Tax Policy Center

Urban Institute and Brookings Institution

TAX REFORM FOR GROWTH, EQUITY, AND REVENUE

Samuel Brown and William Gale
Urban-Brookings Tax Policy Center
November 30, 2012

ABSTRACT

This paper examines the fiscal outlook and tax reform options in the United States. The major conclusions include: the United States faces a substantial fiscal shortfall in the medium- and long-term; both spending cuts and tax increases should contribute to the solution; tax increases need not do significant harm to economic growth; and there are sensible ways to both reform tax structure and raise revenues, including tax expenditure reform, the creation of a value-added tax, the creation of a carbon tax, or an increase in the gasoline tax.

TAX REFORM FOR GROWTH, EQUITY, AND REVENUE

1. INTRODUCTION

The Great Recession and its aftermath have left the United States with a difficult fiscal situation, with a weak economy that would benefit from short-term stimulus, but also with projected medium- and long-term budget shortfalls, even after the economy recovers, that indicate the need for fiscal consolidation. Addressing these medium- and long-term problems will likely require a combination of spending cuts and revenue increases. While tax reform would be a laudable goal even in the absence of a fiscal problem, building a better tax system becomes even more imperative when revenue requirements rise and the equity and efficiency of the tax code are put under even greater scrutiny and pressure.

In this paper, we consider how tax reform could be designed to simultaneously address three goals: promoting economic growth, improving equity, and raising revenue. We begin in section 2 by summarizing the medium-term and long-term fiscal outlook and reviewing the arguments for higher revenues as part of a fiscal solution.

In Section 3, we discuss how to broaden the income tax base by reducing and reforming tax expenditures. Public attention often focuses on raising revenues by raising income tax rates, but in the presence of the current narrow income tax base, this could create significant avoidance and prove economically damaging (Altshuler, Lim, and Williams 2010). Relative to rate increases, broadening the income tax base is more conducive to economic growth; it reduces the distortions created by the tax system and the inefficiencies involved in economic choices, it is fairer and simpler since different types of income and expenditure are treated the same way, and it could raise substantial revenue even when accompanied by lower rates.

In Section 4, we explore how a VAT could be designed as part of the solution to the U.S. fiscal problem. A VAT could raise significant revenue and, if the proceeds are focused on deficit reduction, would raise national saving. Distributional issues raised by the VAT can be addressed in a number of ways.

In section 5, we discuss how taxes on carbon emissions and/or a higher tax on gasoline would reduce externalities, make markets more efficient, and raise significant revenues. As with a VAT, the distributional issues could be addressed via other policies. Section 6 is a short conclusion.

2. FISCAL OUTLOOK AND ITS IMPLICATIONS

2.1 Fiscal Outlook

The United States faces large federal fiscal deficits in the immediate future, the next 10 years, and the longer term. Although the deficits for the 2012 and 2013 fiscal years—the result of the tax cuts and spending increases of the last decade, the "Great Recession," and economic policy response to the recent downturn—are generally thought to be helping the economic recovery, the deficits in the medium-term and long-term are more disconcerting.

Auerbach and Gale (2012) show that under plausible assumptions regarding "business as usual" policies, the federal deficit will equal $9.0 trillion, or 4.5 percent of GDP, between 2013 and 2022. The deficit will fall from 10.0 percent of GDP in 2009 to 3.6 percent of GDP by 2018, before rising to 4.9 percent in 2022 (Figure 1). After 2022, deficits are poised to rise further. The debt-to-GDP ratio will pass its 1946 high of 108.6 percent in the late 2020's if Congress continues "business as usual" (Figure 2).

Unlike the aftermath of World War II, however, the debt-to-GDP ratio will continue to rise after surpassing the previous peak. Expenditures are expected to rise significantly as the aging of the populace and excess cost growth of health care cause Medicare and Medicaid outlays to grow rapidly (Figure 3). Current estimates place the fiscal gap—the immediate and permanent increase in taxes or reduction in spending that would keep the long-term debt-to-GDP ratio at its current level—at 5-7 percent of GDP through 2089 and 6-9 percent on a permanent basis. Although delayed implementation of such policies may be preferable given the state of the economy currently, it will require deeper spending cuts or more revenue in order to address the long-term fiscal gap. For example, if the adjustments are delayed until 2018, when the CBO projects that the economy will reach potential GDP, the fiscal gap increases by up to 0.5 percentage points of GDP.

2.2 The Need for Spending Cuts and Revenue Increases

Since projected spending is slated to rise faster than GDP for the indefinite future, it is clear that spending cuts must be part of the solution, in particular for government health care programs, which have been rising as a share of GDP for several decades and are projected to continue to rise, due to both population changes and increasing relative price of medical care.

There are several reasons to consider tax increases, however, as well as spending cuts, as part of the fiscal solution. First, the sheer magnitude of the fiscal gap suggests that a spending-only solution would need to impose very substantial reductions on spending that might not be seen as equitable. At 5-7 percent of GDP, the fiscal gap is several times larger than the savings that were generated in budget deals in the past. The 1983 Social Security Reform reduced deficits by about 1.0 percent of GDP in the four years after passage while the 1990 and 1993 budget deals reduced deficits by about 1.4 percent of GDP and 1.2 percent of GDP, respectively,

over the five years after passage.[1] In addition, Americans seem particularly reluctant to cut government spending on Social Security and Medicare, two of the key drivers of long-term spending, than on other forms of spending. For instance, a 2011 Gallup poll showed that Americans over 60 percent of Americans were unwilling to cut social security and/or Medicare, and this was true across the political spectrum.

Second, as a political equilibrium, it seems likely that a sustainable budget deal would draw from both sides of the ledger. Indeed, in the past, major deals have included both tax increases and spending cuts. Budget discipline has been successful only when imposed on both sides of the fiscal ledger. With the 1983 Social Security reforms, the 1990 bipartisan budget deal, and 1993 budget deals, Congress both slashed spending and raised taxes. For example, in the 1990 budget deal, 49 percent of the reductions came from higher tax receipts, 34 percent from reduced defense spending, and 17 percent from other cuts in spending (Steuerle 2004).

Third, as a matter of equity, the only way that high-income households will share significantly in the burden of fixing the deficit is through tax increases, since spending cuts typically do not have a large impact on high-income households.

Fourth, it is more effective to control spending by requiring that it be paid for with current taxes than to allow deficits to grow. In contrast, the "starve the beast" hypothesis argues that keeping revenues down is an effective approach to curtailing spending. However, the hypothesis is not consistent with recent experience.[2] Romer and Romer (2009), for example, find that tax cuts designed to spur long-run growth do not in fact lead to lower government spending; if anything, they find that tax cuts lead to *higher* spending. This finding is consistent with Gale and Orszag (2004a), who argue that the experience of the last thirty years is more consistent with a "coordinated fiscal discipline" view, in which tax cuts were coupled with increased spending (as in the 1980s and 2000s) and tax increases were coupled with contemporaneous spending reductions (as in the 1990s).

2.3 Long-Term Growth Effects of Tax-Financed Deficit Reductions

An increase in taxes will not necessarily slow long-term economic growth. Tax changes have two broad sets of long-term effects on the economy.[3] The first set operates through direct changes in relative prices, incentives, and after-tax income. These changes affect the degree to which households are willing to work and save and to which firms invest and hire; these effects are known as income and substitution effects.

The second broad effect is on national saving. A reduction in the deficit raises public saving, which typically results in higher national saving (national saving is the sum of household, corporate, and government saving). This effect is often ignored in discussions of tax policy and economic growth, but it can be quite important. Even in the absence of a financial crisis,

sustained deficits have deleterious long-term effects, as they translate into lower national savings, higher interest rates, and increased indebtedness to foreign investors, all of which reduce future national income. Gale and Orszag (2004b) estimate that a 1 percent of GDP increase in the deficit will raise interest rates by twenty-five to thirty-five basis points and reduce national saving by 0.5 to 0.8 percentage points. Engen and Hubbard (2004) obtain similar results with respect to interest rates. Thus, relative to a balanced budget, a deficit equal to 6 percent of GDP would raise interest rates by at least 150 basis points and reduce the national saving rate by at least 3 percent of GDP. The IMF (2010) estimates that, in advanced economies, an increase of 10 percentage points in the initial debt/GDP ratio reduces future GDP growth rates by 0.15 percentage points. Hence (if this result is extrapolated linearly, and we do so with caution, since it would be easy to think of reasons that would make a larger debt change have more-than-proportional or less-than-proportional effects), the increase in the debt-to-GDP ratio from about 40 percent earlier in the decade to 85 percent by 2022 (Auerbach and Gale 2012) would be expected to reduce the growth rate by a whopping 0.675 percentage points. Thus a deficit reduction plan that included tax increases would help spur economic growth in contrast to continuing policy as normal.

The net long-term effect of a tax change is the result of the two effects outlined above, which are sometimes offsetting and sometimes mutually reinforcing. Stokey and Rebelo (1995), for example, show that even the very large tax increases associated with World War II—on the order of 10 percent of GDP—apparently had no discernible impact on the long-term economic growth rate. Gale and Potter (2002), taking a very different approach than Stokey and Rebelo, find that the impact of the 2001 tax cuts on the deficit and national saving outweighed its impact on incentives, so that the net effect on growth was negative. This suggests that raising taxes by undoing the 2001 tax cuts would raise long-term economic growth.

3. TAX EXPENDITURES

In formal terms, tax expenditures are "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which allow a special credit, preferential rate of tax or a deferral of liability" (The Congressional Budget Act of 1974 (P.L. 93-344)).

3.1. Background

For many purposes, it is useful to categorize tax expenditures by how they mechanically affect income tax liability. Table 1 lists the largest tax expenditures by revenue cost, and the type of tax expenditure each represents.

- *Exclusions* exempt some forms of income from taxation. For example, employer-sponsored health insurance is the economic equivalent of income for workers, but it is

exempt from taxation. Like wage payments, employer payments for employee health insurance are tax-deductible for the business; unlike wages, however, employer-sponsored health insurance benefits are not taxed in the individual income tax.

- *Deductions* reduce taxable income dollar-for-dollar. So-called "above-the-line" deductions are applicable to all taxpayers who meet the requirements. Itemized deductions -- including deductions for mortgage interest deduction, state and local taxes, and charitable contributions -- are typically only used by those whose sum of such deductions exceeds the standard deduction. A dollar's worth of an exclusion or a deduction reduces taxable income by a dollar, and so saves more taxes for a household in a higher marginal tax bracket.
- In contrast, *credits* reduce income tax liability dollar-for-dollar. Whereas the first two categories alter the income subject to taxation, credits directly reduce the tax owed to the federal government. Non-refundable credits can reduce one's tax liability to $0. Refundable credits, once tax liability is negated, can provide a net payment to the taxpayer, effectively creating negative tax liability. For example, the earned income credit is refundable and the child credit is refundable under certain circumstances.[4]
- *Preferential rates* reduce the tax rate on some types of income relative to others. For example, long-term capital gains and dividends are taxed at a maximum rate of 15 percent whereas other forms of income are currently taxed at rates as high as 35 percent. The taxpayer benefits from the difference between the marginal tax rate on regular income and the tax rate on the preferred form of income.
- *Deferrals* postpone the taxation of some forms of income. For example, when employees contribute to 401(k)s, their contributions are deductible, the asset grows tax-free, and tax is only applied when funds are withdrawn. This postponement reduces the net effective tax rate on the income in a manner proportional to the tax rate on the alternative use of the funds.

As these examples make clear, the definition of a tax expenditure is somewhat subjective. It requires application of the word "special" in the definition, and it requires an implicit assumption about what the "normal" or reference tax system looks like. In broadest terms, the notion of a normal system underlying the current tax expenditure definitions is a progressive income tax, where all forms of income are taxed at the same rate, but unrealized capital gains are not subject to taxation. If the normal tax system, however, were thought to be a consumption tax rather than an income, the deferrals applicable to 401(k)s and other retirement saving would not be considered tax expenditures, since the current tax treatment would represent the normal treatment of saving under a consumption tax. On a similar note, personal and dependent exemptions and the standard deduction are not generally considered tax expenditures, since everyone may choose to take such options.

The sheer diversity of tax expenditures should be also be noted. Although Table 1 lists

the largest items, the Office of Management and Budget (2012) identifies 173 total tax expenditures: 138 of which affect the individual income tax and 80 of which affect the corporate income tax (some affect both taxes). Meanwhile, the Joint Committee on Taxation (2012) lists over 200 tax expenditures. The items range from specialized subsidies for particular industries to broadly used initiatives -- for example, mortgage interest, charitable contributions -- that many consider to be core elements of social policy in the United States and that have been present since almost the inception of the income tax code in 1913. The diversity of tax expenditures sometimes makes it difficult to generalize the merits of tax expenditure reform, as many (and often the largest) provisions are not just "loopholes" designed to benefit a select few but to pursue broad public purposes. That is, simply because a tax expenditure is a deviation from a normal tax code does not mean that it is undesirable or should be eliminated. Nevertheless, tax expenditures are a fruitful place to begin thinking about tax reform, since the alternative ways to raise revenue -- higher tax rates and new taxes -- create obstacles.

3.2 Tax Reform and Tax Expenditures

The canonical focus for income tax reform is to create a system with a broad base that taxes all sources and uses of income at the same rate so as to generate lower statutory rates. Tax expenditure reform would be essential to achieving these goals. Broadening the base entails restricting the use of exclusions and deductions. Taxing all sources and uses of income, at the same effective rate, entails restricting the use of preferential rates, credits, and deferrals. In short, tax expenditure reform has the potential to raise revenue and to make the tax system fairer, more efficient and simpler. But the diversity of tax expenditures and the situations they address requires attention to the particular details of each case.

Likewise, if a guiding focus of budget reform is to reduce government spending, it should be noted that many major tax expenditures act essentially as government spending programs that happen to be embedded in the tax code rather than in outlays (Batchelder and Toder 2010; Marron 2011; Marron and Toder 2012). Thus, tax expenditure reform in many cases can be thought of as reducing effective government spending.

The potential benefits of reforming tax expenditures as a partial solution to current tax and fiscal problems is well known. Both the President's National Commission on Fiscal Responsibility and Reform (the Bowles-Simpson Commission) and the Bipartisan Policy Center's Debt Reduction Task Force (the Domenici-Rivlin Commission) recommended massive scaling back of tax expenditures in order to use the revenue to reduce the deficit and decrease statutory tax rates. President Bush's 2005 tax reform commission similarly recommended eliminating and limiting many tax expenditures, although to a lesser extent than the deficit-reduction panels.

3.3 Revenue

There are two key points regarding tax expenditures and revenue potential. First, the revenue value of most tax expenditures rises with the marginal tax rate. For example, a deduction or exclusion that reduces taxable income by one dollar would save fifteen cents in tax liability for someone in the 15 percent tax bracket and thirty-five cents for someone in the 35 percent bracket. Similarly, the value of deferral options and preferential tax rates are related to the ordinary income tax rate. As a result, reducing tax rates will mechanically reduce the value of tax expenditures but is unlikely to generate net new revenues and should be distinguished from closing or curtailing tax expenditures, which typically will raise revenue.

Second, tax expenditure reform has the potential to raise significant amounts of revenue. Although precise estimates are difficult to compute, illustrative calculations indicate the potential for revenue-raising. Assuming the tax code reverts to its pre-2001 rates, a summation of tax expenditures listed in the FY2013 Budget reveals that tax expenditures would reduce revenues by $1.32 trillion in the 2015 fiscal year**,** with $1.12 trillion coming from lower individual income receipts and $160 billion from lower corporate income receipts (Office of Management and Budget 2012, Marron 2012). Since refundable credits have outlay effects ($100 billion) and the elimination of exclusions and other provisions would increase payroll receipts and excise taxes ($120 billion), eliminating all tax expenditures could theoretically raise $1.54 trillion in 2015 (Marron 2012). This estimate still may understate the potential revenue of base broadening because of interaction effects: for example, Toder and Baneman (2012) found that the combined revenue loss from all non-business individual income tax expenditures would have been 9.6 percent greater than the summed individual revenue loss in 2011.[5]

At the same time, the potential revenue gains should be adjusted downward for several reasons. First, behavioral effects may significantly alter the revenues that could be raised from tax expenditure reform; Poterba and Sinai (2008) found that portfolio adjustments would offset 14 percent of static revenue increase if the mortgage interest deduction were eliminated. Second, the estimates above use the scheduled tax law for each particular year: estimates of 2013 and beyond assume the expiration of the Bush tax cuts. If the Bush tax cuts are extended, the value of tax expenditures will fall since the marginal tax rate will be lower. Finally, the potential revenue from reform may be limited by administrative feasibility, which Nguyen et al. (2012) show account for about 17 percent of tax expenditures, and political constraints. All of these items make precise estimates of the revenue potential from restricting tax expenditures difficult.

3.4 Distributional Effects

Tax expenditure reform not only has the potential to raise revenues, but to do so in a progressive manner. High-income households tend to be able to use more of the existing tax expenditures than lower-income households, and – as noted above – the tax benefit per dollar of

tax expenditure used (except for credits) rises with a household's marginal tax rate. Toder and Baneman (2012) found that if all non-business individual income tax expenditures had been eliminated for 2011, the outcome would have been broadly progressive, with the top 1 percent of the income distribution experiencing a decline of 19.8 percent in after-tax income, whereas the bottom quintile would have seen only a 7.5 percent decrease (Figure 4).

Yet distributional estimates of tax expenditures should be interpreted with caution (Toder and Baneman 2012; Toder, Harris, and Lim 2011; Burman, Toder and Geissler 2008). First, changes in tax expenditures may induce change in behavior, as noted above. Second, the use of the revenues would affect the overall distributional impact (Burman, Toder, and Geissler 2008).

Moreover, the aggregate changes, noted above, obscure the fact that different tax expenditures have widely varying effects on the distribution of income (Toder and Baneman 2012; Altshuler and Dietz 2008; Burman, Toder, and Geissler 2008; Hungerford 2006). Itemized deductions, exclusions and in particular the preferential rates for capital gains and dividends barely benefit the lower income quintiles but heavily benefit the upper income quintiles. Above-the-line deductions and non-refundable credits, on average, reduce after-tax income by a similar proportion among the income quintiles. Refundable credits, like the Earned Income Tax Credit and the Child Tax Credit, deliver substantial income assistance to low-income households.

3.5 Efficiency

Given the diversity of tax expenditures, it is difficult to generalize about their efficiency impact. In general, treating sources and uses of income the same for tax purposes is thought to be the right benchmark from which to begin consideration of efficiency within an income tax system. A reduction in the tax rate for one activity generally requires higher rates on other activities to raise the same amount of revenue. This was, for example, the guiding notion behind the Tax Reform Act of 1986, even if it was not fully achieved then, as well as the Bowles-Simpson and Domenici-Rivlin proposals.

There are, of course, important reasons why this rule is not a perfect guide. Different sources or uses of income may have different elasticities, which may dictate different optimal tax rates, according to the Ramsey rule. Likewise, the presence of externalities may also indicate that special treatment of particular activities is appropriate. If a tax expenditure corrects a market failure, it can increase economic efficiency.

The efficiency effects of reductions in tax expenditures are often contrasted to increases in income tax rates. The frequent claim that reducing tax expenditures does not raise effective marginal tax rates, though, can be overstated. For example, consider someone in a 35 percent marginal tax bracket who is able to shelter, through tax expenditures, 20 percent of his income. His effective marginal tax rate is 28 percent, since he pays 35 percent tax on 80 percent of his

income. If the tax expenditures were eliminated and his statutory tax rate reduced to 28 percent, his effective marginal tax rate would remain at 28 percent. That is, although the reduction in statutory marginal tax rates reduces the effective tax rate, the reduction in tax expenditures raises the effective marginal tax rate. In this particular case, those two effects happen to exactly offset.

In addition to the direct efficiency loss of higher tax rates, the political economy of tax expenditures can lead to indirect efficiency losses. Burman and Phaup (2011) suggest that taxpayers' perception of a lighter tax burden through tax expenditures may encourage them to demand more government services via tax expenditures than they would through outlays, thus causing an inefficient provision of government services. Furthermore, discretionary spending (but not entitlement spending) goes through periodic review, but tax expenditures do not. Provision of government services through tax expenditures, therefore, may be both less effective and less efficient than an equal amount of outlay spending.

Moreover, most tax expenditures do not correct market failures and instead promote an inefficient allocation of resources. The itemized deduction for mortgage interest, for example, does not correct a failure of the housing market. It actually appears ineffective at promoting homeownership by instead encouraging households to acquire bigger mortgages and larger houses (Gale, Gruber, and Stephens-Davidowitz 2007; Toder et al 2010). And it may even reduce homeownership as the subsidy is capitalized into home prices, reducing the demand among young workers (Bourassa and Yin 2007).

The ESI exclusion subsidizes the cost of health insurance and increases access to group insurance. Gruber and Poterba (1996), however, found that it also leads to overconsumption of high-cost, inefficient health insurance plans, which increases overall health care costs. The recent health care legislation limited the value of health insurance premiums that are excluded from taxation by introducing a tax on "Cadillac" health plans, effective in 2018. This may still enable access to insurance more generally while mitigating the inefficient consumption of health care.

It is also unclear whether the deferral of tax on retirement saving in pensions, 401(k) plans, and Individual Retirement Accounts are effective at increasing private saving: those who take advantage of retirement saving often would have saved using alternative means, meaning the tax expenditure tends to alter the *type* of private saving much more than the *level* of private saving. The deferral of retirement saving also imposes significant revenue losses that reduce public saving (Engen, Gale, and Scholz 1996; Poterba, Venti, and Wise 1996; Gale 1998; Benjamin 2003; Gelber 2011; Chetty, et al. 2012).

This does not mean that important policy goals cannot be achieved through tax expenditures. The EITC has been effective at promoting work among low-income single mothers. Eissa and Liebman (1996) found that the EITC, which functions as a wage subsidy that is provided through the tax code, increased labor force participation of low-income single

mothers by 1.9 to 2.8 percentage points, and others have found similar effects (Eissa and Hoynes 2005; Meyer 2002; Meyer and Rosenbaum 2001).

3.6 Policy Options

The most radical option would be to repeal all tax expenditures. This would raise substantial revenue and increase the progressivity of the tax code. Nevertheless, it seems unlikely, for political and administrative reasons, and it may not be advisable on economic grounds either. Just as the public discussion of government spending does not typically involve eliminating major programs like Social Security or Medicare, eliminating a whole stream of core social and economic policies merely because they exist in the tax code rather than on the outlay side would not necessarily make sense.

A more practical, but still sweeping, option would be to convert itemized deductions to flat 15 percent credits (Gale 1997; Batchelder, Goldberg, and Orszag 2006). This would raise about $1.2 to $1.3 trillion over the 2013-2022 projection window. [6] It would improve efficiency by limiting the inefficient allocation of resources. It would improve horizontal equity by equalizing the tax benefits of tax-preferred activities across taxpayers. And it would improve vertical equity by eliminating the regressive nature of current itemized deductions. For example, converting the mortgage interest deduction to a 15-percent non-refundable credit would nearly double the number of tax units with cash income less than $50,000 that receive a tax benefit from having a mortgage on their home (Baneman, et al. 2011). If the credits were made refundable, the progressivity of the change would increase, but the revenue effects would fall.

A less extreme version of the idea of converting deductions to flat credits is the Obama Administration's proposal to cap the benefits of itemized deductions at 28 percent. This effectively leaves the deductions as they are for people in tax brackets of 28 percent or less and converts the itemized deduction to a 28 percent credit for people in higher tax brackets.

An alternative proposal would be to place an overall cap on the value of tax expenditures. Feldstein, Feenberg, and MacGuineas (2011) propose to cap the tax-reduction value of tax expenditures at 2 percent of AGI. For example, a taxpayer with AGI of $50,000 could reduce tax liability by up to $1,000 under such a proposal. If he was single and faced a 25 percent marginal tax rate, he would be able to use up to $4,000 worth of deductions and exemptions. The proposal has obvious political attractions for our elected leaders, in that they would not have to curtail specific tax expenditures. Feldstein et al. estimate that the two percent cap could have raised $278 billion in 2011.[7]

Yet the proposal raises several issues. In general, it is important to distinguish the idea of having a cap from the particular cap that Feldstein et al. proposed. One issue is what should be included under a cap? In their proposal, Feldstein et al. include itemized deductions, health

insurance, and the child credit but leave out capital gains and retirement saving. Other choices would generate a progressive change.

A second concern is how the cap adjusts with respect to income. Feldstein et. al make the tax-value a uniform share of income and set that share at 2 percent. This formulation

could affect lower- and middle-income households in unexpected ways. For example, a household with median income of $50,054 that had an average employer sponsored health insurance policy worth $15,745 would not be able to deduct the entire tax value of the plan, even if its marginal tax rate was as low as 15 percent[8], and the family would not be able to use any other deductions. A high-income household, however, may be able to deduct the full ESI premium in addition to other tax-advantaged items. More progressive options could, for example, make the cap a decreasing function of income.

The implicit order of deductible payments under a cap may is also relevant. For example, households must pay their state and local taxes, and they may end up using their entire tax preference on this item. Only if there is value remaining after state and local taxes are paid will one receive a tax benefit for other deductions or exclusions.

Another option for tax expenditure reform would be to tailor solutions that recognize the distinct differences in each of the tax expenditures. This is perhaps the most appealing from an economist's perspective, as each item could be evaluated separately but may be more difficult politically. The system that emerged from such evaluations would, in our view, share the following characteristics. Capital gains would be taxed as ordinary income (Burman 1999; Burman 2012). Dividends would be taxed once and only once at either the corporate or individual level. The mortgage interest deduction would be converted to a $10,000 first-time home-buyers tax credit (Gale, Gruber, and Stephens-Davidowitz 2007). The charitable deduction would continue in full as an above-the-line deduction as President Bush's Advisory Panel on Federal Tax Reform recommended in 2005. Retirement saving deductions would be converted to 15 percent matching credits (Gale 2011). Employer-provided health care would continue to be exempted at the firm level, but would be taxed as regular income at the individual level. The resulting increase in tax liability would be either completely or partially offset by a uniform refundable credit, similar to the proposal by Senator McCain in 2008, that incentivizes taxpayers to demand lower cost health plans (Furman 2008).

4. THE VALUE-ADDED TAX

Under a value-added tax (VAT), businesses pay taxes on the difference between their total sales to other businesses and households and their purchases of inputs from other businesses. That difference represents the value-added by the firm to the product or service in question.[9] The sum of value added at each stage of production is the retail sales price, so the

VAT simply replicates the tax patterns created by a retail sales tax and is like other taxes on aggregate consumption. The key distinction is that VATs are collected at each stage of production, whereas retail sales taxes are collected only at point of final sale. Furthermore, the VAT is easier to enforce and is widely regarded as having a superior administrative structure to a retail sales tax.

Although it would be new to the United States, the VAT is in place in about 150 countries worldwide and in every OECD country other than the United States. Experience suggests that the VAT can raise substantial revenue, is administrable, and minimally harmful to economic growth. Additionally, the VAT has at least one other potential advantage worth highlighting: a properly-designed VAT might help the states deal with their own fiscal issues. This section discusses these issues and addresses several concerns that have been raised about the VAT.

4.1 Revenue

Among non-U.S. OECD members in 2006, the VAT raised almost 7 percent of GDP in revenue, and accounted for almost 19 percent of revenue raised at all levels of government. As with any tax, revenue from a VAT depends on the rate structure and the base. The standard VAT rate, the rate charged on most goods and services, has remained relatively steady in recent years in non-U.S. OECD countries. In 2007, it ranged from a low of 5 percent in Japan to a high of 25 percent in Denmark, Iceland, Norway, and Sweden. The average rate was 18 percent (OECD 2008).

The VAT "yield ratio" measures VAT revenues as a share of GDP divided by the standard VAT rate. A ratio of 0.3, for example, implies that a 10 percent VAT raises 3 percent of GDP in revenues.[10] Note that the yield ratio does not include the net costs of policies intended to compensate low-income households for VAT payments, nor do they include the offsetting effects that the VAT may have on other revenue sources. The yield ratio simply measures how much revenue is actually gained from the VAT itself.

In 2006, in non-U.S. OECD countries, the yield ratio ranged from a low of 0.28 in Mexico to a high of 0.69 in New Zealand. Most countries fell within a range of 0.3 and 0.4 (OECD 2008). The yield ratio depends critically on the extent to which the VAT tax base is kept broad, rather than narrowed by preferential rates or exemptions on certain goods or services. In practice, most OECD countries apply preferential rates to some items. Of the twenty-nine OECD countries with a VAT in 2007, seventeen countries "zero rated" certain goods (meaning that VAT is not charged on the retail sale of the good, but credits are awarded on the VAT paid on the inputs) and twenty-one applied at least one non-zero reduced rate to a sub-sector of goods. Only Japan and the Slovak Republic have no preferential rates (OECD 2008).

Toder and Rosenberg (2010) estimate that the U.S. could raise gross revenue of $355 billion in 2012 through a 5 percent VAT applied to all consumption except for spending on education, Medicaid and Medicare, charitable organizations, and state and local government. This would represent about 2.3 percent of GDP and produce a yield ratio of 0.45 (Table 2).

However, as discussed further below, governments often provide either subsidies or exemptions in the VAT. One way to do so is to exclude some preferred items. For example, exempting rent, new home purchases, food consumed at home, and private health expenditures from the VAT in the U.S. would reduce revenue by 38 percent, cutting the yield ratio to 0.28.

A different way to provide subsidies is to give each household a cash payment. Using the broad base, the provision of a cash payment of $437 per adult and $218 per child would, according to Toder and Rosenberg (2010) cost $97.7 billion. Note that, under this option, the official revenue collected by the VAT would remain at $355.5 billion and the measure of the yield ratio — given by VAT revenues and the standard rate of 5 percent — would remain at 0.45. But what might be called the "effective" revenue—that is, the revenue gain from the VAT net of the costs of making the compensatory cash payments – would fall to $257.8 billion, or 1.64 percent of GDP, giving an "effective" yield ratio of 0.33.

Imposing the VAT would reduce net business income, which would in turn reduce other revenues. Toder and Rosenberg estimate that declines in other tax receipts would offset about 27 percent of gross VAT revenues. This would reduce "effective" revenues – after netting out the costs of cash payments and the loss in other revenues – of 1.02 percent of GDP for either base, resulting in an "effective" yield ratio of 0.2.

These figures imply, after allowing for offsetting adjustments in other taxes and the costs of either cash payments or narrowing the base as described above, that a 10 percent VAT would raise just over 2 percent of GDP in revenues.

4.2 Efficiency

A broad-based VAT that is levied uniformly on all goods and services would not distort relative prices among consumption goods. Similarly, a VAT with a constant tax rate over time would not distort household saving choices, nor would it distort business's choices regarding new investments, financing instruments, or organizational form.[11] Relative to higher income tax rates — which would distort all of the choices noted above — the VAT has much to offer in the way of incentives. Like the income or payroll tax, however, the VAT would distort household choices between work and leisure. The VAT is border-adjustable; it would exempt exports and tax imports. While this is sometimes touted as providing economic benefits, it is actually a neutral treatment of these items.

A substantial literature, based on economic theory and simulation models, documents the potential efficiency gains from *substituting* a broad-based consumption tax for an income tax (Altig et al. 2001; Auerbach 1996; Fullerton and Rogers 1996). These gains arise from a combination of broadening the tax base, eliminating distortions in saving behavior, and imposing a one-time tax on existing wealth.

The tax on existing wealth merits additional discussion. As a tax on consumption, the VAT can be regarded as a tax on the wealth and income that households use to finance current and future consumption: wealth that exists at the time of the transition to the VAT, future wages, and extra-normal returns to capital (Hubbard and Gentry 1997).[12] The tax on existing wealth is a lump-sum tax, since the wealth has been already accumulated. Lump-sum taxes are preferable to other forms of taxation on efficiency grounds, since they do not distort economic choices. In fact, the lump sum tax on existing wealth is a major component of the efficiency gains due to the creation of a consumption tax.[13]

The efficiency and growth effects due to an *add-on* VAT would include both losses from the increased distortion of work/leisure choices as well as substantial gains noted above from the one-time tax on existing wealth and substantial gains from deficit reduction, discussed above.

4.3 Distributional Effects and Offsetting Policies

In theory, the distributional burden of the VAT depends crucially on how household resources are measured. Typical distributional analyses are made with respect to current income. The VAT is regressive if households are classified by, and the tax burden is measured as a share of current income. Because the VAT is a proportional tax on consumption, and because lower-income households tend to spend a larger proportion of their income than higher-income households, the VAT imposes higher burdens – as a share of current income – on lower-income households.

However, several other perspectives are possible. The VAT is a proportional tax if households are classified by current consumption since all households are taxed at the same rate on the amount they consume. Likewise, to the extent that current consumption mirrors average lifetime income, the VAT is also proportional with respect to lifetime income. Empirical research broadly confirms these notions (Caspersen and Metcalf 1994; Metcalf 1994; Toder and Rosenberg 2010). However, empirical analysis is complicated by the fact that alternative methods of distributing the burden of a consumption tax, such as distributing the burden to consumption versus wages and capital less investment, can produce drastically different estimates of progressivity, even though they are equivalent in theory (Burman et al. 2005).

As mentioned earlier, the VAT imposes a one-time tax on existing wealth, a feature that is desirable on efficiency grounds but is more controversial with regard to fairness. We believe a

one-time tax on wealth would be fair, and in fact would be quite progressive. There is concern that imposing a VAT would hurt the elderly, a group that has high consumption relative to its income. However, it is the case that Social Security and Medicare are the principal sources of income for a substantial proportion of low-income elderly households. Since those benefits are effectively indexed for inflation, low-income elderly households would be insulated from any VAT-induced increases in the price of consumer goods or health care services.[14] High-income elderly households, who receive much lower shares of their income in the form of indexed government benefits, would need to pay more in taxes but could afford to do so.

Concerns about the regressivity of the VAT are complex, but they should not obstruct the creation of a VAT for two reasons. First, while we accept the validity of distributional considerations, what matters is the progressivity of the overall tax and transfer system, not the distribution of any individual component of that system. Clearly, the VAT can be one component of a progressive system.

Second, it is straightforward to introduce policies that can offset the impact of the VAT on low-income households. The most efficient way to do this is simply to provide households either refundable income tax credits or outright payments. For example, if the VAT rate were 10 percent, a $3,000 demogrant would equal VAT paid on the first $30,000 of a household's consumption. Households that spent exactly $30,000 on consumption would pay no net tax. Those that spent less on consumption would receive a net subsidy. Those that spent more on consumption would, on net, pay a 10 percent VAT only on their purchases above $30,000. Toder and Rosenberg (2010) estimate that a VAT coupled with a fixed payment to families is generally progressive, even with respect to current income.

In contrast, many OECD governments and state government offer preferential or zero rates on certain items like health care or food to increase progressivity. This approach is largely ineffective because the products in question are consumed in greater quantities by middle-income and wealthy taxpayers than by low-income households.[15] Furthermore, this approach creates complexity and invites tax avoidance as consumers try to substitute between tax-preferred and fully-taxable goods and policymakers struggle to characterize goods. For example, if clothing were exempt from the VAT, Halloween costumes classified as clothing would be exempt, while costumes classified as toys would not.

5. CARBON TAXES

Throughout this paper we use the phrase “carbon tax” to refer to a tax on carbon dioxide, and possibly other greenhouse gas emissions. Although a carbon tax would be a new policy for the federal government, the tax has been implemented in several other countries. Finland, Norway, Sweden, and Denmark instituted carbon taxes in the early 1990s, followed by the Netherlands and Germany in the latter part of the 1990s. The United Kingdom followed suit in

2001. Australia introduced a carbon tax in 2011. North American jurisdictions have also implemented carbon taxes. The town of Boulder, Colorado, adopted a carbon tax in 2006, and Montgomery County, MD, did so in 2010. The Canadian provinces of Alberta and Quebec adopted carbon taxes in 2007, followed by British Columbia in 2008.

5.1 Revenue

Carbon taxes can raise significant amounts of revenue. For instance, in 2007 the tax raised revenue equivalent to about 0.3 percent of GDP in Finland and Denmark, and 0.8 percent in Sweden. A well-designed tax in the United States could similar amounts. A number of studies have estimated the revenue effects of carbon taxes, with estimates ranging from 0.6 percent of GDP for a $20 per ton tax (CBO 2010; Rausch and Reilly 2012) to 1.6 percent of GDP for a $41 per ton tax (Paltsev et al. 2007) and several intermediate estimates (Metcalf 2008 and Shapiro, Pham, and Malik 2008). Estimates in McKibbin, Morris and Wilcoxen (2009) and Metcalf (2010) suggest that a $30 per ton tax would raise about 1 percent of GDP in revenue. In terms of gauging how large a tax that would be, Bauman (2010) has estimated that a tax of $25 per ton would raise gasoline prices by 25 cents a gallon.

The net effects of a carbon tax on the deficit will depend, of course, not only on the magnitude of the tax and the behavioral response by consumers and firms, as the studies above consider, but also on the offsets provided for distributional or transition purposes, and the uses of the funds. In many instances to date, carbon tax revenues have not been used for deficit reduction. Norway and Sweden do include carbon tax revenue as part of general government receipts, which suggests a possible effect on deficit reduction. But carbon tax revenue in Denmark is returned to industry and directed towards environmental subsidies. Several nations have used carbon tax revenue to reduce other taxes (Sumner, Bird, and Smith 2009). Australia coupled its carbon tax with a substantial increase in the tax-free level of income (and other tax changes). The Netherlands and Sweden have exempted a large portion of the industrial sector from the tax, as well as helping low-income households offset the burden of the tax (the latter measure was also implemented by Germany). Quebec deposits carbon tax revenues into a fund devoted to public transportation and environmental initiatives, while British Columbia makes its carbon tax revenue-neutral by reducing corporate and personal income tax rates and providing an annual credit of $100 per adult and $30 per child to lower-income citizens.

5.2 Efficiency

In principle, carbon taxation receives high marks on efficiency criteria. Indeed, the basic rationale for a carbon tax is that it makes good economic sense: unlike most taxes, carbon taxation can improve the efficient allocation of resources by accounting for externalities in the market price. Externalities can be severe. Stavins (2007) notes that the efficiency benefits of a carbon tax are often understated since the largest efficiency gains come in the form of

internationally-shared reduced greenhouse gas emissions. While the United States is the largest per capita emitter of carbon dioxide, China is the largest overall emitter, and the European Union makes a significant contribution as well. Therefore, enacting a program that would lead to better cooperation with other countries, and reduce emissions across the world would be better suited to deal with the well-known problems brought about by global warming, such as rising sea levels, more frequency in extreme temperatures, among others.

Taxes on carbon can address these externalities. Not surprisingly, most analyses find that a carbon tax could significantly reduce emissions. For example, Metcalf (2008) estimates that a $15 per ton tax on carbon emissions would reduce greenhouse gas emissions by 14.0 percent. Sumner, Bird, and Smith (2009) estimate that the European countries' carbon taxes have had a significant effect on emissions reductions, attributing reductions of up to 15 percent to the carbon tax. Andersen (2010) estimates that that the six European countries that introduced carbon taxes saw reduction of fuel demand of 2.6% in the 1994-2003 period compared to a baseline with no such taxes in place. Furthermore, the University of Ottawa (2012) found that the carbon tax implemented in British Columbia led to a 9.9% reduction in greenhouse gas emissions in the province, compared to just 4.6% for the rest of Canada.

In addition to reducing emissions, a carbon tax could improve other economic incentives by reducing other tax rates or paying down the deficit (Parry and Williams 2011).

A carbon tax could have other benefits too. It would reduce the U.S. economy's dependence on foreign sources of energy, and would create better market incentives for energy conservation, the use of renewable energy sources, and the production of energy-efficient goods. The permanent change in price signals from enacting a carbon tax would stimulate new private sector research and innovation in developing new ways of harnessing renewable energy and energy-saving technologies.

The implementation of a carbon tax could also be used a mechanism to phase out the panoply of targeted subsidies for biofuel production. For example, since the 1970s the United States has subsidized the production of ethanol and other biofuels as a means of reducing greenhouse gas emissions, reducing U.S. dependence on foreign energy, and stimulating production in the agricultural sector. These subsidies are costly to administer, both in terms of distortions in market behavior and lost revenue. Because they reduce the price of gasoline, some research suggests the subsidies may increase instead of reducing greenhouse gas emissions because the increased emissions from increased gasoline consumption may more than offset the reduced emissions from substituting ethanol for gasoline.[16] For example, in 2009 the exemption of biofuels from highway motor fuel taxes reduced excise tax receipts by $6 billion[17] (CBO 2010). A carbon tax that accurately reflected the price of these negative externalities would be a more efficient mechanism for achieving reductions in greenhouse gas emissions and improved energy security.

5.3 Distribution

Distributional concerns over carbon taxes stem from the observation that low-income households devote a higher proportion of their income to consumption and will thus bear a higher burden of the tax relative to high-income households. The distributional effects of carbon taxation have been well-studied (Bull, Hassett, and Metcalf 1994; Hassett, Mathur, and Metcalf 2009; Metcalf 1999; Metcalf 2007). The regressivity finding is consistent across studies, but varies in magnitude. Metcalf (2008) analyzes the distributional effects of a carbon tax and finds that it would reduce the after-tax income of taxpayers in the first decile by 3.7 percent, compared to just an 0.8 percent reduction for the wealthiest decile. Findings are dependent on whether incidence is measured on a current income versus lifetime basis, with the tax being more regressive when measured on a current income basis relative to lifetime income basis. For example, Hassett, Mathur, and Metcalf (2009) find that the indirect component of a carbon tax (i.e., higher prices due to higher costs of production) is significantly more progressive, whereas the direct component, which focuses on the changes in the cost of gas and electricity, is regressive. Lastly, the incidence varies with timing: the carbon tax can either fall forward in the form of higher consumer prices or backwards in the form of lower returns to factor inputs. Bovenberg and Goulder (2001) and Paltsev et al. (2007) find that the short- and medium-term incidence falls primary on consumer prices.

Importantly, the regressive impact of a carbon tax could be offset in any of a number of ways, similar to offsets for distributional effects of the VAT, discussed in the previous section. Most prominent among these options would be refundable income tax credits. Thus, while the regressivity of a carbon tax should be addressed, it should not be considered an obstacle to implementation of carbon taxes.

5.4 Gasoline Taxes

Raising taxes on gasoline is another option. While a modest excise tax on gasoline sales already exists in the United States, it is substantially lower than in other industrialized nations.

In the U.S., federal excise taxes on gasoline amount to 18.4 cents per gallon, with local tax rates typically taxing gasoline at additional 20-30 cents per gallon in 2010. The OECD average for gasoline excise taxes is approximately $3.39 per gallon,[18] about seven times the rate of the U.S. tax. OECD taxation of gasoline ranged from $0.34 per gallon (Mexico) to $5.14 per gallon (Turkey); the U.S. has the second-lowest rate of gasoline taxation among OECD countries (OECD 2011). In addition, per-mile fuel taxes in the U.S. are low by historical standards, falling by 40 percent in real terms since 1960 (Parry, Walls, and Harrington 2007).

American levels of gasoline taxation are also well below the level justified by the externalities of gasoline consumption. Parry, Walls, and Harrington (2007) estimate the per-

gallon externality cost of gasoline at $2.38 per gallon, with about half the externality cost being due to congestion and the remainder due to accidents, pollution (including greenhouse gases), and oil dependency.

A higher tax on gasoline could raise significant amounts of revenue. CBO (2009) estimates that a 50 cent increase in the gasoline excise tax would raise about $600 billion over 10 years—0.3 percent of GDP.

A gasoline tax is less efficient than a carbon tax, since the former covers a narrower range of externality-producing goods, but it could still result in significant emission reductions. Davis and Killian find (2009) find that a 10 cent per gallon increase in the U.S. gasoline excise tax would reduce total carbon emissions by 0.5 percent overall and by 1.5 percent from vehicles. Sterner (2007) similarly estimates that fuel demand in Europe would be twice as high if European governments had implemented a gasoline excise tax schedule similar to that in the U.S.

Like carbon taxes, gasoline taxes will fall disproportionately on low-income households, especially in the short-run when households have difficulty adjusting their behavior to avoid the tax (Poterba 1989 and 1991).

Some analysts have proposed a variable tax on gasoline in order to help stabilize the price of energy, reduce economic volatility, and provide a minimum price signal that should encourage production of alternative energy sources, all while still raising revenue. For example, Westin (2010) proposes an oil price stabilization tax, where an excise tax would serve as a mechanism for creating a floor on the price of domestically consumed gasoline.

6. CONCLUSION

Revenue increases will likely be an important part of any resolution to the fiscal problem facing the United States. This presents both challenges and opportunities. The challenge is the political difficulty of enacting tax increases in the United States, where a vast majority of Republican members of Congress have signed a “No New Taxes” pledge. The opportunity is the chance to reform the tax system in ways that it has long needed and that have now become urgent. These reforms include broadening the income tax base, establishing a consumption tax, and bringing carbon taxation in line with the modern economy.

Reference List

Altig, David, Alan J. Auerbach, Laurence J. Kotlikoff, Kent A. Smetters, and Jan Walliser. 2001. "Simulating Fundamental Tax Reform in the United States." *American Economic Review* 91(3): 574–595.

Altshuler, Rosanne and Robert D. Dietz. 2008. "Reconsidering Tax Expenditure Estimation: Challenges and Reforms." Rutgers University Working Paper 2008-04.

Altshuler, Roseanne, Katherine Lim and Roberton Williams. 2010. "Desperately Seeking Revenue." *National Tax Journal* 63: 331-51.

Andersen, Michael S. 2010. "Europe's experience with carbon-energy taxation." http://sapiens.revues.org/1072

Auerbach, Alan J. 1996. "Tax Reform, Capital Allocation, Efficiency and Growth." In H. Aaron and W. Gale, eds. *Economic Effects of Fundamental Tax Reform*: 29-81.

Auerbach, Alan J. and William G. Gale. 2012. "The Federal Budget Outlook: No News Is Bad News." Available at http://emlab.berkeley.edu/~auerbach/Auerbach-Gale%202012-08-27.pdf

Baneman, Daniel, Hang Nguyen, Jeffrey Rohaly, and Eric Toder. 2011. "Options to Reform the Deduction for Home Mortgage Interest." Tax Policy Center.

Batchelder, Lily and Eric Toder. 2010. "Government Spending Undercover: Spending Programs Administered by the IRS." Center for American Progress, Washington, DC.

Batchelder, Lily L., Fred T. Goldberg, and Peter R. Orszag. 2006. "Efficiency and Tax Incentives: The Case for Refundable Tax Credits." *Stanford Law Review* 59(23).

Bartlett, Bruce. 2007. "Starve the Beast: Origins and Development of a Budgetary Metaphor." *The Independent Review*, 12(1): 5-26.

Bauman, Yoram. 2010. "Comments on Nordhaus: Carbon Tax Calculations." The Economists' Voice.

Benjamin, Daniel. 2003. "Does 401(k) Eligibility Increase Saving? Evidence from Propensity Score Subclassification." *Journal of Public Economics* 87, no. 5-6 (2003): 1259-90.

Bickley, James M. 2006. "Value-Added Tax: A New U.S. Revenue Source?" Congressional Research Service Report to Congress RL33619.

Bovenberg, A. Lans and Lawrence H. Goulder. 2001. "Environmental Taxation and Regulation." NBER Working Paper No. 8458.

Bourassa, Steven C. and Ming Yin. 2007. "Tax Deductions, Tax Credits and the Homeownership

Rate of Young Urban Adults in the United States." *Urban Studies* 45(5&6): 1141-1161.

Bull, Nicholas, Kevin A. Hassett, and Gilbert E. Metcalf. 1994. "Who Pays Broad-Based Energy Taxes? Computing Lifetime and Regional Incidence." *The Energy Journal* 15(3): 145-164.

Burman, Leonard E. 1999. *The Labyrinth of Capital Gains Taxation Policy: A Guide for the Perplexed.* The Brookings Institution Press: Washington, D.C.

Burman, Leonard E. 2012. "Statement Before the House Committee on Ways and Means and the Senate Committee on Finance on Tax Reform and the Tax Treatment of Capital Gains." August 21.

Burman, Leonard E. and Marvin Phaup. 2011. "Tax Expenditures and Government Size and Efficiency." Preliminary draft presented at the University of Pennsylvania.

Burman, Leonard, Eric Toder, and Christopher Geissler. 2008. "How Big Are Total Individual Income Tax Expenditures, and Who Benefits from Them?" *American Economic Review* 98(2): 79-83.

Caspersen, Erik and Gilbert Metcalf. 1994. "Is a Value-Added Tax Regressive? Annual Versus Lifetime Incidence Measures." *National Tax Journal*. 47:4: 731-46.

Chetty, Raj, John N. Friedman, Soren Leth-Petersen, and Torben Nielson. 2012. "Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence from Denmark." Presented at the 14th Annual Joint Conference of the Retirement Research Symposium, August 2-3.

Cnossen, Sijbren. 2009. "A VAT Primer for Lawyers, Economists, and Accountants." *Tax Notes* 124(7): 687-98. August 17.

Congressional Budget and Impoundment Control Act of 1974 (Pub.L. 93-344, 88 Stat. 297, 2 U.S.C. §§ 601–688)

Congressional Budget Office, 1983. "The Economic and Budget Outlook: An Update." Washington, D.C.: Congressional Budget Office.

Congressional Budget Office, 1992. "Effects of Adopting a Value-Added Tax." Washington, D.C.: Congressional Budget Office.

Congressional Budget Office. 2009. Budget Options. Washington, D.C.: Congressional Budget Office.

Congressional Budget Office. 2010. "Using Biofuel Tax Credits to Achieve Energy and Environmental Policy Goals." Washington, D.C.: Congressional Budget Office.

Congressional Budget Office. 2011. Reducing the Deficit: Spending and Revenue Options.

Washington, D.C.: Congressional Budget Office.

Davis, Lucas W. and Lutz Kilian. 2009. "Estimating an Effect of a Gasoline Tax on Carbon Emissions." NBER Working Paper No. 14685.

Debt Reduction Task Force. 2010. "Restoring America's Future: Reviving the Economy, Cutting Spending and Debt, and Creating a Simple, Pro-Growth Tax System." Bipartisan Policy Center. November.

Eissa, Nada and Hilary W. Hoynes. 2005. "Behavioral Responses to Taxes: Lessons from the EITC and Labor Supply." Prepared for "Tax Policy and the Economy" Conference, Washington DC.

Eissa, Nada and Jeffrey B. Liebman, 1996. "Labor Supply Response to the Earned Income Tax Credit." *The Quarterly Journal of Economics* 111(2): 605-637.

Engen, Eric M., William G. Gale, and John K. Scholz. 1996. The Illusory Effects of Saving Incentives on Saving. *Journal of Economic Perspectives* 10(4): 113-138.

Engen, Eric M. and R. Glenn Hubbard. 2004. "Federal Government Debt and Interest Rates." *NBER Macroeconomics Annual* 19: 83-138.

Feldstein, Martin, Daniel Feenberg, and Maya MacGuineas. 2011. "Capping Individual Tax Expenditure Benefits." *Tax Notes* 131(5): 505-509.

Furman, Jason. 2008 "Health Reform Through Tax Reform: A Primer." *Health Affairs*, 27, no.3 (2008):622-632

Fullerton, Don and Diane Lim Rogers. 1996. "Lifetime Effects of Fundamental Tax Reform." In *Economic Effects of Fundamental Tax Reform*, ed. Henry J. Aaron and William G. Gale, 321-354. Washington, D.C.: Brookings Institution Press.

Gale, William G. 1997. "Tax Reform is Dead, Long Live Tax Reform." Brookings Policy Brief No. 12. Brookings Institution.

Gale, William G. 1998. "The Effects of Pensions on Household Wealth: A Reevaluation of Theory and Evidence." *Journal of Political Economy* 106(4):706-723.

Gale, William G. 2011. "Tax Reform Options: Promoting Retirement Security." Testimony before the Senate Committee on Finance, September 15.

Gale, William G., Jonathan Gruber, and Seth Stephens-Davidowitz. 2007. "Encouraging Homeownership through the Tax Code." *Tax Notes* 115(12): 1171–89.

Gale, William G. and Samara Potter. 2002. "An Economic Evaluation of the Economic Growth and Tax Relief Reconciliation Act." *National Tax Journal* 55(1): 133-86.

Gale, William G. and Peter R. Orszag. 2004a. “Bush Administration Tax Policy: Starving the Beast?” *Tax Notes*, 105(8): 999-1002.

Gale, William G. and Peter R. Orszag. 2004b. “Budget Deficits, National Saving, and Interest Rates.” *Brookings Papers on Economic Activity* 2:101-187.

Gelber, Alexander. 2011. “How do 401(k)s Affect Saving? Evidence from Changes in 401(k) Eligibility.” *American Economic Journal: Economic Policy*, 3:4, 103-122.

Gruber, Jonathan and James Poterba. 1996. "Tax Subsidies to Employer-Provided Health Insurance." NBER Working Paper No. 5147

Hassett, Kevin, Aparna Mathur, and Gilbert E. Metcalf. 2009. "The Incidence of a U.S. Carbon Tax: A Lifetime and Regional Analysis." *The Energy Journal* 30(2): 155-177.

Hubbard, R. Glenn and William M. Gentry. 1997. “Distributional Implications of Introducing a Broad-Based Consumption Tax” in J.M. Poterba, ed., Tax Policy and the Economy, volume 11, Cambridge: MIT Press.

Hungerford, Thomas L. 2006. “Tax Expenditures: Trends and Critiques.” Library of Congress, Congressional Research Service Report. RL33641, September.

International Monetary Fund. 2010. “Fiscal Monitor: Navigating the Challenges Ahead.” IMF, May 14.

Johnson, Richard W., Leonard E. Burman, and Deborah J. Kobes. 2004. “Annuitized Wealth at Older Ages: Evidence from the Health and Retirement Survey.” Urban Institute.

Joint Committee on Taxation. 2012. Estimates Of Federal Tax Expenditures For Fiscal Years 2011-2015.

Marron, Donald. 2011. “Spending in Disguise.” *National Affairs*. Summer 2011 (20-34).

Marron, Donald. 2012. “How Large Are Tax Expenditures? A 2012 Update.” Tax Notes. Tax Policy Center.

Marron, Donald and Eric Toder. 2012. “How Big is the Federal Government?” Tax Policy Center, March 26.

McKibbin, Warwick, Adele Morris, and Peter Wilcoxen. 2009. "A Copenhagen Collar: Achieving Comparable Effort Through Carbon Price Agreements." CAMA Working Papers. Australian National University. Centre for Applied Macroeconomic Analysis.

Metcalf, Gilbert E. 1999. “A Distributional Analysis of Green Tax Reforms.” *National Tax Journal* 52(4): 655-682.

Metcalf, Gilbert E. 1994. "Lifecycle vs. Annual Perspectives on the Incidence of a Value Added Tax," Tax Policy and the Economy 8: 45-64.

Metcalf, Gilbert E. 2007. "A Proposal for a U.S. Carbon Tax Swap: An Equitable Tax Reform to Address Global Climate Change," *The Hamilton Project, Brookings Institution*. October.

Metcalf, Gilbert E. 2008. "Designing A Carbon Tax to Reduce U.S. Greenhouse Gas Emissions." NBER Working Paper 14375.

Metcalf, Gilbert E. 2010. "Submission on the Use of Carbon Fees to Achieve Fiscal Sustainability in the Federal Budget," http://works.bepress.com/gilbert_metcalf/86.

Meyer, Bruce. D. 2002. "Labor Supply at the Extensive and Intensive Margins: The EITC, Welfare, and Hours Worked ." *American Economic Review*, 92(2): 373–379.

Meyer, Bruce D., and Dan T. Rosenbaum. 2001. "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers." *Quarterly Journal of Economics* 116 (3, August): 1063–1114.

National Commission on Fiscal Responsibility and Reform. 2010. "The Moment of Truth: Report of the National Commission on Fiscal Responsibility and Reform." White House.

Nguyen, Hang, Jim Nunns, Eric Toder, and Roberton Williams. 2012. "How Hard Is It to Cut Tax Preferences to Pay for Lower Tax Rates?" Tax Policy Center.

OECD. 2008. "Value Added Taxes Yield, Rates and Structure." In *Consumption Tax Trends 2008: VAT/GST and Excise Rates, Trends and Administration Issues*.

OECD. 2011. "Energy Prices and Taxes: Quarterly Statistics, Fourth Quarter 2010." OECD: Paris, France.

Office of Management and Budget. 2012. *Analytical Perspectives*. Washington, D.C.: Government Printing Office.

Paltsev, Sergey, John M. Reilly, Henry D. Jacoby, Angelo C. Gurgel, Gilbert E. Metcalf, Andrei P. Sokolov and Jennifer F. Holak. 2007. "Assessment of U.S. Cap-and-Trade Proposals." MIT Joint Program on the Science and Policy of Global Change Report 146. April.

Parry, Ian, Margaret Walls, and Winston Harrington. 2007. *"*Automobile Externalities and Policies*." Journal of Economic Literature* 65:373–399

Parry, Ian W.H. and Roberton C. Williams III. 2011. Moving US Climate Policy Forward: Are Carbon Taxes the Only Good Alternative?" Resources for the Future Discussion Paper 11-02.

Poterba, James M. 1989. "Lifetime Incidence and the Distributional Burden of Excise Taxes,"

American Economic Review 79(2): 325-330.

Poterba, James M. 1991. "Is the Gasoline Tax Regressive?," NBER Chapters, in: Tax Policy and the Economy, Volume 5, pages 145-164 National Bureau of Economic Research

Poterba, J. M., S. F. Venti, and D. A. Wise. 1996. How Retirement Saving Programs Increase Saving. *Journal of Economic Perspectives* 10(4): 91-112.

Poterba, James M. and Todd M. Sinai, 2008. "Income Tax Provisions Affecting Owner-Occupied Housing: Revenue Costs and Incentive Effects," NBER Working Papers 14253.

Rausch, Sebastian, and John Reilly. 2012. Carbon Tax Revenue and the Budget Deficit: A Win-Win Solution?" MIT Joint Program on the Science and Policy of Global Change.

Romer, Christina D. and David H. Romer. 2009. "Do Tax Cuts Starve the Beast? The Effect of Tax Changes on Government Spending." *Brookings Papers on Economic Activity*, 2009(2): 139-200.

Shapiro, Robert, Nam Pham and Arun Malik. 2008. "Addressing Climate Change Without Impairing the US Economy: The Economics and Environmental Science of Combining a Carbon-Based Tax and Tax Relief," http://www.sonecon.com/docs/studies/CarbonTaxReport-RobertShapiro-2008.pdf

Stavins, Robert N. 2007. "A U.S. Cap-and-Trade System to Address Global Climate Change." Hamilton Project Discussion Paper 2007-13.

Sterner, Thomas. 2007. "Fuel taxes: An important instrument for climate policy." *Energy Policy* 35: 3194–3202.

Steuerle, C. Eugene. 2004. *Contemporary U.S. Tax Policy.* 3rd Edition. Washington, D.C.: Urban Institute Press.

Stokey, Nancy L. and Sergio Rebelo. 1995. "Growth Effects of Flat-Rate Taxes." *Journal of Political Economy* 103(3): 510–550.

Sumner, Jenny, Lori Bird, and Hillary Smith. 2009. "Carbon Taxes: A Review of Experience and Policy Design Considerations." National Renewable Energy Laboratory Technical Report NREL/TP-6A2-47312.

Toder, Eric and Daniel Baneman. 2012. "Distributional Effects of Individual Tax Expenditures: An Update." Tax Policy Center. February 3.

Toder, Eric J., Benjamin H. Harris, and Katherine Lim. 2011. "Distributional Effects of Tax Expenditures in the United States." In *Tax Expenditures: State of the Art,* edited by Lisa Philipps, Neil Brooks and Jinyan Li. Toronto: Canadian Tax Foundation.

Toder, Eric and Joseph Rosenberg. 2010. “Effects of Imposing a Value-Added Tax to Replace Payroll Taxes or Corporate Taxes.” Tax Policy Center Publication. April 7.

Toder, Eric, Margery Austin Turner, Katherine Lim, and Liza Getsinger. 2010. “Reforming the Mortgage Interest Deduction.” Washington, D.C.: Urban Institute.

University of Ottawa. 2012. “British Columbia’s Carbon Tax Shift: The First Four Years.” http://www.sustainableprosperity.ca/dl872&display

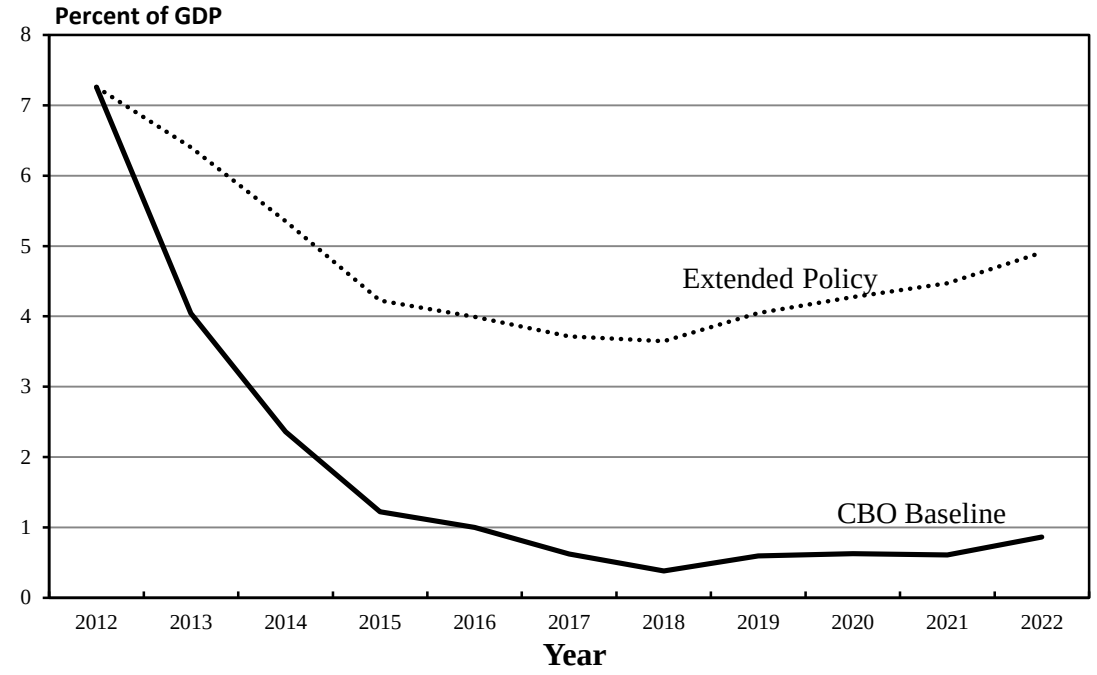
Westin, Richard, 2010. “The Case for a Crude Oil Price Stabilization Tax.” Special Report, Tax Notes, p. 481-494.

William G. Gale is the Arjay and Francis Fearing Miller Chair in Federal Economic Policy at the Brookings Institution and co-director of the Urban-Brookings Tax Policy Center. His work focuses on tax policy, fiscal policy and retirement and saving behavior.

Samuel Brown is a research associate at the Brookings Institution and the Urban-Brookings Tax Policy Center where he analyzes federal tax and fiscal policy.

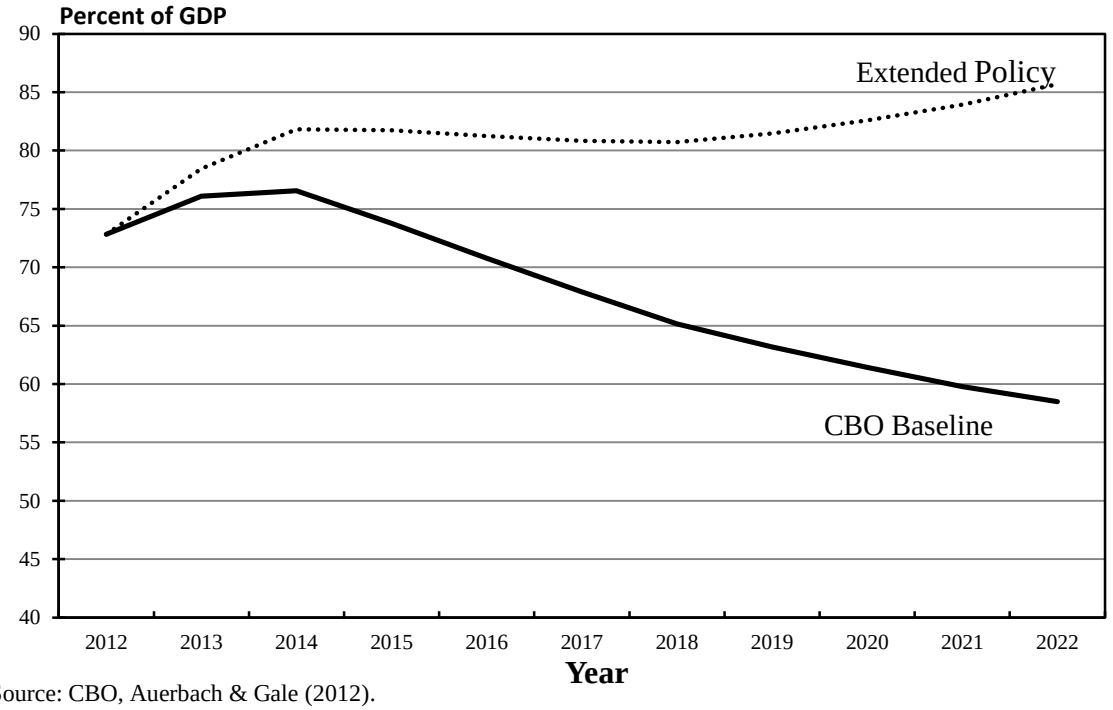
The authors thank Sebastian Leguizamon, Diane Lim Rogers, and conference participants for helpful comments and Fernando Saltiel for excellent research assistance. This paper was prepared for the Fiscal Trilemma Conference hosted by Tulane University's Murphy Institute and Department of Economics.

Figure 1. Alternative Deficit Projections, 2012-2022



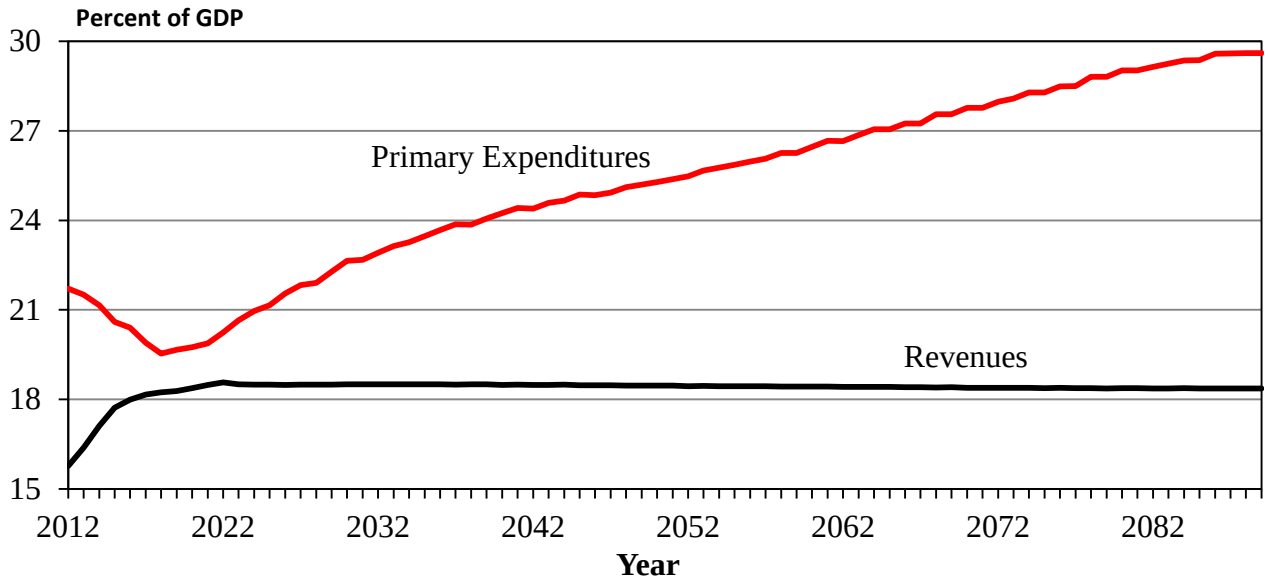
Source: CBO, Auerbach & Gale (2012).

Figure 2. Alternative Debt Projections, 2012-2022



Source: CBO, Auerbach & Gale (2012).

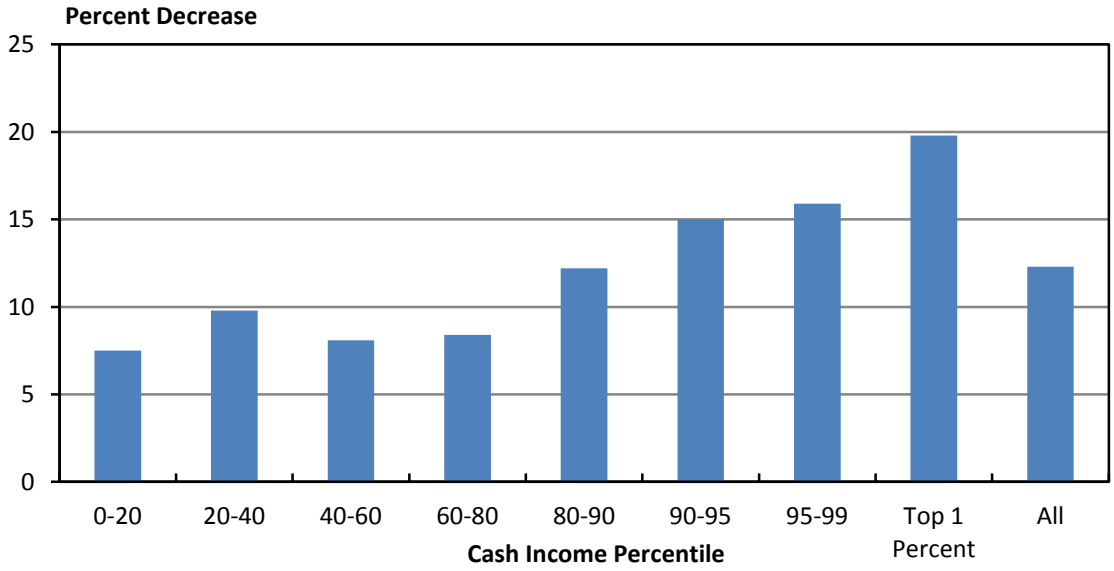
Figure 3. Projections of Revenue and Non-Interest (Primary) Expenditures, 2012-2089



Projection assumes Extended Policy baseline with health care spending growing according to CBO's alternative projections. Sequestration and caps on discretionary spending end in 2021.

Source: CBO, Medicare Trustees, Auerbach & Gale (2012).

Figure 4. Decrease in After-Tax Income from Eliminating All Individual Income Tax Expenditures



Source. Toder and Baneman (2012).

Table 1. Top Ten Total Income Tax Expenditures

Tax Expenditure	Type	2012	2013-17
Exclusion of employer contributions for medical insurance premiums and medical	Exclusion	170,650	1,012,320
Deductibility of mortgage interest on owner-occupied homes	Deduction (Itemized)	86,910	606,420
401(k)-type plans	Deferral	60,090	428,760
Accelerated depreciation of machinery and equipment (normal tax method)	Deferral	76,280	374,640
Exclusion of net imputed rental income	Exclusion	50,640	337,380
Capital gains (except agriculture, timber, iron ore, and coal)	Preferential Rate	66,210	321,470
Employer plans	Exclusion	44,490	298,040
Deductibility of nonbusiness State and local taxes other than on owner-occupie	Deduction (Itemized)	33,180	295,050
Deductibility of charitable contributions, other than education and health	Deduction (Itemized)	33,290	238,720
Exclusion of interest on public purpose State and local bonds	Exclusion	29,080	227,500

Note. Includes individual and corporate portions.
Source. Office of Budget and Management. *Analytical Perspectives, Budget of the U.S. Government, Fiscal Year 2013.*

Table 2
Revenue Effects in 2012 of a 5 percent VAT
(Toder and Rosenberg 2010)

	Broad Base			Narrow Base		
	Billions of Dollars	% of GDP	Yield Ratio	Billions of Dollars	% of GDP	Yield Ratio
Gross Revenues	355.5	26.6	0.45	221.4	1.40	0.28
Cost of Demogrants	97.7	0.62	--			
Revenue Net of Demogrants	257.8	1.64	0.33			
Adjustment of other taxes	96.9	0.62	--	60.5	0.38	--
Revenue net of other taxes	160.9	1.02	0.20	160.9	1.02	0.20

[1] Authors' calculations based on Steuerle (2004) and CBO (1983, 1991, 1993).
[2] Bartlett (2007) outlines the development of the "starve the beast" theory and shows how it failed to apply during the George W. Bush administration.
[3] Short-term economic effects of tax-financed deficit reductions often differ from long-term effects. Consequently, the relative benefits of a tax-financed deficit reduction policy depend on the time frame of the analysis. Since this paper is concerned with a long-term fiscal solution, we focus on the long-term economic effects.
[4] From a budgetary perspective, payments to taxpayers represent an increase in outlays, not a decrease in revenues.
[5] For tax expenditures other than itemized deductions, interaction effects tend to be positive -- that is, the effect of eliminating all of them is larger than the sum of the effects of eliminating each one, leaving the others in place. This occurs because many tax expenditure reductions broaden the tax base and hence push some taxpayers into higher marginal tax brackets, which then increases the revenue-raising potential of removing other tax expenditures. For itemized deductions, however, interaction effects are negative -- the value of eliminating all of them is less than the sum of the value of eliminating each one leaving the others in place. This occurs because when itemized deductions fall sufficiently low, taxpayers have the option of taking the standard deduction.
[6] Authors' calculations based on CBO (2011).
[7] Feldstein et. al also estimated the revenue available from 3 percent and 5 percent caps at $208 billion and $110 billion, respectively.
[8] The household's cap at 2 percent of AGI would be $1316 after adding ESI to household income. The tax value of the health plan, however, is $2,362 at a 15 percent marginal tax rate.
[9] The tax can be administered in different ways. For example, under the credit invoice method, firms receive tax credits for the taxes they have paid on their purchases from other firms. Alternatively, under the subtraction method, firms can fully deduct all of their payments to other firms. For discussion of these and other options, see Bickley (2006) and Cnossen (2009).
[10] If the standard VAT rate applies to all items subject to VAT, the yield ratio provides an estimate of the share of GDP that is covered by the VAT.
[11] It is worth noting that the theory of optimal commodity taxation favors multiple tax rates across consumption goods. The "Ramsey Rule" indicates that under certain conditions commodities should be taxed inversely proportional to their demand elasticity.
[12] In a risk-free world, the normal return to capital is just the risk-free rate of return. Earning the risk-free rate of return on saving does not raise the present value of consumption a household can obtain; it simply affects the timing of the consumption. Allowing for risk changes the normal return to a risk-adjusted return, but also changes the rate at which consumption is discounted, so the result continues to hold that earning the normal return (adjusted for the risk) on capital does not affect the present value (adjusted for risk) of consumption available to the household. In contrast, returns due to rents do affect the present value of consumption available to households and therefore would be subject to a consumption tax.
[13] Altig et al. (2001) show that in the conversion to a flat tax, the taxation of old capital accounts for more than 60 percent of the induced economic growth effect in the first five years, more than half of growth in the first decade, and about 40 percent of the induced growth even after fifty years.
[14] Johnson, Burman, and Kobes (2004) show that for households in the bottom quintile and second quintile of the income distribution for the elderly, 80 percent and 68 percent, respectively, of their financial (i.e., non-Medicare) income comes from Social Security.
[15] Congressional Budget Office (1992, xv) finds that "excluding necessities such as food, housing, utilities, and health care would lessen the VAT's regressivity only slightly." Toder and Rosenberg (2010) find that excluding housing, food consumed at home, and private health expenditures from the consumption tax base can somewhat increase progressivity, but not as much as a per-person payment would.
[16] In addition, because of mandates that dictate the percentage of ethanol per gallon of gasoline, the tax subsidy when combined with the mandate may have no additional effect on the use of ethanol, but instead merely lower the price of gasoline.
[17] There is also an equivalent income tax credit that producers may claim instead of the excise tax exemption, but most of the revenue loss comes from the exemption.
[18] Authors' calculations based on OECD (2011).