts in Model 2, therefore, would cost the government more resources in present value in the form of diverted payroll taxes than they would save the government in the form of smaller future outlays, a point emphasized by Diamond and Orszag (2002). As a result, the personal accounts alone would increase Social Security's FI. However, taken as whole, Model 2 would substantially reduce Social Security's FI and, in particular, could have accommodated much larger personal accounts.

would be subject to manipulation – "budget arbitrage" – by reshuffling revenues and outlays among programs. This issue has been particularly important in recent Social Security reform discussions where some plans recommend using general revenues to shoulder some of the burden of future shortfalls. These transfers are not indicated by the traditional measures that focus only on Social Security and Medicare, creating the illusion of free money.

A fourth desirable property is that the measure should be *based on current fiscal policy*. For a proposed measure to be useful for policymaking, it must characterize today's fiscal policy. That is, it should incorporate projected revenues and outlays based on the continuation of current policy, revealing how far current policy is from being sustainable.[15] The measure should not incorporate hypothetical policies.[16]

For example, a Social Security "shutdown" liability measure based on "accrual accounting" is one potential alternative to the GI measure proposed here.[17] Like the GI measure, accrual accounting attempts to measure the unfunded financial obligations arising because of current and past generations. The accrual concept considers a hypothetical reform in which current participants are effectively bought out of the Social Security system based on their previous contributions, thereby allowing Social Security to be shut down. However, many current participants would actually be better off if they left the Social Security system, because it represents a bad deal for them. Indeed, they would be willing to pay to leave the system. Hence, accrual accounting overestimates the true burden imposed by current and past generations associated with the continuation of Social Security (see Smetters and Walliser, forthcoming). Accrual accounting must also rely on some fairly arbitrary rules for determining a person's benefit when he or she has a limited work history. Finally, accrual accounting deviates from current law by treating past contributions as liabilities of the United States government – that is, as benefits "owed" rather than as a description of scheduled benefits corresponding to current policy.[18] The accrual concept makes sense for a private corporation that cannot assume that it will be in business in future years and, therefore, cannot include future

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[15] In some cases – such as discretionary outlays subject to annual appropriations – it is uncertain what "current policy" entails for the long-term. For example, under the Budget Enforcement Act of 1990, discretionary appropriations were temporarily subject to statutory limits with no clear principle guiding their evolution after the limits expired. In such circumstances, our proposed measure would adopt a convention consistent with longer-term historical experience: Long-term outlay/revenue growth will occur in tandem with overall economic growth after such temporary rules expire.

[16] An example of a measure based on such a hypothetical policy is the concept of generational balance developed in Auerbach, Gokhale, and Kotlikoff (1991), and discussed briefly above. This measure distributes a component of the overall fiscal burden equally across all future-born cohorts. See the critique by Diamond (1996). Also, see Liu *et al.* (2002).

[17] Accrual accounting for Social Security has been analyzed by Jackson (2002). See also the Federal Reserve Board's Semiannual Monetary Policy Report to the Congress Before the United States Senate Committee on Banking, Housing, and Urban Affairs, 11 February 11 2003, op. cited.

[18] In Flemming vs. Nestor 363 U.S. 603 (1960), the Supreme Court made it clear that Social Security benefits are subject to the discretion of policymakers.

expected pension contributions into its analysis. The concept appears less appealing for describing the federal government's finances.

Fifth, the measure should also *correctly reflect the impact of all policy changes.* This condition has two complementary components: First, the measure should not change when policy changes are actuarially neutral for all generations. That is, if a policy alters future taxes, benefits, or outlays in a way that leaves all generations' resources unaffected in present value, the measure should remain unchanged. Second, it must accurately reflect all actuarially *non-neutral* policies. As noted in the previous section, the measure should correctly reflect the size and direction of intergenerational redistributions engineered via pay-as-you-go policies.[19]

Finally, the sixth desirable feature is that the measure should be conceptually straightforward and possess properties that are *easy to communicate*. One advantage of the FI measure is that, under given budget projections, it grows over time at the rate of interest – just like a corpus of debt. Hence, change in the measure from one year to the next can be broken down into the amounts due to accumulated interest, policy changes, differences in economic outcomes relative to projections, and updates to economic assumptions used in making budget projections. The GI measure is also simple: It equals the amount of FI due to current and past generations. However, other complementary measures could also be used, including ones that describe imbalances by narrowly defined birth-cohorts, gender, race, and so on.

4. The bias in policymaking arising from current budget accounting

The previous section emphasized that focusing exclusively on backward-looking or short term fiscal measures – such as publicly held debt – substantially understates the true magnitude of the federal government's fiscal shortfall. This section discusses the biases that such an understatement can introduce into policymaking, in particular with regard to our choices among ways of financing programs such as Social Security and Medicare.

Currently, these programs are financed mostly on a *pay-as-you-go* basis, whereby worker's payroll taxes are immediately used up to pay retiree benefits. Individual Social Security taxes are not saved to pay for the contributors' future benefits. To be sure, Social Security and Medicare both have trust funds that reflect past payroll tax revenue and other receipts in excess of past benefit payments. But

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[19] The desirable features mentioned here imply that the measure will be invariant to accounting conventions adopted in describing different transactions between the government and private entities (Kotlikoff 2001). The FI and GI measures proposed here are both invariant to the choice of accounting labels. For example, if Social Security taxes and benefits were relabeled as "borrowing" and "repayment," the size of FI for the entire federal government would remain unchanged. However, this labeling change would result in Social Security's FI being reclassified as a part of debt held by the public.

their size is very small in comparison to the programs' future obligations. Moreover, the trust funds represent an obligation on the rest-of-federal-government account.[20]

An alternative system would give individuals the option to invest some of their payroll taxes in personal accounts that they would own and control. Suppose, in exchange for this option, a person's Social Security benefit is reduced one dollar in present value for each payroll tax dollar that the person is allowed to invest in his or her personal account. The retirement benefits of those who participate in such a system would consist of reduced traditional Social Security benefits plus income derived from their personal account assets. But to pay current retiree benefits, the federal government would have to borrow an additional dollar for each dollar invested in a personal account rather than paid to the government as payroll taxes. This would drive up annual deficits and public debt. Under traditional accounting, therefore, this reform does not look favorable.

However, the level of publicly held debt is just one component of the government's true fiscal imbalance. Another component includes the present value of Social Security's future scheduled benefits that are not currently tracked in official federal budget reports. Under this reform, future Social Security obligations would decrease by the same amount as the increase in the debt; the government's true fiscal imbalance, therefore, would remain unchanged. In other words, current discussions about Social Security reform start from a *biased* position since even a neutral reform looks bad under the current focus on public debt. Including the present value of future Social Security benefits into the current budget would remove this bias.

Now suppose, for example, that future Social Security benefits were reduced by a little more than one dollar for each dollar of payroll that a person invests into a personal account. This example is very similar to Model 1 of the President's Social Security Commission, where future benefits were discounted by 50 basis points above the government's borrowing rate. Many people might choose this plan in order to have more control over their retirement resources. This reform would increase publicly held debt over the short-term because the government would need to borrow additional resources to meet current benefit obligations, but the government's true long-term fiscal imbalance would actually *decline,* because the increase in debt would be less than the reduction in present value of future Social Security benefits. Nonetheless, policymakers would not favor such a plan if debt were the only measure used for judging the government's fiscal position.

The traditional focus on publicly held debt, therefore, creates a bias in decision-making against potential reforms to Social Security and Medicare that could reduce the government's fiscal imbalance. This bias is especially problematic given the large existing imbalances. A more complete accounting, which explicitly

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[20] Whether previous trust fund surpluses have reduced the debt held by the public or produced higher levels of spending, however, is an area of active research. See Schieber and Shoven (1999), Diamond (2003), and Smetters (2003).

recognizes the future net obligations of Social Security and Medicare as well as the rest of the government, would reduce this bias.

5. Estimates of federal fiscal and generational imbalances in the United States

This section reports estimates of total Fiscal Imbalance (FI) and, where appropriate, the Generational Imbalance (GI) for the federal government under the assumption that the Budget's policies represent "current policies." This so-called policy inclusive treatment of the federal budget is consistent with how the Budget is usually presented. The calculations are based on long-term budget projections (through the year 2080) provided by the Office of Management and Budget (OMB) and, naturally, incorporate OMB's economic assumptions, including a real GDP per capita growth rate of 1.7 per cent per year after ten years (*i.e.*, after projected short-run cyclical effects have elapsed).[21] We use a real discount rate of 3.6 per cent, corresponding to the average yield on 30-year Treasury bonds during the past several years.

As demonstrated later, the most important assumption is the future growth rate in real health-care (Medicare and Medicaid) outlays per capita. Consistent with the Medicare Trustees, our baseline assumes that real health-care outlays per capita will grow at an annual rate that is 1 percentage point faster than the growth rate in GDP per capita until 2080.[22] Between 2080 and 2100, that differential is gradually reduced to zero, so that health care outlays grow as a share of GDP only because of population aging after 2100. These assumptions are considerably more conservative relative to historical experience. Indeed, between 1980 and 2001, health care expenditures have grown by 2.3 percentage points faster per year than GDP.[23]

Constructing the GI measures for Social Security and Medicare as well as extending OMB's projections beyond 2080 required detailed work using micro data sets.[24] In particular, we constructed eight age-sex profiles using various micro data sets corresponding to every tax category (labor, payroll, capital, estate, excise, customs duties, gift taxes, and miscellaneous receipts). Moreover, eighteen other

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[21] This rate of real GDP growth per capita is obtained by deflating projected nominal GDP per capita by the projected CPI rather than by the GDP deflator. This procedure implies that all constant dollar values reflect the opportunity cost in consumption units. In addition, because the CPI is known to contain an upward bias, the FI and GI estimates reported here are likely to err on the low side.

[22] See the Medicare trustees assumptions on the growth in health care outlays, available at http://www.cms.gov/publications/trusteesreport/2003/tabid1.asp

[23] This calculation is based on the Centers for Medicare and Medicaid Services' estimates of national health care expenditures (see http://www.cms.hhs.gov/statistics/nhe/historical/t1.asp). Heffler *et al.* (2003) provide a more detailed breakdown by period. They show that during 1966-88, real national health expenditures grew at an annual average rate of 6.3 per cent, whereas the chain-weighted GDP index grew at 5.4 per cent – a difference of 0.9 per cent. During 1989-93, the numbers were 6.3 per cent and 3.2 per cent respectively; and during 1994-2000 they were 3.8 per cent and 1.8 per cent respectively.

[24] See appendices B through F in Gokhale and Smetters (2003).

age-sex profiles were constructed corresponding to each of the major outlay programs that targets specific population subgroups (Social Security, Medicare, Medicaid, federal civilian retirement, veterans' benefits, SSI, WIC, etc.). Outlay programs whose benefits are more diffused throughout the population (national defense, justice, international affairs, etc.) were distributed equally across population in year of spending. This equal distribution does not represent an "allocation of benefit" to specific generations. Rather, it is an intermediate step used for projecting aggregate discretionary outlays beyond OMB's projection horizon of 2080. The projection method assumes that public goods and services per capita grow at the same rate as GDP per capita beyond 2080 – 1.7 per cent per year.

These age-sex profiles were then used to decompose the OMB numbers by generation before 2080 and then to extend OMB's numbers beyond 2080 using demographic projections relevant for those years. The age-sex profiles also allow us to break down the revenue side of the rest-of-government finances by generation. The profiles must be indexed by age since the amount and type of taxes paid varies by age. The profiles must also vary by gender because women are projected to live longer than men and, therefore, pay different levels of taxes and receive different levels of benefits. Even though we do not break down our final results by gender, its incorporation into the underlying calculations improves the accuracy of our estimates. See the appendices for more details.

FI calculations are reported beginning with fiscal year-end 2002. However, to show the evolution of FI and GI under current policies and projections, they are recalculated each year through 2008. Present values are calculated using projected interest rates on long-term treasury securities (also provided by OMB). The appendices provide detailed descriptions of the methods used in extending OMB's budget projections.

5.1 Total federal fiscal imbalance

Table 2 comprehensively documents total federal FI, its sources by program, and its breakdown into the GI attributable to past and living generations. The first three panels show FI and GI measures for Social Security, Medicare Part A, and Medicare Part B. In each of these panels, the GI measure is subdivided into the present value of prospective payments and receipts by living generations and the trust fund that includes the net contributions from past transactions. The last row in each panel shows the residual – FI minus GI – that indicates the contribution to FI on account of future generations. Panel 4 of Table 2 shows the FI measure for the rest of the federal government – that is, for non–Social Security and non-Medicare transactions. As mentioned earlier, the GI measure is not calculated for the rest of the federal government because outlays cannot be easily distributed across generations. Instead, only prospective revenues are subdivided into those that living and future generations are projected to pay under current fiscal policy.

Table 2

Fiscal and Generational Imbalances in Social Security, Medicare, and the Rest of the Federal Government

(present values in billions of constant 2002 US dollars; fiscal year-end)

	2002	2003	2004	2005	2006	2007	2008
1. Fiscal Imbalance (FI) in Social Security	**7,022**	**7,204**	**7,436**	**7,692**	**7,967**	**8,258**	**8,569**
Imbalance on Account of Past and Living Generations (GI)	**8,771**	**8,943**	**9,171**	**9,424**	**9,694**	**9,981**	**10,289**
Future Net Benefits of Living Generations†	10,100	10,398	10,762	11,166	11,593	12,043	12,518
Trust Fund	–1,329	–1,455	–1,591	–1,742	–1,899	–2,062	–2,230
Imbalance on Account of Future Generations††,♣	**–1,749**	**–1,739**	**–1,736**	**–1,732**	**–1,727**	**–1,723**	**–1,720**
2. Fiscal Imbalance (FI) in Medicare – Part A	**20,497**	**21,071**	**21,764**	**22,513**	**23,285**	**24,091**	**24,939**
Imbalance on Account of Past and Living Generations (GI)	**8,526**	**8,867**	**9,265**	**9,696**	**10,136**	**10,600**	**11,088**
Future Net Benefits of Living Generations†	8,755	9,118	9,537	9,991	10,459	10,949	11,464
Trust Fund	–229	–250	–271	–295	–323	–350	–377
Imbalance on Account of Future Generations††,♣	**11,972**	**12,204**	**12,499**	**12,817**	**13,148**	**13,491**	**13,851**
3. Fiscal Imbalance (FI) in Medicare – Part B	**16,145**	**16,519**	**16,978**	**17,479**	**18,009**	**18,562**	**19,144**
Imbalance on Account of Past and Living Generations (GI)	**6,633**	**6,853**	**7,109**	**7,392**	**7,693**	**8,011**	**8,343**
Future Net Benefits of Living Generations†	6,671	6,881	7,140	7,423	7,728	8,046	8,381
Trust Fund	–39	–28	–32	–32	–35	–36	–38
Imbalance on Account of Future Generations††,♣	**9,513**	**9,666**	**9,869**	**10,087**	**10,315**	**10,552**	**10,801**
Fiscal Imbalance (FI) in Medicare (Parts A and B)	**36,643**	**37,590**	**38,742**	**39,992**	**41,293**	**42,653**	**44,084**
4. Fiscal Imbalance (FI) in the Rest of the Federal Government	**550**	**676**	**753**	**864**	**1,005**	**1,153**	**1,310**
Future Outlays	80,676	81,701	83,161	84,780	86,503	88,307	90,202
Future Revenues	–85,263	–86,552	–88,295	–90,103	–91,985	–93,917	–95,938
Living Generations†	–32,596	–33,273	–34,141	–34,997	–35,885	–36,781	–37,698
Future Generations††	–52,667	–53,278	–54,154	–55,106	–56,100	–57,136	–58,240
Excess Future Outlays Over Revenues	**–4,587**	**–4,851**	**–5,134**	**–5,323**	**–5,482**	**–5,609**	**–5,736**
Obligations to Social Security and Medicare Trust Funds	**1,597**	**1,734**	**1,894**	**2,069**	**2,256**	**2,448**	**2,644**
Debt Held by the Public	**3,540**	**3,793**	**3,993**	**4,119**	**4,231**	**4,314**	**4,402**
Total Federal Fiscal Imbalance (FI)	**44,214**	**45,470**	**46,930**	**48,548**	**50,265**	**52,064**	**53,962**

Note: Positive items increase the Fiscal Imbalance.

† Those born fifteen years ago and earlier. In 2002, for example, this category includes people born before 1988.

†† Those born fourteen years ago and later. In 2002, for example, this category includes people born during 1988 and later.

♣Calculated as FI minus GI.

Source: Authors' calculations.

Total FI for the federal government as of fiscal year-end 2002 equals $44.2 trillion (Table 2, last row). The Social Security program contributes $7 trillion. Medicare contributes $36.6 trillion – the largest share by far. The rest-of-federal-government's contribution is relatively small – only $0.5 trillion. It can be shown that the total fiscal imbalance grows at the rate of interest if no policy action is taken to reduce it.[25] This relationship implies that if future projected revenues and outlays remain unchanged, the imbalance will quickly grow larger over time. By 2008, for example, it will have grown to $54 trillion.

5.2 Social security

Social Security's FI of $7 trillion equals the present value of projected Social Security benefits plus administrative costs minus the present value of projected payroll taxes, federal employer payments, income taxes on Social Security benefits, and minus the initial balances in the Social Security trust fund. It is broken down into the GI of $8.8 trillion and the residual, FI minus GI, of minus 1.7 trillion.

Social Security's imbalance is caused by past and living generations. In particular, as of 2002, past and living generations are projected to receive over $8.8 trillion more in benefits than they will contribute in payroll taxes (using the present value of both benefits and taxes). In contrast, future generations are projected to pay $1.7 trillion more in taxes than they will receive in benefits. Hence, under current tax and benefit rules, future generations are projected to reduce Social Security's imbalance by $1.7 trillion, but not by enough to restore the Social Security program to a sustainable system in the presence of the $8.8 trillion liability "overhang" left over from current and past participants.[26] For Social Security to fully return to balance, living and future generations must collectively receive fewer benefits and/or pay more taxes by $7 trillion in present value. For example, if only future generations were required to carry the full burden of eliminating Social Security's FI, they would need to pay an additional $7 trillion in taxes or receive equivalently lower benefits. As another example, suppose that living generations were required to cover half of Social Security's imbalance in the form of lower benefits or higher taxes while future generations were required to cover the remainder. In that case, the imbalance on account of past and living generations would decline to approximately $5.2 trillion in 2002 while the imbalance on account of future generations would be minus $5.2 trillion. Thus, some generations must receive less or pay more in order to

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[25] See Appendix A in Gokhale and Smetters (2003).

[26] Geanakoplos, Mitchell, and Zeldes (1998) show that most of Social Security's overhang stems from past generations receiving substantially more in benefits than they paid in taxes. In particular, under our calculations, if the amount of Social Security benefits received by past and current generations were equal in present value to the benefits that they received and are projected to receive in the future, the size of the trust fund would be $10.1 trillion in 2002, thereby reducing Social Security's GI to zero. In this case, we would say that Social Security was "fully funded." The actual value of the trust fund, however, is only $1.3 trillion. Most of the $8.7 trillion difference stems from past generations receiving more in benefits than they paid in taxes.

return Social Security to sustainability. Regardless of which policy is chosen, creating balance in Social Security (*i.e.*, a zero Social Security FI) requires that the Generational Imbalance (GI) caused by past and current generations be exactly offset by the imbalance on account of future generations (FI minus GI).

5.3 Medicare

Medicare's FI is $36.6 trillion – more than five times as large as Social Security's imbalance. This number reflects the projected faster growth of Medicare outlays per capita, in addition to the aging of the population during the century. The Medicare program has two parts – Part A (Hospital Insurance) and Part B (Supplementary Medical Insurance). Unlike Medicare Part A, which is financed out of dedicated payroll taxes, Part B is partially financed out of premiums paid by those who choose to participate. Premiums cover roughly 25 per cent of Part B's annual outlay. The remaining 75 per cent is financed through transfers from the general fund (rest-of-government account) to Medicare Part B's trust fund. The transfers are made several times each year, based on estimated outlays through the following year. Consistent with the view of Social Security's Trustees, we follow the convention of not counting these transfers as a dedicated resource for Medicare Part B.[27] This choice reflects the principle of associating FI with the program that incurs the outlays. Hence, Medicare Part B's FI is calculated as the present value of projected spending minus the present value of projected premium receipts.[28] Table 2 shows the breakdown of Medicare's FI arising from Parts A and B. It shows that Part A contributes $20.5 trillion, or about 56 per cent of Medicare's total FI. At $16.1 trillion, Medicare Part B's FI is about 80 per cent as large as that of Medicare Part A.

In sharp contrast to Social Security, a majority of Medicare's FI arises from future generations (FI minus GI) rather than from past and current generations (GI). For example, the GI for Medicare Part A is only $8.5 trillion whereas the residual (FI minus GI) contributes $12 trillion to Medicare Part A's total imbalance of $20.5 trillion. The contributions of past, current, and future generations to Medicare Part B's aggregate Fiscal Imbalance shows a similar pattern. The reason for future generations' significantly larger contribution is the rapid projected growth in Medicare outlays per capita during the next several decades. As with Social Security, some current or future generations must receive less or pay more for Medicare to become fiscally sustainable.

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[27] For example, see Chart E in the Trustees' Summary of the 2003 Annual Reports available at: http://www.ssa.gov/OACT/TRSUM/trsummary.html

[28] If, alternatively, general revenue transfers were treated as dedicated revenue to Part B, they would appear as an outlay in the rest of the budget and, therefore, have no effect on the federal government's total FI. To be sure, the exact placement of Part B's revenue in the table is open to interpretation. However, we follow the Social Security and Medicare Trustees' lead by not representing this revenue as "free" to the Medicare program.

5.4 The rest of the federal government

Table 2 shows that the rest of the federal government's FI is $550 billion. Under current projections, the present value of the rest-of-federal-government's projected receipts exceeds its non–Social Security and non-Medicare outlays by $4.6 trillion. However, the Treasury securities held by the Social Security and Medicare trust funds, and counted among those programs' dedicated resources, must be entered as a liability on the rest-of-government's account. This liability plus debt held by the public exceeds the prospective surplus of rest-of-government receipts over outlays by $0.5 trillion. Out of the present value of all prospective receipts of $85 trillion, past and living generations are projected to contribute only $32.6 trillion, or about 37 per cent. Future generations contribute the remainder – $52.7 trillion. OMB revenue estimates include a secular rise in revenues relative to GDP that could arise from the taxation of withdrawals from assets in tax-deferred saving accounts – as recently claimed by Boskin (2003), real bracket creep, or an increase in the number of taxpayers subject to the Alternative Minimum Tax.[29]

Under the convention adopted here of not counting general revenue financing of Medicare Part B as a resource dedicated to that program, an overwhelming majority – 98.8 per cent – of total federal FI arises from Social Security and Medicare.

6. Evaluating the size of federal fiscal imbalance

6.1 Comparison with official estimates

The FI estimate shown in Table 2 dwarfs the traditional measure of fiscal indebtedness – debt held by the public – by more than a factor of ten. The Budget acknowledges the inadequacy of traditional budget measures as indicators of the government's long-term financial solvency. For example,

> *"A traditional balance sheet with its focus on past transactions can only show so much information. For the government, it is important to anticipate what future budgetary requirements might flow from future transactions. Even very long-run budget projections can be useful in sounding warnings about potential problems despite their uncertainty. Federal responsibilities extend well beyond the next five or ten years, and problems that may be small in that time frame can become much larger if allowed to grow."* [Budget]

Nevertheless, the Budget's summary tables do not include complementary indicators of the federal government's fiscal position.[30] Rather, the budget devotes a

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[29] When asset growth in tax-deferred plans is evaluated on a risk-adjusted basis, however, tax deferral costs the government money.

[30] These comments also apply equally to other budget reporting agencies such as the Congressional Budget Office, Joint Tax Committee, and others who employ short-term reporting horizons.

separate chapter to report the prospective shortfalls in Social Security and Medicare only. An analysis of these estimates is presented in the Analytical Perspectives volume of the Budget. These estimates, however, are based on the economic assumptions of the Social Security and Medicare Trustees, which differ from the economic assumptions that OMB uses in preparing the forecasts that appear elsewhere in the budget. Moreover, the Social Security and Medicare calculations reported in the budget are limited to a projection horizon of 75 years and do not include the administration's own new policy recommendations, in contrast to the "policy inclusive" nature of the rest of the budget. Social Security's "long-term deficiency" is reported as $3.4 trillion and Medicare's is $13 trillion. Both estimates include the programs' trust funds balances as resources dedicated for those programs. Because of the truncated projection horizon (and the non-policy inclusive nature of the Social Security and Medicare projections), these estimates understate considerably the true magnitude of fiscal imbalance embedded in the Budget's policies.

More recently, the 2003 Social Security and Medicare trustees' report shows 75-year as well as infinite-horizon shortfall estimates for that program. The trustees also reported Social Security's closed-group liability, which is constructed in the same way as the GI concept herein. The trustees' 75-year shortfall estimate closely approximates the figures reported in the Budget. Their infinite horizon estimate is $10.5 trillion – larger than that reported in this monograph. We suspect that this difference is primarily due to the higher discount rate that we use – a rate consistent with OMB's projection of interest rates on long-term Treasury debt. Medicare's trustees, however, do not provide an infinite horizon estimate of Medicare's fiscal imbalance. The estimate of Medicare's FI that we report is almost three times as large as the 75-year number reported in the budget. Our estimate, however, also includes the policy proposals contained in the FY 2004 budget.

This paper does not endorse the use of an FI measure calculated over just 75 years. However, for comparison with the estimates in the Budget and in the trustees' report (both of which are based on the trustees' economic assumptions and exclude the Budget's newest policy proposals), Table 3 shows 75-year estimates of FI based on policy-inclusive OMB projections and OMB's own economic assumptions that it uses in the rest of the budget.[31] Our estimate of the 75-year FI for Social Security is only $1.6 trillion, compared to $3.4 trillion that was reported in the Budget. The difference primarily stems from the higher assumed rate of productivity growth under the OMB assumptions that we use. Higher productivity growth increases payroll tax receipts over the short- and medium-term and increases Social Security benefit outlays over the long-term. Also OMB's long-term real discount rate – 3.6 per cent per year – is about 60 basis points higher than that used by the Social Security trustees. The cumulative effect over a 75-year projection window is to make our 75-year estimate of Social Security's FI smaller than that reported in the Budget.

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[31] OMB did not provide projections excluding the administration's latest budget proposals.

Table 3

Seventy-five-year Fiscal Imbalances

(present values in billions of constant 2002 US dollars; fiscal year-end)

Fiscal Years	2002	2003	2004	2005	2006	2007	2008
75-Year Fiscal Imbalance – U.S. Federal Government	**16,315**	**17,101**	**17,943**	**18,889**	**19,900**	**20,966**	**22,097**
Social Security	1,596	1,689	1,804	1,932	2,072	2,224	2,389
Medicare	15,080	15,676	16,361	17,102	17,868	18,672	19,518
Rest of Federal Government	–360	–264	–222	–145	–41	70	190

Source: Authors' calculations.

Table 4

Total Fiscal Imbalance as a Share of Present Values of Payroll, GDP, and Various Outlays

	Fiscal Year-End						
	2002	2003	2004	2005	2006	2007	2008
Total Fiscal Imbalance (FI)	**44,214**	**45,470**	**46,930**	**48,548**	**50,265**	**52,064**	**53,962**
PV of Payroll Base	265,646	272,027	275,398	280,161	285,399	290,918	296,641
Total FI as a Percent of PV of Payroll	**16.6**	**16.7**	**17.0**	**17.3**	**17.6**	**17.9**	**18.2**
PV of Income Taxes	64,564	65,593	66,995	68,474	70,005	71,561	73,181
Total FI as a Percent of PV of Income Taxes	**68.5**	**69.3**	**70.1**	**70.9**	**71.8**	**72.8**	**73.7**
PV of Payroll Taxes	47,038	47,655	48,517	49,456	50,451	51,482	52,565
PV of FI as Percent of Payroll Taxes Plus Taxes on Social Security Benefits	**94.0**	**95.4**	**96.7**	**98.2**	**99.6**	**101.1**	**102.7**
PV of Discretionary Outlays	42,458	42,884	43,533	44,260	45,045	45,875	46,752
PV of FI as a Percent of PV of Discretionary Outlays	**104.1***	**106.0***	**107.8***	**109.7***	**111.6***	**113.5***	**115.4***
PV of Social Security and Medicare Outlays	97,666	99,675	102,234	105,022	107,959	111,017	114,232
PV of FI as a Percent of Social Security and Medicare Outlays	**45.3**	**45.6**	**45.9**	**46.2**	**46.6**	**46.9**	**47.2**
PV of Non-Social Security and Non-Medicare Outlays	80,676	81,701	83,161	84,780	86,503	88,307	90,202
PV of FI as a Percent of Non-Social Security and Non-Medicare Outlays	**54.8**	**55.7**	**56.4**	**57.3**	**58.1**	**59.0**	**59.8**
PV of GDP	682,156	699,070	708,187	720,896	734,861	749,573	764,811
Total FI as a Percent of PV of GDP	**6.5**	**6.5**	**6.6**	**6.7**	**6.8**	**6.9**	**7.1**

Note: Positive items increase the imbalance.

* Exceeds 100 per cent: An immediate and permanent elimination of discretionary spending is insufficient to achieve a sustainable fiscal policy (*i.e.*, FI = 0).

Source: Authors' calculations.

By contrast, Table 3 shows that our 75-year $15.1 trillion estimate of Medicare's FI (using OMB assumptions) is larger than the $13 trillion value reported in the Budget. Our estimate would have been much lower than the Budget's estimate because of the higher discount rate under OMB assumptions if we had also excluded the president's newest policy proposals. However, the impact of new Medicare proposals in the Budget more than offset the effect of using a higher discount rate. In general, we conclude that our estimate for Social Security's FI is more conservative than official estimates. Medicare's FI would also be smaller but for the impact of new Medicare policies proposed in the Budget.

6.2 Comparison of FI with present values of payroll, GDP, and other aggregates

Another way to assess the magnitude of total federal FI is to compare it to the present value of future GDP or future payrolls. Table 4 shows that as of the end of fiscal year 2002, total FI equaled 6.5 per cent of the present value of all future GDP and about 16.6 per cent of the present value of future capped payrolls. So, for example, restoring a balanced fiscal policy could, in theory, be accomplished with an immediate and permanent wage tax increase of 16.6 percentage points. If we instead choose to eliminate FI by increasing federal income taxes, those revenues would have to be increased by another two thirds. Alternatively, Table 4 shows that future Social Security and Medicare outlays would have to be permanently lowered by 45 per cent or non–Social Security and non-Medicare outlays would have to be cut by 54.8 per cent immediately and forever. Alternatively, eliminating the entire federal discretionary budget immediately and permanently would still fall about $1.8 trillion short of achieving fiscal sustainability. Such tax hikes or spending cuts would obviously be devastating to the economy. However, the alternative of waiting to make the adjustment is worse: Waiting until just 2008 to make the adjustment would require an immediate and permanent wage tax hike of 18.2 percentage points rather than 16.6 percentage points, or a 73.7 per cent increase in income tax revenues instead of 68.5 per cent. If the entire adjustment were made by cutting non–Social Security and non-Medicare outlays, they would have to be reduced by 59.8 per cent in 2008 instead of 54.8 per cent today.

6.3 Sensitivity to alternative assumptions

Federal revenue and outlay projections – and, hence, the values of FI and GI – obviously depend on the underlying assumptions. This section reports the sensitivity of FI to variations in three key underlying parameters: the government's long-term annual discount rate (r); the annual growth rate of GDP per capita (g); and the differential (h) between the annual growth rate of outlays on Medicare and Medicaid per capita and g. The differential, h, however, only exists until 2080. Between 2080 and 2100, the annual growth rate of outlays on Medicare and Medicaid per capita is gradually reduced to g so that the differential, h, becomes zero where it remains after 2100. As a result, health care outlays per capita

(distinguished by age and sex) grow no faster than GDP per capita beyond the year 2100. This projection of entitlement outlay growth causes the share of Medicare and Social Security spending in GDP to rise from 7.6 per cent in 2002 to 13.1 per cent by 2080. Under the baseline set of assumptions corresponding to results presented earlier, r = 3.6, g = 1.7, h = 1 per cent. We now consider two alternative values – low and high – for each parameter.[32] The low and high values for r are 3.3 and 3.9 per cent; those for g are 1.2 and 2.2 per cent; and those for h are 0.5 and 1.5 per cent.[33]

Table 5 shows that the FI for fiscal year-end 2002 is quite sensitive to the discount rate assumption: FI is estimated to be $34.6 trillion under the high discount rate assumption (r = 3.9 per cent), whereas it is $58.6 trillion when the assumed discount rate is low (r = 3.3 per cent). The high sensitivity of FI to the different values of r is not surprising. Notice, for example, that the baseline total FI is almost three times larger than the truncated 75-year estimate (see Tables 2 and 3), suggesting that annual imbalances are projected to grow considerably beyond the 75th year. This high projected growth of annual imbalances in the distant future causes the FI to be very sensitive to variations in the assumed discount rate.

To understand the sensitivity of FI to the discount rate, consider, for example, two different time series of annual imbalances. Assume that both series are initially equal in present value at a given discount rate. By the process of compound interest, a change in the discount rate alters the discount factor applicable to values further in time by more than those nearer in time. Hence, between these two time series, the one that exhibits growing annual imbalances will be more sensitive to discount rate changes than one that is stable over time. Therefore, the high sensitivity of FI to changes in the discount rate indicates that projected annual financial shortfalls continue to grow over time. Hence, the sensitivity of FI only confirms the inappropriateness of using short-term fiscal measures or measures based on an arbitrarily truncated projection to assess the extent of policy unsustainability.

Turning now to the productivity growth rate assumption, g, Table 5 also shows that the total FI is $55.9 trillion under the high growth rate assumption (g = 2.2 per cent). Social Security's FI increases from $7 trillion under baseline

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[32] An increase in g does not necessarily have the same impact as an equal decline in r because higher growth does not necessarily imply higher outlays in every category. For example, higher growth is likely to result in lower social welfare outlays. Hence, we show below the sensitivity of FI estimates to variations in r and g separately.

[33] We consider the sensitivity of each parameter relative to the baseline set of parameters. Future work could extend this analysis by considering different parameter combinations, combined with the probability of each combination in order to create a distribution of possible outcomes.

Table 5

Sensitivity of Fiscal Imbalance (2002) to Discount Rate and Growth Assumptions
(present values in billions of constant 2002 US dollars; fiscal year-end)

	Baseline Assumptions	Discount Rate		GDP Growth Per Capita		Health Care Outlay Growth Per Capita	
		High	Low	High	Low	High	Low
Total Fiscal Imbalance – U.S. Federal Government	**44,214**	**34,564**	**58,608**	**55,892**	**36,908**	**63,930**	**29,450**
Social Security	**7,022**	5,025	9,978	**11,975**	**4,933**	**7,022**	**7,022**
Medicare	**36,643**	28,910	47,962	**66,071**	**23,194**	**50,035**	**26,644**
Rest of Federal Government	**550**	**629**	**668**	**–22,153**	**8,781**	**6,874**	**–4,215**
Present Value of Excess of Outlays Over Receipts	–4,587	–4,508	–4,470	–27,290	3,644	1,737	–9,352
Liability to SS and Medicare	1,597	1,597	1,597	1,597	1,597	1,597	1,597
Debt Held by the Public	3,540	3,540	3,540	3,540	3,540	3,540	3,540

Source: Authors' calculations.

Table 6

Sensitivity of Total Fiscal Imbalance (2002) as a Share of the Present Value of Payroll

	Policy Baseline	High	Low
Discount Rate	16.6	15.0	18.8
Productivity Growth Per Capita	16.6	14.8	18.0
Health Care Outlay Growth Per Capita	16.6	24.1	11.1

Source: Authors' calculations.

assumptions to $12 trillion under the high growth rate assumption.[34] Medicare's FI increases from $36.6 trillion to $66.1 trillion because greater productivity growth also occurs in the Medicare sector (*i.e.*, the differential, *h,* is unchanged). However, for the rest of government, faster productivity growth also brings in more general revenue and reduces the outlays on Medicaid, unemployment compensation, and various welfare programs. As a result, the rest-of-federal-government's FI shifts from $0.5 trillion under the baseline to minus $22.2 trillion. Nevertheless, across all government programs, the net effect of higher productivity is to increase total FI relative to its value under baseline assumptions.

Conversely, lower assumed productivity growth (g = 1.2 per cent) reduces Social Security and Medicare's imbalances, but increases the imbalance on account of the rest of the federal government. The resulting total FI is $36.9 trillion, which is smaller than the $44.2 trillion baseline value.

The impact on FI of alternatively assuming higher- and lower-than-baseline growth rates in federal health care spending is more substantial. Under the high-h assumption (h = 1.5 per cent), FI is $63.9 trillion, whereas it comes in at just $29.5 trillion under the low-h assumption (h = 0.5 per cent).[35] Under the high-h assumption, annual health care costs per capita are assumed to grow at 1.5 percentage points above the annual GDP per capita growth rate until 2080 – an assumption that is actually quite plausible when compared with experience during the previous two decades when, as noted above, we witnessed an annual differential of 2.3 percentage points. Under the low-h assumption, however, health care costs are assumed to grow at just 0.5 percentage points above GDP, an assumption that strikes us as fairly unlikely. In both cases, between 2080 and 2100, the differential is reduced to zero where it stays forever – an assumption that is clearly conservative by historical standards.

The *ratio* of FI to the present values of payroll and GDP, however, exhibits greater stability than the present value constant 2002 *dollar* amounts in response to changes in the various parameter values because the denominator – the present value of future payrolls or GDP – changes in the same direction as total FI. In other words, while the dollar value of the Fiscal Imbalance is sensitive to the underlying assumptions, the size of the tax rate increase or percent decrease in spending

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[34] The increase in Social Security's FI seems counterintuitive at first glance because faster future productivity growth does not affect the real value of existing retirees' benefits. Rather, payroll tax revenues increase immediately but benefits rise only gradually as faster wage growth (stemming from the assumed faster productivity growth) is incorporated in calculating future retirees' benefits. To understand why Social Security's FI increases in value, suppose that in response to faster productivity growth, the payroll tax base, payroll tax revenues, and outlays double. The imbalance between outlays and revenues would also double. However, if, more realistically, outlay increases are delayed by a few years, the imbalance would increase to less than twice its original size. We discuss below how the total FI changes relative to payroll tax base and other measures as we change the underlying economic assumptions.

[35] Notice that Medicare's FI is actually larger under the high-g assumption relative to the high-h assumption even though the assumed growth rate of future health, g plus h, is identical under both assumptions. The reason is that we follow OMB rules and begin the high-g assumption in 2003 while starting the high-h assumption in 2014.

required to achieve sustainability is much less sensitive. Table 6 shows that under baseline assumptions, the total FI is 16.6 per cent of the present value of the (uncapped) payroll tax base as of fiscal year-end 2002. Under high and low productivity growth assumptions, it is 14.8 and 18 per cent, respectively. Recall that, as reported earlier, the total FI is larger in present-value dollar terms under the high productivity growth assumption. In contrast, it is actually *smaller* as a share of the present value of future payrolls relative to the baseline. The reason is that FI grows proportionally less than the payroll base because of larger rest-of-government receipts and smaller outlay growth for some expenditure categories. Under the high and low health-care growth assumptions, the variation in the ratio of FI to the present value of payrolls is wider – between 24.1 and 11.1 per cent respectively. This variation is not so surprising given the 100 basis point difference *per year* between our high- and low-cost health growth rate assumptions, which produces a large compounded difference over time. These numbers show that an immediate and permanent 11.1 percentage point tax increase on all wages is needed to return U.S. fiscal policy system to sustainability even under very optimistic assumptions about growth in health costs per capita.

7. Conclusion

The federal government's spending priorities are set to change over the coming decades as the baby boom generation retires: future federal outlays will predominantly consist of social insurance payments. In such a budget environment, traditional measures such as debt held by the public, five- or ten-year-ahead cash-flow deficit projections, and longer-term but truncated summary measures have limited usefulness for policymaking. Indeed, continuing to focus on such measures is likely to sustain a policy bias that favors short-term debt reduction over policies that would be beneficial in addressing the nation's true longer-term Fiscal Imbalance. To evaluate and compare all available policy alternatives on a neutral footing, we need to introduce new fiscal measures as part of our fiscal vocabulary.

The FI and GI measures proposed here possess several desirable properties. The main effect of adopting them would be to place the debate on entitlement reform on a *neutral* basis. These measures would provide policymakers with a powerful tool for analyzing the long-term financial health of the federal government: The FI measure informs us about the extent of the federal government's long-term insolvency and the GI measure provides a metric for choosing among alternative sustainable policies to strike an acceptable balance between the costs imposed on different generations. The GI measure could also be augmented with other, more detailed measures of the impact of fiscal policies across population subgroups.

Based on OMB's policy-inclusive budget projections, the federal government's long-term Fiscal Imbalance is $44.2 trillion as of fiscal year-end 2002. This value is ten times as large as the size of debt currently held by the public; it is also several times larger than similar values published elsewhere under a 75-year projection horizon. To fully eliminate the existing FI, wage taxes, for example, will

have to be increased by 16.6 percentage points forever. Eliminating all discretionary spending immediately and forever would fall short by $1.8 trillion.

To be sure, the dollar value of the FI is sensitive to underlying growth and discount rate assumptions. But this occurs because of the rapid growth in projected financial shortfalls – which only reinforces the case for reporting the perpetuity FI measure rather than a truncated 75-year measure. The ratio of the FI to the tax base or GDP – and, hence, the sizes of alternative fiscal reforms to achieve solvency – is much less sensitive to changes in these economic assumptions since the tax base and GDP tend to respond in the same direction as FI.

We remain optimistic about the potential for further reform in federal budget accounting. Positive changes have already occurred in the official reporting of the long-term financial status of Social Security and Medicare: The Social Security trustees have adopted the FI and GI measures for that program along with other changes including stochastic analysis. We hope that the trustees will soon begin officially reported these measures for Medicare and that CBO and OMB will begin reporting these measures for the rest of the federal government as well.

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