Hutchins Center
on Fiscal & Monetary Policy
at BROOKINGS

Working Paper #8 December 15, 2014

THE ECONOMICS AND POLITICS OF LONG-TERM BUDGET PROJECTIONS

Henry J. Aaron
Bruce and Virginia MacLaury Senior Fellow
The Brookings Institution

SUMMARY

Budget projections can provide a valuable look at what the world will look like if current laws remain in place, but they cannot tell us how or when to act in the face of projected imbalances.

All projections are based on assumptions around some set of variables and are vulnerable to error, or the variability in predictable factors, as well as uncertainty stemming from unforeseeable circumstances. Because error and uncertainty grow as the projection horizon is lengthened, in some cases, lengthening the window is not useful and can degrade decision making.

This paper reviews the utility of four sets of projections: long-term budget projections by the Congressional Budget Office, 75-year projections for Social Security, 75-year projections for Medicare, and infinite-horizon generational accounts. Within its 75-year projections, the CBO has recently shifted attention towards the first 25 years, a welcome change, as the later years are based on unrealistic assumptions. In contrast, the 75-year Social Security projections are useful, as the variables that the projections are based upon can be reliably predicted. Because Medicare costs depend heavily on unpredictable advancements in medical technology, the 75-year projection window should be pared down to a 25-year period. Infinite horizon generational account projections simply freeze the underlying variables at their value in the 75th year and extrapolate into perpetuity, providing no new information after the 75th year.

Whether and when action should be taken based on a projection depends not just on the uncertainty surrounding a projection, but also on the political options available. Taking action now can raise the cost of, or even preclude, future action. If political constraints only allow for less-than-optimal policy action, it may be beneficial to wait for political or economic conditions to change.

The views expressed here are my own and do not necessarily reflect those of the trustees, officers, or other staff of the Brookings Institution.

INTRODUCTION

Budget projections shape public policy debates in two ways. First, they describe what the world will be like if current policies or laws are unchanged. In so doing, they help define the nature of problems with which policy makers must cope. For this purpose, it is the *level* of the projection that counts. Second, budget projections are also used as the starting point to measure the impact of policy interventions. For this purpose, it is the *difference* between a initial projection and a post-policy-change projection that counts.[1]

Both functions are important. The first—describing the world if current policies or laws remain in place—helps define the need for economic or political actions.[2] If budget projections indicate that deficits will be small and that debt will grow no faster than income, inaction is an option. If the projections show that large deficits will cause debt to balloon and threaten economic stability, they establish a *prima facie* case for cutting spending or raising taxes at some time before the damage occurs. Projections can show the consequences of changing policy in various ways or at different times. But they cannot show when or how to act. Those are political decisions. Under trust-fund financed programs such as Social Security or Medicare, if earmarked revenues exceed promised benefits, it is possible to raise benefits, cut taxes, or let surpluses accumulate. In contrast, when promised benefits exceed earmarked revenues plus reserves, benefit cuts are automatic unless Congress raises revenues.

All projections rest on assumptions regarding particular variables. If those variables can be accurately anticipated and projection methods are not in dispute, then the projections have a strong claim to objectivity. But if the variables cannot be reliably forecast or if the projections rest on opaque or disputed methods, then projections that vary widely may have equal claim to policymakers' attention. And if those projections generate large and politically important differences in perceptions of the future, the supposedly technical act of making assumptions loses its claim to objectivity and becomes, willy-nilly, a political act.

Furthermore, all projections are subject to both error and uncertainty. By error I mean the variability in key quantities that can be expressed as a probability distribution based on past experience. By uncertainty, I refer to those events, such as natural disasters, wars, pandemics, or the advance of medical technology for which it is impossible to construct well-defined probability distributions—or any probability distributions at all—given current information and methods. In general, the reliability of probability distributions even for those variables about which considerable historical and contemporary information

[1]Both sorts of projections differ from forecasts. Forecasts entail assumptions about how both objective variables and policies will change. The distinction between *projections* and *forecasts* is not sharp, but it is crucial, as observers who differ sharply in their forecasts about what course actual events are likely to take can work constructively from projections that either or both regard as implausible.

[2]Current policy and current law need not be the same. For example, current laws may be written so that they expire, but current policy is to renew them. The law expires in the first case; it continues in the second.

is available fades into uncertainty if one looks sufficiently far into the future.[3] The relative importance of both risk and uncertainty grows as the projection window lengthens. Because projection error and uncertainty generally increase with the length of the projection period, it is important to consider whether extending the projection period is helpful or harmful. While it is certainly true that as *well-defined risk* increases, the case for precautionary action increases, it is quite unclear that as *uncertainty* increases, the case for precautionary action increases.[4]

As the projection period lengthens, the sheer quantity of numbers in the projection grows. Whether the quality of the information improves is less clear. Additional numbers do not physically extinguish any content in the shorter and less voluminous projection. If one posits that the *quality* of decision making—where "quality" is for now undefined—is positively related to the *quantity* of numbers available, decisions will in general improve as the projection period increases. But extending the projection period will degrade the quality of decisions if one or both of two conditions is violated:

1. Decision makers recognize the increased uncertainty as the projections lengthen.
2. Decision makers have unlimited capacity for processing information, so that the introduction of new and comparatively uncertain projections does not supplant or "crowd out" attention given to nearer-term and, presumably, more reliable projections.

Putting the point the other way, extending the projection period may degrade decision making if decision makers are not fully rational (in the sense that they do not correctly reduce the weight given to distant projections because of their increased error and uncertainty) or if their capacity to process information is limited (so that comparatively poor quality distant projections 'crowd out' or reduce attention given to nearer projections).

The optimal projection period is separate from, but related to, the question of when action should be taken to deal with future, "projected" problems. Determining when action should be taken is a far more complex problem, as that determination is inherently and inextricably political. The reason is that at each point in time, a certain configuration of political forces exists, which creates a range of possible policy responses, each with its own likelihood of implementation. That configuration changes over time. Thus, recommending action today, rather than action tomorrow, means that one attaches greater utility to the sum of expected values from action now than to the expected values from actions taken later. Each

[3]As an illustration, historical and contemporary information about labor force participation rates of people ages 20 to 55 is quite good, certainly adequate to generate a reasonable probability distribution over ranges on which most labor economists could agree. But if one considers labor force participation rates in, say, the year 2200, as one must do, even if only implicitly, for generational accounts, the plausible range widens and the basis for predicting even the shape of the distribution asymptotically vanishes.

[4]Consider two variables, each of which has a target or "preferred" outcome at a point in time, with identical distributions of expected outcomes distributed around that preferred outcome. One distribution is based on good information built on historical experience. The other is based on little better than guesswork. Precautionary action is more justifiable in the first case than in the second. That would be true even if the variance in the second case is larger than in the first. Consider a second example in which the variance in outcomes also extends over time. An adverse event could be anticipated with high probability at a given point in the future or it could be expected to occur with some probability at an early date, later, or not at all–that is, with increased temporal variance. It is not clear in which case current action to avoid that risk is more indicated.

person's welfare weights in such a comparison will differ, as do the probabilities they assign to the time-designated ranges of outcomes. For this reason, arguing that action be undertaken now or that it be deferred is essentially and inescapably a political, and not merely an analytic or economic, decision.

I. BUDGET PROJECTIONS — SHORT AND LONG

To explore these considerations with some concreteness, I shall review issues relating to the utility of four sets of projections:

- the long-term budget projections of the Congressional Budget Office;
- the 75-year projections for Social Security, as reported annually by the Trustees of Old-Age, Survivors, and Disability Insurance Trust Funds;
- the 75-year projections for Medicare, as reported annually by the Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds; and
- Generational Accounts, as embodied in The Inform Act (113th Cong., 1st sess.).

The challenges of making long-term projections and the uses to which they are put differ in these four cases.

The Congressional Budget Office formerly used a 75-year window for its long-term budget projections. Recently it has shortened its projection window, to which it directs most attention, to 25 years (through 2039) (CBO 2014a).[5] This change was constructive, as previous projections rested on assumptions about variables that the projections themselves showed could not be sustained. To carry out projections beyond this point is as helpful as would be a "projection" that an object falling from a tall building at an accelerating velocity will penetrate the earth and emerge on the other side of the globe. The challenge is to choose a projection horizon that helps instruct *current* policy.

In contrast, the 75-year horizon for Social Security projections is reasonable, given the nature of the program, the variables on which such projections depend, and the political uses of the projections. They contribute in a major way to informed discussion of Social Security's finances, of its projected funding gap, and of various proposals on how best to close that gap. The recently-added infinite-horizon projections contain no additional useful information.

The Medicare projection window, initially 25 years, was extended to 75 years in 1983. Medicare differs from Social Security in two respects that make the decision to extend the projection horizon a mistake. First, Medicare costs depend sensitively on the advance of medical technology, which is subject to vast uncertainty. Second, the nature of the insurance commitment under Medicare differs in fundamental ways from that under Social Security.

[5]Estimates for 75 years are still available in the supplementary tables available online (CBO, 2014b), but are not featured in the main report on long-term projections.

Generational accounts originally used a window of about 200 years. The Inform Act calls for infinite-horizon projections. Because computation of balances required for generational accounts depends so sensitively on projections of quantities that are easy to "assume" but impossible to predict with any reliability, I shall argue that they demonstrate the power of spreadsheet software, but are useless as tools of policy analysis.

II. CONGRESSIONAL BUDGET OFFICE PROJECTIONS

Starting in 1996, the Congressional Budget Office began to publish long-term projections of federal revenues, expenditures, and deficits.[6] The initial and continuing motivation has been to bring to public attention the fiscal consequences of the aging of the baby-boom generation and of rising health care spending. The financial crisis of 2008 and resulting budget deficits intensified concern about the long-term accumulation of debt if those budget deficits persisted.

In truth, no one has any very good idea of what spending for different functions of government will actually be decades into the future. Similar uncertainty applies to revenues because they depend sensitively on the large number of tax laws Congress has enacted in the past and doubtless will enact in the future. Thus, CBO's long-term projections cannot point to legislative provisions expected to endure for decades, but must rest on more-or-less arbitrary rules of thumb regarding shares of GDP that will be devoted to broad purposes. Even these broad shares have varied enormously over recent decades and may be expected to fluctuate in the future, possibly by large amounts, based on evolving security threats and perceived domestic problems.[7]

CBO also employs similar rules of thumb in preparing its annually published medium-term, 10-year projections used by Congress to guide current legislation and to analyze the president's proposed budget. Widely differing rules of thumb are plausible. For example, discretionary spending may be assumed to grow not at all, with prices, with prices and population, or with prices, population, and per person income—that is, with GDP. Taxes may follow current law, reflect frequently renewed expiring provisions, or remain at one or another shares of GDP. CBO releases a single 10-year projection together with sensitivity analyses that show the effect of varying particular assumptions, such as interest rates, the rate of growth of discretionary spending, or unemployment.

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[6]CBO released such projections in 1997, 2000, 2003, 2005, 2007, and in yearly intervals since 2009 . Shortly after CBO began operations, the first director, Alice Rivlin, testified on April 3, 1975 to the Joint Economic Committee on the challenges of making long-term projections, emphasizing many of the difficulties that the agency later experienced when it translated qualitative concerns into specific numbers (U.S. Congress, 1975).

[7]The short term nature of almost all budget commitments regarding discretionary spending and much so-called mandatory spending contrasts starkly with the commitments under Social Security, where tax and spending are heavily freighted with political (although not legal or contractual) commitment. Few federal budget categories carry any such message of permanence. Tax laws are changed periodically in major ways. Defense and other discretionary spending has fluctuated over enormous ranges. The difference is one of degree, not of kind, but the difference is palpable and large.

In the case of long term projections—those extending beyond 10 years—CBO has invariably released at least two, and on occasion, several separate projections. The sources of variation in the projections have differed over time. In 1996 and 1997, CBO assumed alternately that discretionary spending grew with GDP or with prices. In the former case, the ratio of discretionary spending to GDP remained constant. In the latter case, the ratio of discretionary spending to GDP declined steadily over time. In addition, CBO assumed, alternatively, that deficits did or did not affect the growth of GDP.[8]

All of the CBO projections released before 2000 projected that debt would rise faster than GDP. By 2020 debt was expected to exceed annual GDP under all projections but one—where real discretionary spending did not increase *at all* and deficits did not reduce economic growth.

By 2000, budget prospects had brightened. The federal budget was in surplus. CBO's long-term projections reflected this changed budgetary weather. Debt was projected to shrink as a share of GDP, at least for a time. Under no projection was debt was expected to return to the 2000 ratio for at least two decades. If budget surpluses persisted, the 2000 projection anticipated that all public debt would be eliminated before 2010. And if only the budget outside Social Security remained in balance, debt would be eliminated by 2020.

Momentous events occurred between 2000 and release of the next long-term projections in 2003 and 2005. Wars began in Afghanistan and Iraq. Military spending soared. Tax cuts reduced projected revenues. A serious recession boosted spending and cut revenues. Some of these circumstances were bound to be transitory, but it was unclear how long the budgetary shocks would last. Furthermore, the emergence of politically divided government magnified uncertainty about the trajectories for federal spending and revenues. The benign budget prospects of the late 1990s gave way to large current and prospective budget deficits and increased uncertainty.

CBO's 2003 and 2005 long-term projections reflected these changed circumstances. Six projections were released in each year, based on three spending and two revenue assumptions. The range among these projections was huge (as shown in Table 1). One 2005 projection indicated that not only would the public debt be eliminated by 2030, but that budget surpluses would have cumulated so that the government's net assets would be larger than GDP and that annual surpluses would be growing. Another showed that debt would grow to 138 percent of GDP by 2030 and that annual deficits would be growing explosively.

[8]The ratio of debt to GDP grows faster if deficits are assumed to affect GDP, as deficits reduce national saving and capital accumulation. It is worth noting that estimates of this growth-feedback effect depend sensitively on a number of assumptions on which economists do not agree. Including feedback effects gives an exaggerated indication of the size of fiscal measures necessary to lower or eliminate deficits because the feedback effects work in reverse as such measures are put into effect.

Table 1: Long-Term Budget Projections, 2005
Projected debt (+) or surplus (-) as percent of GDP

Revenue assumption	Spending assumption	2010	2030	2050
Low	High	43.5	137.9	449.4
Low	Intermediate	42.1	96.9	256
Low	Low	40.9	38.6	34.3
High	High	43.1	91.2	286.4
High	Intermediate	41.7	50.3	95.9
High	Low	40.5	-9.7	-123.7

Source: Congressional Budget Office

Projections with so huge a variation of outcomes certainly showed that, continued for many years, rather modest differences in assumed rates of growth of spending and revenues would have enormous ramifications. But they gave no guidance as to which merited the most attention. Beginning in 2007, CBO presented just two long-term projections. An *extended baseline scenario* in most respects reflects current law. An *alternative fiscal scenario* is based on the assumption that Congress would change some laws, such as extending expiring tax provisions, as it had done in the past. Without exception, projections based on the *extended baseline* scenario have shown smaller deficits than those based on the *alternative* scenario. Many observers regarded the alternative fiscal scenario as "more realistic." In fact, both projections incorporated assumptions flatly contrary to law and to established Congressional policy in crucial respects.

The revenue projections in the extended baseline scenario consistently assumed that personal income tax rates and brackets (adjusted for price inflation) and payroll tax rates and the wage base to which they applied (adjusted for wage inflation) would remain unchanged. Given these assumptions, the ratio of personal income taxes to GDP would rise gradually over time as rising real incomes expose people to higher tax rates. In contrast, the ratio of payroll tax collections to GDP was assumed to fall gradually because it was also assumed that the share of workers' compensation that comes through untaxed employer contributions for health insurance would increase. The corporation income tax was fixed at a constant share of GDP.[9] In total, all projections under the extended baseline scenario from 2007 through 2014 have anticipated that revenues as a share of GDP would rise gradually—by 2.8 percentage points of GDP from 2014 to 2050 in the 2014 projection.

[9]In fact, corporate taxes as a share of GDP had varied widely since 1980, from 6.6 to 12.5 percent of GDP, and were projected in the president's 2015 budget to rise to 14.1 percent in 2016.

The alternative fiscal scenario expressly deviates from current law in important ways. This projection is constructed on the plausible assumption that Congress will, as it has done repeatedly in the past, change certain laws in certain ways. Still, it is far from clear whether the alternative fiscal scenario is more 'realistic' future than the baseline scenario.

The alternative fiscal scenario incorporates the assumption that a number of tax breaks statutorily set to expire will be renewed as they have been in the past. More importantly, starting in 2011 the alternative fiscal scenario has been based on the assumption that revenues will quickly converge to a constant 18 percent of GDP in all years beyond the 10-year budget window that CBO uses for most of its reports. That share approximates the ratio of revenue to GDP that prevailed over an extended historical period.

The assumption that past tax policy will be replicated in the future is quite unrealistic, however. Congress has regularly cut income taxes to offset bracket creep. Large cuts were necessary before the income tax was price-indexed in 1985, and smaller and less frequent cuts have been made since. During most of that period, the excess of spending over revenues was small enough that the ratio of debt to GDP fell or, at worst, was trendless,[10] and taxes were actually raised at certain times when large deficits loomed. Furthermore, the assumed 18 percent tax share was generated when spending exceeded revenue by a much smaller margin than that shown under the alternative fiscal scenario. To maintain a stable ratio of revenue to GDP in the future, Congress would have to cut tax rates periodically (because bracket-creep under the personal income tax tends to increase the ratio) and to do so *in the face of deficits that are expected to be intolerably large and growing*. Such an assumed policy implies that Congress will voluntarily create a fiscal situation that projections indicate will be close to dire. Far from being more realistic, this assumption presumes a mindless malignity on the part of Congress that even its most severe critics do not allege.

Making projections that incorporate a rigid limit on the ratio of revenues to GDP has an additional peculiar, and politically non-neutral, effect. Under this convention, *legislated tax changes have no effect on CBO's projections of future primary deficits*. For example, when Congress ended the Bush-era tax cuts for those with relatively high incomes, CBO's methods meant that this action left projected primary budget deficits unchanged beyond the 10-year budget window.[11]

The accounting for changes in spending is quite different. When Congress changes spending, CBO adjusts the level of spending and uses this new level as the basis for future budget projections. Depending on the nature of the spending change, it may alter projected growth over the initial 10-year budget window, which then forms the basis for long-term projections which are tied to the share of spending in

[10]The most glaring instance of such action was the tax cut legislation enacted in 2001, which cut long-term government revenues by approximately 2 percent of GDP. Over the next 75 years, the Bush-era tax cuts would have lowered revenues by a share of GDP approximately three times larger than the average gap between Social Security spending promised in the current benefit formula and earmarked revenues. The average Social Security gap, 0.7 percent of GDP, at the time the tax cuts were enacted is an average of early years when Social Security was projected to be in surplus and later years when it was projected to be in deficit.

[11]Ending some of the Bush-era tax cuts has a second-order impact on the total budget deficit to the extent that it lowers the primary budget deficit during the 10-year budget window, which reduces the amount of debt carried forward and therefore lowers annual interest outlays.

the final year of the 10-year window. Thus, spending changes are carried forward indefinitely, while tax changes are erased when the assumed tax share reverts to the 18 percent assumed level. One way or another, the long term (primary) budget deficit under the alternative fiscal scenario is reduced by spending cuts, and raised by spending increases, but tax changes leave it unchanged.

This convention fundamentally distorts how measures to close the deficit are treated in the long-term budget projections. If one seeks to cut projected deficits, spending cuts help, but tax increases do not. A balanced program that in fact matches tax and spending increases so that deficits are unaffected will be scored under the alternative fiscal scenario as raising the long-term deficit. Such a metric is unrealistic, uninstructive, and politically non-neutral.

With respect to spending, CBO has generally assumed that spending on national defense and on other payments to individuals under statutory formulas eventually claim a constant share of GDP. In fact, the share of GDP devoted to national defense trended down from the Korean War years until just before the destruction of the twin towers, at which time defense spending dropped to just under 3 percent of GDP, a low point from which defense spending has risen roughly 1 percent of GDP. Future defense spending depends on unpredictable external events, trends in the relative cost of defense materiel, and a host of other factors. Trends in non-defense discretionary spending depend sensitively on which of the competing political views of the proper role of government in American life prevails. To adopt a given rule of thumb regarding non-defense discretionary spending is, therefore, a political, not an economic, projection. As any projection must rest on one assumption or another, those issuing them should provide sensitivity analyses and make clear that none merits treatment as a forecast.

The most difficult and arbitrary choices revolve around how to treat health care spending, principally Medicare and Medicaid. The problem arises from two sources. First, Congress has capped growth of Medicare spending for physician services at levels it has been unwilling to enforce. The extended baseline projections have been and continue to be based on the repeatedly violated assumption that Congress would enforce those limits. The alternative fiscal scenario projections have been and are based on the assumption that they would not be enforced.

The larger problem concerns the projected growth of overall health care spending and its impact on Medicare and Medicaid. For several decades, per person spending on health care grew faster than per person income. This excess growth of health care spending cannot continue indefinitely, of course, as health care spending would eventually exceed total consumption spending or even GDP. But when and how the gap closes affects long-term budget projections. Accordingly, CBO has devoted considerable staff time to long-term projections of spending on health care in general and on Medicare and Medicaid in particular. Unfortunately, the resulting projections are close to arbitrary, as CBO candidly acknowledges on page 39 of its report *The 2014 Long-Term Budget Outlook*.

> All long-term economic and demographic developments are uncertain, but excess cost growth in health care may be particularly so.* Medical procedures and technology and the delivery of care all continue to evolve rapidly, and spending for any of the federal health care programs could be substantially higher or lower than CBO projects. The number of beneficiaries in Medicaid and the exchanges is also very uncertain because changes in the distribution of income and the steps states might take regarding eligibility are unclear. (Chapter 7 shows how CBO's projections would differ if the growth of

> health care costs was significantly higher or lower than is projected in the extended baseline.)
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> * This year, CBO changed its projection methods for Medicare and Medicaid to better reflect uncertainties about the timing and nature of changes in rates of excess cost growth and the relationship of those changes to specific provisions of current law. (CBO, 2014a)

Chapter 7, referenced in the quotation above, projects that the ratio of debt to GDP could remain constant or more than double over the next quarter century depending on four particular variables. Although CBO still publishes 75-year projections under the extended baseline and alternative fiscal scenarios, it presented only the 25-year projections in its written report and provides access to the 75-year projections only through supplemental tables available on the internet.

Looking back, CBO has altered its projections of health care spending by huge amounts. Projections of Medicare spending published in 2014 were lower than those published in 2007 by $554 billion for the year 2030 and by $1.3 trillion for the year 2050.[12] But for these revisions the projected primary deficit for 2030 in the extended baseline scenario would have been increased from 1.4 percent of GDP to 3.6 percent, and the gap in 2050 would have been increased from 1.5 percent of GDP to 4.9 percent of GDP. The revisions in projected Medicare spending cut the projected primary deficit by 61 percent for 2030 and 69 percent for 2050. As the projected primary deficits under the alternative fiscal scenario are much larger than under the extended baseline, the proportional reductions are correspondingly smaller, but even under the alternative fiscal scenario the reductions in estimated Medicare spending reduce the primary deficits in 2030 and 2050 by approximately one-third.

Although legislation accounts for some of these changes in projected Medicare spending, most arise from changes in the gap between the assumed rates of growth of health care spending and of income for which there is no generally accepted explanation. Nor is there an adequate basis for assuming that this gap will remain constant, widen, or narrow. That, in turn, means that there is no adequate basis for the projections of the overall gaps between spending and revenues, which depend so sensitively on health spending. Furthermore, Medicare is only one, although the largest, federal health program. Expenditures on Medicaid and refundable tax credits under the Affordable Care Act also depend on the rate of growth of overall health care outlays. Thus, the sensitivity of projected deficits to health care spending is considerably larger than is indicated by recent shifts in Medicare spending alone.

One other assumption deserves special note, as it leads to exaggerated deficit projections in both the extended baseline and the alternative fiscal scenarios. Spending on social insurance managed through trust funds that receive all of their external revenues from earmarked taxes—Social Security and Medicare Hospital Insurance—is projected to match benefits promised under current benefit formulas. Earmarked taxes are also projected to follow current law. But projected revenues plus accumulated reserves are less than the cost of projected Social Security and Medicare Hospital Insurance benefits.

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[12]These dollar amounts are the product of the change in projected Medicare spending as a share of GDP multiplied by the estimated GDP measured in constant 2014 dollars for each of those years. Because CBO's 2014 estimates of real GDP in 2030 and 2050 were somewhat smaller than those reported in 2007, the numbers stated in the text are somewhat overstated.

Current law also has established which of these two laws has priority over the other. Payments of Social Security and Medicare Hospital Insurance benefits may not be made when trust fund balances have been depleted if current revenues are insufficient to cover those benefit payments. What this means is that CBO's projections of Social Security and Medicare Hospital Insurance spending can be correct, once the trust funds are depleted, only if Congress raises earmarked taxes. If Congress does not raise earmarked taxes, the benefits cannot be paid. In either case, deficits would be smaller by the amount of the difference. CBO's methods contradict law and are contrary to repeatedly demonstrated Congressional intent that these programs must be financed through specifically earmarked revenues, not from general revenues. Thus, projected deficits are exaggerated because they include spending that is statutorily prohibited.[13]

This current CBO treatment of Social Security and Hospital Insurance distorts their long-term projections, but it does so only after the trust funds are depleted. Current projections indicate that the Social Security trust funds will be depleted in 2033; that of Hospital Insurance in 2030.[14] The incorrect accounting of the Social Security and Medicare funding gaps has a first order impact on CBO's long-term budget projections. The Social Security and Medicare actuaries estimate the gap between projected benefits and revenues at 1.9 percent of GDP after the Social Security trust funds are depleted. (CBO estimates the Social Security gap to be somewhat larger than do the Social Security actuaries, widening from 1.6 percent of GDP in 2035 to 2.1 percent of GDP in 2087; CBO does not release separate estimates of the gap in Hospital Insurance.) Correcting for the inclusion of this gap, as estimated by the Social Security and Medicare actuaries, nearly erases the projected primary deficit in the extended baseline. Accordingly, it eliminates most of the growth in the overall budget deficit, as it also eliminates most of the added borrowing and associated interest costs.

CBO has made a number of changes in its long-term projections that have increased their utility. It has downplayed projections beyond 25 years. It has included explicit sensitivity projections that underscore the enormous uncertainty even over this period. It has recognized that Congress is unlikely to enforce reductions in physician payments under Medicare's sustainable growth rate formula. Two additional changes should be made to align projections with current law. The first is to drop from its alternative fiscal scenario the arbitrary assumption that revenues will remain at 18 percent of GDP, an assumption that Congress will behave perversely in the face of a projected fiscal shortfall and that biases discussions

[13]The law governing payment of benefits from the Social Security and Medicare Hospital Insurance trust funds is not an example of a simple conflict of laws. In sharp contrast, a conflict-of-laws situation would arise if Congress refused to raise the debt ceiling at a time when the ceiling had been reached and expenditures exceeded revenues. If that situation occurred, the president's clear obligation to spend funds according to law, not to collect taxes beyond those Congress has authorized, and not to borrow beyond a legislated limit would present a clear conflict of laws. In that situation, the president would have no option other than to violate one set of laws or another. In the case of the trust funds, the bar on spending is clear beyond doubt.

[14]Whether to distinguish between Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI), which are financed through two separate trust funds, poses an additional question. The DI trust fund is projected to be depleted at the end of calendar year 2016. In the past, when the DI trust fund has faced depletion, Congress has simply reallocated some of the payroll tax used to finance both programs from OASI to DI. While the transfer of taxes in 2016 may well be linked to other changes in the DI program, there is little doubt that such transfers will occur. For that reason, I think that treating OASI and DI as a single program for purposes of budget projections is reasonable.

of means to lower projected deficits. The second is to drop its assumption that Social Security and Medicare Hospital Insurance spending will exceed earmarked revenues after when and if the trust funds that pay for these benefits are depleted.

If these two changes were made, the extended baseline would present an improved "as-if" projection of the fiscal challenges that the United States faces over the next quarter century. Even then, policy makers would be well advised to keep in mind that deficits measure the rather small gap between two very large quantities, expenditures and revenues, both projected with considerable error. The error stems both from legislation enacted for a host of motives other than deficit reduction and from economic events. Small errors in projections of either spending or revenues generate large errors in projected deficits or surpluses.

To appreciate the size of these errors, one need only note that in 2001, when CBO first projected the fiscal balance for 2011, it anticipated a *surplus* of $889 billion; the actual outcome was a *deficit* of $1.3 trillion, a difference of $2.2 trillion. A Congress that took the initial projection as a guide to what it could, or should, prudently do would have been—correction: *was*—misguided.

III. SOCIAL SECURITY PROJECTIONS

The Social Security actuaries publish short-term (10-year) and long-term (75-year) projections of spending and revenues. They also prepare infinite-horizon projections that, with good reason, receive less attention than do the 75-year projections. The infinite-horizon projections freeze the demographic, economic, and behavioral assumptions used to compute balance in the terminal year of the 75-year projections and extrapolate them indefinitely. As the infinite-horizon projections add no new information to the balance shown in the 75th year, it is difficult to detect what useful purpose they serve. Phrased differently, if the system were in balance in the 75th year, no additional shortfall would be accumulated in later years.

The better question is why a projection period as long as 75 years provides useful information. The values of key variables—birth rates, mortality rates, labor market behavior, productivity—can plausibly take on an ever-widening range of values the farther one looks into the future. Projections depend sensitively on which values are actually realized. If trust funds are depleted, as current projections indicate will happen in less than 75 years, action to change revenues or expenditures is inescapable because not all statutory benefits can be paid under current law if the trust fund has been depleted and current revenues are insufficient to pay for the benefits. In recognition of this fact, the annual reports now show what benefits would be payable if trust funds are depleted and current earmarked revenues are less than benefits promised under the benefit formula.[15]

[15]The gap between benefits under the benefit formula and payable benefits is not difficult to compute. But should benefits have to be cut because the trust fund is depleted and promised benefits exceed current revenues, little is known on just how benefits would be cut. The government could pay all beneficiaries a portion of their statutory entitlement. It could pay full benefits but with a delay. Or it might prioritize beneficiaries in some fashion. There is no precedent for what might occur and no legal or regulatory template.

Long-term projections are useful for various reasons. First, they provide a template for analyzing the financial impact of proposed social security legislation. A large library of such estimates exists, which enable anyone to examine how the projected shortfall could be closed when and if action is required (Social Security Administration, 2014). In addition, the long-term projections are useful for at least two other reasons, one political and one due to the nature of the plans and commitments based on Social Security.

The political reason is that legislators have developed a taste for phasing in legislated changes gradually, possibly over quite extended periods. Politically difficult experience in the 1970s with an abrupt benefit cut is the source of such gradualism. In 1972 Congress codified a long-used procedure for adjusting benefits based on price inflation. That procedure had the effect of raising benefits more than prices. At low rates of inflation, the over-adjustment for price inflation just about kept constant the ratio of newly awarded benefits to average earnings—the replacement rate. When inflation accelerated in the 1970s, however, the newly enacted statutory formula sharply increased replacement rates and contributed to an overall funding shortfall. In 1977 Congress changed the benefit formula in a way that abruptly withdrew the unintended benefit increases. The 1977 legislation introduced a revised method of adjusting benefits for real wage growth but applied the new formula to a baseline calculated as if the previous benefit increases had not occurred. Thus, people claiming benefits under the new formula received benefits substantially lower than those who had claimed benefits the year before. Those first affected by the corrected formula, known as "notch babies" because of the notch in the ratio of benefits to average earnings, protested long and hard. Congress came close to buckling under this pressure, but held to the corrected benefit formula.

This experience helped deter Congress from making large benefit cuts abruptly when, shortly after the 1977 legislation, a recession precipitated another Social Security funding crisis. The actions Congress took in 1983 to deal with that crisis illustrated this caution. Congress instituted some modest benefit cuts immediately, but implemented larger benefit cuts with remarkable gradualism. The larger cuts—an across-the-board benefit cut of about 13 percent—did not even start until 2000 (for people reaching age 62 in that year) and would not apply fully to those turning age 62 until 2022, 39 years after enactment. It will be decades more before everyone on the rolls is subject to the cuts, as those on the rolls before 2022 will continue to receive benefits under previous law as long as they live. Measurement of the full financial effect of not only those reductions, but also others Congress may contemplate, requires a projection period approximating the one now in use.

The second reason why long-term Social Security projections are desirable relates to the nature of commitments embodied in Social Security. The system ties benefits for retirees and the disabled to indexed earnings averaged over 35 years. Workers have the option of beginning retirement benefits at any time from age 62 to age 70 and may continue to receive them for two or more decades.[16] Those benefits may be based on earnings received when they were in their twenties or even earlier. While nothing Constitutional prevents Congress from raising, lowering, or even repealing these benefits, current law is a political commitment to make payments that have some influence on important personal decisions about

[16]People may claim benefits after age 70, but it is not in their interest to wait beyond age 70, and few do.

education, work, and saving in anticipation of, but long before, retirement. Legislative planning based on reasonable long-term projections is therefore useful.

Taken together, these reasons justify making long-term projections. Although they will err in detail, they are useful in revealing gross imbalances between revenues and expenditures and for measuring the impacts of policy changes.

IV. MEDICARE PROJECTIONS

The Medicare program consists of two major parts, each subject to a different form of fiscal control. Medicare Hospital Insurance (Part A)—which covers hospital, skilled nursing facility, and hospice costs—is financed by earmarked payroll and income taxes. These taxes are deposited in a trust fund from which all Part A benefits are paid. Cumulative expenditures under Part A cannot exceed cumulative earmarked taxes plus interest earnings on bond holdings purchased when earmarked revenues exceeded outlays. Like Social Security, Medicare Part A is legally barred from paying costs in excess of total earmarked taxes plus interest earnings. Supplemental Medical Insurance (Parts B and D) is subject to no such constraint. It is financed by a permanent appropriation from general revenues that covers all costs in excess of premiums paid by enrollees. Congress could change these fiscal arrangements, of course, but it has shown no disposition to do so. For that reason, projections which show Medicare part A outlays permanently out of line with revenues have no basis in law or in well-established Congressional policy.

Medicare projections, like those of Social Security, now span 75 years. That was not always the case. From 1965, when Medicare was enacted through 1983, projections spanned 25 years. For the initial years of each projection—25 years in the case of Part A and 10 years in the case of Part B—the actuaries try to anticipate in detail changes in the quantity and price of various medical services. In projections released from 1983 through 2000, the actuaries assumed that per person Medicare spending would grow at the same rate as per person income during the final fifty years of the projection Events forced a reexamination of that assumption. Actual growth of health care spending had long exceeded income growth and it was expected to continue to do so indefinitely. Accordingly, a technical panel in December 2000 recommended that the actuaries revise their long-term projections and assume that after the first 25 years, per person health care spending would grow 1 percentage point a year faster than per person income (HHS, 2000).

As one might suppose, the impact on projected Medicare costs of the revised growth rate assumption was dramatic, increasingly so the longer one looked into the future. Projected costs for year 2075 in the 2002 projection jumped more than two-fifths. Other developments caused additional large shifts in projected Medicare costs. The Medicare Modernization Act enacted in 2003 added a new drug benefit. Growth of health care spending, which had slowed in the mid- and late-1990s accelerated in the early 2000s, pushing up projected costs still more. Then, around the time that the Great Recession began, growth of health care spending decelerated. The Affordable Care Act, which became law in 2010, contained provisions directly restricting growth of Medicare spending and setting up regulatory procedures to limit growth. Long term projections of Medicare spending thereupon dropped by roughly one third.

Projected Total Medicare Spending in various years
as percent of GDP

Projection year	2040	2075
2000	4.8	5.3
2002	5.4	8.5
2007	8.0	11.2
2014	5.6	6.7

These huge swings show the difference between projections and forecasts. Furthermore, they differ sharply from projections of spending for Social Security, which have varied comparatively little since the last major legislation, which was enacted in 1983.[17] They also raise questions whether the 75-year projections of health care spending (or of budget deficits in which health care spending is a major driving force) add anything of value to the shorter-term projections that CBO publishes or to the 25-year projections that the Medicare trustees formerly published. The Medicare actuaries, like those at Social Security, go to great pains to point out that their projections are not forecasts, but merely show the long-term implications of a particular set of assumptions. The assumptions are chosen with some care to be reasonable, in the sense that they are within the range of values that researchers have observed in the past. Furthermore, expert panels periodically subject these assumptions to review, leading to revisions in official projections. The assumptions in the central projections are thought to be reasonably compatible with one another.[18]

For two additional reasons, Medicare's long-term projections should not be regarded as forecasts or even as much guide to what outlays actually will be. First, most of the long-term growth of health care spending is traceable to advances in medical technology. While most of the technology that medical care will embody in the near future is known, the proportion declines the farther one looks into the future.

[17]The fact that the Social Security trust fund has moved from approximate balance in 1983 to a projected deficit in 2014 does not indicate that the projections of revenues and spending changed materially, as most of the swing in overall balance reflects the fact that the projection period changed. In 1983, the early years were ones in which revenues exceeded outlays; the later years were ones in which outlays exceeded revenues. As time passed, the projection period moved forward a year at a time. Early surplus years were replaced by late, deficit years. Most of the deterioration in trust fund balance is traceable to the passage of time and the shifting projection period, comparatively little to revisions in estimated spending and revenues in each year.

[18]In contrast, the assumptions underlying the alternative high cost and low cost projections are not chosen for mutual compatibility. For example, both Medicare and Social Security costs measured as a percent of taxable payroll decline as fertility rates and labor force participation rates increase. Accordingly, the low-cost projections assume both high fertility and high labor force participation. But as fertility rates rise, labor-force participation, at least among women of child-bearing age, is likely to fall.

Reliable predictions of the pace and nature of Medical advance is impossible. Knowledgeable observers have some general idea of innovations that are on the horizon and that are likely to occur in the near future. But the simple fact is that no one alive today has much of an inkling about what sorts of medical advances will occur 75 years hence, a point in time as remote from today's world as was the medical world of pre-World War II America. The nature of health care technology several decades in the future is unknowable, just as physicians of 1940 were unaware of organ transplantation, *in vitro* fertilization, non-invasive diagnostic radiology, angioplasty, coronary bypass grafts, and most drugs now in common use.

The internal dynamics of medical research are somewhat random, depending as they do on advances in the basic sciences—physics, chemistry, and biology. Past advances in medical technology have mostly added to health care spending. But the nature of technical advance depends in part on the incentives driving research. Were public policy to reward spending reductions by shifting from fee-for-service (which does not penalize, and may even reward, cost-increasing advances) with other payment arrangements, such as fixed budgets or shared savings, many analysts have speculated that the nature of technological advance would change. To speak of a probability distribution surrounding the rate or character of technological change in medicine so far in the future is risible. There is no probability distribution; there is only science fiction. To pretend otherwise is scientism, no science.

Second, changes in the mode of payment for health services could shift the level of spending quite substantially and do so over time in a way that would be hard to distinguish from a shift in the trend rate of growth. Analyses of the factors contributing to past growth of health care spending now attach considerable weight to the extension of health insurance coverage. Projections of future health care spending embody strong if implicit assumptions about the behavior of policy makers. Whether public policy encourages a shift to high-deductible insurance plans, where stop-loss ceilings on liabilities are set, whether insurers are permitted to limit customers to narrow lists of providers, and many other policy choices will have first-order effects on the level and possibility of growth of health care spending. If projections rest on assumed policies that differ materially from those adopted, the projections are no better as guides to policy changes than they would be if they embodied demonstrably implausible assumptions about economics, demographics, or anything else.

The extreme past sensitivity of long-run projections of Medicare spending to changes in assumptions, which are themselves essentially arbitrary, together with the impossibility of knowing the nature of the most important force driving the growth of long-term spending, discredits efforts to project Medicare spending for as much as 75 years. The actuarial resources now devoted to projections beyond 25 years should be redeployed to socially productive uses.

V. INFINITE-HORIZON PROJECTIONS

Most projections cover finite periods–10 years in the case of the basic CBO budget projections, 75 years in the case of Social Security, Medicare, and CBO's long-term projections. In addition, several projections look into the infinite future. This category includes so-called generational accounts, supplementary infinite-horizon projections by the Social Security and Medicare actuaries, and some private projections as well. Do such infinite-horizon projections add to the quality of public debate about budget, social insurance, or other policies?

The methods used in preparing infinite-horizon projections differ in detail, but they share a key feature. All compute a gap between projected outlays and projected revenues into the indefinitely distant future.

Generational accounts "measure, as of a particular base year, the present value of the gap between net taxes (that is, less transfers) and projected spending" for people born in each past year and for all people taken collectively born from now into the infinite future taken as a group. The future cohort is assumed to pay off all debts accumulated on behalf of those born in the past and alive now.[19] The gap for each cohort is translated into a tax rate which, if that generation paid the tax, would close the gap entirely. The tax is expressed as a percent of total income projected for that generation.

In addition to the traditional 75-year projections, the Social Security actuaries provide an infinite-horizon projection. This projection reports the discounted present value of benefit payments and administrative costs less revenues at statutory rates, computed on the assumption that the values of all relevant demographic and economic variables prevailing in the last year of the 75-year projection continue unchanged in perpetuity. This gap is reported as a capital sum and as a percent of projected GDP.

Similarly, the Medicare actuaries report separate infinite-horizon projections for part A (Hospital Insurance), B (covering doctors services), and D (pharmaceutical benefits). In each case, all but one of the assumptions that apply in the 75th year of the regular projections are assumed to continue indefinitely. The exception is that the rate at which per beneficiary spending under parts A and D is projected to grow after the 75th year is the same as the rate of growth of per person GDP. Part B spending per person is projected to grow annually 0.3 percentage points more slowly than per person GDP. Only Hospital Insurance shows a funding gap. Parts B and D show no funding gap, as both are financed by general revenues, to the extent that enrollees' premiums fall short of total outlays. But the Trustees reports now show a capital sum equal to the discounted present value of the projected draw on general revenues.

Some private budget projections also report estimates of the differences between federal budget spending and revenues into the limitless future. For example, Auerbach and Gale (2014), who have been projecting fiscal gaps since 1999, present estimates over three periods...through 2040, 2089 (75 years), and permanent. The size of the projected gaps, as well as their sensitivity to alternative assumptions, increases with the length of the projection period. The permanent (that is, infinite-horizon) gap is nearly four times as large as that through 2040 compared to CBO's Alternative Fiscal scenario.

The practical question is whether infinite-horizon projections add useful information that improves public discussion of relevant current policies. Three facts suggest that they do not.

The first point is that the infinite-horizon projections for Social Security, Medicare, and the Auerbach-Gale projections of the fiscal gap are based on variables that are frozen at the same value as in the terminal year of the 75-year projections. In other words, they add no new information, but are simply spreadsheet extensions of data that is already incorporated in other projections. As noted earlier, this

[19]The Inform Act, H.R. 2965, August 1, 2013. An earlier version appeared in EOP (1993). The principle difference is that The Inform Act requires projections into the infinite future, while the earlier version required projections only until the year 2200.

assumption freezes and extrapolates in perpetuity an assumed imbalance between revenues and outlays that current law flatly prohibits in both Social Security and Medicare Hospital Insurance.

The second point is that no one knows the growth rates a century or more in the future at which the economy will grow, how long people will live, how many children they will have, or many of the other variables on which such long-term projections sensitively depend. Inserting into current policy debates a number which embodies virtually complete ignorance debases that debate.

The third fact is one of simple arithmetic. As noted earlier, the relative size of the gap between two series that grow at different rates widens exponentially over time. Even tiny differences in growth rates, compounded hundreds of times, produce ever growing relative differences between any two series. This simple arithmetic observation means that no component of a broader series can be permitted to grow faster than an entity of which it is a part. If it did, the component would eventually become bigger than the than the entity of which it is a part, a logical impossibility.[20] Thus, infinite-horizon projections must assume that the growth rate of any component of GDP that initially is increasing faster than GDP must eventually grow at the same rate as GDP. But when? Given the acceptance of 75-year projections in some contexts, the switch from differential to uniform growth rates sometimes is imposed at the 76th year. That is what is done in infinite-horizon projections of the share of GDP devoted to health care spending. But imposing such an assumption arbitrarily—and all such switch-overs are, in fact, arbitrary—points out the arbitrary nature of assuming, without any real evidence regarding more proximate growth rates, the fact that infinite-horizon projections, as well as many with shorter horizons, reflect numerical conventions that those doing the projections impose in order to avoid results that are absurd or simply "feel wrong."

VI. SUMMARY COMMENT

The usefulness of projections as guides to policy diminishes steadily as the ability to assign probabilities to any given outcome fades. How fast such fading occurs depends in part on the nature of the problem being examined—the uncertainty associated with projections of pension costs grows much more slowly than does the uncertainty associated with medical spending. Both fade more slowly than do projections of budget deficits, which are the small gaps between two large numbers, both of which suffer from their own growing uncertainty. Just how far into the future growing uncertainty transforms a projection from an instrument for thinking about the likely policy environment and the impact of policy changes into mechanical numerical extrapolation, a gassy cloud of specious specificity, cannot be reduced to formula and is inevitably a matter of judgment.

Whether and when action should be taken based on a projection depends not just on the cone of uncertainty surrounding a projection, but also on the political options open at a particular time. Whether, given a projection that indicates the need for action at *some* time, action should be taken at *this* time does not depend only on the assumption that the expected cost of erroneous policy rises with the variance of outcomes. Action now often raises the cost of action later or flatly precludes it; in such cases, waiting for

[20]Strictly speaking, a component can permanently grow faster than the larger entity so long as the growth rate of the component approaches the growth of the larger entity and the gap becomes every smaller. Put another way, a component can comprise an ever larger proportion of a whole without ever exceeding it.

more information and acting later may be preferable. The current configuration of political forces may be deemed to be unfavorable, with the prospect of a better menu of options in the future. And, the approach of the date when action will become inescapable may alter the range of acceptable responses.

Moving from abstraction to a current policy debate, one may ask when action should be taken to close the projected long-term funding gap in Social Security. The following not-so-hypothetical positions far from exhaust the range of intellectually defensible strategies.

- Among those who believe that currently-promised benefits are too large to be sustained, some may believe that the best time to start to scale back benefits is now, as benefit cuts can be phased in more slowly than if the start of implementation is delayed and gradualism may make cuts more palatable.
- Others may hold that benefit cuts will become more feasible when, as they hope, the number of political offices held by supporters of benefit reductions increases and trust fund insolvency is imminent.
- Those who wish to sustain current benefit commitments may nevertheless hold that now is the time to negotiate a plan that will restore long-term financial balance, even at the price of small benefit cuts. The reasoning is that such a deal would take the issue of financial insolvency off the table, thereby denying those seeking large cuts a financial rallying cry at some future time when they may be politically ascendant.
- Some supporters of sustaining benefits hold that the best strategy is to oppose all benefit cuts now and forever, to insist on closing the financial gap with tax increases, and to count on the popularity of the program to enable them to hold the line.

The point of these examples is that the course of action one may recommend inevitably depends not just on projections, and not just on what outcome is sought to deal with an agreed problem. A similar, if lengthier, list of options could be assembled for what should be done in the face of projected long-term budget deficits. Evaluating all such lists is inherently political. It is not merely an exercise in arid algebraic analytics. Projections that illuminate plausible future outcomes are of enormous value, but projections into a foggy future, beyond the capacity of any analyst to see, hinder clear thinking about the choices policy makers need to make right now.

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