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THE U.S. FISCAL PROBLEM: WHERE WE ARE, HOW WE GOT HERE AND WHERE WE'RE GOING

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ABSTRACT

This paper deals with several issues regarding the causes and implications of recent and projected U.S. federal budget deficits. It considers why deficits have remained so large in spite of deficit reduction efforts, evaluates the impact of the recent policies of the Clinton administration, and offers long-range deficit projections. Among the paper's findings are:

1. Until the past year, deficit projections over the past decade have been consistently too optimistic; had initial projections for the current fiscal year proved accurate, the deficit-reducing policies of the early 1990s already would have driven the federal budget well into surplus; there is no single explanation for these large and systematic forecasting errors.

2. The budget rules that legislators have developed to control deficits, including those now in effect, are ill-designed for their apparent purpose. They fail to compensate for forecasting errors and encourage shifts in the timing of revenues and expenditures. The paper presents evidence that such shifting has followed the incentives of the different schemes.

3. The projected decline in the deficit as a share of GDP over the next few years reflects not only the policies already enacted but also the continuation of significant real reductions in discretionary spending -- representing a drop of 2.2 percent of GDP between 1994 and 2004.

4. Even if such optimistic forecasts prove to be correct, longer run projections suggest that current fiscal policy is unsustainable. Without any growth in the relative price of health care, the demographic transition still is projected to lead to sharp increases in Social Security and Medicare benefits as a share of GDP, and primary deficits of nearly 4 percent of GDP.

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1. *Introduction*

In fiscal year 1992 the U.S. federal budget deficit was $290 billion dollars, equal to nearly 5 percent of GDP and contributing to the continued rapid growth in the national debt. By the end of that fiscal year (on September 30 of the calendar year), the ratio of publicly held national debt to GDP had risen from a low of 24.5 percent in 1974 to 51.1 percent.

To attack the deficit, President Clinton proposed, and each house of Congress barely passed in August, the Omnibus Reconciliation Act of 1993 (OBRA 1993), an act which, according to Executive branch estimates, will raise revenues and reduce spending by a total of roughly $500 billion over the five fiscal years from 1994 through 1998.[1]

Was this action necessary? Was it enough? Among the questions addressed in this paper are:

- **What is the current path of U.S. fiscal policy?**
- **How has this path been altered (thus far) by the Clinton economic program?**
- **Is the current fiscal policy trajectory sustainable and, if not, what is the magnitude of necessary changes?**

These questions are central to the fiscal policy debate but difficult to answer. To identify fiscal policy's current trajectory, we must make long-range economic projections as well as assumptions regarding what current policy actually is. Moreover, we must know how to interpret this information. The budget deficit can be defined in a variety of ways and there is nothing to ensure that one year's budget deficit will be comparable to the next, or what a short-term trend in the budget deficit signifies about the long-run viability of fiscal policy. Conclusions about the state of fiscal policy should not depend on arbitrary accounting conventions or budget "scoring" rules. Finally, to

[1]According to the Office of Management and Budget's 1993 Midsession Review (OMB 1993), the total is $504.8 billion, while the Congressional Budget Office's estimate is $432.9 billion (CBO 1993b).

consider the magnitude of necessary policy changes, we must be able to gauge how different policies will change the economy's fiscal path.

As discussed below, the uncertainties involved in each of these stages are considerable. Fiscal performance has proved difficult to project with any degree of accuracy; budget measures are rife with ambiguous concepts, making them difficult to interpret; and the measurement of economic responses to fiscal policies has been a source of controversy. This leaves those who would design policy with a daunting task, the nature of which is amply illustrated by recent events.

The politically difficult deficit reduction effort of 1993 follows an equally painful OBRA 1990, signed after a protracted "budget summit" by a President who had made a campaign commitment to "no new taxes" but who nevertheless agreed to significant revenue increases along with spending cuts, again estimated at the time to total about $500 billion over a five-year budget period.

With recent Federal budget deficits running in the neighborhood of $200-$300 billion per year, one might think that these two acts, each apparently reducing the deficit by about $100 billion per year, would have led us close to budget balance in the ensuing years. Yet the near-term outlook is for continued budget deficits of nearly $200 billion dollars, even assuming that the 1990 Act's very tight caps on discretionary spending, which keep discretionary spending essentially fixed in nominal terms, are followed through fiscal year 1998.

What's going on? Another of this paper's goals is to find out, to address the question:

- **Why have large deficit reduction policies apparently resulted in so little deficit reduction?**

Each of the difficulties cited above might have played a role. First, economic responses to tax increases may have blunted the force of these deficit-reducing policies. Second, "deficit reduction" doesn't necessarily mean deficit reduction. Budget scoring rules measure the effects of legislation on the deficit relative to some hypothetical "baseline", which is intended to indicate what the deficit in

some future year would have been had no policy changes been adopted. If the baseline forecasts project sharply increasing deficits, then even significant "deficit reduction" would not necessarily result in reduced deficits. Third, we may simply have been the victims of forecasting errors, expecting deficits to be lower than they turned out to be.

Identifying the reasons for the recent Sisyphean fiscal ordeal has implications for future policy design. Most importantly, the recent success or failure in forecasting budget trends should help inform our judgment about the accuracy of current forecasts and the extent to which additional policies are needed to achieve long-run fiscal viability. Studying recent fiscal performance can also help us understand the effects of budget accounting rules and procedures. Much of the federal government's effort at budget control during the past decade, beginning with the Gramm-Rudman-Hollings Emergency Deficit Control Act of 1985, has taken the form of procedural changes intended to place obstacles in the way of deficit spending. In light of recent events, I will consider the following question:

- **How have budget control rules affected fiscal policy, and how is the effectiveness of such rules influenced by our ability to forecast future fiscal performance?**

After a brief review of recent current budget trends, I turn in Section 2 to a review of the past decade of budget forecasts and results, in order to sort out the causes of these trends. Section 3 considers the impact of deficit control measures on fiscal policy, in light of recent history. Section 4 describes the recent changes in fiscal policy brought about by the 1993 legislation. In Section 5, I'll return to the paper's initial question of sustainability and, in light of all the difficulties recognized, discuss the magnitude of the current fiscal imbalance and the changes potentially needed to produce a sustainable fiscal policy. Section 6 offers some conclusions.

1.1. Recent Fiscal Performance

Figure 1 presents annual U.S. federal budget deficits since fiscal year 1983, and deficits projected through 2004 by the Congressional Budget Office.[2] As the figure indicates, the deficit has ranged between $150 billion and $290 billion throughout the historical period, and between 3 and 6 percent of GDP. Current projections are for the deficit to fall over the next couple of years, both in nominal dollars and as a share of GDP, then begin rising again by both measures. I'll discuss below why the deficit is projected to rise, and the extent to which deficit trends accurately represent the path of fiscal policy. First, however, it is useful to consider the factors that have contributed to the deficits, measured as they are, experienced over the past decade.

2. *Identifying the Sources of Recent Deficits*

As indicated above, there are three potential explanations for the persistence of deficits of $200 billion or more in the face of the large deficit reduction packages passed in 1990 and 1993: high "baselines," unanticipated behavioral responses, and other forecast errors. I'll consider each of these explanations. Much of my analysis will be based on the historical record of CBO deficit forecast revisions.

For several years, CBO has published forecasts of deficits, revenues and expenditures for the current and five subsequent fiscal years. Typically twice a year, CBO has provided revised estimates, dividing the revisions from one forecast to the next for a particular future fiscal year into three categories, according to whether they could be attributed to changes in policy, changes in projected macroeconomic behavior, or those residual, or "technical", changes in revenues and spending that

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[2]Throughout the rest of this paper, I will use CBO forecasts except as noted otherwise. These projections do not incorporate CBO's recent estimates of the impact of the Clinton health proposals.

could not be explained either by policy changes or macroeconomic changes. Within each category, revisions are broken into spending and revenue forecast revisions, and sometimes further.

For example, a reduction in projected tax collections due to an unexpected recession would be classified as an economic change, while a reduction in income taxes caused by a shift in the distribution of taxable income toward lower marginal tax brackets would count as a technical error, because the income distribution is not part of the macroeconomic forecast. Policy projections, and changes in them, reflect not simply actual legislation, but a professional judgment of what is likely to occur. This revision process my be expressed as:

$$_{t-i}D_t = {}_{t-i-1}D_t + {}_{t-i}P_t + {}_{t-i}E_t + {}_{t-i}T_t \qquad (1)$$

for i = 0 to 5, where ${}_{t-i}D_t$ is the deficit forecast for year t at the end of year t-i (equal to the actual deficit D_t for i = 0) and ${}_{t-i}P_t$, ${}_{t-i}E_t$, and ${}_{t-i}T_t$ are the policy, economic, and technical revisions to the year t deficit forecast in year t-i (denoted P_t, T_t, and E_t when i = 0).

A similar procedure has been followed by OMB, with similar results, at least in recent years. I use CBO figures for two reasons. First, the CBO methodology is likely to have been more consistent over the past decade than the corresponding OMB projections of three different presidential administrations. Second, the CBO projections are likely to have been closer to true forecasts than the OMB projections, because the latter were often distorted by budget rules requiring that projected

budget deficits meet certain targets.[3] My comments should not be taken as a critique of CBO methods or competence.[4]

2.1. Initial Baselines and the Effects of Policy

To understand why deficits remain so large, it is helpful to begin by applying expression (1) successively for a given fiscal year's deficit, cumulating all the revisions that occur during years t-5 through t. This yields:

$$D_t = {}_{t-6}D_t + \sum_{i=0}^{5} (P_{t-i} + E_{t-i} + T_{t-i}) \qquad (2)$$

One possible reason why deficits remain so large is that initial baseline deficits themselves -- the original projections ${}_{t-6}D_t$ made five years prior to each fiscal year in question -- were extremely high. This could have come about for two reasons. First, the excesses of the past simply might have set policy on a smooth trajectory that, left to its own, would have produced ever higher deficits. For example, the Reagan tax cuts of 1981 have often been blamed for subsequent deficits. Alternatively, previous policies might have included timing shifts in revenues and/or expenditures that reduced near-term deficits at the expense of deficits beyond the six-year forecasting period. For example, a policy enacted in 1983 to speed up revenue collections from 1990 to 1987 would reduce the 1987 deficit but lead to a higher baseline deficit forecast for 1990, when the initial baseline forecast for that fiscal year first appeared in 1985.

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[3]Reischauer (1990) provides evidence that the gap between OMB budget projections and CBO reestimates of these budgets rose after the enactment of the Gramm-Rudman-Hollings Act, which required that budgets meet specified deficit targets.

[4]Indeed, CBO (1993b, Appendix A) provides evidence that its ex post macroeconomic forecasting record, measured in terms of root mean squared errors in the prediction of real GNP, inflation and short-term interest rates, is comparable to that of the private sector "Blue Chip" consensus and somewhat better than the combined Administration record.

While offering different explanations for why the initial baseline for a particular fiscal year might be high, each argument suggests that policy changes enacted during the six-year forecasting window between the date of the initial baseline forecast and the end of the fiscal year itself simply were too small to offset the high initial baseline deficits. However, this story is not consistent with the data for recent fiscal years or for those in the immediate future.

There have been several policy changes aimed at reducing deficits since the early '80s, in addition to the changes of 1990 and 1993 already cited. The importance of these intervening changes can be seen in Figure 2. This figure presents two series, based on data from February 1983 to January 1994. The first, labelled "Initial Baseline Deficit," is the deficit for that year as forecast by CBO six years earlier, ${}_{t-6}D_t$, or, for fiscal years prior to 1988, the deficit forecast in February 1983, which is as far back as the data go. The second curve in Figure 2, labelled "Baseline Plus Policy" adjusts the initial deficit forecasts for the effects of all policy changes dating from the first forecast for each fiscal year through the end of the fiscal year itself or, for fiscal years after 1993, through January 1994. It corresponds to the right-hand-side of expression (2), with the economic and technical revisions set to zero, cumulating the changes in deficit forecasts that CBO attributed to changes in policy, from the date at which calculations for that fiscal year began until the end of that fiscal year or, for current and future fiscal years, until January 1994. Thus, a full six years' estimated policy effects are presented only for fiscal years 1988-93.

As the figure indicates, fiscal policies since 1983 have, according to estimates, reduced budget deficits relative to initial baseline in every fiscal year. For the fiscal years 1988-93, the average reduction over six years was $154 billion. Some of these reductions may simply have acted to offset the deficit increases embedded in the initial baselines by earlier policy actions. Still, had the policy effects actually measured been the only changes from initial baseline projections, the federal budget

would have been in surplus in 1991 and 1992 and would be projected in surplus for fiscal years 1994 through 1996.

Of course, the policies themselves would probably have been different had there been no other (i.e., economic and technical) revisions from initial baseline forecasts during this period. That is, some of the policies aimed at deficit reduction resulted from the realization that things were worse than originally projected. But this argument does not alter the conclusion that the policies actually enacted were estimated to be large enough to offset the budget deficits initially projected.

After fiscal year 1996, the initial baseline deficits rise quite sharply. For the future, then, as I'll discuss below, the devil may well be in the baselines (or at least may start there); but for recent years, we need to look elsewhere.

2.2. Forecast Errors

The surpluses indicated by the lower curve in Figure 2 were exceeded by actual deficits (or those projected as of January 1994) by the sum of cumulative economic and technical forecast errors. Figure 3 presents these errors for the same period. Moving vertically, the figure shows the cumulative impact of, respectively, economic errors, technical errors, and the additional interest payments associated with these two changes. These interest costs include the effects (counted as economic changes) of revisions in nominal interest rate forecasts, as well as the cumulative debt service effects resulting from the economic and technical errors.

There are two reasons to consider these changes in interest costs separately. First, errors in the prediction of debt service costs arise only as the result of underlying errors in other projections. Second, to the extent that projected nominal interest rates and hence interest costs change because of changes in the expected inflation rate, the associated change in the projected deficit is a change in the

nominal deficit but not the real deficit.[5] For fiscal years after 1995, declines in projected nominal interest rates have outweighed increased debt service projections, causing revisions of estimated interest costs to be slightly negative, thus far.

In studying Figure 3, one needs to keep in mind that, as in Figure 2, only the years 1988-93 offer a full six years of data. Hence, the small errors in the early '80s and late '90s simply reflect the relatively short intervals over which errors are being cumulated. Focusing again on the period from 1988 to 1993, then, we observe that both technical and economic forecast errors have been positive in every one of these fiscal years. Further, both economic and, particularly, technical errors have been very large in recent fiscal years. For fiscal years 1990-93, technical errors alone (excluding interest) accounted for an average of $132 billion per year. Even more disturbing is the fact that for fiscal years 1994-96, for which fewer than six years' revisions have been counted, the average technical error equals $166 billion.[6]

2.3. Decomposing Technical Forecast Errors

These large technical prediction errors deserve further attention for several reasons. First of all, unlike economic forecast errors, which by definition are directly attributable to changes in the forecasts of aggregate variables, these are the residuals of the forecasting process and therefore not

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[5]Presumably, there are other components of the economic forecast error attributable to changes in inflation expectations that we would also like to exclude or consider separately for the same reason. However, at least in recent years, holding nominal interest rates fixed, "changes in inflation have little impact on the deficit because they tend to push up revenues and spending by roughly equal amounts." (CBO 1993b, p. 35). Hence, the net changes in the primary deficit (i.e., the deficit excluding interest) associated with changes in macroeconomic forecasts should be due mainly to changes in real economic variables, such as real growth and the unemployment rate. This will not be true, of course, for forecasts of nominal revenues and spending, each of which will be quite sensitive to rate of inflation.

[6]The cumulative forecast error for fiscal year 1998 is negative, in contrast to the general trend. This reflects one year's revision (from January 1993 to January 1994), during which technical and economic forecast errors for fiscal years 1994-1997 were negative as well. Whether these very recent revisions indicate a shift in the trends of recent years is too early to tell.

directly linked to any aggregate changes. Their causes are not as easily identified and could have different implications for the future. Second, economic forecast errors may present less reason for concern or policy reaction, because they reflect, in part, the automatic stabilizers that, at least from a traditional Keynesian perspective, are desirable. On the other hand, there need be no obvious benefit associated with forecast errors, conditional on the state of the economy.

Finally, to the extent that recent deficits have been caused by inaccurate assessments of taxpayer responses to tax changes, we would expect this to show up in technical forecast errors of tax revenues. For example, suppose an increase in capital gains tax rates reduced capital gains realizations more than CBO predicted. This would reduce capital gains realizations, given the level of income and other macroeconomic aggregates, and therefore would lead to overestimates of individual income tax collections, conditional on macroeconomic conditions, in the years following the enactment of the tax increase.

Perhaps the biggest single source of technical forecasting error during the past decade was the Savings and Loan bailout and associated problems. There was, initially, an underprediction of the cost of the bailout, leading to large forecast errors in the early '90s. Thereafter, there was uncertainty regarding when Congress would choose to provide the funds already seen as needed, essentially a timing issue that has led to both positive and negative technical forecast errors in fiscal years after 1992.

However, the S&L bailout explains only a small part of the overall picture. Figure 4 graphs the cumulative technical forecast errors for fiscal years 1983-98 shown in Figure 3, but excluding both the associated debt service and the errors attributable to the S&L bailout. The figure breaks the remaining forecast errors into three components: revenue overpredictions, underpredictions in the cost of Medicare and Medicaid, and all other.

The rapid growth of medical spending in recent years has (until calendar year 1993) been underpredicted consistently, leading to the technical errors associated with the Medicare and Medicaid programs. While these errors have been important, the figure shows that revenue overpredictions have been an even more significant source of technical forecast errors in recent years. However, even with these two areas (plus those already excluded) accounted for, a significant residual – around $70 billion in fiscal years 1993 and 1994 -- remains.

Although a relatively short period of time is represented in Figure 4, this persistence of large positive cumulative technical errors calls into question whether these are true forecast errors in terms of being the results of an optimal forecasting process.

One possibility is that technical errors are systematically positive because baseline forecasts fail to account for the "unexpected" emergencies that always arise, in the way that a local government might not "expect" snow and hence fail to provide a snow removal budget. Aside from the Savings and Loan bailout, which is already excluded from Figure 4, recent years have seen hurricanes, floods, earthquakes, Operation Desert Storm, etc. On the other hand, we have also experienced an unpredictably rapid decline in defense spending (the "peace dividend") due to the deterioration of the Soviet Union and now Russia as a military threat, which has led to negative technical forecast errors.

Moreover, unlike in the snow removal example, these are deficit forecasts. They are not the actual budgets presented by presidents who have been accused of adopting a "rosy scenario" in order to put off proposing difficult budget choices, and who have been given further incentive to do so by budget rules requiring that submitted budgets be claimed to satisfy certain criteria (see footnote 3 above). There undoubtedly has been political pressure not to forecast realistically large deficits, but it is difficult to know how important a role such pressure has played in producing the forecasting record observed during the past decade.

2.4. The Statistical Properties of Revenue Forecast Errors

Whatever the importance of the "one unexpected emergency after another" hypothesis on the spending side, it is difficult to think of comparable examples on the revenue side, given that these errors are residuals after account has been taken of macroeconomic and policy effects. Further, while CBO provides a breakdown of spending forecast errors by source (defense, medical, etc.) there is usually no explicit breakdown given for revenues.

In the aggregate, though, these revenue forecast errors have typically been negative (i.e., revenues were overpredicted), not just cumulatively for each fiscal year, but for each individual revision as well. Table 1 presents the average k-year-ahead forecast revisions during the sample period, for k ranging from 0 (the current fiscal year) to 5 (the most distant fiscal year being predicted). For each value of k, average economic and technical revisions are negative and policy revisions are positive.[7] Presumably, the economic revisions are attributable to unexpectedly weak growth and lower inflation after the mid '80s, while the policy revisions simply reflect the continual process of attempts at deficit reduction.

Whence the technical errors? As a first step toward answering this question, Table 2 presents the results of regressions in which each technical revision for each fiscal year is represented as an individual observation. Explanatory variables in the first specification include a constant and lagged values of the three forecast revisions for the same fiscal year.

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[7]These calculations are based on the evidence through fiscal year 1993. The revisions are smaller, on average, for the 5-year-ahead estimates because these typically reflect only a partial year's information. The first forecast for the fiscal year 5 years into the future is typically published in January, whereas the fiscal year begins on October 1. For example, CBO's first published estimate for fiscal year 1998 appeared in January 1993. Hence, the 5-year-ahead revision for fiscal year 1998 reflects changes only from January 1993 through late September 1993. The fiscal-year-1993 revisions of projected deficits in fiscal years 1993-1997 (0 through 4 years ahead) include revisions from September 1992 through September 1993.

As the first column of the table shows, technical revisions are essentially unpredictable using this information -- the equation's $\bar{R}^2$ is -.01, and no variable has a statistically significant impact. However, adding a simple time trend to the regression explains one-third of the variance of the technical forecast errors. In this second specification, the technical error, aside from trending sharply downward over time, relates negatively to all three components of the lagged forecast revision, suggesting that revisions are systematically too large in absolute value. Interestingly, though, the one such relationship that would have the most straightforward explanation -- the overstatement of revenues attributable to policy changes because of an underprediction of the magnitude of behavioral effects -- is the least significant, both statistically and quantitatively.

What can we conclude from this exercise? First, that technical errors seem clearly not to be optimal forecast errors in the sense of being drawn from a distribution having zero mean and independent of available information. On average, they are significantly negative and related to past information. Second, at least in the aggregate, underprediction of behavioral responses to taxation does not seem to have played a crucial role in producing the consistent overprediction of revenues.[8] Finally, the errors themselves have been getting worse over time. While it is implausible that such a trend could continue for very long (and recent evidence encourages the hope that it may be ending), one still is led, pending a better understanding of the process, to be concerned about what revisions lie in store, and to be skeptical of any conclusions about the sustainability of fiscal policy based on point

[8]This finding does not demonstrate that behavioral effects have been accurately predicted in all instances, or that potential prediction errors are not an important factor in evaluating future policy. Rather, it simply indicates that there is much more to the historical puzzle. Indeed, an important component of CBO's forecasting errors following the Tax Reform Act of 1986 can be attributed to overestimated capital gains tax realizations. Also after 1986, individual income tax revenues rose more than originally predicted, which some (e.g. Feenberg and Poterba 1993, Feldstein 1993) have attributed to the behavioral response of high-income taxpayers. However, this is masked in the data by the fact that corporate income tax revenues fell unexpectedly.

estimates of revenues or expenditures. I will return to this issue below when evaluating the current state of policy and recent fiscal changes.

3. *Budget Rules and Their Impact on Policy*

Since the advent of large federal budget deficits in the early 1980s, the federal government has relied on a succession of budget control measures in its attempts to achieve fiscal balance. Recently, despite the 1993 extension of the provisions of the 1990 Budget Enforcement Act, there have been renewed calls for an even stronger measure, namely a balanced budget amendment.

Presumably, budget rules are imposed by legislators (and presidents) to force themselves to accept more fiscal austerity than they would agree to in the normal course of events. The notion is that while a majority of legislators may agree on the need for overall limits, the legislative process fails to produce a majority coalition in opposition to any particular deficit-increasing provision. While the political economy of this process is not particularly well understood and thus merits further attention[9], I will confine my discussion to how well the rules have been designed to achieve their apparent objective. The persistence of significant deficits throughout the past decade suggests the absence of complete victory, to say the least.

This section describes the different budget control measures that have been used since the mid-'80s, and considers the impact that they have had on fiscal policy. It also draws out the implications for the design of such measures of two important factors. One is the difficulty of making accurate budget predictions, which was discussed in the previous section. The other, which is illustrated below, is the demonstrated ability of government to alter the timing of measured deficits with minimal changes in the underlying fiscal policy itself. Each of these factors has confounded past budget control mechanisms and, indeed, led to perverse results.

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[9]See Gramlich (1990) for some further discussion along these lines.

3.1. Budget Rules

The first attempt at imposing an external mechanism to control the budget deficit was the Balanced Budget and Emergency Control Act of 1985, commonly known as Gramm-Rudman-Hollings (GRH). Enacted in December 1985, it imposed specific deficit targets for fiscal years beginning in the same fiscal year (1986), declining linearly to zero by fiscal year 1991. If, at the beginning of a fiscal year, the target for that year was judged by OMB not approximately to have been met, automatic, across-the-board budget cuts (sequestration) would follow. Once the target was declared met for a particular fiscal year, subsequent forecast revisions during the remainder of that fiscal year were ignored.

Failure to meet the original GRH targets for fiscal year 1988 led to amended targets in 1987, declining to zero by fiscal year 1993. Failure to meet the revised targets led ultimately to the supplanting of GRH by the 1990 Budget Enforcement Act (BEA). Under BEA, there are specific caps on discretionary spending that translate into real annual spending reductions, along with a Pay-as-You-Go (PAYGO) process for revenues and entitlements (excluding Social Security, which is treated separately and in similar fashion) that prohibits policy changes from increasing the estimated deficit in any year during the six-year period (covering the current and five subsequent fiscal years) for which official deficit forecasts are made.

Unlike GRH, BEA effectively imposes no deficit targets -- only the requirement that any year's policy changes not increase the estimated current and near-term deficits relative to the levels forecast at the beginning of the current fiscal year. For example, policy changes enacted during fiscal year 1992 could not increase the estimated deficits in any of the fiscal years from 1992 through 1997 over the levels predicted for these deficits at the beginning of fiscal year 1992.

3.2. The Impact of Forecast Errors

The large forecast errors discussed in the previous section clearly have confounded the operation of GRH and BEA in reducing deficits. Consider first the impact under GRH. The GRH budget rule can be written:

$$P_t \leq D_t^* - {}_{t-1}D_t \tag{3}$$

where D_t^* is the deficit target for year t. Given that the actual deficit in year t, D_t, equals the previous year's estimate plus economic, technical and policy revisions,

$$D_t = {}_{t-1}D_t + P_t + T_t + E_t \tag{4}$$

it follows that, if (3) is just satisfied, then:

$$D_t = D_t^* + T_t + E_t \tag{5}$$

That is, the GRH target for year t is missed by the extent of technical and economic forecast errors.[10]

Under BEA, the deficit policy rule is much simpler, namely:

$${}_{t-i}P_t \leq 0 \tag{6}$$

for i = 0 to 5. If this condition is satisfied by equality, then expression (2) becomes:

$$D_t = {}_{t-6}D_t + \sum_{i=0}^{5} (E_{t-i} + T_{t-i}) \tag{7}$$

[10]While there might be stabilization arguments for not offsetting some components of the economic forecast errors, the same argument presumably would call for a simultaneous adjustment to future years' targets as their economic forecasts were revised in year t.

Thus, the BEA rule incorporates the cumulative effect of the full six years' prediction errors of a fiscal year's deficit, rather than just those occurring in the fiscal year itself. Even if each individual prediction error were unbiased, this cumulation would increase the magnitude of deviations.[11] But the sample mean of $123.8 billion dollars in cumulative economic and technical forecast errors for a typical fiscal year (see Table 1) implies that the rule also systematically has led to a deficit exceeding the initial baseline forecast by this amount. Moreover, in comparing equations (5) and (7), it is important to realize that there is nothing to suggest that the initial baseline forecast bears any relation to an optimal deficit target. Thus, in practice, the BEA validates deficits substantially higher than those initially forecast, which may themselves be viewed as far too high. Indeed, one reason for their being too high is that policy actions prior to the date of initial forecast may have shifted the timing of deficits from earlier years.

3.3. The Timing of Deficit Reductions

In addition to impounding forecast errors in the eventual deficits, both GRH and BEA provided policymakers seeking to avoid the austerity of "permanent" deficit reduction with the incentive and the opportunity to alter the timing of revenues and expenditures without necessarily affecting their long run levels or even their present values.

Under GRH, a particular fiscal year's deficit target could be met by increasing deficits in subsequent years. The classic mechanism for doing so was the sale of government assets which, in the most straightforward case, would reduce a current year's deficit and increase the deficits of remaining years by an amount equal in present value. According to Reischauer (1990), fully half of the deficit reduction under GRH fell into the "one-time savings" category including asset sales and moving agencies off-budget.

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[11]This follows directly from the fact that the optimal forecast errors of the year t deficit made in years t-5 through t should be temporally uncorrelated.

Some have argued that this use of "smoke and mirrors" could have been curtailed through better budget rule design. For example, a capital budget would have eliminated the deficit impact of pure asset sale transactions. However, there were many "legitimate" fiscal changes during this period, not generally criticized as "budget gimmicks", that had the same timing effects. An example is the provisions of the Tax Reform Act of 1986 that repealed the investment tax credit immediately and retroactively and partially compensated for this tax increase by reducing the corporate tax rate.[12] This illustrates the futility of trying to distinguish between "good" and "bad" budget changes in an annual context.

The experience under GRH led to the BEA's use of a multiyear approach. However, even under the BEA, incentives for shifting remain. Now, they simply must occur from fiscal years beyond the six-year budget window over which the restrictions on policy apply. However, because the shifting of deficits would be made only to those budget years for which an official deficit forecast has yet to be made, it is impossible to identify such shifting from the policy changes actually recorded. These shifts of deficits to "outside the budget window" would ultimately show up indirectly through unusually high initial deficit forecasts for those future fiscal years.

The fact that the restrictions that the BEA places in the future are then based on these initial baseline deficits leads to the perverse result (not present under GRH, which relied on predetermined deficit targets) that policies that decrease current deficits at the expense of future ones are then sustained by the budget rules once those future years enter the budget window.

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[12]Since the investment tax credit reduces taxes on investments when they occur, while a corporate tax cut reduces taxes on investments over time, a policy of reducing the ITC and the corporate tax at the same time, keeping the present value of taxes collected from each new investment constant, accelerates the tax collections from new investment. The provisions of the '86 Act were somewhat more complicated in that they repealed the ITC retroactively and extended the corporate tax reduction to existing assets.

For example, the current budget window includes fiscal years 1994-99. A tax speed-up enacted this year from fiscal year 2000 to fiscal year 1999 might be used to raise enough revenue in 1999 to offset some other, deficit-increasing policy of equal magnitude in the same fiscal year. As a result, the combined policy would cause no net change in the estimated fiscal year 1999 deficit, and an increase in the baseline deficit for fiscal year 2000, when initially reported. The BEA rules would then be based on this initial forecast, and thereby would sustain the previous year's deficit increasing policy. Indeed, if the collection of all the income taxes from fiscal year 2000 were speeded up to fiscal year 1999, the initial baseline deficit for fiscal year 2000 would reflect the absence of any income tax collections.

How much shifting has occurred under the different budget rules? We cannot observe the magnitude of shifts under BEA, for they would occur from future years for which estimates have not generally been available. Within the six-year budget window, we can only observe the shifts induced by GRH, which would take the form of deficit reductions in the current fiscal year achieved at the cost of increased deficits in subsequent fiscal years.

Figure 5 presents the pattern of deficit reduction (excluding interest) during three regimes: pre-GRH, GRH and BEA. For each of these eras, I have aggregated the policy changes, in each case recording the impact of the change on the current year's deficit and those of the five subsequent fiscal years. In terms of the notation introduced above, the policy changes along each curve are the average values of P_t, ${}_tP_{t+1}$, ${}_tP_{t+2}$, ${}_tP_{t+3}$, ${}_tP_{t+4}$, and ${}_tP_{t+5}$ during the regime, expressed in terms of deficit reduction (i.e., in negative terms) and as a percentage of the total.[13]

The incentives under GRH for shifting into the current fiscal year suggest that a greater share of such deficit reduction would occur during the current fiscal year under GRH than before GRH. On

[13]Because of the difficulty of classification, I have omitted the changes that occurred contemporaneously with the enactment of both GRH and BEA.

the other hand, BEA's restrictions on shifting from any of the next five years would, if anything, make shifting from these fiscal years less likely even than before GRH, when no explicit restrictions on shifting existed.

Indeed, Figure 5 bears these predictions out. Before GRH, the average policy change involved an increase in the current year's deficit and reductions in the deficits of the next five years. Under GRH, enacted policies had little effect on the deficit five years out but a considerable impact on the current year's deficit. Under BEA, we have reverted to a situation in which the average impact of policy is to increase the current year's deficit[14], but the pattern of deficit reduction is shifted even more toward the later years of the sample than before GRH. In a sense, the adoption of the BEA has succeeded in eliminating timing shifts within the budget window. But this change does not indicate the absence of shifts from fiscal years more than five years into the future, and could be one explanation for why the initial baselines jumped suddenly in fiscal year 1997, the first initial baseline to appear after the adoption of the new budget rules (see Figure 2).

3.4. Summary

The budget rules of the past decade have not succeeded in achieving sustained deficit reduction. The "budget gimmicks" and unrealistic deficit targets of GRH gave way to the less ambitious but longer-horizon constraints of the BEA. However, the BEA still permits policies that shift deficits "outside the budget window" and sustains these policies by relying on initial baseline estimates rather than budget targets. Moreover, it provides no error-correction mechanism to deal with the six years of forecast errors that occur after a fiscal year's deficit is first officially forecast.

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[14]These deficit increases are possible, given the restrictions against enacting a policy to increase the deficit, because of various loopholes in the rules, such as the ability to suspend the rules in cases of "emergency".

These incentives to shift deficits from one year to another have translated into policy actions, as measured by patterns of deficit reduction within the six-year budget window. Much of these shifts resulted from "legitimate" budget changes not viewed as budget "gimmicks," illustrating one of the weaknesses of budget control measures based on annual or multiyear deficits rather than on long-run fiscal consequences. Under BEA, though, the full impact is difficult to ascertain precisely because the increased deficits are beyond the official forecast horizon.

4. *OBRA 1993 and its Medium-Run Effects*

The Clinton program enacted in OBRA 1993 was the first important change in fiscal policy since the 1990 budget agreement. As the introduction indicated, the legislation was estimated to have provided as much as $500 billion in deficit reduction over the five fiscal years between 1994 and 1998. It includes a variety of tax increases, reductions in the level of discretionary spending, and reductions in spending on entitlements, particularly Medicare.

4.1. Sources of Short-Term Deficit Reduction

Before considering the long-run impact of the Clinton plan, it is important to ask how realistic its projected savings are, even in the short run. Put another way, how likely is it that the recent pattern of upward forecast revisions of deficits continue.

On the revenue side, there has been the critique, already cited above, of the projected revenues from the legislation's large increases in the top individual marginal tax rates. For example, Feldstein (1993) argues that virtually no net revenue will be collected as a result of the tax increase, representing a gap of over $20 billion per year at 1993 income levels relative to estimates ignoring

any behavioral effects.[15] His estimates are based on the responsiveness of taxpayers to the marginal tax rate reductions of the Tax Reform Act of 1986.

Given the relatively small overall labor supply and savings elasticities typically found in the empirical literature, how can Feldstein's estimated revenue effects be justified? There are two main arguments, both based on the fact that the 1993 tax changes are highly progressive.

First, absent any behavioral effects, a progressive tax change will raise less revenue from affected taxpayers than would a proportional tax change on the same group that produced the same increase in their marginal tax rate, since the average tax rate will be lower than the marginal tax rate. But the policies will have the same substitution effect of behavior. Hence, if the two policies lead to the same behavioral reduction in before-tax income, the associated percentage reduction in the revenue gain will be larger under the progressive tax increase. This is just another way of saying that the deadweight loss of progressive taxation is greater than that of proportional taxation.

In addition, the implied behavioral responses of taxpayers, particularly those in the highest income classes, to the 1981[16] as well as the 1986 reductions in marginal tax rates, are much larger than would be implied by labor supply and savings elasticities. The usual explanation is that much of the taxpayer response took the form of income shifting from tax-favored to fully taxable (and observed) categories, rather than changes in underlying work and saving behavior.

Is behavior after the 1986 Act a good predictor of what will happen after the 1993 Act? Given the many other provisions contained in each piece of legislation, and other economic changes that have occurred simultaneously, it is extremely hard to know. There are differences in the two pieces of legislation that could push the results in either direction. For example, some of the increase

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[15]The CBO projections, based on revenue estimates produced by the Joint Tax Committee, presumably incorporate some assumed behavioral changes, but they are clearly smaller than those for which Feldstein argues.

[16]See Lindsey (1987).

in taxable income in higher income classes after the 1986 Act undoubtedly resulted from the Act's restrictions on tax shelter activity, which were not reversed by the 1993 Act. On the other hand, because the 1993 Act is very progressive, its income effects on labor supply and saving behavior are likely to be smaller relative to its substitution effects, compared to the those of the 1986 Act. As long as leisure and consumption are normal goods, this would lead to greater behavioral responses, given the marginal tax rate changes, than occurred after the 1986 Act.

In summary, it is difficult to know whether we will observe large "technical" adjustments to revenue forecasts over the next few years as a result of the assumptions underlying present projections. There is also the question of whether any large behavioral changes that do occur represent permanent changes, or simply temporary ones.[17]

While OBRA 1993's projected revenue increases derive from changes in specific tax rules, some of the estimated spending reductions simply reflect the legislation's changes in the targets for future spending levels, which both CBO and OMB have chosen to incorporate into their baseline forecasts. Foremost among these -- and representing about a third of the estimated non-interest deficit reduction by 1998 -- is the "hard freeze" in overall discretionary spending that would keep discretionary spending roughly constant in nominal terms between fiscal years 1993 and 1998 -- representing a drop of roughly 2 percent of GDP, or about a 22 percent cut in the level of discretionary spending relative to what would prevail if such spending remained at its 1993 share of GDP.

[17]Feenberg and Poterba (1993) provide evidence that the surge of reported income among high income taxpayers occurred largely in 1987 and 1988, and actually receded in 1989. This is relevant to the results Feldstein presents, which compare the behavior of taxpayers in the years 1985 and 1988.

4.2. Timing and Deficits Beyond 1998

The previous discussion dealt with the extent to which the estimated effects of OBRA 1993 on near-term budget deficits is plausible. Even if these estimates are accurate, a second question is the extent to which such deficit reductions help address the federal government's long-run fiscal problems, as opposed simply to reducing deficits temporarily or shifting deficits to fiscal years beyond 1998 that lie beyond the official budget forecasting horizon.

Because much of OBRA 1993's estimated deficit-reduction on the spending side simply takes the form of reduced spending targets, rather than specific reductions, it is difficult to identify the longer run effects of the legislation on spending. On the revenue side, though, it is easy to identify specific provisions of the legislation that do not increase revenues beyond 1998 as much as they do during the budget period, or lose more revenue after 1998 than they do during the budget period.

For example, both corporate and individual estimated tax provisions have been tightened, leading to a one-time speed-up in the timing of tax collections as a greater share of each year's tax payments are made in advance. Securities dealers holding appreciated securities in inventory must move from a cash basis to an accrual basis in paying tax on these gains, again a one-time speed-up revenue collections. The tax treatment of intangible assets was altered in a way that raised more revenue during the budget period than afterward, when it may well lose several billion dollars per year.[18] These four revenue provisions alone have been estimated by the Joint Tax Committee (1993) to raise approximately $14.8 billion over the period 1994-98. The small business capital gains tax

[18]There were two factors that led to this result. First, the provisions could be applied up to two years retroactively at the discretion of the taxpayer. As a result, firms whose past acquisitions of intangible assets would benefit from the new provisions were induced to settle court cases and pay the now-lower taxes due on these past transactions, thereby speeding up tax payments but lowering them in present value. Second, by shifting from a system under which some intangible assets (i.e. goodwill) could not be amortized at all and others were amortized over short lifetimes to one under which most intangibles were written off over 15 years, the legislation raised more revenue in the short run than the long run. See Gravelle (1993) for further discussion.

cut, one of the key tax incentives of the Clinton program, loses less than a billion dollars over the five years through 1998 -- because stock must be held for at least five years after the effective date to qualify for the 50 percent capital gains tax exclusion. Presumably, once the five year waiting period is over, the revenue loss will burgeon.[19] And, while the extension of the low-income housing credit is projected to lose $4.9 billion between 1994 and 1998, its annual cost will reach much higher levels in the years that follow because more and more vintages of housing will be receiving this multi-year credit simultaneously.

How much impact do these and other such provisions have on future deficits? As discussed above, official forecasts of the impact of OBRA 1993 in fiscal years beyond 1998 do not exist. However, an estimate can be made using the overall, "unofficial" 10-year budget forecasts that CBO recently has begun publishing. While CBO does not explicitly identify how much of the revisions in these forecasts over time are attributable to economic, technical and policy changes, a rough division can be made. The Appendix describes the method used. The resulting estimates of the policy impact of OBRA 1993 for fiscal years 1999-2003, expressed as a share of GDP, are shown in Figure 6, along with CBO's official estimates for the period 1994-1998.[20]

In Figure 6, the revenue increase attributable to OBRA 1993 clearly falls after 1998. The magnitude of this drop amounts to about 15-20 billion dollars per year in 1994 dollars, which is plausible given the magnitude of the various speed-up provisions reviewed above and the crudeness of the calculation. However, there is no such drop on the spending side where, remarkably, the magnitude of the projected deficit reduction continues to grow, not simply in absolute terms but as a

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[19]The small immediate revenue loss estimated results from the assumption that some gains that otherwise would have been realized will be deferred in order to receive the tax cut.

[20]The lack of smoothness in the projected revenue and expenditure patterns in 1999 presumably is attributable to the roughness of the projection technique being used.

share of GDP -- from 1.53 percent of GDP in fiscal year 1998 to 2.04 percent in 2003. A large part of this comes from a projected slowing of Medicare growth after 1998.

Are these spending forecasts plausible? In addition to the slower growth of Medicare, they include the prediction (carried over from before OBRA) that discretionary spending will continue to fall after 1998 as a share of GDP, from 6.9 percent to 6.3 percent -- a net reduction of 2.5 percent of GDP over the 10-year period beginning in fiscal year 1993, and a drop of 4.2 percent of GDP from fiscal year 1985. Whether such continued reductions are feasible remains to be seen. However, it is clear that they cannot continue forever, even if the projections through 2003 prove to be accurate.

5. *The Sustainability of Current Fiscal Policy*

Despite the persistence of deficits in recent years, many observers find reasons for optimism about fiscal policy's long-run trajectory. After all, the federal deficit, which exceeded 5 percent of GDP for each year of the period 1983-86 and neared this level again in the early '90s, is projected to fall to 2.2 percent of GDP by 1998. The deficit for 2003, which before the passage of OBRA was projected to rise to 6.9 percent of GDP, is now forecast to rise only to 3.1 percent. Moreover, the primary deficit (the deficit excluding net interest paid), a key measure for empirical tests of sustainability, is now (in fiscal year 1994) only .4 percent of GDP and is projected to pass into surplus in fiscal year 1995 and stay there through 2003.

However, longer run projections do not support optimistic conclusions based on such short-run measures. There are two basic reasons for this. One is the continuing rapid growth of government medical care expenditures. The other is the shift of the social security system from its recent cash-flow surpluses to significant cash-flow deficits. Each of these changes illustrates the difficulty of evaluating sustainability based on the behavior of current or past deficits, as empirical tests typically have tried to do.

5.1. Sustainability and the Intertemporal Budget Constraint

Most discussion of the sustainability of fiscal policy begins with the presentation of the government's intertemporal budget constraint,

$$B_t + \sum_{s=t}^{\infty} (1+r)^{t-s-1} DP_s = 0 \qquad (8)$$

where B_t is the debt outstanding at the beginning of year t, DP_t is the primary deficit at the end of year t, and r is the discount rate. This constraint is derived simply by applying the annual budget constraint relating B_t and B_{t+1} forward successively and then imposing the terminal condition, $\lim_{T \to \infty} (1+r)^{(t-T)} B_T = 0$.

A policy that does not satisfy this terminal condition is not sustainable, for it implies that the debt will explode at a rate faster than r. Hence, one strategy of testing for sustainability, put simply, has been to see whether the behavior of B_t over time has been consistent with the terminal condition being met -- basically whether the national debt, given its past time series properties, is predicted to grow faster than the appropriate discount rate (see, e.g., Hamilton and Flavin 1986; Wilcox 1989). An intrinsic problem with such tests, however, is their reliance on past behavior of the debt as a predictor of the future. This is a particular problem now, as demographic shifts alter the level and growth rate of entitlement spending.

Moreover, these tests are very susceptible to the changes in the timing of deficits so easily accomplished by policymakers in the past. The underlying hypothesis being tested relates to the sum of the initial stock of debt and the present value of future primary deficits -- the left hand side of (8) above. But, without changing the value of this sum, it is very easy to change B_t and each annual primary deficit, and hence the short-run behavior of both the debt and the deficit.

The problem here is much more serious than needing to make corrections for "budget gimmicks" that distort the "true" pattern of deficits. As discussed above in Section 3, there are many "legitimate" policy changes that have precisely the same time pattern of deficit effects. There really is no true pattern of deficits, only what particular policies and conventions define.

For example, replacing the social security system with an actuarially fair public pension system investing in government debt plus an old age transfer program to the elderly (to replicate the net transfers implicit in the current social security system) would have no effect on the sum of the national debt plus the present value of future primary deficits -- indeed, it would have no real effects at all -- but it would raise the national debt immediately by the stock of outstanding unfunded liabilities of the social security system, and offset the surpluses presently being recorded with even larger accumulating liabilities to the working population. Hence, our conclusions, not only about the level of deficits but also about their trajectory, would be strongly affected.

In short, while the intertemporal budget constraint is well-defined, the level of any year's debt or deficit is not (Kotlikoff 1986). There are many examples from actual and proposed legislation of policies that are essentially equivalent to one another, except for their consequences for the timing of measured deficits.[21] The only solution is to measure the entire left-hand side of (8) -- to look at projected fiscal policy into the very distant future.[22]

5.2. Long-Run Fiscal Projections

To evaluate the sustainability of fiscal policy, I form projections of primary Federal deficits after 2004, the last fiscal year for which CBO estimates exist. To highlight the importance of entitlement spending, I assume -- probably optimistically, given the low level of discretionary

[21]See Auerbach and Kotlikoff (1987) and Auerbach, Gokhale and Kotlikoff (1991).

[22]Even this statement is true only under the assumption, which seems reasonable, that satisfaction of the terminal condition will not be influenced by changes in budget accounting conventions.

spending relative to GDP forecast for 2004 – that all non-interest spending other than Medicare, Medicaid and OASDI (Social Security) remain constant at their projected 2004 shares of GDP, and that all revenues except OASDI payroll taxes do so as well. Hence, I assume primary deficits as a share of GDP grow after 2004 exactly to the extent that Medicare plus Medicaid and OASDI benefits less payroll taxes do so.

For social security benefits, I use the Social Security Trustees' 1993 middle ("Alternative II") projections, which extend through the year 2070.[23] For federal Medicare and Medicaid spending[24], I use the middle projections for real spending through the year 2030 made by the Health Care Financing Administration (HCFA) in 1991, the most recent such projections publicly available[25]. Between 2030 and 2070, I assume that Medicaid stays constant as a share of GDP, and that Medicare grows at the same rate as OASDI benefits. This assumption basically means that post-2030 growth in federal medical costs comes from demographic shifts – the growing share of elderly in the population -- rather than changes in the relative price of medical care. After 2070, I assume that OASDI, Medicare, and Medicaid all grow at the same rate as GDP.

These projections, along with those resulting for the primary deficit, are shown in Figure 7. The Social Security system's current cash flow surpluses are projected to turn to deficits by 2017, which continue growing in magnitude thereafter. The swing increases the primary deficit by 1.7 percent of GDP by 2030, and 2.3 percent by 2070. At the same time, federal spending on Medicare

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[23]These projections give taxes (income), benefits (outgo) and the balance between taxes and benefits as a share of GDP every five years. I interpolate to obtain values for the years in between.

[24]Medicaid spending financed by state governments is excluded from the calculations.

[25]These are the same projections used in the "Generational Accounting" calculations of the federal budget during the past three fiscal years. See, for example, OMB (1994). Because the HCFA projections for 2004, primarily for Medicaid, differ from those currently offered by CBO, I benchmark the 2004 numbers to the CBO projections, and adjust all subsequent years' HCFA projections by the same fraction of real GDP as the 2004 adjustments represent. The projections for real GDP are based on CBO's assumed growth rate for the period 1998-2003 of 2.3 percent per year.

and Medicaid is predicted to continue to grow faster than GDP through 2030, due to growth in both the real cost of health care and the ratio of beneficiaries to the total population. This growth in medical care spending increases the primary deficit by 2.3 percent of GDP between 2004 and 2030. After 2030, demographic shifts alone add another .2 percent of GDP to the primary deficit.

Together, these two factors are projected to increase the primary deficit steadily over the period from .2 percent of GDP in 2004 to 4.2 percent of GDP in 2030 and 5.0 percent by 2070. Indeed, the prospects may be even worse. These calculations incorporate projections for the growth of real health care spending between 2004 and 2030 that were based on a lower assumed rate of GDP growth than the 2.3 percent assumed here. In a sense, I am assuming that faster GDP growth will not lead to faster growth in Medicare and Medicaid. If, instead, I incorporate the original projections of Medicare and Medicaid spending, relative to GDP, through 2030, the result will be faster growth in health care entitlements and primary deficits that are nearly 2 percent of GDP higher by 2030, as indicated by the upper dashed line in Figure 7.

Even if the relative price of medical care were completely stabilized in 2004, rather than 2030[26] (as represented by the lower dashed line in Figure 7), the primary deficit would still grow to 3.2 percent of GDP by 2030 and 3.9 percent by 2070.

5.3. Addressing the Long-Run Imbalance

With primary deficits projected to grow continually over the next several decades, fiscal policy is not on a sustainable path. These large projected primary deficits, in combination with the initial stock of outstanding debt, would cause the full deficit, including interest, to grow explosively relative to GDP. For example, under the base case projections in Figure 7 and a real interest rate exceeding the real GDP growth rate by 1 percentage point, the debt-GDP ratio would grow from .55

[26]For this simulation, Medicaid is held constant as a share of GDP at its projected 2004 level, and Medicare is assumed to grow at the same rate as OASDI benefits starting in 2004, rather than 2030.

in 2004 to 1.31 at the end of 2030 (the beginning of 2031) and 4.1 at the end of 2070. For an inflation rate of 2.5 percent, this would translate into full nominal deficits rising from 3.3 percent of GDP in 2004 to 11.5 percent of GDP in 2030 and 28.5 percent of GDP in 2070!

One way of interpreting an imbalance of this magnitude is in terms of the immediate, permanent reduction in the primary deficit (brought about through tax increases and/or spending reductions) that, if projections prove accurate, would be needed to bring the debt-GDP ratio at some date T in the future down to its level at some initial date t, in this case 2004. This needed reduction in the primary deficit, as a share of GDP, may be shown to equal:

$$\Delta = (r-g)[b_t + (\frac{1}{1+r})\frac{\sum_{s=t}^{T} d_s(\frac{1+r}{1+g})^{T-s}}{(\frac{1+r}{1+g})^{T-t}-1}] \qquad (9)$$

where g is the growth rate of GDP and d_s is the primary deficit-GDP ratio in year s.

As discussed in Blanchard et al (1990), a terminal date of $T=\infty$ corresponds to satisfying the intertemporal budget constraint, (8). Given the projected growth of primary deficits between 2004 and 2070, hitting the target debt-GDP ratio at some intermediate date will require a lower tax increase, but still leave the job partially unfinished.

Table 3 presents the permanent reductions in the primary deficits indicated by this procedure, for terminal dates of 2031, 2071 and ∞, for different assumptions about medical care spending and different government discount rates. As a comparison of the upper and lower panels of the table indicates, a lower interest rate assumption (with the interest rate exceeding the growth rate by 1 percent rather than 2 percent) reduces the needed deficit reduction for the shortest horizon, but increases it over the longest horizon. This is because, in the short run, the lower cost of servicing the existing debt dominates the calculation (see (9)). Over the longer run, the future primary deficits

dominate the calculation and, with a lower interest rate, those far in the future -- which are larger as a share of GDP -- matter relatively more.

Even under the more optimistic assumptions about the growth of Medicare and Medicaid, an immediate, permanent reduction of nearly 4 percentage points in the primary deficit-GDP ratio is needed to satisfy the intertemporal budget constraint (8) (i.e., for $T=\infty$). The magnitude of this change can be understood by noting that the federal individual income tax now raises just over 8 percent of GDP. Hence, individual income taxes would need to be raised permanently by nearly 50 percent. Alternatively, OASDI benefits would have to be cut permanently by about 60 percent.

5.4. What Policy Changes Are Needed?

A natural reaction by policy makers is to dismiss pessimistic calculations based on long-term forecasts, because the forecasts involve so much uncertainty. Indeed, the bounds on long-run projections are wide. For example, the Social Security Trustees' more optimistic ("Alternative I") projections show the OASDI system in positive balance until around 2028, and back in positive balance again about ten years later. Under such projections, even with no change in the medical projections through 2030 or any of the other assumptions made above, the fiscal imbalance as measured by Δ would be reduced by 1.1 to 1.6 percent of GDP. On the other hand, under the more pessimistic ("Alternative III") Social Security projections, Δ would rise by 1.6 to 2.3 percent of GDP. But the uncertainty inherent in long-run projections doesn't imply that no policy actions are necessary until the uncertainty is resolved, merely that further actions will be inevitable.

The calculations for $T=\infty$ made at any particular date t indicate the magnitude of the permanent reduction in the primary deficit-GDP ratio, say Δ_t, that is needed for currently projected fiscal policy to satisfy the government's intertemporal budget constraint, (8). Such a change, maintained over time, will actually satisfy (8) if projections at date t prove to be accurate. In

general, though, a trajectory based on Δ_t will not satisfy (8) in year $t+1$, once forecasts are revised. Assuming that forecast revisions cannot be predicted, the process Δ_t, Δ_{t+1}, Δ_{t+2}, ... will thus equal a random walk. But the fact that Δ_t will change does not alter the fact that it represents an optimal forecast at date t. At best (given recent experience), uncertainty means that projected deficits are as likely to rise as to fall.

It is a separate issue how the fiscal imbalance as estimated at any date should be addressed over time. If tax rate changes are used to close the estimated fiscal gap, the simplest tax-smoothing arguments derived from single-agent models (e.g. Barro 1979) might be used to support a policy of implementing each period's Δ immediately, and letting the tax rate follow a random walk.

In the real world, a variety of complications too numerous to mention make the solution more difficult. It may not be feasible or even desirable to induce large frequent changes in tax rates. In the short run, other macroeconomic concerns may dominate decisions. Moreover, with population heterogeneity within and across generations, distributional concerns must be added to arguments based on minimizing the deadweight loss of taxation. Once this is done, annual patterns of deficit reduction will not tell us enough about the underlying policy being adopted, for we must know which generations, and which individuals within generations, are bearing each year's tax increases or spending reductions.[27] Here, the recently developed technique of generational accounting (Auerbach et al 1991) is more appropriate, at least for evaluating changes in fiscal burdens across generations. Put simply, generational accounting considers the impact on different generations of alternative ways of satisfying the government's intertemporal budget constraint, (8).

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[27]Such disaggregate analysis is also important for understanding the macroeconomic effects of deficits, for the wealth effects of different policies on household consumption will vary across members of particular generations and across generations as well. One recent attempt to consider the macroeconomic effects of the large long-term deficits looming in the next century may be found in U.S. General Accounting Office (1992).

Recent calculations using generational accounting (OMB 1994, Table 3.3) are very sobering. They suggest that, should the tax burden of meeting the intertemporal budget constraint fall entirely on future generations (representing, perhaps, an unrealistic delay given the magnitude of the imbalance), these generations will face tax burdens (net of transfers) that are more than double what current policy would indicate – an increase from 36 percent to 82 percent of the present value of lifetime labor income.[28]

6. *Conclusions*

The United States federal government has appeared to reduce deficits mightily over the past decade, without actually doing so. Deficit forecasts during this period have proved very inaccurate and overly optimistic. There is no simple economic explanation for such errors and, while political pressures may have played a role, the exact mechanism is not yet clear. The budget rules of the period may have hastened legislators to act, but were poorly designed for the purpose of restoring fiscal balance. The Gramm-Rudman-Hollings Act and, particularly the 1990 Budget Enforcement Act, impounded forecasting errors in their rules, and both permitted the postponement of serious action.

Even with the passage of the 1993 Omnibus Budget Reconciliation Act, the United States still faces a major fiscal imbalance, attributable to growing health care costs and changing population demographics. This imbalance, though enormous, is not easily identified using traditional methods of evaluating fiscal sustainability because it is not apparent in the projections of current or near-term deficits. Even if the growth of health care costs were stabilized within the next decade, demographics alone would still produce large increases in the share of GDP accounted for by Social Security and Medicare. Yet, the recent CBO estimates of the impact of the Clinton health plan (CBO 1994b),

[28]These calculations include state and local taxes and transfer payments as well as those at the federal level.

which project increased near-term deficits, suggest that health care reform may actually worsen the looming fiscal imbalances reported here.

Appendix - Estimating the Effects of OBRA 1993 for the Period 1998-2003

This appendix describes how the changes in deficits forecast by CBO for the period 1999-2003 from just before to just after the passage of OBRA 1993 are divided into economic, technical and policy revisions. All calculations apply to the primary deficit, excluding interest.

I begin with the changes in the deficits forecast for fiscal years 1999-2003 in early 1993 (CBO 1993a), before OBRA 1993, and late 1993 (CBO 1993b), after OBRA. I assume that economic changes are captured entirely by changes in the forecast of nominal GDP. Specifically, I measure as changes due to economic factors those changes in revenues and non-interest spending that would have occurred had these items been held constant at their post-OBRA shares of nominal GDP. Technical changes are more difficult to guess, but, fortunately, these were quite small for the reported years 1993-1998 during this interval. Given this, I simply assume that the technical revisions over this period to estimated 1998 revenues and expenditures also apply to each of the years 1999 through 2003, as well.

Subtraction of these estimated economic and technical changes in revenues and spending yields the estimated policy effects presented in Figure 6.

References

Auerbach, Alan J., and Laurence J. Kotlikoff, 1987, Dynamic Fiscal Policy (Cambridge: Cambridge University Press).

Auerbach, Alan J., Jagadeesh Gokhale, and Laurence J. Kotlikoff, 1991,"Generational Accounts: A Meaningful Alternative to Deficit Accounting," in D. Bradford, ed., Tax Policy and the Economy 5 (Cambridge: MIT Press), pp. 55-110.

Barro, Robert J., 1979, "On the Determination of the Public Debt," Journal of Political Economy 87, October, pp. 940-971.

Blanchard, Olivier, Jean-Claude Chouraqui, Robert P. Hagemann, and Nicola Sartor, 1990, "The Sustainability of Fiscal Policy: New Answers to an Old Question," OECD Economic Studies 15, Autumn, pp. 7-36.

Feenberg, Daniel R. and James M. Poterba, 1993, "Income Inequality and the Incomes of Very High-Income Tax Payers: Evidence from Tax Returns," in J. Poterba, editor, Tax Policy and the Economy 7 (Cambridge: MIT Press), pp. 145-77.

Feldstein, Martin, 1993, "The Effect of Marginal Income Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act," NBER Working Paper No. 4496, October.

Gramlich, Edward M., 1990, "U.S. Federal Budget Deficits and Gramm-Rudman-Hollings," American Economic Review 80, May, pp. 75-80.

Gravelle, Jane G., 1993, "Estimating the Long-Run Revenue Effects of Tax Law Changes," Congressional Research Service, September.

Hamilton, James D. and Marjorie A. Flavin, 1986, "On the Limitations of Government Borrowing: A Framework for Empirical Testing," American Economic Review 76, September, pp. 808-819.

Kotlikoff, Laurence J., 1986, "Deficit Delusion," The Public Interest no. 84, Summer, pp. 53-65.

Lindsey, Lawrence, 1987, "Individual Taxpayer Response to Tax Cuts: 1982-1984, With Implications for the Revenue-Maximizing Tax Rate," Journal of Public Economics 33, pp. 173-206.

Reischauer, Robert D., 1990, "Taxes and Spending Under Gramm-Rudman-Hollings," National Tax Journal 43, September, pp. 223-232.

U.S. Congressional Budget Office, 1983a-1994a, The Economic and Budget Outlook.

_____, 1983b-1993b, The Economic and Budget Outlook, Update.

_____, 1994b, An Analysis of the Administration's Health Proposal, February 8.

U.S. General Accounting Office, 1992, Budget Policy Prompt Action Necessary to Avert Long-Term Damage, June 5.

U.S. Joint Committee on Taxation, 1993, Summary of the Revenue Provisions of the Omnibus Budget Reconciliation Act of 1993, August 23.

U.S. Office of Management and Budget, 1993, Mid-Session Review of the 1994 Budget, September.

_____, 1994, Budget of the United States Government, Fiscal Year 1995: Analytical Perspectives, Chapter 3, February.

White, Halbert, 1980,"A Heteroscedasticity-consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity," Econometrica 48, pp. 817-838.

Wilcox, David W., 1989, "The Sustainability of Government Deficits: Implications of the Present-Value Borrowing Constraint," Journal of Money, Credit and Banking 21, August, pp. 291-306.

Table 1

Revenue Forecast Revisions, 1983-1993

Years Ahead	Policy	Economic	Technical
0	3.8	-11.9	-4.6
1	10.0	-15.2	-6.5
2	11.0	-15.7	-6.7
3	14.9	-17.6	-7.6
4	17.9	-20.7	-7.2
5	9.5	-7.2	-2.9
Total	67.9	-88.3	-35.5

Source: CBO and author's calculations

Table 2

Explaining Technical Revenue Forecast Revisions

	Specification	
	(1)	(2)
Independent Variable		
Constant	-4.21 (-1.54)	10.94 (2.56)
Dependent Variable, lagged	0.28 (1.84)	-0.61 (-2.83)
Policy Revision, lagged	-0.01 (-0.09)	-0.12 (-1.39)
Economic Revision, lagged	0.04 (0.73)	-0.13 (-2.03)
Time Trend (1985 = 1)	--	-4.50 (-4.22)
$\bar{R}^2$	-.01	.31

Number of Observations: 45

Note: t-statistics (incorporating the White (1980) standard error correction) are in parentheses

Table 3

Primary Deficit Reductions Needed to Achieve 2004 Debt-GDP Ratio

(Percent of GDP)

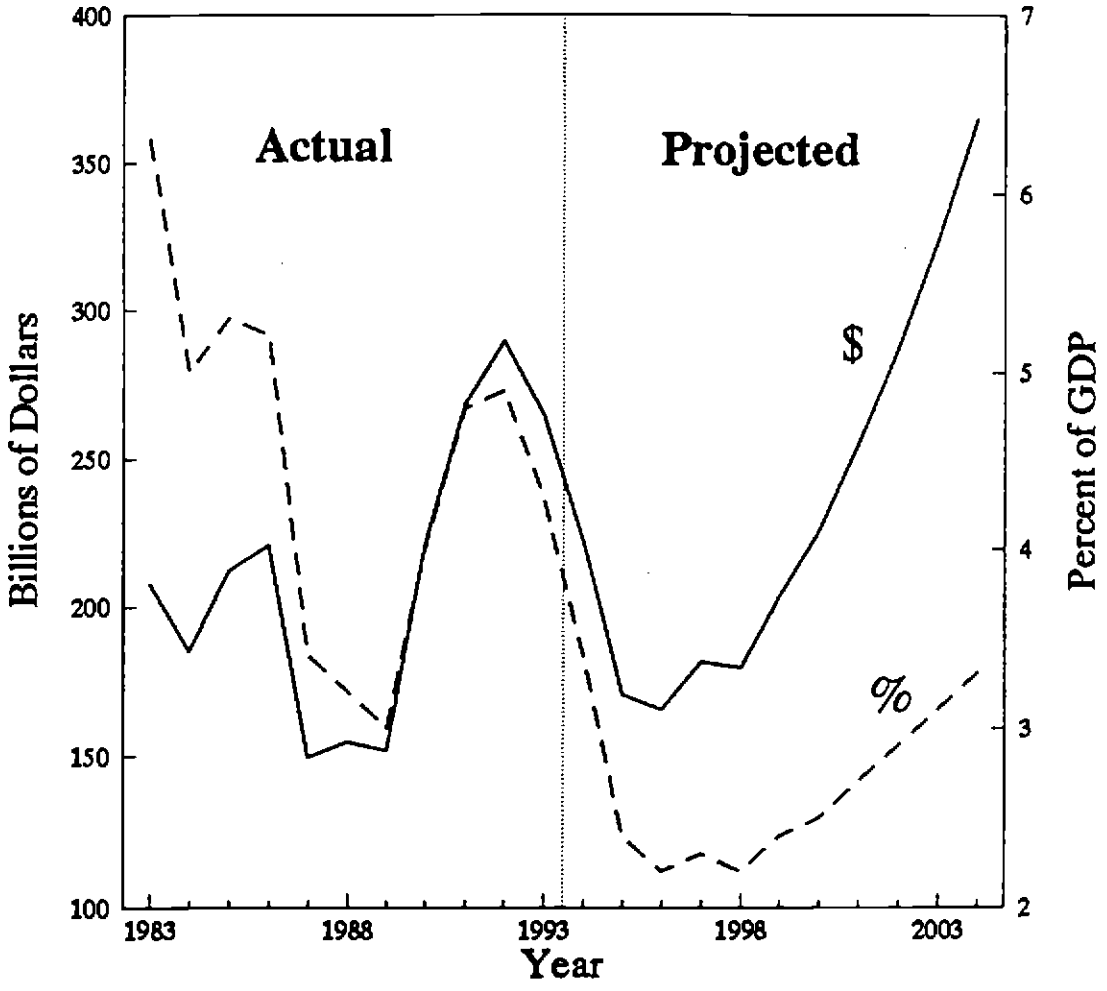
	Terminal Year		
	2031	2071	∞
Interest Rate			
Growth Rate + 2%:			
Base Case	2.97%	4.16%	4.72%
Demographics only	2.34	3.33	3.81
Health Care GDP-adjusted	3.60	5.32	6.07
Growth Rate + 1%:			
Base Case	2.52	3.88	4.80
Demographics only	1.86	3.01	3.81
Health Care GDP-adjusted	3.19	5.16	6.39

Note: Simulations labeled "Base Case" incorporate HCFA's 1991 projections of the levels of real health care entitlement spending from 2004 to 2030; those labeled "Demographics only" exclude those increases in Medicare estimated to result from increases in the relative price of health care; those labelled "Health Care GDP-adjusted" base health care projections from 2004 to 2030 on HCFA's original projections of health care entitlement spending as a share of GDP. These simulations show faster health care spending growth than the base case because the original HCFA projections were based on lower real GDP growth rates than the 2.3 percent used in the base case simulations.

Figure 1

U.S. Federal Budget Deficits

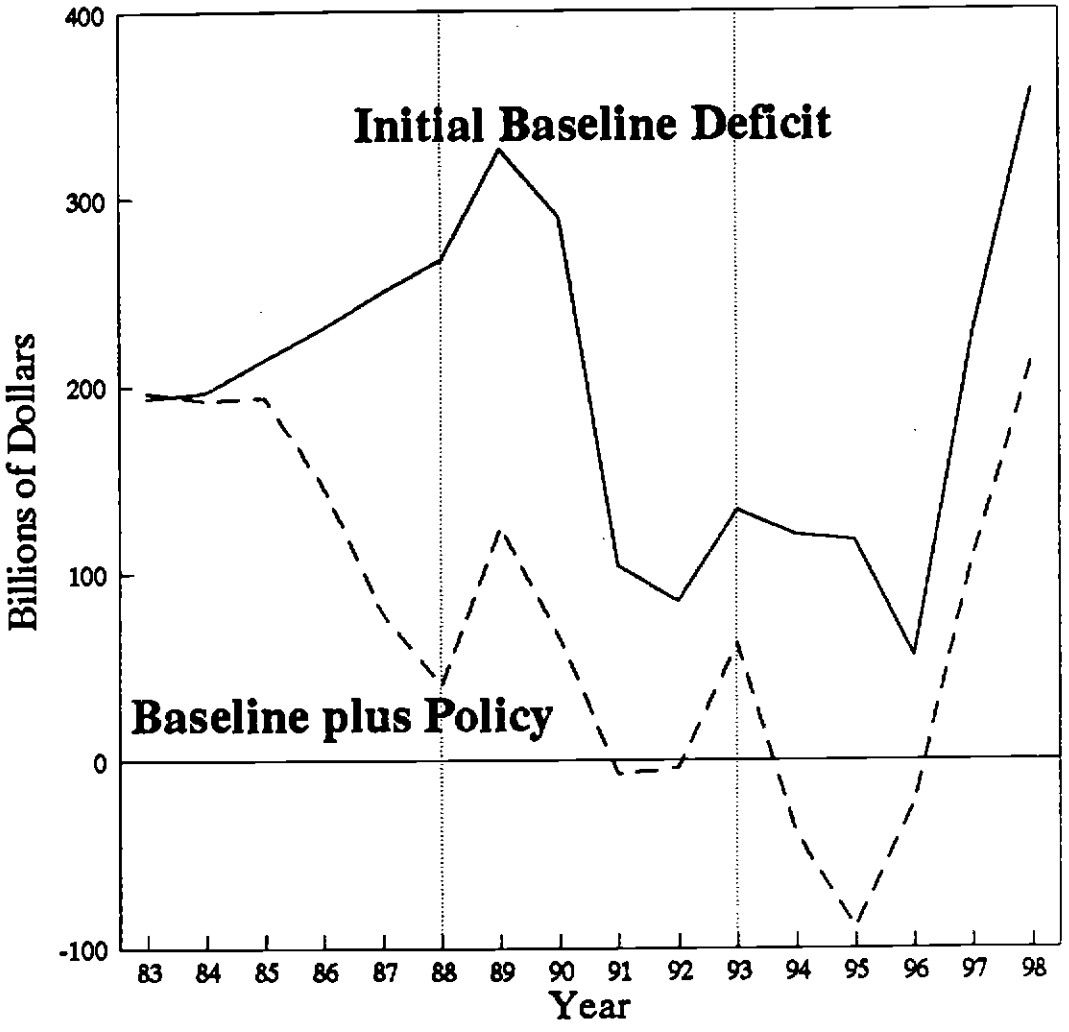
Actual and Projected



Source: Congressional Budget Office

Figure 2

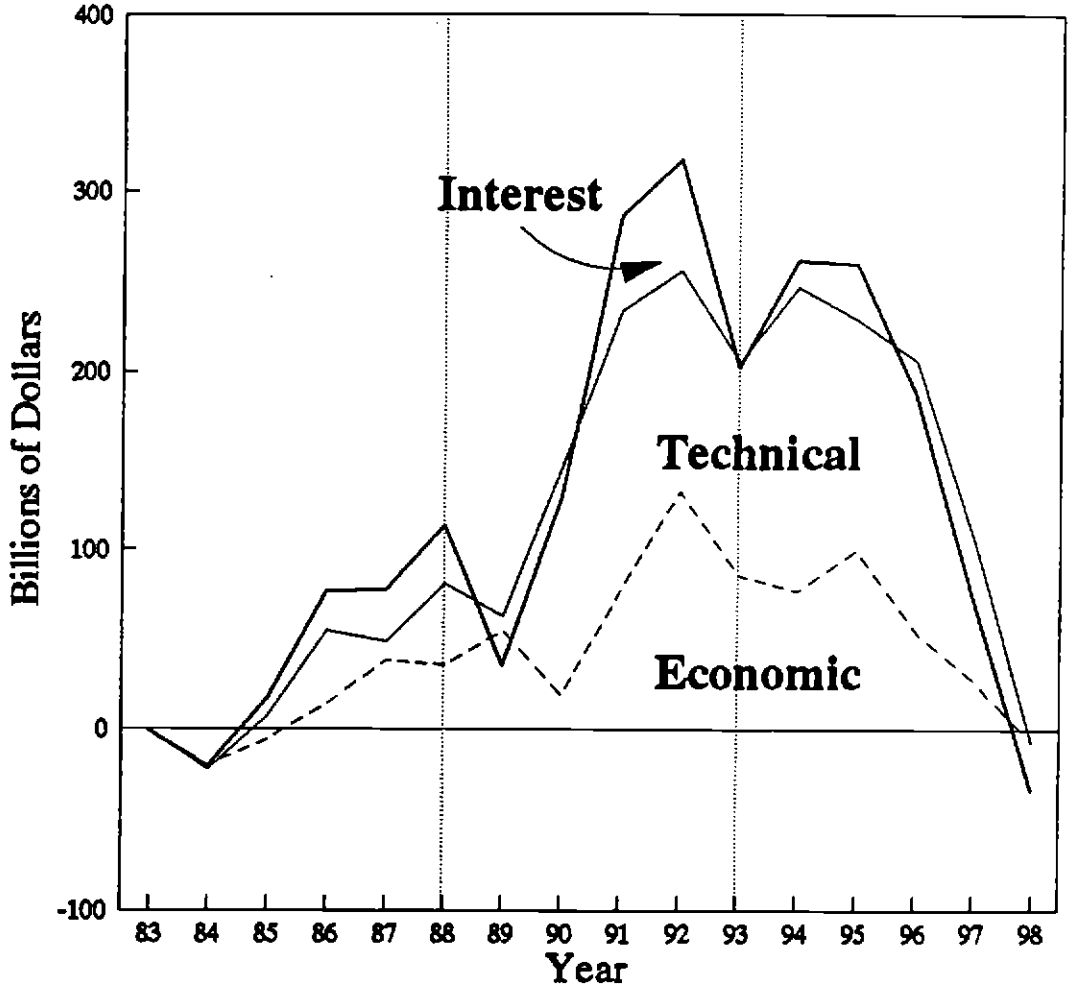
Initial Baselines and Policy



Source: Congressional Budget Office and author's calculations

Figure 3

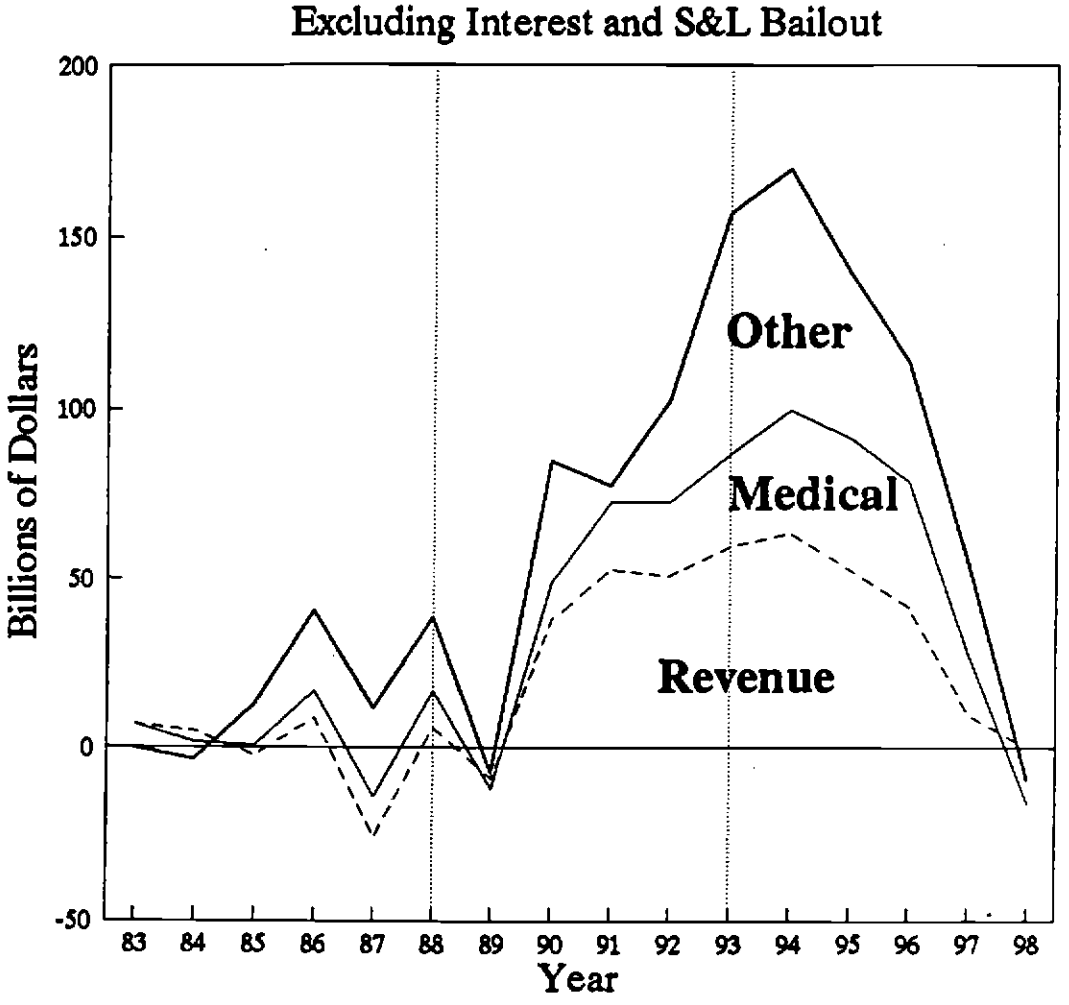
Forecast Errors



Source: CBO and author's calculations

Figure 4

Technical Errors

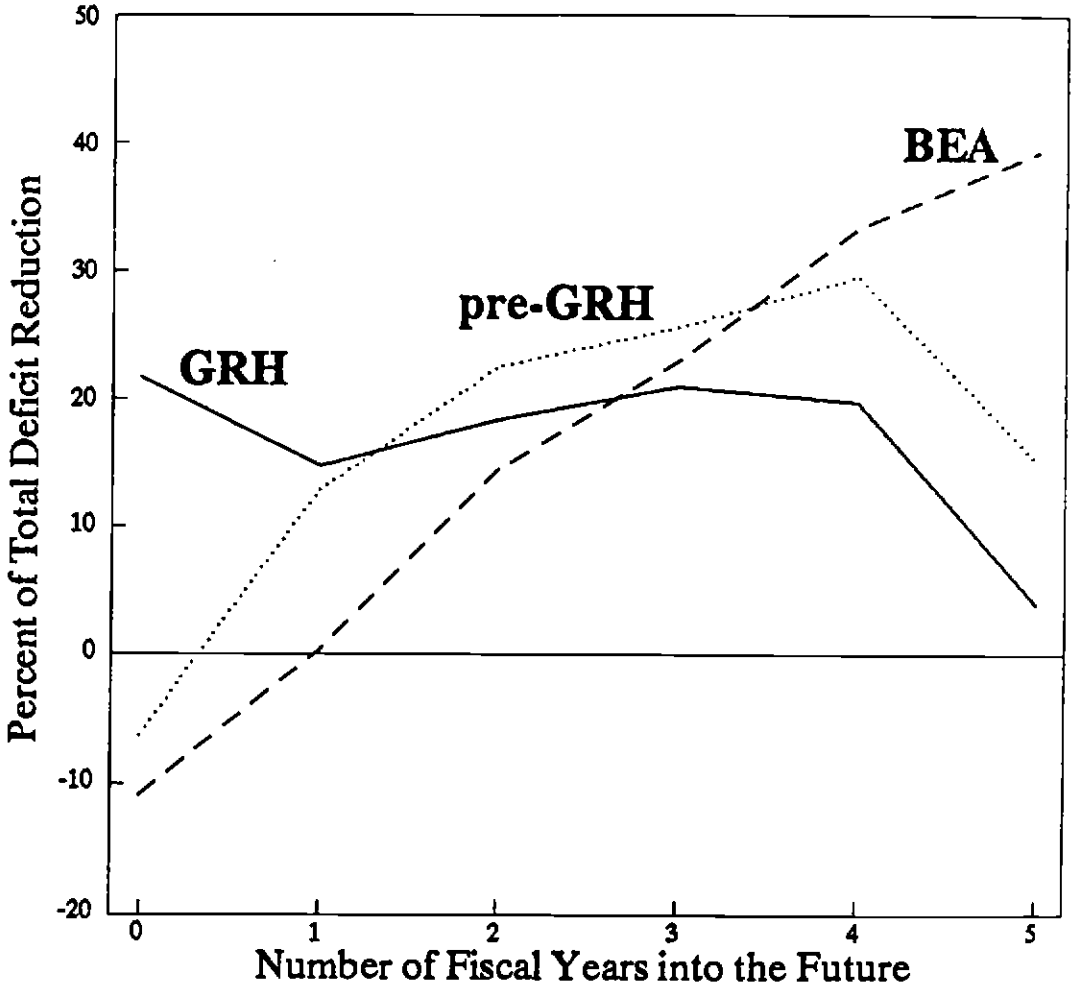


Source: CBO and author's calculations

Figure 5

Deficit Reduction Patterns

Under Different Budget Regimes

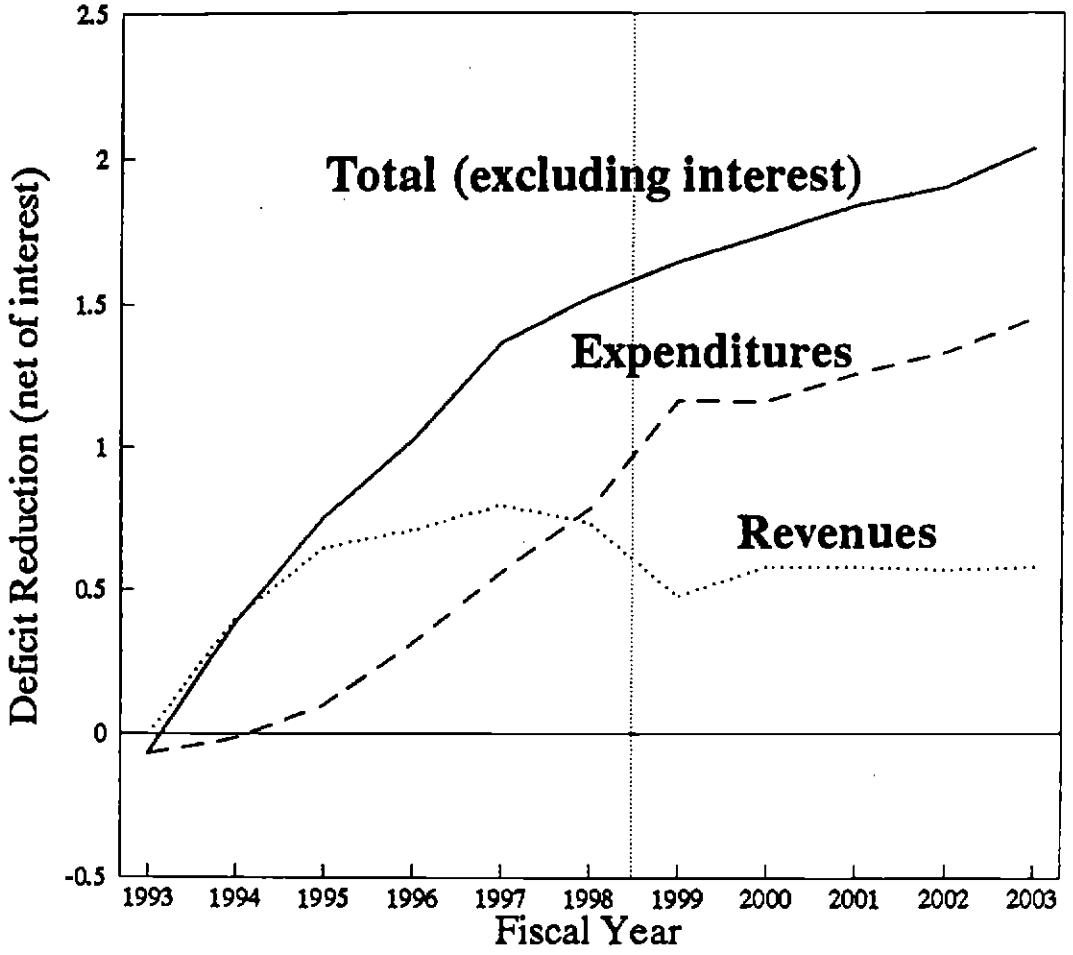


Source: CBO and author's calculations

Figure 6

Deficit Reduction, Relative to GDP

OBRA 1993

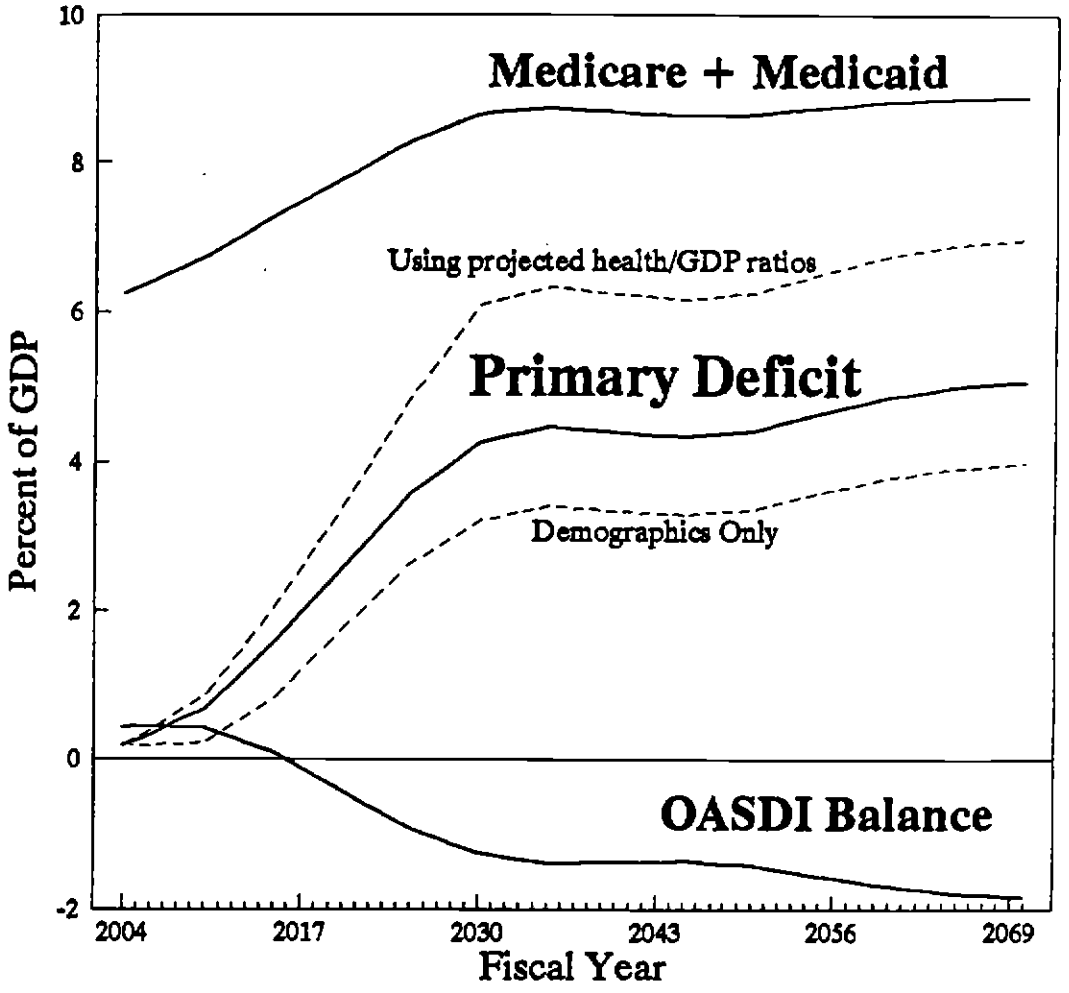


Source: CBO and author's calculations

Figure 7

Components of Primary Deficits

Relative to GDP



Source: See text