

# THE U.S. FISCAL GAP AND RETIREMENT SAVING

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## INTRODUCTION

Many recent studies have suggested that the United States faces a substantial long-term fiscal gap, with projected federal receipts falling far short of projected outlays.<sup>2</sup> But the long-term federal budget projections used in such calculations are, necessarily, based on a series of simplifying assumptions. As a result of the strikingly large fiscal gaps being projected, researchers have searched for hidden underlying assumptions in the calculations that may be biasing the results. The search has often focused on the revenue projections.

The standard approach to estimating the fiscal gap, explained in more detail below, assumes that in each year after the first ten years of the projection period, aggregate federal revenues remain the same share of GDP as they are projected to be in the tenth year of the projection. But, as many commentators have noted, receipts from the taxation of withdrawals from retirement accounts are expected to rise over time (see Sabelhaus 2000, Boskin 2003) as a share of GDP. Holding other factors constant, rising revenues from retirement account withdrawals should lead to rising federal revenues as a share of GDP over time. The effect of incorporating any such increases on the standard estimated fiscal gap, however, depends on the degree to which revenue increases as a share of GDP after the tenth year of the projection period, after which such revenue had been implicitly assumed to be constant as a share of GDP. Of course, other sources of revenue may change over time as well, which might offset or accentuate the changes in retirement accounts, but we focus our attention here on the effect of revenue associated with retirement accounts.

This paper addresses the extent to which alternative projections of activity in, and revenues from, tax-preferred retirement accounts quantitatively affect estimates of the long-term fiscal gap. In doing so, we review previous contributions on this topic, beginning with Boskin (2003), our own initial contribution on the subject (Auerbach, Gale and Orszag 2003), and a more recent analysis by the Congressional Budget Office (CBO 2004a). Boskin's results were interpreted by some as implying that the revenues from retirement accounts provided a considerable offset to conventionally-estimated fiscal gaps. Using Boskin's projections, we estimate that only a very small adjustment to standard revenue assumptions was called for. The results of the CBO analysis, we argue, indicate that an even smaller adjustment is needed. Indeed, despite the fact that CBO estimates rising revenues (as a share of GDP) from retirement account withdrawals over time, using the CBO projections in place of the standard revenue assumptions actually **increases** the estimated fiscal gap slightly, at least over a 75-year horizon. The reason is that the standard fiscal gap assumptions incorporate even steeper increases in revenue associated with retirement accounts between 2003 and 2014 than CBO (2004a).

The next section describes the calculation of the fiscal gap under standard assumptions about future revenue growth. We then discuss how to adjust the standard revenue assumptions to incorporate the Boskin (2003) and CBO (2004a) projections, and report the estimated fiscal gaps based on these alternative projections. Our penultimate section deals with some of the methodological issues and limitations of the present approach, and is followed by a brief conclusion.

## THE FISCAL GAP: METHODOLOGY AND STANDARD ESTIMATES

The methodology used here follows that developed in Auerbach (1994) and used subsequently in several studies. Considering long-range projections of the tax and spending components of the primary surplus, we solve for the permanent increase in taxes or reduction in expenditures (as a constant share of GDP) necessary to satisfy the government's long-run budget constraint that the base year's national debt,  $B_t$ , equal the present value of future primary surpluses. This change, denoted as  $\Delta$ , satisfies the equation:

$$(1) \quad B_t = \sum_{s=t}^{\infty} (1+r)^{-(s+1-t)} (S_s^p + \Delta \cdot GDP_s),$$

where  $r$  is the government's nominal discount rate,  $GDP_s$  is the level of nominal GDP in year  $s$ , and  $S_s^p$  is the primary surplus in year  $s$  absent the change in policy.<sup>3</sup> The government constraint in (1) is implied by the assumption that the debt-GDP ratio cannot grow forever without bound. It would also follow from the assumption that the debt-GDP ratio eventually (i.e., as time  $s$  approaches infinity) converges to its current value.

A different measure of fiscal imbalance is the increase in the primary surplus, say  $\Delta'$ , needed from now through some future year,  $T$ , to cause the debt-GDP ratio to equal its current level at the end of that year. It is defined implicitly by the expression:

$$(2) \quad B_t = \sum_{s=t}^T (1+r)^{-(s+1-t)} (S_s^p + \Delta' \cdot GDP_s) + (1+r)^{-(T+1-t)} (B_t / GDP_t) \cdot GDP_{T+1}$$

As will be illustrated below,  $\Delta$  will be larger than  $\Delta'$  because the primary deficits in the years after  $T$ —typically defined to be around 75 years in the future—are projected to be larger than those of the typical year between now and year  $T$ . Thus, including such years, which provides a more complete picture of the projected fiscal situation, also makes this situation appear worse.

Estimates based on (1) or (2) take macroeconomic projections as given. They do not account for the macroeconomic effects of policy changes. As will be discussed below, the potential role of macroeconomic feedback effects is an issue that has arisen in this literature, with the debate also illustrating the need to be consistent with regard to feedback assumptions when comparing different calculations.

### Estimates from 2003

To evaluate Boskin's estimates of the impact of taxes from retirement accounts, we use the baseline assumptions and projections from Auerbach, Gale, and Orszag (2003), which used 2002 as the base year and defined  $T$  in expression (2) as 2075.

Following our standard methodology, we start with the medium-term projections provided by CBO, for a roughly ten-year period, adjust these projections to reflect more realistic policy assumptions,<sup>4</sup> and then extend these adjusted ten-year projections for the period beyond using supplemental projections from CBO and/or other sources, depending on their availability.<sup>5</sup> For the 2003 calculations, the CBO revenue and spending projections are available through fiscal year 2013. We adjust tax revenues to reflect a more realistic forecast, assuming that all expiring revenue provisions will be made permanent, and that the Alternative Minimum Tax (AMT), which under current law will grow sharply over time, will have its exemption level increased so that approximately three percent of taxpayers remain on the AMT in each

year in the future. We adjust discretionary spending so that, rather than remaining constant in real terms, it grows with inflation **and** the population. As a result, the adjusted baseline has lower revenues and higher outlays than the CBO baseline.

After the first decade, we assume that federal tax revenues and discretionary spending remain constant as a share of GDP at its 2013 level, and use CBO projections of nominal GDP through 2076, with constant nominal growth assumed thereafter. For the three main entitlement programs, Social Security, Medicare, and Medicaid, the expenditures on which are growing more rapidly than GDP and are expected to continue doing so after 2013, expenditures through 2076 are obtained from unpublished CBO projections. After 2076, spending in these three categories is assumed constant as a share of GDP at 2076 levels. Interest payments are determined by debt accrual and interest rates, with the gap between the nominal interest rate and the GDP growth rate based on the intermediate projections of the Social Security Trustees in their 2003 annual report.

The first line of Table 1 reports results using this methodology. The fiscal gap using 2003 data, the adjusted baseline for the first ten years, and the standard revenue assumptions after the first 10 years amounts to 7.55 percent of GDP on a permanent basis and 4.55 percent of GDP through 2075.

### **Estimates from 2004**

Our methodology for 2004, described in more detail in Auerbach, Gale and Orszag (2004a), is similar to that used in 2003. We take 2003 as our base year, and adjust CBO's recent revenue and spending projections through 2014 for the initial part of our baseline. We take Social Security and Medicare spending projections for the period thereafter directly from the 2004 Trustees Reports' intermediate projections, and base Medicaid spending projections on those from Scenario 2 from CBO's most recent long-term projections (CBO 2003).<sup>6</sup>

As shown in Table 1, the estimated fiscal gap using 2004 data rises to 10.47 percent on a permanent basis and 7.20 percent through 2080. The increase over the past year is due largely to the Medicare prescription drug bill passed in the fall of 2003, declining revenue projections, and increases in projected discretionary spending (Auerbach, Gale, and Orszag 2004a).

## **THE FISCAL GAP UNDER ALTERNATIVE RETIREMENT ACCOUNT PROJECTIONS**

Our goal is to understand how alternative assumptions and projections about tax-deferred retirement accounts affect estimates of the long-term fiscal gap. The revenue effects of tax-deferred retirement accounts come from three flows. The contribution itself is tax-deductible. The build-up of assets inside the account is not subject to taxation. Withdrawals are taxed as ordinary income.<sup>7</sup> The magnitude of the revenue effect from each of these sources depends on the size of the flow and the effective marginal tax rate.

In the standard set of assumptions used above, aggregate federal revenues are assumed to be constant as a share of GDP in every year after the first ten years. This does not require any specific assumptions about components of the revenue stream. But, consistent with the overarching assumption, we assume the revenue gain or loss from each component of retirement saving flow—contributions, inside build-up, and withdrawals—is the same share of GDP in years after the tenth year of the projection period as it is in the tenth year.

During the first ten years of the forecast, the treatment of retirement flows in the baseline is somewhat different. Estimates of the tax loss from contributions, for example, may change as a share of GDP over time because of scheduled changes in contribution limits over time. Likewise, estimates of the tax gain from withdrawals may change as population ages or imputed retirement account balances rise.

### **Boskin's Projections**

To adjust the fiscal gap estimates for Boskin's projections, we need to (a) add his revenues from retirement accounts to the revenues in the fiscal gap calculations, and (b) subtract revenues from retirement accounts that are already implicitly in the baseline.

Boskin projects that withdrawals will rise sharply from 2003 to 2013 and continue to rise through the mid-2020s before falling somewhat. He assumes the tax rate on withdrawals is constant over time. We apply a 20 percent tax rate to this stream of withdrawals, which is close to the average marginal tax rate that applies to the withdrawals. The resulting projected revenue stream from taxation of withdrawals is shown as the "Boskin" line in Figure 1.

To estimate baseline revenues from withdrawals (as revenues associated with retirement accounts are not explicitly broken out by CBO), we use the Tax Policy Centre micro-simulation model. In each year from 2003 to 2013, we multiply projected taxable withdrawals from retirement accounts by 20 percent. For years after 2013, we assume that revenue from withdrawals is the same share of GDP as in 2013. This generates the line called "Baseline" in Figure 1.

In Boskin's projections, the revenue loss from tax-deductible contributions is assumed to be a constant share of GDP over time. The revenue loss from inside build-up evolves only very slowly over time relative to GDP and for simplification purposes we assume it is constant over time.<sup>8</sup> Under that assumption, both of these flows are consistent with standard revenue assumptions—i.e., constant as a share of GDP—for years after 2013. For years before 2013, we explicitly assume that the baseline is based on the same contribution and inside build-up figures as Boskin's projections. The assumption we make is buttressed by the similarity of the withdrawal estimates shown in Figure 1.

Based on these assumptions, we incorporate Boskin's projections of retirement account activity into the standard fiscal gap estimate by adding to the standard revenue assumptions the difference between the revenues implied by the "Boskin" and "Baseline" trends in Figure 1.<sup>9</sup> This difference is shown in Figure 2 and is well below 0.5 percent of GDP in every year and close to 0.2 percent of GDP in 2040 and subsequent years. The result is that, as the second line of Table 1 shows, the estimated fiscal gap using Boskin's retirement account projections is just 0.17 percent of GDP smaller than under the standard assumptions under either the permanent horizon or through 2075.<sup>10</sup>

### **CBO Projections**

CBO (2004a) provides a different set of assumptions for retirement income flows, with separate projections for defined benefit (DB) and defined contribution (DC) type accounts. In CBO's model, contributions and withdrawals for DB plans fall over time as a share of GDP, while the inside build-up grows slightly. For DC plans, on the other hand, contributions are roughly constant over time as a share of GDP, the revenue loss from inside build-up grows, but the revenue gain from withdrawals grows even faster. CBO also provides an explicit set of marginal tax rate assumptions: 20 percent on contributions and withdrawals, and about 11 percent on inside build-up.<sup>11</sup> The CBO (2004a) projections assume constant tax rates after 2003. This implicitly assumes no structural changes, no real bracket creep, and no

expansion of the alternative minimum tax over time. As a result, these assumptions are somewhat similar to those underlying the revenue side of our adjusted baseline, described above.<sup>12</sup>

CBO combines these estimates to generate the net effects of these flows on revenue in Figure 7 of CBO (2004a), which is replicated as the line labelled “CBO retirement account revenue” in Figure 3. Following CBO’s practice, the line labelled “Normalized CBO” subtracts the 2003 value from the value in each subsequent year.

To develop an estimate of the revenue effects of retirement accounts in the baseline, we use information provided by CBO on the projected level of withdrawals and assume the average marginal tax rate on withdrawals is 21 percent, the average marginal tax rate on withdrawals in the CBO baseline for 2003. This provides an estimate of revenue from withdrawals for each year through 2014 (the 10th year of the forecast horizon for the 2004 budget projections). Following our standard approach to extending the baseline, we assume that revenue in future years is the same share of GDP as in 2014. The resulting time series is reported as “Baseline withdrawal revenue” in Figure 3.

Based on discussions with CBO (and consistent with Boskin’s projections described earlier), we assume that the revenue effects of contributions and inside build-up of retirement accounts already included in the CBO baseline are constant as a share of GDP during the next 10 years. Under our standard assumption for extending the baseline, they are also held at that share in all subsequent years and therefore are a constant share of GDP over the whole forecast horizon. The net revenue effect of retirement accounts equals the revenue effect of withdrawals, shown in Figure 3, less the effects of contributions and inside build-up. But since the latter two effects are constant over time, changes in the baseline revenue estimates over time due to retirement accounts as a whole are just equal to changes in revenues from withdrawals. Thus, to calculate the change relative to 2003, we simply normalize the revenue from withdrawals series by subtracting its 2003 value, showing the result as the “Normalized baseline” in Figure 3.

Based on these assumptions, we incorporate CBO’s projections of retirement account activity into the standard fiscal gap estimate by adding to the standard revenue assumptions the difference between the revenues implied by the “Normalized CBO” and the “Normalized baseline” lines in Figure 3.<sup>13</sup> This difference is shown in Figure 4. Although it is small relative to the fiscal gap, its most notable quality is that it is negative for much of the period.

As shown in Table 1, the fiscal gap using CBO’s revenue projections is 7.28 percent of GDP through 2080. This estimate is very close to, but actually larger than the 7.20 percent of GDP fiscal gap estimated under the standard revenue assumptions. (Both estimates use the adjusted baseline over the first ten years.) The fact that using CBO’s projections raises the fiscal gap estimate may seem counterintuitive in light of CBO’s (2004a, page 1) statement, consistent with Figure 3, that “At the end of 75 years, the effect is to make receipts about 0.5 percent of GDP higher than in 2003.” The reason the fiscal gap rises, in spite of this trend, is that relative to 2003 values, the average increase in baseline revenues from retirement accounts exceeds the average increase in CBO’s retirement revenue projections. This serves to re-emphasize the point, discussed further below, that the key issue is not the overall size of the revenue effect from retirement accounts, but the revenue effect from retirement accounts relative to what is already incorporated in the standard revenue assumptions.

CBO does not provide information on retirement accounts over the permanent horizon, but if it is assumed that the 2076 values as a share of GDP are maintained over time, the estimated permanent fiscal gap is 10.44 percent of GDP, very slightly lower than the estimate using the standard assumptions.<sup>14</sup> Because the CBO projection of net revenues from retirement accounts rises as a share of GDP through the

end of its projection period (2080), as shown in Figure 3, it might be desirable to allow a continuation of that increase over time. Making this change in isolation would reduce the estimated permanent fiscal gap. Medicare and Medicaid spending, however, also rise as a share of GDP through the projection period and are then set to be a constant share of GDP thereafter. If retirement account revenues and Medicare and Medicaid spending were allowed to continue to grow relative to GDP after 2076 at the rates projected before then, the net effect would be to raise the estimated permanent fiscal gap. In other words, outlays for Medicare and Medicaid are projected to grow faster than revenues from retirement accounts, so assuming that both series remain constant shares of GDP after 2076 understates the permanent fiscal gap.

## **ALTERNATIVE MEASURES OF THE IMPACT OF RETIREMENT ACCOUNTS**

As stressed above, the goal of our calculations is to estimate the impact on existing fiscal projections of a more careful accounting of retirement savings accounts and their associated revenue flows. Because standard projections already incorporate **some** of these flows, the impact on projections of this correction can be small even if the **total** impact of the accounts is large.

Estimating the total impact of the accounts is a more challenging task. First, it potentially requires more information on the relevant flows. For our calculations to adjust the baseline, a flow that is roughly constant as a share of GDP need not be measured, for one can assume that it is already incorporated in the baseline. But, if one wants to know this flow's total contribution to revenues, its actual level is required, even if it is constant as a share of GDP. Still, such calculations are clearly feasible, having been carried out by CBO (2004a) in its recent report.

A second, and more challenging task, is the incorporation of macroeconomic feedback effects. For the "differential" calculations we have done in this paper, the estimated revenue effects are so small, relative to GDP, that any associated effects on the budget gap that might result from induced economic responses must be small as well, and would not change our basic finding. But, if one wished to consider how revenues would be different if the accounts didn't exist at all, then the feedback effects could be substantially larger. This potential is illustrated by the differing conclusions of CBO (2004a) and Boskin (2003) about the total impact of retirement accounts on revenues.

CBO estimates (see Figure 3) that retirement savings accounts **reduce** revenues in each year of the projection period, by between 0.3 and 1.2 percent of GDP. Boskin (2003), on the other hand, estimates that the accounts **increase** net revenues, in present value, by 12 trillion dollars through 2040 alone. A major difference between the two approaches is that CBO intentionally leaves out feedback effects from its calculations. It refers to these calculations as "revenue projections," defined to exclude any effects on revenue that might be generated by additional saving or through other behavioural responses. By contrast, Boskin attempts what CBO refers to as a "revenue cost estimate," one that includes the feedback effects attributable to the existence of tax-preferred retirement saving. Thus, the difference between CBO's negative estimate and Boskin's positive one is attributable in part to the positive feedback effects Boskin estimates and includes in his calculation. Auerbach, Gale, and Orszag (2003) challenge a number of the assumptions made by Boskin in arriving at his 12-trillion-dollar estimate, concluding that the impact likely is substantially smaller. But it is important to emphasize that such a calculation, whether it includes feedback effects or not, is quite distinct from the ones we have provided above, which are more directly relevant to the question of whether current projections paint an unduly pessimistic picture of our fiscal future.

## CONCLUSION

Alternative methods of projecting retirement account contributions, inside build-up, and withdrawals appear to have little effect on the estimated long-term fiscal gap. Results using the simple, standard assumptions, Boskin's (2003) somewhat more detailed projections, and CBO's elaborate (2004a) projections yield very similar results for the estimated shortfall of revenues relative to outlays. None of the projections changes the conclusion that the United States faces a substantial fiscal gap.

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## ENDNOTES

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<sup>2</sup> For recent assessments of the long-term budget outlook, see Auerbach, Gale and Orszag (2004), Congressional Budget Office (2003) and Gokhale and Smetters (2003).

<sup>3</sup> This equation and the next take the nominal interest rate  $r$  as fixed, although the actual calculations presented below are based on more general versions of the equations that allow the interest rate to vary from year to year.

<sup>4</sup> These adjustments are needed because CBO’s methodology, in some instances dictated by Congress, follows a variety of rules and customs and are not intended to reflect current policy in any but the most mechanical manner.

<sup>5</sup> Previous studies using this methodology include CBO (2000, 2003), GAO (2004), Auerbach (1994, 1997), Auerbach and Gale (1999, 2000, 2001), and Auerbach, Gale, and Orszag (2002, 2003, 2004).

<sup>6</sup> Scenario 2 assumes that medical costs per beneficiary increase at 1.0 percent per year faster than per capita GDP growth, which is the same long-term assumption made in the Medicare trustees’ projections. The CBO projections end in 2050. After 2050, we assume that Medicaid spending grows at the same rate as Medicare. CBO (2004b) provides a different set of Social Security projections. Incorporating these projections would have little effect on the main results presented here.

<sup>7</sup> There is growing use of “back-loaded” retirement savings accounts in the United States, including the Roth IRAs introduced during the 1990s and the Roth 401(k)s slated to come into existence in 2006. For these accounts, inside build-up is still untaxed, but the additional untaxed flow is the withdrawals rather than the contributions.

<sup>8</sup> Boskin (2003, Table 1) estimates that forgone revenue on diverted saving is 0.22 percent of GDP in 2010 and rises to 0.26 percent of GDP by 2050.

<sup>9</sup> More formally, the net change in the revenue projection is  $(WB + CB + IB) - (WS + CS + IS)$ , where  $WB$  is the gross revenue gain from withdrawals in Boskin’s projections,  $CB$  is the gross revenue gain from contributions in Boskin’s projections, and  $IB$  is the gross revenue gain from inside build-up in Boskin’s projections, and  $WS$ ,  $CS$ , and

$IS$  are analogous items in the standard revenue assumptions. We assume that  $CB = CS$  and  $IB = IS$ , so the net change in the revenue projection is  $WB - WS$ , which is shown in Figure 2.

<sup>10</sup> In his own calculations, Boskin assumed a higher tax rate on withdrawals, 28.7 percent rather than 20 percent. While we believe that 20 percent is more appropriate, the adjustment to the fiscal gap is only slightly larger using the 28.7 percent rate, 0.25 percent through 2075 and 0.24 percent over the infinite horizon.

<sup>11</sup> We thank Paul Burnham for this information and the additional information provided by CBO described later in the text.

<sup>12</sup> The adjusted baseline does have some structural changes incorporated into it (e.g., the liberalization and then elimination of the estate tax), and also reflects real bracket creep. The official baseline, however, is even more dissimilar to the CBO assumptions in this case. That highlights that CBO's assumptions for these projections do not necessarily mimic the ones used to develop the CBO baseline budget projections. The differences are justified by the fact that the revenue projections have a different purpose and posit a different underlying scenario than the baseline. CBO's retirement revenue projections are not intended as predictions of likely outcomes, just as projections that show how the changing flows of contributions, inside build-up and withdrawals will affect revenues, holding other items constant.

<sup>13</sup> This is a slightly different calculation than what is reported in endnote 9 for incorporating Boskin's projections. The difference is dictated by the different data available. Specifically, our goal is to estimate {CBO retirement account revenues in year  $t$ } - {baseline retirement account revenues in year  $t$ }. To do this, we subtract year-2003 values from each item. Because 2003 is in the past, the two figures should be the same for that year. Hence, we calculate {normalized CBO retirement account revenues in year  $t$ } - {normalized baseline retirement account revenues in year  $t$ }, which is given by  $\{(CC_t + IC_t + WC_t) - (CC_0 + IC_0 + WC_0)\} - \{(CS_t + IS_t + WS_t) - (CS_0 + IS_0 + WS_0)\}$ , where the first letter in each term ( $C$ ,  $I$ , or  $W$ ) refers to contributions, inside build-up, or withdrawals, the second letter ( $C$  or  $S$ ) refers to the CBO revenue projections or the standard revenue projections, and the subscript ( $t$  or  $0$ ) refers to the year in question or 2003 ( $= 0$ ). As discussed in the text, we assume that  $CS_t = CS_0$  and  $IS_t = IS_0$ , so taking the difference between the normalized CBO retirement account revenue (the first six items) and the normalized baseline withdrawal revenue ( $WS_t - WS_0$ ) yields the difference in projected revenue under the two scenarios.

<sup>14</sup> Under the infinite horizon, the slightly positive contributions to revenue associated with the correction for deferred taxes in the distant future (see Figure 4) are accorded more weight than in the calculation of the gap through 2080. Hence, the correction through 2080 contributes to the fiscal gap over that period, while it reduces the fiscal gap calculated over the infinite horizon. Both of these corrections, though, are extremely small in magnitude.

**Table 1. Measures of the Fiscal Gap**

(as a percent of GDP)

Starting Year	Specification Regarding Long-Term Retirement Saving	Infinite Horizon	Through 2075	Through 2080	Source
2003	Standard	7.55	4.55	--	AGO (2003)
2003	Boskin	7.38	4.38	--	AGO (2003)
2004	Standard	10.47	--	7.20	AGO (2004)
2004	CBO	10.44	--	7.28	Authors' calculations

## Notes:

1. All estimates are based on the adjusted ten-year baseline, which is described in the text.

2. The standard assumption is that aggregate federal revenue stays constant as a share of GDP after the 10th year of the budget projection. We interpret this assumption as implying that revenues from retirement saving stay constant as a share of GDP after the tenth year. The "Boskin" assumptions use withdrawal projections from Boskin (2003) coupled with a 20 percent marginal tax rate, as described in the text. The "CBO" assumptions use data on contributions, inside build-up, withdrawals and the associated marginal tax rates from CBO (2004a, Figure 7).

Figure 1. Revenues from withdrawals: baseline and Boskin (2003 data)

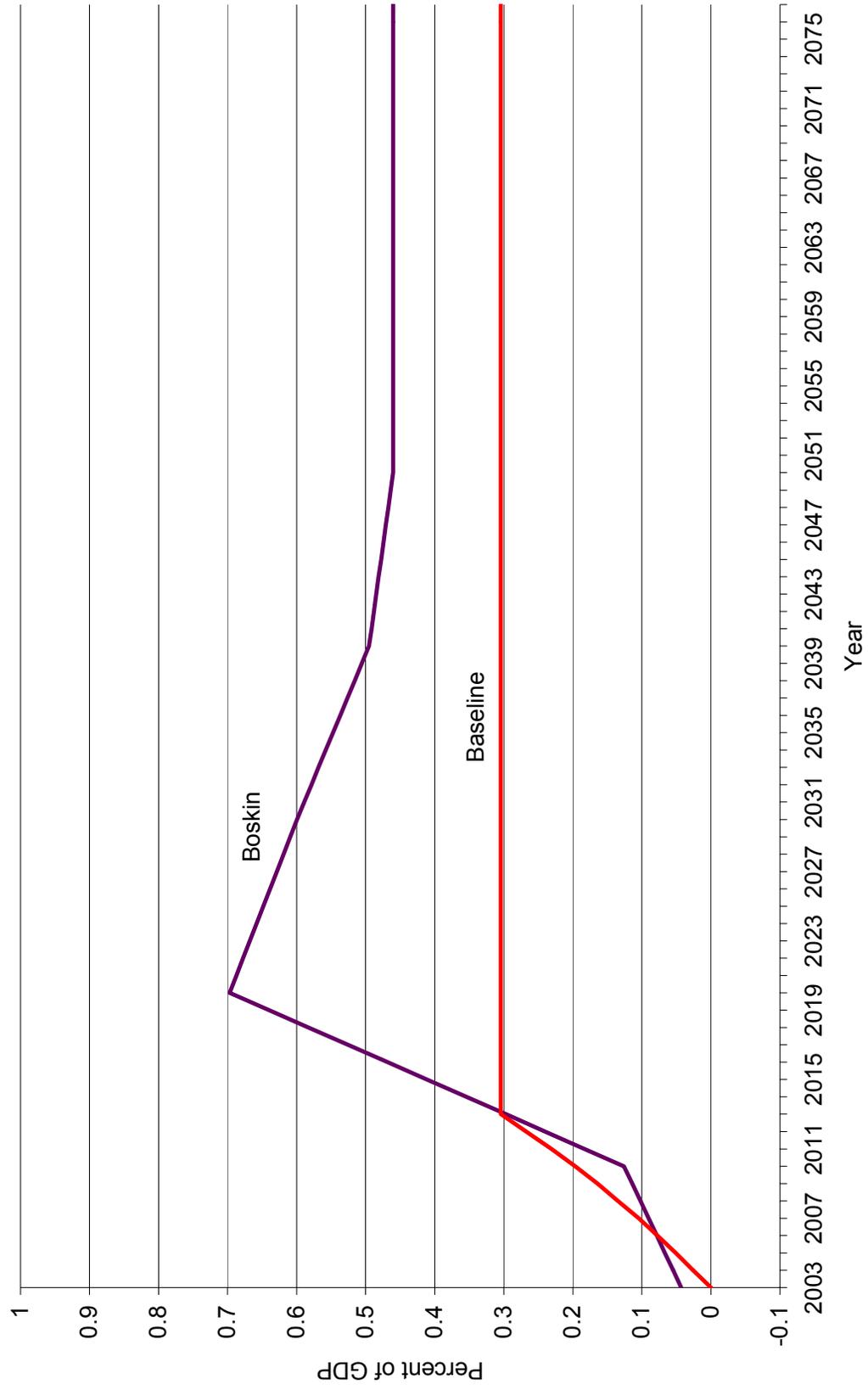


Figure 2. Difference in revenues due to adjustment based on Boskin (2003)

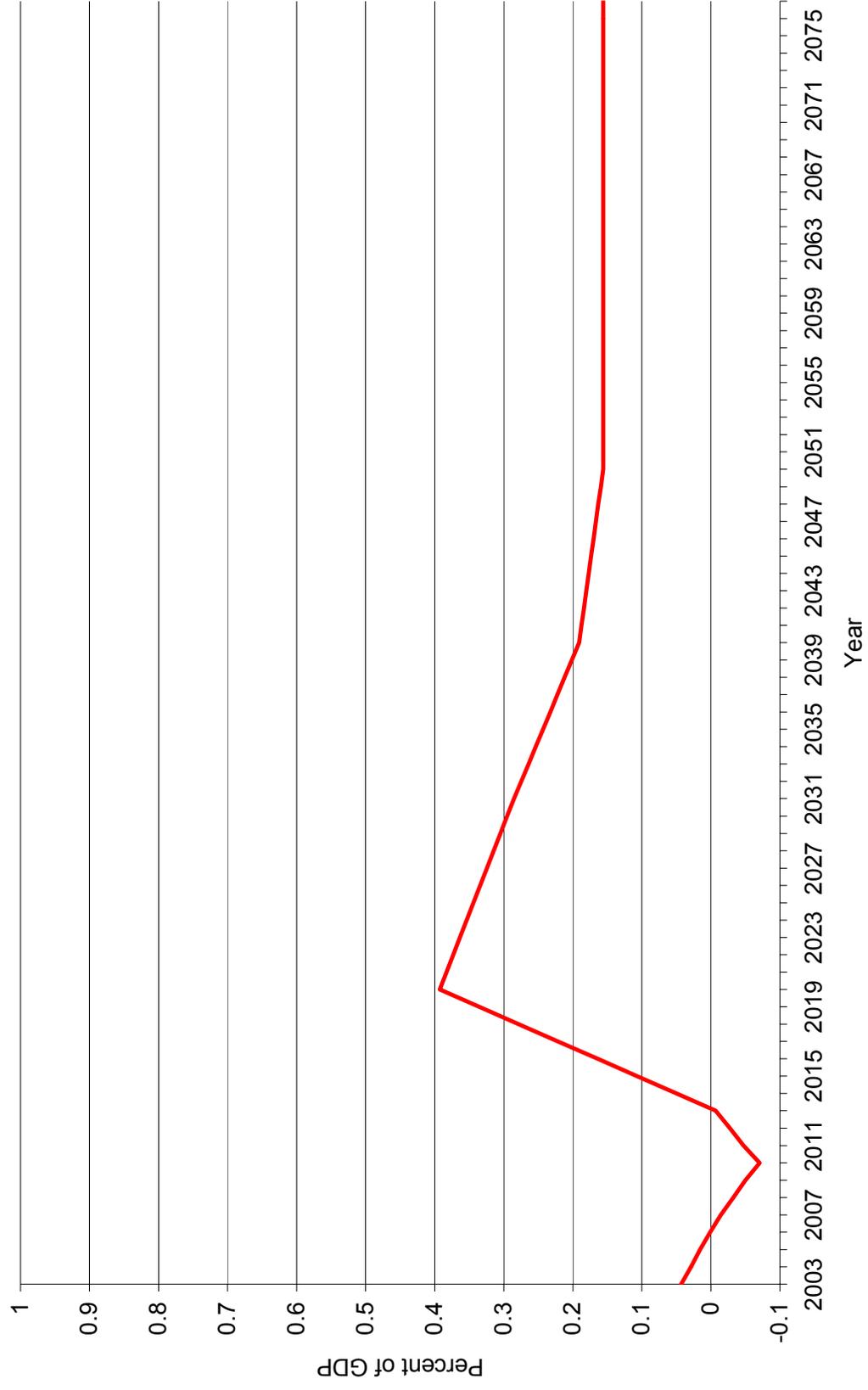


Figure 3. Revenues from retirement accounts: baseline and CBO (2004 data)

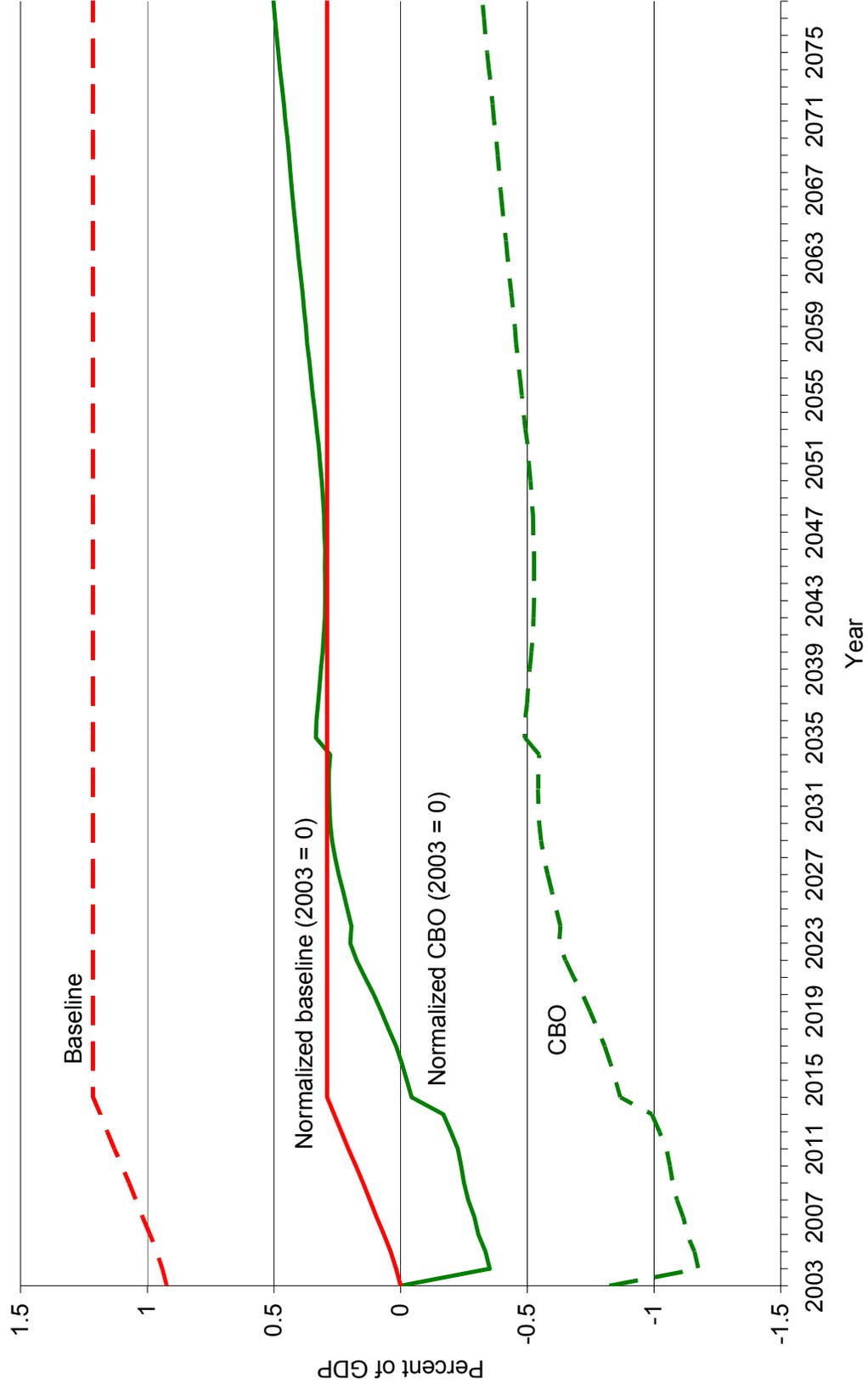


Figure 4. Difference in normalized revenues due to adjustment based on CBO (2004)

