



A Comparison of the FairTax Base and Rate with Other National Tax Reform Proposals

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February 2007

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Executive Summary

The U.S. federal tax code has undergone major changes since the last important attempt at tax simplification in 1986. In subsequent years, Congress enacted legislation to raise and then lower income tax rates, reduce the tax rates on capital gains and dividends, increase deductions for IRA contributions, create Roth Individual Retirement Accounts and Medical Savings Accounts, increase the Earned Income Tax Credit for the working poor, and make other changes. The result is over 60,000 pages of tax code, rules, and rulings that can confuse even the most adept tax professionals.

With federal tax reform on the table anew, several groups and legislators have proposed alternative plans. The FairTax plan is one such proposal. It essentially aims to replace most current federal taxes with a national retail sales tax. In 2007, Representative John Linder filed legislation in the form of H.R. 25: The Fair Tax Act of 2007.¹ Senator Saxby Chambliss is expected to introduce companion legislation in the Senate, as he did in the previous Congress. A number of other plans, including publisher Steve Forbes's "flat tax" proposal, have also come forward.²

As they consider the various tax reform proposals before them, policy makers should determine what they are going to tax (the tax base) and by how much they are going to tax it (the tax rate). The Beacon Hill Institute at Suffolk University (BHI) has undertaken such an endeavor. In this paper, BHI

- provides an estimate of the revenue-neutral tax rates and the size of the tax bases for the FairTax, the Hall-Rabushka flat tax, a business transfer tax (BTT) and the current federal tax system – these estimates are "static" estimates and do not take into account economic growth effects of the proposals;
- compares the size of each base, explaining any differences between bases, along with the magnitude of those differences and the reasons for them;
- determines applicable tax rates, both on a tax-exclusive and tax-inclusive basis; and
- calculates average and marginal tax rates by income and consumption class.

The three tax systems under consideration for replacing the current tax law target consumption as the base for taxation; therefore, in principle, their bases and corresponding tax rates should be the same. However, due to differences in the details of each proposal, the bases and tax rates ultimately diverge. Table 1 displays the tax base and rates of the current tax law and each of the alternative tax systems. The following summarize our main findings:

- The FairTax rate is 23.82 percent on a tax-inclusive basis and 31.27 percent on a tax-exclusive basis. This is only 0.82 percent higher than the 23 percent tax-inclusive rate called for in H.R. 25.
- To implement a FairTax rate of 23 percent, non-Social Security expenditures in 2007 would have to be reduced by \$76 billion or by 2.73 percent, representing the difference between the spending that would be necessary with a 23 percent rate and the revenue that

¹ In the 109th Congress the bills were H.R. 25 and S. 25. In the 110th Congress the Fair Tax Act is H.R. 25 in the House but as of February 1 was not yet reintroduced in the Senate.

² Forbes (2005).

would actually be raised. The \$76 billion reduction in non-Social Security spending would keep this portion of federal expenditure at the 2006 level in nominal terms, representing a 0.5 percent spending reduction between calendar years 2006 and 2007.

- The FairTax does not necessarily impose a burden on state and local government. Rather, it transfers some purchasing power from state and local government to individual consumers. State and local government would have the option, under the FairTax, to permit the transfer to take place or to maintain revenue neutrality by raising tax rates or otherwise changing tax laws. A partial solution would be to take the simple step of imposing state and local sales taxes on the FairTax-inclusive price of consumer goods. Another option would be to adopt legislation conforming the state sales tax base to the FairTax base and levy a revenue-neutral rate.
- On a net basis, the FairTax has the largest tax base; at \$9.355 trillion it is \$256 billion higher than the BTT base (\$9.099 trillion), \$1.822 trillion larger than the flat tax base (\$7.533 trillion), and \$2.322 trillion more than the current system (\$7.033 trillion).
- The FairTax base is the largest of the four because it eliminates the exemptions and deductions characteristic of the current tax law. Moreover, the FairTax exempts only a portion of state and local sales taxes, while the flat tax and BTT allow for the deduction of excise taxes and import duties. The current tax law and the flat tax bases are relatively small because they provide for large personal exemptions and do not tax imports (or exempt exports). In other words, the FairTax and the BTT are destination principle consumption taxes and the flat tax and the current system are origin principle taxes. Since the U.S. is running a very large current account deficit, this difference is quite significant.
- The larger tax base under the FairTax and BTT translate into the lowest tax-inclusive rates (23.82 percent and 24.49 percent, respectively) while the current tax law and flat tax have the highest inclusive rates at 32.55 percent and 29.68 percent, respectively. These rates are calculated assuming that all plans replace the same taxes as the FairTax, including the federal payroll tax.
- A distributional analysis indicates that the FairTax, flat tax, and BTT – all consumption taxes – are progressive when measured against expenditure or lifetime income and regressive when measured against current income. The current tax law is progressive when measured against current income but much less progressive when measured against current expenditure or lifetime income.

H.R. 25 calls for the replacement of the current personal and corporate income taxes, payroll taxes, and the estate and gift taxes in a revenue-neutral manner. We define revenue neutrality as keeping the level of government spending constant in real, or price-adjusted, terms. In other words, the real size of the federal government sector relative to the rest of the economy would remain constant.

Table 1. A Comparison of the 2007 Tax Rates and Bases

Tax System	Current			
	Law	FairTax	Flat Tax	BTT
Net Tax Base (\$ billions)	7,033	9,355	7,533	9,099
Tax-Exclusive Rate (%)	48.25	31.27	42.21	32.43
Tax-Inclusive Rate (%)	32.55	23.82	29.68	24.49

To mitigate the burden of taxation on lower-income groups, H.R. 25 proposes a family consumption allowance based on the federal poverty level guidelines. The bill provides for a monthly *prebate* to all qualified households. This may be thought of as a rebate, paid in advance to every household, of the amount of FairTax that a taxpayer spending at the poverty level would normally be expected to have paid. Alternatively, it may be considered as a transfer payment by the federal government to households. We assume that the prebate is funded through new revenue to be raised by the FairTax, keeping our definition of revenue neutral intact.

H.R. 25 also calls for indexing Social Security benefits to increases in the Consumer Price Index (CPI), a clause aimed at assuaging beneficiaries' fears that any increase in consumer prices that might result from implementing the FairTax would hurt their purchasing power. Some Social Security benefits are currently taxed under the federal income tax, though most are not. We reduce the taxable Social Security benefits by the current income taxes paid and then allow for them to be adjusted by any change to the CPI. This treatment of taxable Social Security benefits is consistent with our assumption that the FairTax rate must maintain the real level of federal government spending.

The calculations of all the tax bases and rates in this paper are based on a static analysis and do not take into consideration the likely dynamic effects on the economy that would result from adopting any of the three tax reform proposals contained in this paper. The dynamic shock that would arise from the removal of the tax wedge on working and saving would boost income and consumption and ultimately enlarge the tax base.

Critics of the FairTax argue that it would be vulnerable to tax evasion.³ This paper does not directly address this issue. We observe, however, that the FairTax rate calculated here is substantially below that calculated by certain FairTax critics. The rate calculated here dispels the worry that the FairTax rate would have to be far higher than the rate provided for in H.R. 25 and, to that extent, invite evasion. The FairTax lowers marginal tax rates. Lower marginal tax rates reduce the marginal benefit to evasion. In addition, the FairTax radically simplifies the tax system and, therefore, audits would be simpler, and more audits could be conducted with the same audit resources. Therefore, the likelihood of evaders being apprehended will increase. We further observe that the tax base calculated here is based on National Income Product Account (NIPA) data provided by the U.S. Bureau of Economic Analysis, which undercount consumption expenditures due to evasion under the current tax system that would be taxed under a vigorously enforced FairTax. For these reasons, tax evasion is likely to decline under the FairTax.

The BHI calculation of the rate and base for the flat tax follows that outlined in the 1995 book authored by Hall and Rabushka.⁴

BHI's calculation of the BTT follows the outline of S. 1921 filed by Senator Jim DeMint.⁵ The bill calls for the combination of a national sales tax and a business transfer tax. We assume that only the BTT portion of the bill is implemented and that the tax also applies to the total compensation of government employees at all levels of government.

³ Gale (2005) p. 889-91.

⁴ Hall and Rabushka (1995). In the 109th Congress H.R. 1040, S. 812, and S. 1099 are all versions of a Hall-Rabushka flat tax.

⁵ The DeMint BTT is similar to the BTT in the USA Tax, a version of which was introduced in previous Congresses by Sens. Sam Nunn and Pete Domenici and in the House of Representatives by Rep. Phil English.

I. Introduction

History provides two overarching, competing principles of tax policy. According to one principle, taxes should be imposed on the taxpayer's income or wealth. According to the other, taxes should be imposed on the taxpayer's consumption. It is on this question – whether the taxpayers should pay according to their ability to pay, which is to say, according to their ability to consume, or whether they should pay according to what they actually consume – that the debate over tax policy has been centered for hundreds of years.

The argument for taxing what a taxpayer actually consumes dates back at least to 1651, when Thomas Hobbes argued that “equality” in imposition of taxes requires “equality of that which is consumed, rather than in the riches of the persons that consume the same.” Explaining why a consumption tax is thus superior to an income tax, Hobbes went on to ask:

For what reason is there, that he which laboureth much, and sparing the fruits of his labour, consumeth little, should be more charged, than he that living idly, getteth little and spendeth all he gets; seeing the one hath no more protection from the commonwealth, than the other? But when the impositions, are laid upon those things which men consume, every man payeth equally for what he useth; nor is the commonwealth defrauded by the luxurious waste of private men.⁶

Writing 125 years later, Adam Smith reasoned differently:

The subjects of every state ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities; that is, in proportion to the revenue which they respectively enjoy under the protection of the state. The expence of government to the individuals of a great nation, is like the expence of management to the joint tenants of a great estate who are all obliged to contribute in proportion to their respective interests in the estate. In the observation or neglect of this maxim consists, what is called the equality or inequality of taxation.⁷

For Hobbes it was a matter of principle that taxes be imposed on consumption, rather than on the fruits of a person's labor. For Smith, taxes imposed on “consumable commodities” were an expedient to which the state resorted when taxation according to “the revenue of its subjects” was impractical. The justification for this expedient lay only in the presupposition that “in most cases” peoples’ “expences” will “be nearly in proportion to their revenue.”⁸

In modern times, prominent contenders include Nicholas Kaldor, who argued for the taxation of consumption, and Henry Simons, who argued for the taxation of income, defined as consumption plus an “accretion” to wealth.⁹ *Blueprints for Basic Tax Reform*, published by the U.S. Treasury in 1977, identified the choice as lying between the taxation of consumption on the one hand and the “comprehensive” taxation of income on the other.¹⁰

The longevity of this debate stems from different views of what is meant by “equality” of taxation. To understand the argument made by advocates of the consumption tax, let us consider a simple example.

⁶ Hobbes (1962) pp. 254-55.

⁷ Smith (1937) p. 777.

⁸ Ibid. p. 821.

⁹ See Kaldor (1955) and Simons (1938).

¹⁰ See archived copy of *Blueprints for Basic Tax Reform* from U.S. Treasury posted at <http://www.treasury.gov/offices/tax-policy/library/blueprints>.

Suppose that there are no taxes and that the return on saving is 5 percent. This means that the reward for saving \$1.00 today is \$1.05 next year. If a worker makes \$10.00 per hour, then the worker faces two choices. The first choice is whether to sacrifice an hour of leisure in exchange for sufficient income to purchase either \$10.00 in goods now or \$10.50 in goods next year. Given that he chooses income over leisure, the second choice is whether to consume the \$10.00 now or save the \$10.00 and enjoy \$10.50 in consumption next year.

Suppose that \$10.00 buys one unit of some good, say, pizza. The reward for sacrificing an hour of leisure is sufficient purchasing power to buy 1 pizza now or 1.05 pizza next year. Having chosen work over leisure, the reward for sacrificing 1 pizza now is 1.05 pizza next year.

Now suppose that the government introduces a 25 percent tax on consumption, specifically a 25 percent sales tax. Assume further that the tax causes the price of pizza to rise by 25 percent. The tax would affect the worker's first choice but not his second. In regard to his income/leisure choice, income is now less attractive. The sacrifice of an hour of leisure provides a reward of only $.80 (= \$10.00/\$12.50)$ pizza now or $.84 (= \$10.00(1.05)/\$12.50)$ pizza next year.

The tax does not affect the second choice, however. Having worked an hour, the worker can, as before, spend either \$10.00 now and get $.80$ pizza or, by saving the \$10.00, spend \$10.50 next year and get $.84$ pizza. The reward for sacrificing one pizza now is still $1.05 (= .84/.80)$ pizza next year.

But suppose that, instead of a consumption tax, the government imposes a 20 percent income tax. As with the consumption tax, the reward for work over leisure declines. The income tax leaves the worker with only \$8.00 in take-home pay for one hour's work. Assuming that the price of goods (a pizza) remains at \$10.00, the worker can purchase only $.80$ pizza by sacrificing an hour's leisure.

Here, however, the reward for saving also declines. If the worker does not save, he gets $.80$ pizza now, just as with the consumption tax. But suppose he does save; that he puts his \$8.00 in take-home pay into saving, on which he receives $$.40 (= .05(\$8.00))$ in interest income. The tax on this investment income next year would be $$.08$, leaving him with $\$8.32 (= \$8.00 + \$.40 - \$.08)$ to spend on pizza, which at \$10.00 per pizza, permits him to buy $.832$ pizza. The reward for sacrificing 1 pizza now is $1.04 (= .832/.80)$ pizza, rather than 1.05 pizza next year. Whereas the consumption tax does not reduce the reward for saving, the income tax does.

To understand the inequality to which this state of affairs gives rise, consider two workers, one who decides to save the take-home pay for an hour's work and another who does not. Under the consumption tax, savers and spenders are treated equally: If parsimonious Pauline saves the "fruits" of an hour's work, i.e., \$10.00, she gets \$10.50 next year, which, as shown, permits her to purchase $.84$ pizza, which has a present value of $.80 (= .84/1.05)$ pizza.¹¹ If profligate Paul spends the same \$10.00 now, he likewise enjoys consumption whose present value is $.80$.

Under the income tax, however, savers are treated unequally. Pauline's decision to save the fruits of an hour's work yields \$8.32 next year, permitting her to buy, as shown, $.832$ pizza, the

¹¹ To understand how $.80$ pizza is the value today (the present value) of $.84$ pizza a year from now, suppose that Pauline wants the cash value today of $.84$ pizza, which she would produce next year. She decides to take out a loan for \$10.00 today, which, repaid at 5 percent, requires her to provide the lender with $\$10.50 (= 1.05 \times \$10.00)$ next year. The loan permits her to buy $.80 (= \$10.00/\$12.50)$ pizza today. She produces $.84$ pizza next year and sells that pizza for $\$10.50 (= .84 \times \$12.50)$ to pay the lender, who can now purchase $.84$ pizza.

present value of which is $.792 (= .832/1.05)$ pizza. Paul, who spends now, gets $.80$ pizza now. Pauline, who saves now, gets $.832$ pizza later, worth $.792$ now.

Consumption taxes and income taxes, therefore, reward leisure and penalize work equally. Unlike income taxes, however, consumption taxes do not reward consumption and penalize saving. It seems clear, therefore, that a consumption tax would be superior to an income tax, provided that the consumption tax was crafted in such a fashion as to allay concerns about “ability to pay” or, in the parlance below, concerns about “vertical equity.”

It is on the question of whether a consumption tax can be so crafted that the debate over consumption tax versus income tax must, for the most part, turn. There can be no principled debate over the question of whether discrimination against savers is *per se* an unattractive feature of the income tax. By any standard, this discrimination is not only inequitable but also has negative effects on economic activity. By penalizing saving, the income tax shrinks investment and hence production, productivity, and future well-being, matters that we take up in a separate report.¹²

There are, to be sure, other questions to be addressed: Will a consumption tax be vulnerable to evasion? Is there one form of a consumption tax that will be less vulnerable to evasion than another? Are there transitional issues to be addressed in shifting from an income tax to a consumption tax? Will people who have accumulated savings over their lifetime, paying an income tax along the way, now have to pay an unanticipated penalty in the form of a new sales tax?

We leave these and other issues to be addressed elsewhere. Here we focus on a single issue, the calculation of the applicable U.S. sales tax rate that would replace most existing U.S. taxes. In setting the stage for this analysis, we would like to address two concerns that have arisen in connection with the rate at which a national sales tax would have to be imposed. The first concern is related to whether the substitution of a sales tax for an income tax would impose a higher burden on taxpayers. The second concern is related to whether a sales tax would impose a higher burden on taxpayers than some other form of consumption tax.

With regard to the first concern, let us revisit Paul and Pauline. Both receive income of \$10.00 per hour. That income, by necessity, is disposed of in three ways: Consumption, taxes, and saving. A 20 percent income tax yields \$2.00 in tax revenue, of which the worker may consume or save the remaining \$8.00. A sales tax of 25 percent yields the same revenue, in real dollars, assuming that the worker chooses to allocate the entire \$10.00 to consumption: The sales tax yields \$2.50 in revenue, which, given the 25 percent price increase, is worth \$2.00 in real terms. If either worker allocates all untaxed income to consumption, it is immaterial whether the government imposes an income tax of 20 percent or a sales tax of 25 percent.

Indeed, the two taxes are equivalent. That they are may be seen by recognizing that the income tax rate, thus reported, is being expressed on a “tax-inclusive” basis, while the sales tax is expressed on a “tax-exclusive” basis. The tax-inclusive calculation expresses the tax as a fraction of the base, defined to include the tax. Thus if income, including the tax, is \$10.00 and the tax is \$2.00, then the tax-inclusive income tax rate is 20 percent. If consumption, excluding the tax, is \$10.00 and the tax is \$2.50, the tax-exclusive tax rate is 25 percent. While this is the conventional way of expressing those taxes, the apparent distinction is, in fact, nonexistent. We

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¹² See Tuerck, et al. (2006b). We take up the distributional effects of the FairTax in Tuerck, et al. (2006a).

could equally well have expressed the income tax on a tax-exclusive basis ($25\% = \$2.00/\8.00) and the sales tax on a tax-inclusive basis ($20\% = \$2.50/12.50$).¹³

If, under an income tax, all untaxed income were consumed, then there would be no difference between the tax rate imposed on income and the tax rate that would, under a sales tax, have to be imposed on consumption, provided that we consistently expressed both tax rates on a tax-inclusive or tax-exclusive basis.

Measured in inflation-adjusted or “real” dollars, we have exactly the same amount of aggregate tax revenue being collected on exactly the same tax base under either tax. Under the income tax, without any increase in prices (i.e., the price of pizza) the government collects \$4.00 in taxes on either \$20.00 in income, both measured in current or “nominal” dollars. Under the sales tax, with prices up 25 percent the government collects \$5.00 ($= .2 \times \25) on a tax base of \$25.00 ($= \20×1.25), both measured, again, in nominal dollars. It collects \$4.00 ($= \$4.20/1.25$) in taxes on a base of \$20.00 ($= \$25/1.25$), both measured in real dollars. Everything remains the same in real dollars.

Because, in reality, not all income is consumed under the current income tax, the tax rate – and, hence, the tax “burden” – will not, however, be the same for a consumption tax that raises the same amount of revenue. Return to the foregoing example in which, in year one Paul and Pauline are subject to an income tax of 20 percent, and suppose that the government drops the income tax and puts a 20 percent consumption tax (both expressed on a tax-inclusive basis) in its place. Here Paul saves nothing and Pauline saves her entire wage of \$10.00. Whereas in this scenario and under the income tax the government had collected \$4.00 in taxes, it now collects only \$2.00 in taxes, measured in real dollars (\$2.50 in nominal dollars). The sales tax needed to collect the same amount of revenue would be double the 20 percent tax that applied under the income tax.¹⁴

While this would shift the individual burden of paying taxes from Pauline to Paul, it would not affect the aggregate burden. The government would still be extracting tax revenues equal to 20 percent of aggregate income.

In general, we should expect the requisite sales tax rate to exceed the existing income tax rate as current income exceeds current consumption. The revenues, consisting mainly of personal and corporate income tax revenues that would be replaced by the FairTax in 2007, will be an estimated \$2.228 trillion. National income in 2007 will be about \$12.170 trillion. Dividing, we get 18.31 percent.¹⁵

Below, we show that the tax base for a proposed national sales tax would be \$11.293 trillion. This implies that the requisite rate would be in the neighborhood of 19.73 percent ($= 18.31\% \times$

¹³ For further discussion, see Section II. D below.

¹⁴ We could make a similar calculation for year two, when Pauline receives income on saving from the previous year and when Paul, the non-saver, has only wage income. Under the income tax, the government collects 20 percent of their total income, or \$4.08 ($= .2(\$20.00 + \$4.00)$). Total consumption is, however, \$24.32 ($= (\$20 + \$8 \times .05) .8 + \8). Under the consumption tax, the government collects 20 percent of consumption, inclusive of taxes. This consumption, in real dollars, is \$30.50 ($= \$20 + \10×1.05). The government thus collects \$6.10 in taxes ($= .20 \times \30.50). The rate should be 13.38 percent ($= \$4.08/\30.50).

¹⁵ Bureau of Economic Analysis, National Income and Product Accounts, Table 1.12: National Income by Type of Income; available at <http://www.bea.gov/bea/dn/nipaweb/SelectTable.asp?Selected=N>.

12.170/11.293), assuming that the sales tax did not make any provision for redistributing income based on “ability-to-pay” or “vertical-equity” considerations.

This is a crude estimate, but it is useful because it demonstrates that the aggregate burden imposed by a sales tax is, in every important respect, identical to that imposed by an income tax. True, the individual and inter-temporal burdens will vary, but those are matters that have nothing to do with the rate and that may be addressed by making the rate high enough to provide permanent or transitional assistance to persons adversely affected.

The second concern noted above is whether the rate applicable to a sales tax would exceed that applicable to some other form of consumption tax. Let us consider a number of alternative consumption taxes.

Consider the simple income identities:

$$Y = C + I + G + NX$$

$$Y = C + S + T$$

$$T = G$$

$$Y = W + rK$$

where

Y = income

C = personal consumption expenditures

I = gross private domestic investment

G = government purchases

NX = net exports = $X - M$, where X = exports and M = imports

S = gross private saving

T = net taxes

W = wages

r = the return to capital

K = the capital stock

Here total income equals wages W plus capital income rK . It is convenient to think of total consumption as consisting of personal consumption expenditures C plus government purchases G .¹⁶

Now consider a value-added tax. This tax is similar to a sales tax except that it taxes value added incrementally at each stage of production rather than, as with a sales tax, taxing total value added at the point of final sale. A value-added tax imposed at the rate t_i will yield the same revenue as a sales tax imposed at the same rate. Both are taxes on total consumption.

¹⁶ This is because some of the taxes collected under an income tax are collected on factor services supplied to government. By including G in total consumption, we assume, in effect – and consistent with the FairTax proposal examined below – that government would pay taxes on its consumption under a national sales tax. Even though the NIPA distinguish between government consumption expenditures and government investment, all consumption tax proposals, including the ones examined here, treat G as consumption.

One consumption tax, usually called a flat tax, would create two taxes, one on individuals and another on business. Details aside, individuals would pay a tax on wages and business would pay a tax on gross income Y minus W minus investment I . Thus the tax falls on $W + rK - I = Y - I = C + G + NX$, or total consumption plus net exports.

An alternative formulation, identified below as a BTT, would achieve the same result by taxing business only. Business would calculate its taxable income as $Y - I - NX = C + G$. The only difference between the flat tax and the BTT is that the former taxes net exports, while the latter does not.

Another alternative, sometimes called a cash-flow tax, expenditure tax, consumed income tax, or inflow-outflow tax, would collect taxes only on individuals, who would calculate their taxable income as cash flow minus saving. The tax base is therefore $Y - S$. $Y - S = C + T$.¹⁷ Assuming that $T = G$, the tax base is $C + G$.

The upshot of this analysis is that there are several ways to tax consumption, all essentially equivalent and all therefore requiring the imposition of an essentially identical tax on consumption. There will be differences, depending on such matters as the treatment of foreign trade and allowances for personal exemptions and the like, but the rate should otherwise be the same.

The next four sections examine in turn each of the main tax structures – the FairTax, the current system, the flat tax, and the business transfer tax. Each section begins with a brief description of the tax, estimates the base, and derives average and marginal tax rates. A comparative analysis of the tax base of all four systems is presented in Section VI.

II. The FairTax

A. Introduction

The Fair Tax Act of 2007 (H.R. 25) recently introduced in the U.S. Congress, would replace most existing federal taxes with a comprehensive consumption tax in the form of a national retail sales tax levied at a tax-inclusive rate of 23 percent, effective January 1, 2009. The act would repeal the federal income tax (including the capital gains tax and the alternative minimum tax), the corporate income tax, federal payroll taxes, the self-employment tax, and the estate and gift tax. The act is intended to be revenue neutral.

In this section we measure the size of the base of the FairTax, as envisaged in H.R. 25. We then determine the tax rate that would be necessary to maintain the level of real federal spending under the FairTax. Many critics of the FairTax have argued that the rate needed for this purpose would be far greater than 23 percent.¹⁸ On the basis of the foregoing discussion, we would expect the rate to exceed 23 percent only insofar as the architects of H.R. 25 underestimated the difference between national income and the FairTax base in 2007. Our results will show that the 23 percent called for in H.R. 25 is, in fact, very close to the required rate.

¹⁷ For these sorts of taxes to work correctly, net borrowing must usually be included in the taxable base and payments of debt principle must be deductible; this adds a further complication to the tax system.

¹⁸ See President's Advisory Panel on Federal Tax Reform (2005) and Gale (2005) p. 889-91.

H.R. 25 calls for revenue, rather than spending, neutrality. Revenue neutrality commonly means maintaining the existing level of tax dollars in nominal terms. For example, if the current tax system is expected to generate \$10.00 in tax revenue next year, any changes to the tax system would also need to generate \$10.00 in tax revenue next year. However, because the implementation of the FairTax would likely change the prices that consumers and governments pay for goods and services, we have defined revenue neutrality a little differently:

For example, if the federal government purchases a good for \$1.00 under the current tax system, it needs to raise \$1.00 in tax revenue to pay for that good. If we assume the price of that good rises from \$1.00 to \$1.30 under the FairTax, now the government needs \$1.30 in tax revenue in order to purchase the same good. If the FairTax were to replace only the \$1.00 in tax revenue raised under the current system, the government would not be able to purchase the same quantity of the good as under the current system. As a result the real, or price-adjusted, value of government spending would shrink by 23 percent.

To allow the government to purchase the same quantity of goods and services under the FairTax as it does under the current tax system we need to account for any possible changes in the price level that may result from the implementation of the FairTax. A better definition of revenue neutrality would therefore be to keep the level of government spending constant in real, or price-adjusted, terms. In other words, the real size of the government sector relative to the rest of the economy would remain constant. This is the concept of revenue neutrality that we use in this study, *even though we show that the overall price changes turn out to be irrelevant when it comes to calculating the FairTax rate*. In section II. E “Determining the FairTax rate,” we provide a complete discussion of possible price changes under the FairTax.

B. The FairTax Base

H.R. 25 calls for a tax on “all consumption of goods and services in the United States.” That consists, for the most part, of what the NIPA defines as “personal consumption expenditures” and “government consumption expenditures and investment.”¹⁹ Table 2 below shows that consumption, so measured, comprised approximately 86 percent of gross domestic product in 2005.

The remaining 14 percent consisted of gross private domestic investment and net exports, all of which are excluded from the base of the FairTax. By relieving investment expenditures from taxation, the FairTax provides an incentive to save and invest. Also, as a destination principle tax, the FairTax removes the current income (personal and corporate) and payroll taxes embedded in the price of U.S. exports, effectively increasing the competitiveness of U.S. exports on world markets. Imports of consumption goods and services would be subject to the FairTax when sold at retail, just as domestically produced products are.

¹⁹ The FairTax adopts a pre-payment approach to taxing government investment since much of the consumption generated by government investment would otherwise never be taxed.

Table 2. GDP and Consumption, United States, 2001-2005 (\$ billions)

	2001	2002	2003	2004	2005
Gross Domestic Product	10,128	10,470	10,971	11,734	12,494
Personal Consumption Expenditures	7,055	7,351	7,710	8,214	8,746
Government Consumption Expenditures	1,502	1,617	1,737	1,843	1,963
Government Investment Expenditures	324	344	355	373	400
Total Consumption (personal + government)*	8,881	9,312	9,802	10,431	11,109
As a % of GDP	87.7	88.9	89.3	88.9	88.9

Source: U.S. Bureau of Economic Analysis, National Income and Product Accounts. CBO, "The Budget and Economic Outlook for Fiscal Years 2007 to 2016."

Note: * Totals may not add due to rounding.

While Table 2 provides an initial measure of the base on which the FairTax would be levied, a number of further adjustments are required. The most important of those have to do with the treatment of housing and educational expenditures. The additional details are set out in Table 3, to which the following comments apply.

1. Personal Consumption Expenditures

We separate our adjustments to personal consumption expenditures into five categories: Housing, education, financial intermediation services, travel, and other.

a. Housing: In theory, a homeowner consumes housing in the same manner as a renter, the difference being that the renter makes an explicit rental payment, whereas the homeowner does not; and under current law, the homeowner may take a deduction for home mortgage interest and property tax payments against his/her federal income taxes. The existing tax code thus discriminates against renters in favor of homeowners.

The FairTax seeks to equalize the tax burden on renters and homeowners. Because rent is a payment for the consumption of housing services, rents will be subject to taxation under the FairTax, which the NIPA accounts include as personal consumption expenditures. The question then becomes how to tax the housing consumption of homeowners in an equivalent manner. Two methods are available: (1) Impute the rental value of owner-occupied housing and levy a tax on that amount or (2) adopt a pre-payment approach, under which the tax is levied on the sale of newly constructed homes that will be owner occupied.²⁰ The FairTax adopts the second of these approaches and therefore we remove the value of imputed rent for housing and farm dwellings from the base. Since purchases of new homes are counted as investment in new structures in the NIPA accounts, we add these figures to the base.

Under the FairTax, improvements to single-family homes and realtors' fees, which represent payments for a service provided, are also taxable. Those expenditures are also counted as investment and not consumption in the NIPA tables, and they are added to the base. It should be

²⁰ According to the National Association of Realtors, approximately 23 percent of homes are purchased for investment purposes. These homes would not be subject to the Fair Tax when they are newly built, but the payments made by the renters of these units would be subject to FairTax. We make an adjustment to account for these purchases.

noted that, under the FairTax, there is no tax on the resale of existing houses because they were taxed when they were first sold, or on any resulting capital gain.

b. Education: Tuition and job training expenditures are treated as an investment in human capital and, as such, are excluded from the FairTax base.

c. Financial Intermediation Services: The FairTax calls for the taxation of both explicit and implicit financial intermediation services that consumers pay to financial services firms. Explicit financial intermediation services include fees for brokerage, banking, loan origination, mutual fund management, and other financial services; and are counted in personal consumption expenditures of the NIPA tables.

Implicit financial intermediation services are defined by H.R. 25 as the difference between the basic interest rate (as defined in Section 805) over the rate paid on an investment, account, or debt. The difference between actual interest payments (new home mortgage interest) and basic interest payments (10-year Treasury bond yield) is taxable. Thus, for example, a taxpayer with a mortgage rate of 7 percent would have 29 percent of the mortgage interest payment subject to tax if the Treasury rate were 5 percent. Implicit financial intermediation services are not included in the accounting of personal consumption expenditures in NIPA, and we have calculated values for implicit financial intermediation services for home mortgage, non-profits, and personal borrowing.²¹

d. Travel: As a destination-principle sales tax, the FairTax applies to all retail purchases within the United States regardless of the nationality of the purchaser or the origin of the goods. Adjustments to the accounts are necessary to capture purchases made by nonresidents visiting the United States and to subtract overseas purchases made by U.S. residents.²²

e. Other: The portion of state and local sales taxes that applies to sales at the retail level is deducted to avoid cascading or levying the FairTax on top of state and local sales taxes. Because the FairTax does not apply to intermediate transactions (businesses-to-business sales), the state and local sales taxes that apply to those transactions are automatically excluded from the tax base. We have adjusted our calculations to reflect an estimate that 40 percent of state and local sales taxes apply to business transactions.²³

²¹ In Table 3, line 9, implicit fees are imputed as follows: The excess of the basic interest rate (as defined in Section 805 of H.R. 25) over the rate paid on such investment. The value for implicit fees for home mortgages is derived by estimating the principal (\$6.481.9 trillion in 2007) by dividing the total interest payments listed in NIPA Table 7.11, line 16 (\$465.4 billion in 2007) by the new-home mortgage interest rate listed in Table B-73 of the 2006 Economic Report of the President (7.18 percent in 2007). We apply the basic interest rate defined as the 10-year bond rate listed in Table B-73 of the EROP to the principal (\$6.481.9 trillion x 5.20% = \$337.1 billion). The difference between total home mortgage payments and the basic interest payments (\$465.4 billion – \$337.1 billion = \$128.3 billion) is the taxable implicit financial intermediation fee. This calculation is repeated for nonprofit interest using the new-home mortgage rate.

The implicit fee for personal interest paid is calculated by applying the basic interest rate (three-year U.S. Treasury securities rate) from Table B-73, EROP to the Federal Reserve estimate for total outstanding consumer credit (for 2007: \$2.4149 trillion x 3.7% = \$89.35 billion). This figure is subtracted from the total interest paid by persons listed in NIPA Table 7.11, line 17 (\$244 billion in 2007) to arrive at our estimate of the implicit financial intermediation service for personal credit that is subject to the FairTax (for 2007: \$244 billion – \$89.35 billion = \$154.6 billion).

²² According to officials from the Bureau of Economic Analysis, NIPA Table 2.5.5, line 112: “expenditures in the U.S. by non-residents” includes travel to the United States by non-residents.

²³ Ring (1999) p. 79-90.

Food produced and consumed on farms never reaches retail markets and is not subject to the FairTax. We subtract the amount of that consumption from the base.

Finally, nonprofit institutions are treated as persons by the NIPA tables so their consumption expenditures are included in the private tax base. The consumption expenditures of nonprofit institutions consist of their operating expenditures, including wages and salaries of nonprofit workers, but do not include their sales of goods and services to individuals. The FairTax taxes non-profits' sales of goods and services to individuals and their purchases of goods and services that are not sold on to individuals, including capital goods. However, the FairTax does not tax the salaries and wages of nonprofit workers so an adjustment is needed. We remove the salaries and wages of nonprofit workers that are not involved in the production of goods and services sold to individuals.²⁴ We also remove the capital consumption allowance to avoid double counting.

2. Government Consumption Spending

Government consumption is included in the FairTax base to put personal and government consumption expenditures on an equal footing.²⁵ Government consumption expenditures include payroll taxes paid by governments and income taxes and payroll taxes paid by government employees. They also reflect payroll and income taxes paid in the course of producing consumption goods bought by government from private-sector firms. The intent of the FairTax is to substitute a sales tax for all of those taxes. Failing to tax government consumption, while taxing only private consumption, would make government consumption expenditures artificially cheap in comparison with private consumption expenditures and could cause the provision of some goods and services to migrate from the private sector to the government sector. Activities such as trash collection and transportation services are taxed under the FairTax, whether provided by government or the private sector.

²⁴ The personal consumption expenditure (PCE) within the NIPA accounts includes the final consumption of nonprofit institutions serving households (NIPA Table 2.9, line 57, \$183.7 billion) and their sales to households (NIPA Table 2.9, line 64, \$676.8 billion). We estimate and remove the wage and salary portion of the final consumption expenditures of nonprofit institutions. First, we remove the portion of nonprofit final consumption expenditures that is attributable to educational nonprofit institutions, since they have already been removed from the base institutions (NIPA Table 2.9, line 61 minus line 67, \$52 billion). That leaves the final consumption expenditures at \$131.7 billion. Next we estimate the ratio of wages and salaries to total expenditures of non-profits by taking NIPA Table 1.13, line 51 and dividing it by the sum of NIPA Table 2.9, lines 58 and 70; the result equals 51.65 percent. We apply this ratio to the \$131.7 billion to get \$68 billion. This represents our estimate of the salaries and wages of nonprofit employees that are not involved in the production of goods and services that are sold to households.

²⁵ Gale, et al. (1998) p. 3.

Table 3. Computation of FairTax Base, 2007 (\$ billions)

Line	Taxable Consumption Categories	2007	Source
	Private Consumption Spending		
1	Personal Consumption Expenditures	9,772	NIPA 1.1.5, line 2
	Housing		
2	Purchase of New Homes	394	NIPA 5.4.5B, line 36
3	Purchases of New Mobile Homes	9	NIPA 5.4.5B, line 40
4	Improvements to Single-Family Homes	176	NIPA 5.4.5B, line 42
5	Brokers' Commissions on Housing	121	NIPA 5.4.5B, line 43
6	Less: Imputed Rent on Housing	-1,067	NIPA 2.4.5, line 49
7	Less: Imputed Rent on Farm Dwellings	-15	NIPA 2.4.5, line 51
	Education		
8	Less: Education Expenditure	-221	NIPA 2.4.5, lines 95, 96, and one-half 97
	Financial Services		
9	Plus: Taxable Home Mortgage Interest	128	NIPA 7.11, line 16, EROP, Table B-73
10	Plus: Taxable Nonprofit Interest	5	NIPA 7.11, line 18, EROP, Table B-73
11	Plus: Taxable Personal Interest	155	NIPA 7.11, line 17, EROP, Table B-73
	Travel		
12	Plus: Expenditure in U.S. by Nonresidents	115	NIPA 2.5.5, line 112
13	Less: Expenditure Abroad by U.S. Residents (nondurables)	-8	NIPA 2.5.5, line 111
14	Less: Foreign Travel by U.S. Residents (services)	-54	NIPA 2.5.5, line 110 (50%)
	Other		
15	Less: Food Produced and Consumed on Farms	-0.6	NIPA 2.5.5, line 6
16	Less: State Sales Taxes	-263	NIPA 3.3, line 7 (60%)
17	Less: Salaries and Wages of Non-Profits	-68	NIPA 2.9, line 62 minus line 68, multiplied by 52% (% of non-profit wages to total expenses)
18	Plus: Net Capital Spending by Non-Profits	58	NIPA 6.7, line 8, minus NIPA 7.5, line 20
19	Subtotal, Private Consumption Base	9,235	
	Government Consumption Spending		
	State and Local Government		
20	State and Local Government Consumption	1,333	NIPA 3.3, line 22
21	Less: Current Education Spending (Wages and Salaries)	-403	NIPA 6.3D, line 94
22	Less: Capital Consumption Allowance	-163	NIPA 3.3, line 38
	State and Local Government Investment		
23	Gross Purchases of New Structures	263	NIPA 3.9.5, line 24
24	Gross Purchases of Equipment	63	NIPA 3.9.5, line 25
25	Subtotal, State & Local Tax base	1,093	
	Federal Government Spending		
26	Federal Government Consumption	845	NIPA 3.9.5, line 7
27	Less: Capital Consumption Allowance	-108	NIPA 3.2, line 44
	Subsidies	60	NIPA 3.2, line 31
	Federal Government Investment		
29	Gross Purchases of New Structures	17	NIPA 3.9.5, line 9
30	Gross Purchases of Equipment and Software	102	NIPA 3.9.5, line 10
31	Subtotal, Federal Government Tax Base	916	
32	Gross Fair Tax Base	11,244	
33	As a % of GDP	81%	
34	Untaxed Federal Government Spending (GN)	272	NIPA 3.2, line 28 (57.23%), IRS, SOI Table 1.4

Note: Totals may not add due to rounding.

3. *Estimating the FairTax Base*

Since the effective date of H.R. 25 is January 1, 2007, we estimate the tax base for the FairTax and the federal tax revenues that would be replaced by it for calendar year 2007. The CBO provides estimates of several important economic statistics and tax revenues for the major federal taxes (see Table 4).²⁶ We use CBO projections to inflate 2004 data, and when available 2005 data, for each component of the tax bases into estimates of the 2007 components. A detailed explanation of the methodology is provided in the Appendix.

So defined, we estimate the 2007 FairTax base to be \$11.244 trillion dollars, representing 81 percent of 2007 U.S. GDP projected by the CBO.²⁷ Starting with personal consumption expenditures of \$9.772 trillion, we make adjustments for housing by adding purchases of new homes and the improvement of existing homes. The imputed rent for owner-occupied housing and farm dwellings is removed because the tax due on the imputed rent will become prepaid when the property is sold as a new dwelling.²⁸

Adjustments are also made for education tuition (excluded under the FairTax), taxable interest and financial intermediation, foreign travel, and other items.²⁹ The net effect of these adjustments is to reduce the private consumption base to \$9.235 trillion.³⁰

Next, we add government consumption at the local, state, and federal level to the base. The current income tax system taxes government spending through the income tax imposed on government employee salaries. We then further adjust the base by subtracting government wages paid to government employees who provide education and training (as with private consumption expenditures) and we subtract the capital consumption allowance.³¹ Spending for new buildings and equipment is added to the base. State and local government consumption, thus adjusted, equals \$1.093 trillion; federal government consumption equals \$916 billion. Those amounts sum to \$11.244 trillion dollars, representing 81 percent of 2007 U.S. gross domestic product as projected by the CBO.³²

²⁶ U.S. Congress (2006).

²⁷ *Ibid.*, p. 26.

²⁸ Table 3, line 2. According to a March 2005 report by the National Association of Realtors, 23 percent of homes purchased in 2004 were for investment purposes. Also, 79 percent of homes purchased for investment purposes are single-family homes. Those numbers provide a basis for this estimate.

²⁹ Table 3, line 8 includes “Other” (see NIPA 2.5.5, line 110), which consists of (1) fees paid to business schools and computer management training, technical and trade schools, and so on, and (2) current expenditures (including consumption of fixed capital) by nonprofit research organizations and by grant-making foundations for education and research. Gale (1999) includes it while Burton and Mastromarco (1997) exclude it. We have chosen to include half of its value.

³⁰ In Table 3, line 9, implicit fees are imputed as follows: The excess of the basic interest rate (as defined in Section 805 of H.R. 25) over the rate paid on such investment. The value is derived by estimating the principal (payment/rate) and estimating the interest as if “basic interest rate” had applied. The difference between actual interest payment (for example: New home mortgage yield) and basic interest payment (ten-year bond yield) is taxable.

³¹ According to BEA, government consumption expenditures include the consumption of fixed capital; to avoid double counting of the consumption of capital, we have removed capital consumption allowance from the base.

³² U.S. Congress (2006) p. 26.

C. The FairTax Rate

Given the base, we can calculate the rate at which the FairTax must be levied once we know how much tax revenue needs to be raised. Two items need to be computed: The 2007 revenue to be collected from taxes that the FairTax would replace and the value of tax revenue required to cover the “prebate” – discussed below – that is designed to ensure that the FairTax does not burden poor households.

1. Replacing Tax Revenue

Table 4 sets out the amount of revenue that is raised by individual and corporation income taxes, social insurance and retirement contributions, and estate and gift taxes on a calendar-year basis – taxes that would be repealed and replaced by the FairTax.³³ In calendar year 2005, those taxes yielded \$2.059 trillion, or 16.5 percent of GDP. In 2007, those taxes are expected to yield \$2.288 trillion, or 16.4 percent of GDP, using CBO estimates assuming all tax provisions scheduled to expire before 2016, including the tax cuts enacted between 2001 and 2004, are made permanent and not allowed to expire.³⁴

Table 4. Revenue from Income, Payroll, and Estate/Gift Taxes, 2003-2007 (\$ billions)

Tax Source	Actual		Estimates		
	2003	2004	2005	2006	2007
Individual income taxes	798	839	945	1,019	1,101
Corporation income taxes	146	212	284	298	290
Social insurance and retirement receipts	718	749	804	841	871
Estate and gift taxes	23	25	26	27	26
Total	1,685	1,825	2,059	2,185	2,288
GDP	10,971	11,734	12,494	13,262	13,959
Memo: Taxes as % of GDP	15.4	15.6	16.5	16.5	16.4

Sources: NIPA Table 1.1.5. Estimates from U.S. Congress, CBO, “The Budget and Economic Outlook: Fiscal Years 2007 to 2016.”

Note: Totals may not add due to rounding.

It is worth noting what the FairTax rate would be were it not for the prebate. To calculate the rate before the prebate is included, we would divide the gross FairTax base (line 32 in Table 3) by the unadjusted revenues to be replaced, as listed in Table 4 under the total for 2007, to get 20.35 percent $\left(= \frac{2,288}{11,244} \right)$. In the absence of the prebate, the FairTax rate would be 20.35 percent, well below that called for in H.R. 25.

2. The Prebate

A common criticism of consumption taxes is that they are regressive, in the sense that the fraction of income paid in taxes is less for rich households than for poor households. The current federal tax system seeks to achieve progressivity by relying heavily on a graduated personal income tax along with a highly complex set of deductions, exemptions, and tax credits. A

³³ Since the federal fiscal year begins October 1, calendar year 2007 contains the last nine months of fiscal year 2007 and the first three months of fiscal year 2008. We adjusted the fiscal year revenue numbers to calendar year 2007 by adding three-fourths of the fiscal 2007 total revenues to one-fourth of the total revenues for fiscal 2008.

³⁴ U.S. Congress (2006) p. 105.

consumption tax falls relatively heavily on the current income of the poor insofar as they are likely to spend a relatively high proportion of their income.

Some consumption taxes, such as the value-added tax (VAT) used in many countries, exempt basic goods, such as food, clothing, and shelter, which figure heavily in the budgets of the poor. However, this has the effect of increasing the tax rate that must be imposed on all other goods, thus compromising the sought-for neutrality of the tax. Moreover, in practice, these exemptions do little to enhance the progressiveness of a sales tax or VAT because wealthy people tend to live in mansions, eat expensive food, and buy designer clothes while poor people live in apartments and purchase inexpensive food and clothing.

To mitigate the burden of taxation on lower-income groups without introducing this non-neutrality, the FairTax proposes a family consumption allowance, or *prebate*, which is an amount of consumption or spending based on the federal poverty guidelines adjusted to remove any marriage penalty. This may be thought of as a rebate, paid in advance to every household, of the amount of FairTax that someone at the poverty line would normally be expected to have paid. Alternatively, it may be considered as a transfer payment by the federal government to households. The prebate is equal to the FairTax rate times the U.S. Department of Health and Human Services poverty level divided by 12 (because it is monthly). There is an extra amount for married couples to prevent a marriage penalty because the poverty level for a family of two is not two times the poverty level for one person.

For instance, in 2007, the FairTax annual consumption allowance for a family of four is projected to be \$26,981 resulting in an annual prebate of \$6,205 ($0.23 \times \$26,981$). The total family consumption allowance or prebate base was calculated by using the U.S. Department of Health and Human Services Poverty Level Guidelines for 2006 and U.S. Census Bureau estimates for the number and size of households in the United States. The family consumption allowance computed for each family size/marital status combination was multiplied by the number of households in each size category to compute the total value of the prebate for that category. Those totals were summed to arrive at the total base on which the prebate would be calculated. (See Table 5.)

Table 5. Computing the FairTax Base Reduction Due to the Prebate for 2007

I. Single Households			
Household Size	Family Consumption Allowance	Number of Households (thousands)	Prebate Base Reduction (thousands)
1	\$10,016	29,858	\$299,049,690
2	\$13,490	12,719	\$171,584,833
3	\$16,965	6,645	\$112,727,257
4	\$20,440	3,233	\$66,092,706
5	\$23,915	1,441	\$34,464,747
6	\$27,390	489	\$13,406,258
7 or more	\$30,864	395	\$12,179,087
Subtotal, Single Households		54,781	\$709,504,577
II. Married Households			
2	\$20,031	24,991	\$500,599,437
3	\$23,506	11,489	\$270,055,951
4	\$26,981	12,980	\$350,222,029
5	\$30,456	5,775	\$175,871,370
6	\$33,930	2,009	\$68,177,390
7 or more	\$37,405	1,006	\$37,636,330
Subtotal, Married Households		58,250	\$1,402,562,508
TOTAL		113,031	\$2,112,067,084
Prebate as % of GDP			18.8%

D. Tax-inclusive versus Tax-exclusive Rates

It is worth noting the difference between a tax-inclusive and a tax-exclusive rate. Suppose that Joe earns \$125 and spends all of his earnings. Suppose further that he pays a tax of \$25. If he were subject to an income tax, he would earn \$125 before tax, \$100 after tax and spend \$100 at the store. Thus, he would need to earn \$125 to spend \$100. In the case of a sales tax, he would earn \$125 and pay \$125 at the store for \$100 of goods. Of the \$125 paid by Joe at the store, the store would remit \$25 in sales tax. We may think of the tax rate as $\$25/\$100 = 25$ percent, which is the *tax-exclusive* rate (t_e); alternatively, we may report the tax rate as $\$25/\$125 = 20$ percent, which is the *tax-inclusive* rate (t_i). The 23 percent FairTax rate in H.R. 25 is a tax-inclusive rate, as is the current personal income tax, whereas most state-level sales taxes are quoted on a tax-exclusive basis. For ease of comparison, we report tax rates in both ways in Table 6.

E. Determining the FairTax Rate

In this section we determine the rate at which the FairTax would need to be levied in 2007. We assume that the FairTax would be neutral in the sense that it would permit the same real expenditures by federal, state, and local government as well as cover the costs of the prebate.

Under current law, the federal budget balance for 2007 may be written as:

$$(1) \quad R1_{07} + R2_{07} + DEF_{07} \equiv G_{07} + TR_{07} + GN_{07}.$$

Here:

- $R1_{07}$ is the revenue from taxes that would be eliminated under the FairTax (including income and payroll taxes);
- $R2_{07}$ is the revenue from federal excise and other taxes that will continue to be levied after the FairTax is enacted;
- DEF_{07} is the federal budget deficit;
- G_{07} is taxable federal government spending on goods and services;
- TR_{07} measures federal transfer payments to individuals, including most Social Security payments, Medicaid and Medicare subsidies, and social programs such as food stamps, for which the recipients are not taxed under current law; and
- GN_{07} represents federal spending and transfers for which the recipients would not be taxed under the FairTax, but for which they would be under current law – essentially, wage and salary costs of education, plus interest payments on the government debt held by the public plus currently taxable Social Security payments.

Note that all the terms in equation (1) can be measured by using estimates for 2007.

Now consider what happens with the introduction of the FairTax. Under the FairTax, equation (1) becomes:

$$(2) \quad R_{FT} + R2_{FT} + DEF_{FT} = G_{FT} + TR_{FT} + GN_{FT} + PRE_{FT} + AC_{FT}.$$

In equation (2) the FT subscript indicates values under the FairTax, and the components that have the same basic names as in equation (1) – $R2$, DEF , G , TR , and GN – represent the same revenue or expenditure components as in equation (1). Also in equation (2) we have three new terms, which are:

- R_{FT} : The tax revenue to be raised by the FairTax in 2007.
- PRE_{FT} : The prebate. This is a new expenditure to be financed by new tax revenue raised by the FairTax.
- AC_{FT} : The administrative credit that the federal government will pay vendors and states for collecting the FairTax.

Unlike the terms in equation (1), the terms in equation (2) are not directly measurable. Two issues that arise in determining the FairTax values are the reaction of the monetary authorities to the switch to the FairTax and the amount of revenue needed for the FairTax to cover the real expenditures that had previously been financed by the existing federal taxes.

Because the FairTax falls on consumption, there is a question of how its imposition would affect the prices of consumer goods. If prices rise, then some terms in equation (2) will be larger than their counterparts in equation (1); for example, we will find that $G_{FT} > G_{07}$. If they do not rise, then we will find that $G_{FT} = G_{07}$.

We now want to consider what happens to prices and their components when shifting from the current tax law to the FairTax. This is going to be valuable when considering the relationship between the federal government's different revenue and spending categories under the current law and their counterparts under the FairTax. Since the FairTax does not fall on top of any state and local government tax embedded in the price consumers pay, the prices we shall consider here do not include the mentioned state and local taxes.

At a macroeconomic level, prices depend on how the monetary authorities react to changes in tax policy, in macroeconomic conditions, and other variables affecting prices. In simple terms, the overall price level must be consistent with the "quantity theory" equation, whereby $MV = PY$. Here M is the money supply, V is the velocity of circulation of money, P is the price level, and Y is real income. For the purpose of this analysis, we assume that, under the FairTax, V and Y would remain unchanged. Therefore, a rise in the price level would be possible only if accommodated by an increase in the money supply.³⁵ Put another way, without monetary accommodation, prices faced by consumers under the FairTax would not rise. Any changes to the level of monetary accommodation – that is, increase in the money supply – would cause prices to increase in the same proportion.

Let us designate as α the percentage by which market prices under the FairTax would exceed market prices under current law in 2007. We assume that the monetary authorities determine this percentage through their control of the money supply, such that $0 \leq \alpha \leq t_e$, where t_e is the tax-exclusive FairTax rate. With no change in real income or the velocity of money, the maximum amount that prices could increase when the FairTax is imposed is the amount of the tax, so the price would go up by a factor of t_e when there is full monetary accommodation. In general the relationship between pre- and post-FairTax consumer prices, P_{07} and P_{FT} , is given by:

$$(3) \quad P_{FT} = P_{07} (1 + \alpha).$$

Consumer prices have two main components:

1. Producer prices (PP): The prices producers receive. This component incorporates all unit costs of production and any profit margin the producer is able to make. Under current law this component of prices has income and payroll taxes embedded in it through the wages and salaries of employees and compensation paid to professionals. Under the FairTax producer prices would not have the taxation components embedded in them, because those taxes are removed when switching the taxation system.
2. Other federal commodity taxes ($PR2$): Import duties, excise taxes, and the like. Revenues from these taxes form the $R2$ component of the federal government revenue mentioned above.

Under current law this means that consumer prices are:

$$(4) \quad P_{07} = PP_{07} + PR2_{07}.$$

³⁵ In fact, Y would not remain constant, but would rise, owing to the "dynamic" effects that would arise from replacing the existing tax system with the FairTax. We discuss this further below in connection with the evasion issue.

Under the FairTax, prices have a new component which they do not have under current law: The FairTax itself. Because the FairTax is levied on producer prices as well as on top of other federal commodity taxes, consumer prices under the FairTax satisfy:

$$(5) \quad P_{FT} = (PP_{FT} + PR2_{FT})(1 + t_e).$$

Now we determine how P_{07} and P_{FT} are related. Consider the case of no monetary accommodation, where as we have seen, $P_{07} = P_{FT}$. As we shall see later, $R2$ will not change in this case when imposing the FairTax (after all, the price of fixing a road will be the same and hence the revenue raised by the excise tax on gasoline should be the same). Therefore, the only way for the market price under the FairTax to be identical to the market price under current law is for producer prices under the FairTax to be less than producer prices under current law. The reason for this is the FairTax component of the price under the FairTax. With any level of monetary accommodation, the relationship between producer prices is:

$$(6) \quad PP_{FT} = PP_{07}(1 - T)(1 + \alpha),$$

where T is the rate by which producer prices under current law would fall owing to the adoption of the FairTax. Note that this rate is not necessarily equal to the FairTax rate due to the presence of other commodity taxes.³⁶ As we have already mentioned, under non-monetary accommodation the $R2$ component of the price is going to be the same. With any level of monetary accommodation that component will be affected in the same manner, because that revenue should still be able to buy the same services for the federal government. Therefore:

$$(7) \quad PR2_{FT} = PR2_{07}(1 + \alpha).$$

Letting t_i be the FairTax inclusive rate:

$$(8) \quad 1 + t_e = \frac{1}{1 - t_i}.$$

Now, substituting (3), (6), and (7) in (5):

$$\begin{aligned} P_{07}(1 + \alpha) &= [PP_{07}(1 - T) + PR2_{07}](1 + t_e)(1 + \alpha) \\ P_{07} &= [PP_{07}(1 - T) + PR2_{07}](1 + t_e) \\ P_{07}(1 - t_i) &= PP_{07}(1 - T) + PR2_{07} \\ P_{07}(1 - t_i) &= PP_{07} + PR2_{07} - PP_{07}T \\ P_{07}(1 - t_i) &= P_{07} - PP_{07}T \\ PP_{07}T &= P_{07}t_i, \end{aligned}$$

we get:

$$(9) \quad T = \frac{P_{07}}{PP_{07}}t_i.$$

³⁶ As we will see later, the fact that $PR2$ is also taxed causes T to be greater than the tax-inclusive FairTax rate, t_i .

Letting $\gamma = \frac{P_{07}}{PP_{07}}$ we have:

$$(10) \quad T = \gamma t_i.$$

To calculate γ we use consumption and R2, which we estimate at \$147 billion in 2007. Hence, we have:

$$\gamma = \frac{C_{07} + G_{07} + GS_{07}}{C_{07} + G_{07} + GS_{07} - R2_{07}} = \frac{11,244}{11,244 - 147} = 1.0132.$$

Thus (10) becomes:

$$(11) \quad T = 1.0132 t_i$$

Let us now consider the individual components of equation (2). We start with nominal government expenditures G (on the right-hand side of the equation) of goods and services. Those expenditures must buy the same real goods and services under the FairTax as they would under current law except for the amount now dedicated to collection and enforcement of the taxes that are going to be replaced by the FairTax. Calling this reduction in expenditure $IRSS$:

$$(12) \quad G_{FT} = (G_{07} - IRSS)(1 + \alpha).$$

Nominal federal transfer payments TR that are not taxed under current law must remain high enough to command the same goods and services under the FairTax as they do under current law. Because the individuals who would be receiving these payments in 2007 would not be taxed under current law and because the FairTax would not fall on transfer payments, TR_{FT} bears a similar relationship to TR_{07} :

$$(13) \quad TR_{FT} = TR_{07}(1 + \alpha).$$

Now let us consider transfer payments to individuals that are not purchases of goods and services but that are like transfer payments except insofar as individuals receiving these payments pay income taxes on them under current law. Consider, for example, a government bond held by a U.S. bondholder on which the before-tax yield is r . The producer price, or after-tax yield, received by the bondholder holding a bond worth \$1.00 is $r(1-T)$ in interest after taxes, assuming his federal tax rate is t_i and ignoring state and local taxes. If the market price of goods is P_{07} under current law, then the bondholder's consumption in real terms is $\$ \frac{r(1-T)}{P_{07}}$.

Under the FairTax, with the federal income tax removed the real value of the interest received by the bondholder, barring any adjustment, becomes $\$ \frac{r}{P_{07}}$. Thus the government can now induce the taxpayer to buy the same \$1.00 in bonds by reducing the before-tax yield from r to r' , where $r' = r(1-T)$.

Another example is Social Security benefits on which the recipients pay taxes. A recipient who receives a benefit of \$1.00 currently keeps $\$1(1 - T)$, permitting the purchase of $\$ \frac{r(1-T)}{P_{07}}$ in goods. It costs the federal government \$1.00 in before-tax benefits to provide $\$ \frac{(1-T)}{P_{07}}$ in after-tax benefits. Once the income tax is removed and the FairTax imposed, the recipient can receive the same goods at a cost to the government of only $\$1(1 - T)(1 + \alpha)$ in nominal dollars or $\$1(1 - T)$ in real dollars.

We can think of any government expenditure – a taxable expenditure falling under the rubric of G , or a transfer-like payment falling under the rubric of TR or GN – as the purchase of a service. The difference is that services bought under the rubric of G are taxable to the federal government, whereas those purchased under the rubric of TR or GN are not. Another difference is that the receipt of TR is not taxed under current law to the recipient, whereas the receipt of GN is.

We label, as GN , government spending for services on which the government will not pay a FairTax but on which the recipient does pay income tax under current law. Under the FairTax, government can obtain the same volume of services by reducing the real value of GN to $GN(1 - T)$. Whether the services being provided are those of government worker time or of a bondholder, the real value of the payment received by the individual providing those services remains the same. The difference between the worker and the bondholder is that, while the government must pay the FairTax on its purchases of the worker's services, it does not pay the FairTax on its purchases of the services of the bond. It can thus reduce its payment by T .

Thus:

$$(14) \quad GN_{FT} = GN_{07}(1 - T)(1 + \alpha).$$

Substituting (11) we can write:

$$(15) \quad GN_{FT} = GN_{07}(1 - 1.0132 t_i)(1 + \alpha).$$

It is possible that some elements of GN would not undergo the once-and-for-all adjustment assumed by equation (15). For example, H.R. 25 requires the indexation of Social Security benefits, which might be interpreted to mean that the portion of those benefits falling into GN would, in practice, be adjusted upward by α but not downward by T . For our purpose of maintaining government overall spending constant in real terms, the indexing of the Social Security payments included in GN would cause the real value of G and/or TR to decrease correspondingly. Because we are interested in the FairTax rate and not the actual values of G , GN , and TR , we consider this approach to be valid.

The prebate is a new category of spending and by including it on the right-hand side in equation (2) we are assuming that it will be financed by new revenue. This new category presents a unique problem, because the size of the prebate cannot be determined until t_i is determined. But t_i cannot be determined without knowing the prebate. The solution is to measure the base on which the prebate is founded – poverty-line expenditure levels for each household, including the

FairTax – which we will call B_{07} and then to multiply it by the tax-inclusive rate (t_i). Now we know that the prebate must buy the same number of goods and services under the FairTax and that it includes the amount of the FairTax. Therefore we must recognize how monetary accommodation could “inflate” the value of the prebate:

$$(16) \quad PRE_{FT} = B_{07}t_i(1 + \alpha).$$

The administrative credit that will be paid to vendors and state government for collecting the FairTax, AC_{FT} , is set in H.R. 25 at a quarter of 1 percent (0.25 percent) of the revenue collected by the retailer, and another quarter of 1 percent of the revenue collected by the state and local government. The federal government gets no administrative credit for collecting any FairTax revenue. To calculate the administrative credit, we must identify the sources of collection, and for that purpose we separate purchases done at the vendor level – predominantly retailers and professionals – from those done at the government level. The latter are wages paid by the different governments to their employees.

Sales tax revenue collected at the vendor level includes all private and government retail purchases. That amount comprises private consumption, C_{07} , and the non-wage portion of G_{07} and GS_{07} . That revenue is first collected by the vendors, who claim a credit equal to 0.25 percent of revenues collected and send the remaining 99.75 percent (100% – 0.25%) to the state government. The state government then takes its 0.25 percent of the amount remitted by the vendor, sending the remainder to the federal government. The total administrative credit for this type of revenue, as a portion of the revenue, is therefore 0.499375% (0.25% + 0.25% × (1 – 0.25%) ≈ .50%). It is important to consider that federal wages are 32 percent of federal government purchases, and state and local government wages are 41 percent of state and local government purchases. This means that the non-wage portion of government purchases relevant to this type of revenue is 68 percent of G_{07} and 59 percent of GS_{07} .³⁷

The FairTax on state and local government wages is collected only at the state government level and therefore would “earn” a credit of only 0.25 percent. That means that for the administrative credit we also have to apply a 0.25 percent on 41 percent of GS_{07} .

Finally, the private sector increases its consumption by $IRSS$ on the assumption that this reduction in federal government spending is passed on to taxpayers in the form of a reduced tax burden:

$$(17) \quad AC_{FT} = \left\{ 0.50\% \left[C_{07} + IRSS + 0.68(G_{07} - IRSS) + 0.59GS_{07} \right] + 0.25\% \times 0.41GS_{07} \right\} t_i (1 + \alpha).$$

We now consider the revenue side of equation (2) and begin with R_{FT} , the revenue raised by the FairTax. We know that the tax is levied on consumption; personal consumption and the consumption of federal, state, and local governments. Therefore:

$$(18) \quad R_{FT} = (C_{FT} + G_{FT} + GS_{FT})t_i.$$

³⁷ For the federal government, NIPA Table 6.2D, line 87 (salary and wages) is divided by the federal government tax base (G) to give the portion of the tax base that comprises wages and salaries. This percentage is subtracted from 100 percent to obtain the value of non-wages in the tax base. The process is repeated for state and local governments, NIPA 6.2D, line 92, except that wages and salaries for education, line 94, (\$403) are subtracted from total wages and salaries since this is subtracted from the state and local government tax base.

In the above equation we have two new terms:

C_{FT} : Personal consumption at market value in 2007 under the FairTax.

GS_{FT} : Taxable state and local government consumption at market value in 2007 under the FairTax.

Assume there is no monetary accommodation. The FairTax would cause producer prices, and therefore, the tax base for state and local governments to fall. Unless some measure is taken, state and local government revenue would fall. That would be the equivalent of state and local governments providing a tax cut to their taxpayers. We assume that state and local governments take the necessary measures to maintain the real value of their revenues, which, in this setting means raising their tax rates or expanding their state sales tax bases by conforming to the FairTax base.³⁸ And that assumption implies that those governments will maintain the real value of their consumption purchases.

We extend that assumption to the cost saving enjoyed by the federal government in the form of reduced expenditures on the IRS. The cost saving is passed fully on to consumers. Therefore:

$$(19) \quad C_{FT} = (C_{07} + IRSS)(1 + \alpha),$$

$$(20) \quad GS_{FT} = GS_{07}(1 + \alpha).$$

Substituting the relationships in equations (12), (19), and (20) into equation (18):

$$R_{FT} = (C_{07} + IRSS + G_{07} - IRSS + GS_{07})t_i(1 + \alpha)$$

$$(21) \quad R_{FT} = (C_{07} + G_{07} + GS_{07})t_i(1 + \alpha).$$

Now consider $R2_{FT}$. The revenue in this category is raised by excise taxes, import duties, and the like. As we have mentioned previously, the revenue must buy the same goods and services for the government as it did previously. Therefore, the real revenue from those sources under the FairTax must be the same as it would be under the current law. Hence:

$$(22) \quad R2_{FT} = R2_{07}(1 + \alpha).$$

Let us now consider the deficit. We assume the deficit to be financed by private saving. We continue to assume that household purchasing power remains fixed. In particular, we assume that wages will adjust to keep purchasing power constant in real terms. Therefore, we further assume saving to be constant in real terms. That means that the deficit in 2007 will be the same under the FairTax, without monetary accommodation, as it would be under the current law. Thus:

³⁸ States will have an incentive to conform their state sales tax base to the FairTax base because H.R. 25 provides that conforming states are allowed to collect state sales taxes on Internet and remote sales to residents of their state. Other studies have estimated this to be a potential revenue gain of between \$21.5 billion and \$33.7 billion for 2008.

$$(23) \quad DEF_{FT} = DEF_{07}(1 + \alpha).$$

We are finally ready to set up a budget equation under the FairTax using readily available estimates of the current law terms for 2007. Substituting expressions (12), (13), (15), (16), (17), (21), (22), and (23) in equation (2) gives the equation for budget balance under the FairTax:

$$(24) \quad \begin{aligned} & (C_{07} + G_{07} + GS_{07})t_i(1 + \alpha) + R2_{07}(1 + \alpha) + DEF_{07}(1 + \alpha) = \\ & (G_{07} - IRSS)(1 + \alpha) + TR_{07}(1 + \alpha) + GN_{07}(1 - 1.0132 t_i)(1 + \alpha) + B_{07}t_i(1 + \alpha) + \\ & \left\{ 0.50\% [C_{07} + IRSS + 0.68(G_{07} - IRSS) + 0.59GS_{07}] + 0.25\% \times 0.41GS_{07} \right\} t_i(1 + \alpha). \end{aligned}$$

We note that $(1 + \alpha)$ accompanies every term in equation (24), so it drops from the equation. This is important because it implies that *the FairTax rate is independent of the level of monetary accommodation*. Simplifying equation (24):

$$(25) \quad \begin{aligned} & [0.9950C_{07} - 0.0016IRSS + 0.9966G_{07} + 0.9960GS_{07}]t_i + R2_{07} + DEF_{07} = \\ & G_{07} + TR_{07} + GN_{07}(1 - 1.0132 t_i) + B_{07}t_i - IRSS. \end{aligned}$$

We now group the terms that are multiplied by t_i to get:

$$\begin{aligned} & [0.9950C_{07} - 0.0016IRSS + 0.9966G_{07} + 0.9960GS_{07} + 1.0132GN_{07} - B_{07}]t_i = \\ & G_{07} + TR_{07} + GN_{07} - R2_{07} - DEF_{07} - IRSS. \\ & t_i = \frac{G_{07} + TR_{07} + GN_{07} - R2_{07} - DEF_{07} - IRSS}{0.9950C_{07} - 0.0016IRSS + 0.9966G_{07} + 0.9960GS_{07} + 1.0132GN_{07} - B_{07}} \end{aligned}$$

Using (1):

$$(26) \quad t_i = \frac{R1_{07} - IRSS}{0.9950C_{07} - 0.0016IRSS + 0.9966G_{07} + 0.9960GS_{07} + 1.0132GN_{07} - B_{07}}.$$

Inserting values from Table 6 and solving gives:

$$(27) \quad t_i = \frac{2,228}{9,189 - 0.01 + 913 + 1,089 + 276 - 2,112} = 23.82\%.$$

The information required to determine the FairTax rate is set out in Table 6. The FairTax calls for the replacement of the federal taxes on personal and corporate income, the gift and estate taxes, and the payroll tax. We estimate that the revenues raised by these taxes would be \$2.288 trillion in 2007 under current law. We subtract the cost of the earned income tax credit and the child tax credit, which the federal government counts as spending and which represent revenue that would not be raised under the FairTax. H.R. 25 also calls for abolishing the IRS, since the states would administer the FairTax. The federal agency that would take responsibility for working with the states to coordinate FairTax collections would need far fewer resources than the IRS now needs. Therefore, we estimate that the federal government would be able to cut \$8

billion from the FY 2007 IRS budget of \$11.01 billion.³⁹ Those adjustments reduce the revenues replaced by the FairTax to \$2.228 trillion.

Table 6. Computation of the FairTax Rate

	2007
Revenues to be Replaced (billions)	
Gross Revenue to be Replaced	\$2,288
Less: Earned Income Tax Credit and Child Tax Credit	-\$52
Total Revenue To Be Replaced ($R1_{07}$)	\$2,236
IRS saving ($IRSS$)	-\$8
Adjusted Revenues to be Raised ($R1_{07} - IRSS$)	\$2,228
Adjusted Tax Base (Inclusive of Tax) Components	
Personal Consumption Adjusted for Administrative Fee ($0.9950C_{07}$)	\$9,189
State and Local Government Consumption Adjusted for Administrative Fee ($0.9960GS_{07}$)	\$1,089
Federal Government Consumption Adjusted for Administrative Fee ($0.9966G_{07}$)	\$913
Taxed Federal Government Transfers ($1.0132GN_{07}$)	\$276
Less: IRS Savings Adjustment ($0.0016IRSS$)	-\$0.01
Less: Prebate Base (B)	-\$2,112
Adjusted Tax Base (billions)	\$9,355
Therefore tax rate (t_i) is $2,228/9,355$, which equals	23.82%
Tax-Exclusive rate (t_e) is $2,228/(9,355-2,228)$, which equals	31.27%
Rates without the Prebate	
Tax-Inclusive Rate (t_i) is $2,228/11,244$, which equals	19.82%
Tax-Exclusive Rate (t_e) is $2,228/(11,244-2,228)$, which equals	24.71%
Rates Without Replacing Payroll Taxes (includes prebate)	
Tax-Inclusive Rate ($1,357/9,355$)	14.51%
Tax-Exclusive Rate ($1,357/9,355-1,357$)	16.97%

Note: Totals may not add due to rounding.

As set out in Table 6, the FairTax base needs some adjustments to match equation (26). We have to adjust personal, state, and local government and federal government consumptions by the deduction of the administrative credit fees. We must add the base for the reduction in GN . We reduce the base the net effect of the $IRSS$ in the administration credit. Finally, we must deduct the prebate base. We thus calculate the adjusted base to be \$9.355 trillion. To raise a revenue of \$2.228 trillion from a base of \$9.355 trillion, the rate that must be imposed is 23.82 percent in tax-inclusive terms, or 31.27 percent in tax-exclusive terms.

For comparisons purposes, in Table 6 we calculate two additional FairTax rates based on different assumptions. First, we calculate the rates without the prebate, allowing us to better compare the rate under the FairTax and under the current law. The tax-inclusive rate falls to 19.82 percent, which is close to the rate referenced in the introduction, and provides more evidence that our FairTax rate is accurate.

³⁹ BHI estimates the following IRS appropriations for fiscal 2007 could be cut: filing and account services (\$1,619 million), shared services support (\$1,504 million), compliance services (\$4,497 million), offsetting collections-reimbursables (\$183 million), existing user fees (\$100 million), and new user fees (\$135 million). See U.S. Department of Treasury, "Department of Treasury – Budget in Brief FY 2007," Internal Revenue Service, available at <http://www.irs.gov/pub/irs-news/fy07budgetinbrief.pdf>.

We also calculate the FairTax rate that would apply if it were not to replace payroll taxes – allowing us to make better comparisons between the FairTax and the other proposals, such as the flat tax and BTT, which do not call for the replacement of federal payroll taxes. As a result, we reduce the revenues replaced by the FairTax by the amount of revenues expected to be raised by the payroll tax in 2007, or \$871 billion, and therefore the FairTax would replace \$1.357 trillion in federal revenue. The tax-exclusive FairTax rate drops to 16.97 percent and the tax-inclusive FairTax rate would be 14.51 percent.

F. Federal Spending with a 23 Percent Rate

In the previous section, we showed that the FairTax rate required to keep existing federal government spending constant in real terms is 23.82 percent. However, H.R.25 calls for a rate of 23 percent. Although there is only a small difference between the two rates, it would be necessary for the federal government to undergo a reduction in real spending were the 23 percent rate to be implemented. Alternatively, the FairTax could enhance economic growth enough to increase the FairTax base by 3 percent, in which case 23 percent would be sufficient to avoid any spending reduction. (As previously explained, this report provides a purely static analysis that ignores the expansive effect that the FairTax could be expected to exert on economic activity as it eliminates the existing bias against saving. In practice, therefore, it would probably be possible to implement the FairTax at the 23 percent rate without any reduction in federal spending. In the absence of this expansive effect, however, some reduction in spending would be necessary.)

While this reduction is also necessarily small, there is a question of just how large a reduction would be required. The answer is in part political, inasmuch as every government program has some constituency that would resist even small budget cuts.

Here we estimate the percentage reduction in federal government spending that would be required under a 23 percent rate; all spending that would be in place under the FairTax, except for Social Security benefits, is available for reduction.

We must take into account a number of complexities that arise in making this calculation. First, we must recognize that the available pool of spending depends partly on the rate itself. Some spending (expenditures that fall under the categories of *GN*, *AC*, and *PRE*) would be different under a 23 percent rate than under a 23.82 percent rate. Second, we must recall that Social Security spending falls under the *TR* as well as the *GN* category. Social Security payments would make up 24.12 percent of *TR* and 47.96 percent of *GN* in 2007.

We define:

NSS_{FT} : The amount of non-Social Security spending that would be in place under the FairTax.

δ : The percentage of the non-Social Security spending (identified as NSS'_{FT}) under a 23 percent rate that would need to be cut.

We let:

$$(28) \quad NSS_{FT} = G_{FT} + .7588TR_{FT} + .5204GN_{FT} + AC_{FT} + PRE_{FT}.$$

Substituting this definition in equation (2):

$$(29) \quad R_{FT} + R2_{FT} + DEF_{FT} = NSS_{FT} + .2412TR_{FT} + .4796GN_{FT}.$$

From section II. E we know this equality will hold only when a rate of 23.82 percent is imposed. Note that R_{FT} , NSS_{FT} , and GN_{FT} are all a function of the tax-inclusive rate. Those values will be different when we impose a 23.82 percent rate than when we impose a 23 percent rate. Calling the values of these categories under a 23 percent rate R'_{FT} , NSS'_{FT} , and GN'_{FT} , respectively, the corresponding equation to (29) under a 23 percent rate is:

$$(30) \quad R'_{FT} + R2_{FT} + DEF_{FT} = (1 - \delta)NSS'_{FT} + .2412TR_{FT} + .4796GN'_{FT}.$$

In equation (30) we introduce δ because we know that the imposition of the 23 percent rate will bring in less revenue than would be needed, and we want to know what share of NSS'_{FT} that is. We now solve for δ :

$$(31) \quad \delta = 1 - \frac{R'_{FT} + R2_{FT} + DEF_{FT} - .2412TR_{FT} - .4796GN'_{FT}}{NSS'_{FT}}.$$

Using the appropriate values from Table 7 in equation (31):

$$(32) \quad \delta = 1 - \frac{2,586 + 147 + 476 - 403 - 100}{2,782} = .0273.$$

Table 7 shows the values of the different revenue and spending categories that would be in place under the FairTax with a rate of 23 percent. It also estimates the necessary spending cut to be \$76 billion, which is simply the difference between the spending that would be necessary with a 23 percent rate and the revenue that would actually be raised. The \$76 billion represents 2.73 percent of the non-Social Security spending that would be in place if no cut were needed with a 23 percent rate.

To put that “cut” in perspective, Table 8 displays non-Social Security spending from the CBO for calendar years 2003 to 2007.⁴⁰ The CBO expects that non-Social Security spending will increase by 3.1 percent, or \$76 billion, between calendar years 2006 and 2007. Therefore, the “cut” in that spending, necessary to implement a 23 percent FairTax rate, can be achieved by simply holding nominal non-Social Security spending at its 2006 level. Meanwhile, non-Social Security spending has increased by 23 percent, or \$395 billion, in the three year period from 2003 to 2006. Therefore, the “cut” in non-Social-Security spending required to implement the FairTax rate of 23 percent would actually almost represent a freeze in the growth rate of nominal spending at the 2006 level.

⁴⁰ See note 33, supra.

Table 7. Federal Revenue and Expenditure: The FairTax with a 23 Percent Rate

FairTax Revenue (R'_{FT}) = $0.23 \times \$11,244$	\$2,586
Other Federal Revenue ($R2_{FT}$)	\$147
Deficit (DEF_{FT})	\$476
Total Revenue (billions)	\$3,209
Government Purchases (G_{FT})	\$908
Non-Taxed Transfers (TR_{FT})	\$1,670
Social Security ($.2412 \times TR_{FT}$)	\$403
Non-Social Security ($.7588 \times TR_{FT}$)	\$1,268
Taxed Transfers (GN'_{FT})	\$209
Social Security ($.4796 \times GN'_{FT}$)	\$100
Non-Social Security ($.5204 \times GN'_{FT}$)	\$109
Administrative Credit (AC'_{FT})	\$12
Prebate (PRE'_{FT})	\$486
Total Spending (billions)	\$3,285
Total Social Security	\$503
Total Non-Social Security	\$2,782
Necessary Cut = $3,285 - 3,209$ (billions)	\$76
As % of Non-Social Security Spending	2.73%

Note: Some numbers may not add up due to rounding.

One critic of the FairTax has argued that it is unrealistic politically to design the FairTax base to include a portion of state and local government spending. According to that critic:

There are several reasons why state and local purchases may not end up in a national retail sales tax base. First, although including state and local government purchases reduces the required *federal tax rate*, it does not reduce the *overall burden* on taxpayers. After all, state and local government purchases (and the federal sales taxes that would have to be paid on them) are financed by state and local government taxes. The tax on state and local purchases may also raise constitutional issues. It would certainly be fiercely opposed by the states.⁴¹

That reasoning strongly implies that the FairTax simultaneously maintains the real value of federal government spending and of consumer spending, while reducing the real value of state and local government spending. After all, why else would the states “fiercely oppose” the FairTax? That this reasoning is muddled can be seen in the fact that the real value of state and local government spending cannot fall unless (1) the real value of federal government and consumer spending rises or (2) the FairTax brings about a fall in real national income. Because the author eliminates (1) as a possibility and because there is no reason to expect (2), there is clearly a slip in logic. As for constitutional issues, any burden imposed by the FairTax on state and local government would not differ materially from the burden already imposed under current law.

⁴¹ Gale (2005) p. 898.

Table 8. Non-Social Security Spending, 2003-2007

Description	Actual			Estimates	
	2003	2004	2005	2006	2007
Non-Social Security spending (billions)	\$1,717.6	\$1,839.5	\$1,989.9	\$2,112.5	\$2,177.5
Percent Increase	7.9%	7.1%	8.2%	6.2%	3.1%
2007 with \$76 billion cut					\$2,101.5

Source: U.S. Congress, CBO, "The Budget and Economic Outlook: Fiscal Years 2007 to 2016."

Note: Totals may not add due to rounding.

An important economic question must be addressed, however: Would the FairTax impose a burden on state and local government that would create a political or philosophical barrier to its adoption?

In approaching this question, we make three simplifying assumptions. The first is that the FairTax is adopted without monetary accommodation. This assumption should raise no objection inasmuch as we have already shown that the degree of monetary accommodation is irrelevant to the calculation of the FairTax rate or of the real burden that it imposes on consumer spending – which is to say, on federal government spending, state and local government spending, and individual spending.

As long as state and local governments raise the same revenue, in real dollars, under the FairTax as under current law, they will be able to maintain the real value of current spending. The question is whether that real revenue necessarily falls.

Second, as throughout this article, we assume a purely static world in which adoption of the FairTax has no effect on economic behavior. In particular, and contrary to what a dynamic analysis would show, there is no effect on saving.

The third assumption is that the federal government imposes only an income tax and that state and local governments impose both income and sales taxes. Taxpayers deduct state income taxes when computing their federal income tax liability. As usual, we use the "07" subscript to denote baseline values, which are the values if current law remains in effect, and the "FT" subscript to denote values under the FairTax. All variables are expressed in terms of constant dollars:

- ft*: The federal government statutory income tax rate.
- sst*: The state and local government sales tax rate (expressed as a tax-exclusive rate).
- sit*: The state and local government income tax rate.
- Y_{07} : Gross income.
- C_{07} : Personal consumption expenditures.
- G_{07} : Federal government purchases.
- GS_{07} : State and local government purchases.

In this simplified economy, we note that t_i , the FairTax inclusive rate, is equivalent to the effective federal income tax rate, so that $t_i = ft(1 - sit)$, reflecting the assumption that the state income tax is deductible from federal income tax. We adopt the balanced-budget equations for federal government and for state and local government. Then:

$$(33) \quad G_{07} = Y_{07}t_i.$$

Because after-tax income is fully devoted to gross consumption: $C_{07}(1 + sst) = Y_{07}(1 - t_i - sit)$,

which gives

$$(34) \quad C_{07} = Y_{07} \frac{1 - t_i - sit}{1 + sst},$$

$$(35) \quad GS_{07} = C_{07}sst + Y_{07}sit = Y_{07} \left[\frac{1 - t_i - sit}{1 + sst} sst + sit \right],$$

and

$$(36) \quad Y_{07} = C_{07} + G_{07} + GS_{07}.$$

We assume that the monetary authorities do not accommodate the adoption of the FairTax, which is to say that they restrain the growth of the money supply sufficiently to prevent market prices from rising. As mentioned, this is merely a simplifying assumption. We could just as well have allowed for monetary accommodation, so that there would be no fall in producer prices under the FairTax. Doing so, however, would merely have made the algebra more complicated without changing the results.

Under above-specified assumptions, national income (in both nominal and real terms) under the FairTax equals national income in 2007:

$$(37) \quad Y_{FT} = Y_{07}$$

and

$$(38) \quad C_{FT} + G_{FT} + GS_{FT} = C_{07} + G_{07} + GS_{07}.$$

The federal government sets the FairTax rate just high enough to maintain the real value of its expenditures under current law. Because we have shown that under our assumptions the tax base for the FairTax would be equal to total consumption under current law, that implies that the (tax-inclusive) FairTax rate would be t_i . Then federal government purchases are:

$$(39) \quad G_{FT} = Y_{FT}t_i = Y_{07}t_i = G_{07}.$$

Private consumers would receive lower (gross) wages under the FairTax because producer prices fall.⁴² Because there is no *R2* component in the example, the rate by which producer prices fall is t_i . Prices faced by private consumers are also affected, because the state and local sales tax is imposed on the reduced producer prices.⁴³ Here the after-tax income under the FairTax again equals gross consumption, so:

⁴² Again, it would not matter if we assumed monetary accommodation and if, as a result, producer prices remained constant. Then the real value of producer prices would fall because prices would rise.

⁴³ Note that in section II. E we did not include state and local sales taxes as components of the prices. The reasons for that are that the FairTax is not imposed on top of the state and local sales tax and that for the determination of the FairTax rate those taxes are not included in the base.

$$(40) \quad C_{FT} = \frac{Y_{07}(1-sit)(1-t_i)}{(1-t_i)(1+t_e+sst)},$$

which may be written as:

$$(41) \quad C_{FT} = \frac{Y_{07}(1-sit)}{1 + \frac{t_i}{1-t_i} + sst}$$

$$(42) \quad C_{FT} = Y_{07} \frac{(1-sit)}{\frac{1}{1-t_i} + sst}$$

or

$$(43) \quad C_{FT} = Y_{07} \frac{(1-sit)(1-t_i)}{1+sst(1-t_i)}.$$

State and local government purchases, then, are:

$$(44) \quad GS_{FT} = (C_{FT}sst + Y_{07}sit)(1-t_i).$$

The $(1-t_i)$ term adjusts for the fall in gross income and in producer prices, given the assumption of no monetary accommodation; with full monetary accommodation that term would drop out. Substituting equation (43) in (44), we can write:

$$(45) \quad GS_{FT} = Y_{07} \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} sst + sit \right] (1-t_i).$$

We now compare state and local government purchases under the FairTax with the same purchases under current law. Using equations (35) and (45):

$$(46) \quad \frac{GS_{FT}}{GS_{07}} = \frac{Y_{07} \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} sst + sit \right] (1-t_i)}{Y_{07} \left[\frac{1-t_i-sit}{1+sst} sst + sit \right]}$$

$$= \frac{\left[(sst - sst \times sit)(1-t_i) + sit + sit \times sst(1-t_i) \right] (1-t_i)}{1 + sst(1-t_i)}$$

$$= \frac{sst - sst \times t_i - sst \times sit + sit + sit \times sst}{1 + sst}$$

$$\begin{aligned}
& \frac{[sst(1-t_i) + sit](1-t_i)}{1 + sst(1-t_i)} \\
&= \frac{sst(1-t_i) + sit}{1 + sst} \\
&= \frac{(1 + sst)(1-t_i)}{1 + sst(1-t_i)} \\
&= \frac{1 + sst(1-t_i) - t_i}{1 + sst(1-t_i)}.
\end{aligned}$$

Further simplifying:

$$(47) \quad \frac{GS_{FT}}{GS_{07}} = 1 - \frac{t_i}{1 + sst(1-t_i)}.$$

In equation (47) we find that $\frac{GS_{FT}}{GS_{07}} < 1$, which implies that $GS_{FT} < GS_{07}$, and in turn implies that real state and local government spending would decrease under the FairTax, given that state and local government passively accommodates a transfer of purchasing power to consumers. Because $G_{FT} = G_{07}$, it follows from equation (38) that $C_{FT} > C_{07}$, which means that personal consumption increases. Assuming passive accommodation by state and local government, the decrease in real state and local government spending must be matched by an equal increase in real personal consumption:

$$(48) \quad C_{FT} - C_{07} = -(GS_{FT} - GS_{07}).$$

or

$$(49) \quad \Delta C = -\Delta GS.^{44}$$

Thus, although ΔGS is negative, it is matched exactly by ΔC , which is positive. Suppose, for example, that the federal income tax rate is 20 percent and that state and local government impose a 5 percent sales tax and a 5 percent income tax, so that $t_i = 0.19$ and $sst = 0.05$. Then the real value of state and local government spending will fall by 18.26 percent. If $GS_{07} = \$1$ trillion, and the fall in state and local government spending will equal \$182.6 billion, it is matched by an equal rise in consumer purchasing power. Note that purchasing power is fully transferred to state and local taxpayers from state and local government. In other words, state and local taxpayers would have received a \$182.6 billion tax cut.

To return to the question posed above, the FairTax does not necessarily impose a burden on state and local government. It would be up to state and local government, under the FairTax, to decide whether to permit the transfer identified here to take place or to recapture the lost revenue by raising tax rates or otherwise changing their tax laws. A partial solution would be to take the

⁴⁴ Appendix A provides a more detailed proof of that equality.

simple step of imposing state and local sales taxes on the FairTax-inclusive price of consumer goods.

At any rate, it is wrong to suggest that the FairTax is a kind of negative-sum game in which at least one constituency – in this case state and local government – has to lose. It should come as no surprise that a major restructuring of taxes at the federal level would require state and local government to make some accommodating restructuring of tax policy at that level as well. With that restructuring, all parties – federal, state, and local government, as well as individuals – would remain whole at the end of the day.

For the determination of the rate in section II. E we assume that either (1) state and local government accepts that loss in real revenue and the corresponding reduction in real spending while consumers increase their spending by ΔC or (2) state and local governments keep the real burden on their taxpayers unchanged by increasing effective tax rates sufficiently to recover the lost revenue and then use the revenue thus recaptured to maintain their real spending. Although it makes no difference to our results which assumption holds true, it also follows, as we have shown, that implementation of the FairTax does not necessarily impose a burden on state and local government. Only if state and local governments passively accept a real transfer from their coffers to those of their taxpayers is there a burden.

G. Vertical Equity and Horizontal Equity

In presenting the results of incidence analysis, it is customary to classify the population into tenths (“deciles”), from lowest to highest. But this raises an important question of how to best measure affluence. As a number of economists have rightly pointed out, annual income may be a poor indicator of ability to pay.⁴⁵ Ideally we would like to measure an individual’s “permanent income,” which reflects lifetime income. In practice this is unrealistic, since we need a more immediate measure and cannot wait for years to determine whether someone is truly poor or not. So in practice the issue reduces to the question of whether households should be classified based on expenditure per capita or on income per capita.⁴⁶

The practice in most developed countries is to classify households by income per capita. This appears to be because income is easier to measure in societies where most activity is in the formal sector and where few people are self-employed. Also, in such countries information on income is readily available.

However, one can safely say that the use of income per capita overstates tax regressivity. This is because a significant fraction of those in the lowest income deciles are there only because they are temporarily poor – the result of a bad harvest, a layoff, going to college – and their current income does not properly reflect their “permanent” income.

Thus, there is a strong case for constructing deciles using expenditure per capita. To the extent that households are willing and able to smooth their consumption stream, this should serve as a better proxy for permanent income. The use of expenditure deciles typically gives more

⁴⁵ Metcalf (December 1997).

⁴⁶ There are other possibilities; for instance, one could sort households by expenditure per adult equivalent, putting more weight on adults than children. However, in practice the most important decision is about whether to use expenditure or income.

reasonable results in the lowest decile: When income is used, many of the households in the bottom decile report zero or negative income, which is clearly not a sustainable situation.

It is possible that the use of expenditure-per-capita deciles leads to an overadjustment and so may understate tax regressivity. Gilbert Metcalf makes this argument based on his efforts to measure permanent income using longitudinal data from the United States. He finds that households do not appear to be able, or willing, to smooth their expenditure streams so completely that they fully reflect permanent income. Thus, annual expenditure is a noisy proxy for permanent income and annual expenditure, like annual income, is an imperfect means of measuring progressivity.⁴⁷

Assuming that consumption is a better measure of ability to pay, taxing consumption satisfies the vertical equity measure of tax fairness. The tax burden on a consumer who spends \$60,000 annually will be approximately twice that of a consumer who spends \$30,000 annually. In this sense, a consumption tax cannot be viewed as a regressive tax.

H. Distributional Effects

In order to measure the progressivity of the different tax reform proposals and the current system, we first need to construct a data set that includes information for a sample of households on both expenditure and income. The next step is to construct variables that mirror the incidence of taxes on each household in the sample and to allocate the tax burden to each household.⁴⁸

Table 9 displays the average tax rates for individuals sorted into specific income deciles, taken from a database constructed using 2001 data from the IRS, the Current Population Survey (CPS) of the U.S. Census Bureau, and the Current Expenditure Survey from the U.S. Bureau of Labor Statistics. The tax liability for each individual was determined by applying a tax-inclusive rate to the taxable expenditures that will raise the same revenue as the current federal tax system and will fund the prebate. The average tax rate for each income and expenditure group was determined by dividing the average tax liability, net of the prebate, by average income and expenditures.⁴⁹

When our data set is sorted into income deciles, the FairTax appears regressive, as the tax burden is a higher percentage of income for those individuals in the lower deciles and a lower percentage of the income of those in the higher income deciles. This situation results because income fails to capture the true lifetime earnings of individuals that find themselves temporarily in each income group discussed in section II. G above, which is clearly evident by the discrepancy between income and expenditures experienced at the bottom of the income scale. Individuals are spending above their incomes in the first five income categories, as individuals in these groups are in the process of acquiring housing, cars, and other large purchases in anticipation of higher incomes in the future. Other individuals, namely sole proprietors, partners in partnerships, members of limited liability companies, owners of S corporations and contract workers, have very erratic and unpredictable income patterns which can result in negative incomes over the course of a year. Both situations push average income levels down at the lower end of the scale, especially the bottom three income deciles in Table 9.

⁴⁷ Metcalf (December 1997).

⁴⁸ For a detailed description of the process of our methodology see Tuerck, et al. (2006a).

⁴⁹ Note that we use a 2001 database, the latest available at the time, and the FairTax inclusive rate is 25.2 percent.

**Table 9. Average Tax-Inclusive Rates by Income Groups for the FairTax
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Income Per Capita Deciles	Average Annual Income	Average Annual Expenditure	FairTax Paid	Prebate	Net Tax Liability	By Annual Income	By Annual Expenditures
1 (lowest)	\$2,692	\$24,516	\$7,420	\$1,407	\$6,012	223%	25%
2	\$9,648	\$14,909	\$4,202	\$1,299	\$2,903	30%	19%
3	\$13,003	\$17,561	\$4,819	\$1,485	\$3,334	26%	19%
4	\$16,301	\$18,859	\$4,996	\$1,440	\$3,556	22%	19%
5	\$19,794	\$21,215	\$5,511	\$1,481	\$4,030	20%	19%
6	\$24,212	\$23,900	\$6,091	\$1,569	\$4,522	19%	19%
7	\$29,788	\$27,353	\$6,811	\$1,551	\$5,260	18%	19%
8	\$37,223	\$33,904	\$8,448	\$1,506	\$6,943	19%	20%
9	\$49,996	\$41,364	\$9,954	\$1,532	\$8,423	17%	20%
10 (highest)	\$124,153	\$85,455	\$18,000	\$1,545	\$16,455	13%	19%
Average	\$32,681	\$30,904	\$7,625	\$1,481	\$6,144	19%	20%

Note: Totals may not add due to rounding.

Table 10 shows the distributional results when individuals within the same data set are sorted into deciles based on expenditure as opposed to income. The FairTax proves to be solidly *progressive* when measured against average expenditures and income. Taxpayers in the lowest expenditure bracket would experience a negative average tax rate, and those in the highest would pay 25 percent of their annual expenditures in FairTax. Taxpayers at the lower end of the income scale would pay a lower FairTax compared to taxpayers with a higher income – ranging from an average of minus 1 percent in the lowest decile to 25 percent in the highest.

**Table 10. Average Tax-Inclusive Rates by Expenditure Groups for the FairTax
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Expenditure Per Capita Deciles	Average Annual Income	Average Annual Expenditure	FairTax Paid	Prebate	Net Tax Liability	By Annual Income	By Annual Expenditures
1 (lowest)	\$13,002	\$6,127	\$1,153	\$1,234	\$-80	-1%	-1%
2	\$18,887	\$9,799	\$1,973	\$1,401	\$571	3%	6%
3	\$20,768	\$12,434	\$2,665	\$1,436	\$1,229	6%	10%
4	\$23,389	\$15,322	\$3,394	\$1,464	\$1,930	8%	13%
5	\$27,097	\$18,706	\$4,229	\$1,487	\$2,742	10%	15%
6	\$28,987	\$22,618	\$5,307	\$1,505	\$3,802	13%	17%
7	\$31,236	\$27,497	\$6,683	\$1,505	\$5,178	17%	19%
8	\$36,322	\$34,930	\$8,620	\$1,552	\$7,069	19%	20%
9	\$43,450	\$47,435	\$12,157	\$1,587	\$10,569	24%	22%
10 (highest)	\$83,672	\$114,180	\$30,074	\$1,644	\$28,430	34%	25%
Average	\$32,681	\$30,905	\$7,626	\$1,482	\$6,144	19%	20%

Note: Totals may not add due to rounding.

Our distributional analysis confirms that the FairTax is progressive when measured by expenditure class or lifetime income and regressive when measured by temporary income, as one would expect.

III. The Current Federal Tax System

A. Introduction

The federal government's principal source of revenue is the individual income tax, accounting for 43 percent of total tax revenue in 2004. Growing in importance, though, are payroll taxes, as Table 11 shows. These taxes have grown from 15.9 percent of total tax revenue in 1960 to 39 percent in 2004. The remaining 18 percent of tax revenue is comprised of corporate income taxes (10 percent), excise taxes (3.7 percent), and an assortment of other taxes (customs duties, estate and gift taxes, and so on). By 2007, the income tax is expected to rise to 45 percent, while corporate income and payroll taxes drop slightly.⁵⁰

The current income tax system is a relatively new phenomenon. Although employed briefly during the Civil War, the income tax did not become a permanent fixture in the tax system until the 16th Amendment to the U.S. Constitution was adopted in 1913. Prior to this, customs duties were the major source of revenue for the federal government. When adopted in 1913, the income tax exempted the first \$3,000 for a single person and \$4,000 for a married person (\$59,212 and \$78,949 in 2005 dollars). Income above this exemption up to \$20,000 (\$394,746 in 2005 dollars) was taxed at one percent. Income above \$20,000 was taxed at increasing rates but was capped at 7 percent on income in excess of \$500,000 (\$9,869,000 in 2005 dollars). Income and payroll taxes have since come to take a far larger share of income. Table 11 illustrates recent trends in the size and distribution of major federal taxes.⁵¹

Table 11. Major Sources of Revenue as a Percent of Total Revenues

Fiscal Year	Total Federal Tax Revenue (% of GDP)	Individual Income Taxes	Corporate Income Taxes	Social Security and Medicare Taxes	Excise Taxes	Other Taxes
1960	17.8	44.0	23.2	15.9	12.6	4.2
1965	17.0	41.8	21.8	19.0	12.5	4.9
1970	19.0	46.9	17.0	23.0	8.1	4.9
1975	17.9	43.9	14.6	30.3	5.9	5.4
1980	18.9	47.2	12.5	30.5	4.7	5.1
1985	17.7	45.6	8.4	36.1	4.9	5.1
1990	18.0	45.2	9.1	36.8	3.4	5.4
1995	18.5	43.7	11.6	35.8	4.3	4.6
2000	20.8	49.6	10.2	32.2	3.4	4.5
2004	16.3	43.0	10.1	39.0	3.7	4.2
2005	17.5	43.0	12.9	36.9	3.4	3.8
2006	17.5	43.6	12.1	36.8	3.2	4.2
2007	17.6	45.4	10.8	36.6	3.1	4.1

⁵⁰ Assuming that federal tax cuts enacted in 2001 and 2003 are made permanent by subsequent legislation.

⁵¹ Office of Management and Budget, "Budget of the United States Government," Fiscal Year 2007, Historical Tables, U.S. Government Printing Office (Washington D.C.: February 26, 2006) 32, Internet; available at <http://www.gpoaccess.gov/usbudget/index.html>.

B. The Current Tax Base

The current federal income tax base can be derived from taxable and nontaxable components of net national income.⁵² The individual income tax base is composed of wages and salaries; business and farm income; taxable interest; corporate dividends paid to individuals; realized net capital gains; income from rent, royalties, and estates; and taxable benefits (pensions, annuities, and so on). The gross personal income tax is reduced by adjustments (reimbursed employee business expenses, contributions to special retirement plans, penalties for early withdrawal of savings, and alimony payments), yielding adjusted gross income. Taxable income is equal to adjusted gross income less standard or itemized deductions and personal and dependent exemptions. In 2004, total taxable personal income in the United States was \$4,670 billion according to recent IRS data.⁵³ See Table 12 for computation of the tax base for 2007.

The corporate income tax base is gross revenue minus costs, or profits. Gross revenue includes receipts from sales and net capital gains on assets. From this gross revenue, labor costs, interest payments, payments for materials and services purchased, and depreciation of capital equipment are subtracted. This will provide a measure of taxable corporate income. Payroll taxes represent a growing share of federal taxes. If one includes the employee and employer share of the payroll tax (which, many economists agree, are both borne by workers), 77 percent of households paid more in payroll taxes than in income taxes in 2000. Even if one only considers the employee portion of the payroll tax, 41 percent of households paid more in payroll taxes than in income taxes.⁵⁴

The remaining components of the current federal tax base are relatively small in magnitude. Excise taxes, levied on certain types of consumption, accounted for less than 4 percent of revenue in 2007. Likewise, estate and gift taxes, levied on the transfer of wealth and almost exclusively on the top 20 percent of earners, accounted for less than 3 percent of federal tax revenue.

⁵² In breaking down the individual components of the income tax base, we follow the methodology derived in Sabelhaus, John, "Comparing Income and Consumption Tax Bases," CBO Paper, July 1997.

⁵³ Internal Revenue Service, Statistics of Income, Table 1.2--2003, "Individual Income Tax, All Returns: Adjusted Gross Income, Exemptions, Deductions, and Tax Items, by Size of Adjusted Gross Income and by Marital Status," available at <http://www.irs.gov/taxstats/indtaxstats/article/0,,id=96981.00.html>.

⁵⁴ For a more complete discussion see <http://www.taxpolicycenter.org/TaxFacts/TFDB/TFTemplate.cfm?Docid=230&Topic2id=50>.

Table 12. Computation of the Tax Base for the Current Federal System (\$ billions)		
Line	Taxable Items	2007
1	Net National Income	12,224
	Wage and Salary Disbursements	
2	Cash Wages (excluding contributions to pension and social insurance funds)	5,776
	Corporate Profits	
3	Profits Before Taxes (less dividends paid to households)	698
4	Corporate Dividends Paid to Households	563
	Non-Corporate Business Income	
5	Proprietors' Income with IVA and Capital Consumption Adjusted	1,058
6	Rental Income of Persons with Capital Consumption Adjusted	53
	Net Interest Paid by Business	
7	Less: Net Interest Paid by Business to Households	-16
	Other Sources of Income Subject to Taxation	
8	Private Pension Benefits	450
9	Taxable IRA Distributions	110
10	Social Security Benefits	107
11	Unemployment Insurance Benefits	48
12	State and Local Refunds	25
13	Taxable Interest Income	136
14	Realized Capital Gains	564
15	Subtotal, Gross Current Income Tax Base	9,572
	Personal Income Tax Deductions and Exemptions	
16	Standard	634
17	Itemized	1,412
18	Personal Exemptions	921
19	Less: Unused Deductions and Exemptions	-293
20	Less: Total Exemptions and Deductions	-2,673
21	Taxable Personal Income (9570-698-2673=6198)	6,201
22	As a % of National Income	51%
24	Taxable Corporate Income	698
25	As a % of National Income	6%
26	Net Personal and Corporate Income Tax Base	6,899
	Estate and Gift Tax	
27	Gross Estate for Tax Purposes	229
28	Total Allowable Deductions	104
29	Taxable Estate	126
30	Taxable Gifts	8
31	Net Estate and Gift Tax Base	134
	Payroll Tax	
32	Private Wages and Salaries (adjusted for Social Security cap)	4,157
33	Government Salaries and Wages	593
34	Contributions to Employee Pension Funds	990
35	Proprietors' Income	1,034
36	Net Payroll Tax Base	6,774

Note: Totals may not add due to rounding.

C. The Current Tax Rates

The burden of the current federal tax system is often shown as the ratio of total tax liability to some measure of income. For instance, the CBO uses a broad measure of income including wages, salaries, business income, rents, interest, dividends, and cash pension benefits. Such a broad measure of income will understate the effective tax rate. In Table 13, we present average effective tax rates for the major federal taxes that would be repealed under the FairTax plan and the total effective tax rate for all four taxes.

The base of \$7.033 trillion under the current tax law does not include the payroll tax base because it is included in the personal income tax base. We adjusted the corporate tax base to strip out dividends that are also taxed twice and otherwise would overstate the base. The combined tax rate for income taxes, payroll taxes, and estate and gift taxes is 32.55 percent compared to the revenue-neutral FairTax rate of 23.82 percent (using tax-inclusive rates).

Table 13. Computation of 2007 Tax Rates for the Current Tax System

Tax	Personal and Corporate Income Tax	Payroll Tax	Estate and Gift Tax	Current System Total Taxes
Tax Revenue (billions)	\$1,391	\$871	\$26	\$2,288
Net Tax Base (billions)	\$6,899	\$6,774	\$134	\$7,033
Tax Rate				
Tax-Inclusive Rate	20.16%	12.86%	19.40%	32.53%
Tax-Exclusive Rate	25.25%	14.76%	24.07%	48.22%

Note: Totals may not add due to rounding.

D. Distributional Effects

Tables 14 and 15 display the average tax rates for households, within specific income and expenditure deciles, from the same data set used to analyze the FairTax in section II. F. The taxes included in the analysis are corporate income taxes, payroll taxes, and estate and gift taxes.

When sorted by income, the current system displays progressiveness; taxing 10 percent of the income of those in the second decile – ignoring those in the first decile for reasons stated in section II. H above – and a high of 23 percent of the income of those in the tenth decile. The current system shows to be very progressive when measured against average annual expenditures, our proxy for permanent income. Taxpayers in the lowest expenditure decile experience a 4 percent average tax-inclusive rate and those in the highest pay 34 percent of their annual expenditures in taxes.

**Table 14. Average Tax-Inclusive Rates by Income Groups for the Current Tax System
(Including Income, Payroll, and Estate and Gift Taxes)**

Income Per Capita Deciles (By Persons)	Average Annual Income	Average Annual Expenditure	Tax Liability	Rate By Annual Income	Rate By Annual Expenditures
1 (lowest)	\$1,285	\$23,108	\$819	64%	4%
2	\$8,349	\$13,611	\$841	10%	6%
3	\$11,518	\$16,076	\$1,360	12%	8%
4	\$14,861	\$17,419	\$2,087	14%	12%
5	\$18,313	\$19,734	\$2,713	15%	14%
6	\$22,643	\$22,331	\$3,630	16%	16%
7	\$28,237	\$25,802	\$4,919	17%	19%
8	\$35,717	\$32,399	\$6,677	19%	21%
9	\$48,465	\$39,832	\$9,676	20%	24%
10 (highest)	\$122,608	\$83,909	\$28,717	23%	34%
Average	\$31,200	\$29,422	\$6,144	20%	21%

Note: Totals may not add due to rounding.

Table 15 displays the average tax rates for households sorted into expenditure deciles. The current system also displays progressivity, taxing 12 percent of the income of those in the first decile and a high of 24 percent of the income of those in the tenth decile. However, when measured by annual expenditures the current system shows to be regressive as taxpayers in the lowest three deciles face tax-inclusive rates that are generally higher than taxpayers in the highest three deciles. Individuals that fall into the first two deciles pay 30 percent of their expenditures, while those in the last two pay 19 percent and 18 percent.

**Table 15. Average Tax Rates by Expenditure Groups for the Current Tax System
(Including Income, Payroll, and Estate and Gifts Taxes)**

Expenditure Per Capita Deciles (By Persons)	Average Annual Income	Average Annual Expenditure	Tax Liability	By Annual Income	By Annual Expenditures
1 (lowest)	\$11,768	\$4,893	\$1,456	12%	30%
2	\$17,486	\$8,397	\$2,497	14%	30%
3	\$19,333	\$10,998	\$3,013	16%	27%
4	\$21,925	\$13,858	\$3,674	17%	27%
5	\$25,610	\$17,219	\$4,494	18%	26%
6	\$27,481	\$21,113	\$5,086	19%	24%
7	\$29,731	\$25,992	\$5,670	19%	22%
8	\$34,770	\$33,378	\$6,974	20%	21%
9	\$41,862	\$45,847	\$8,692	21%	19%
10 (highest)	\$82,028	\$112,536	\$19,884	24%	18%
Average	\$31,200	\$29,423	\$6,144	20%	21%

Note: Totals may not add due to rounding.

The current tax system proves progressive when measured by current income. However, when individuals are sorted by expenditure, or lifetime income, the current tax system proves to be less progressive.

IV. The Hall-Rabushka Flat Tax

A. Introduction

The term “flat tax” refers to a system of taxation containing a single tax rate uniformly applied to all taxpayers. Stanford University economists Robert E. Hall and Alvin Rabushka proposed their version of such a tax in their 1985 book, *The Flat Tax*. In what follows, we stay close to the tax model that they proposed.⁵⁵

The Hall-Rabushka flat tax (the “flat tax”) is a subtraction method, value-added tax (VAT) on consumption. The flat tax plan would apply a single 19 percent tax rate on the value added by both labor and capital to the production process. The flat tax would tax each contribution at its source: Individuals would pay taxes on labor value added measured in wages, salary, and pension income through the familiar payroll withholding system that operates today. Taxpayers would still be required to file an annual tax form, yet in a much-abbreviated version; the size of a postcard, according to the authors.⁵⁶ Meanwhile, businesses would pay the tax on the value-added contribution of capital and business owners would pay their taxes by filing their own equally brief tax form.

The flat tax indirectly targets consumption as the source of its revenues via its treatment of business investment. Under the flat tax, all business investment expenditures for capital equipment and buildings are subject to an immediate 100 percent deduction from taxes in the year of purchase. By relieving investment expenditures from taxation, the flat tax provides an incentive to save and invest and discourages consumption spending, thus indirectly placing the burden of taxation on income that is spent for consumption rather than on savings and investment.

B. The Flat Tax Base

Since the flat tax is levied on the income of individuals and businesses, our analysis of the base naturally follows along the same split and is displayed in Table 16.

The individual components of the tax base consist of all cash compensation paid by an employer or received by an employee, including wages, salary, pensions, bonuses, prizes, and awards for work completed inside the United States.⁵⁷ In 2007, workers in the United States are projected to receive \$6.870 trillion of income in wages, salaries, and pensions. However, the flat tax allows taxpayers to deduct a large personal allowance from their income before calculating their tax burden, with the amount depending on their marital status and the number of dependents living in their household. Using the Hall-Rabushka figures for 1995, and adjusting for inflation using the Consumer Price Index, we calculate the total aggregate personal deduction as \$2.904 trillion

⁵⁵ Hall and Rabushka (1995). In the 109th Congress H.R. 1040, S. 812, and S. 1099 are all versions of a Hall-Rabushka flat tax.

⁵⁶ *Ibid.*, p. 41.

⁵⁷ *Ibid.*, p. 41.

for 2007.⁵⁸ The difference between the total for wages, salaries, pension income, and government employee fringe benefits (\$6.870 trillion) and the total for the “standard deduction” (\$2.904 trillion) yields a total individual tax base of \$3.966 trillion for 2007.

The base calculation for the business income component of the flat tax involves a few more steps. The business portion of the flat tax allows owners to deduct their costs of doing business, including their purchases of goods and services used in the production process; wages, salaries, and pensions paid to workers (already taxed at the individual level); and investment in capital equipment and buildings used in the production process.⁵⁹ Also, indirect business taxes, consisting mostly of sales and excise taxes, are deducted from the base to avoid cascading. Table 16 shows the detailed calculation of the business tax base.⁶⁰

Employer-provided fringe benefits are also subject to taxation under the flat tax, including those paid to employees at nonprofit organizations and governments. Businesses pay tax on the fringe benefits supplied to their employees because, unlike the current tax system, they cannot deduct the cost of providing benefits from their income tax. Governments and nonprofit institutions return no income to their owners and, as a result, pay no income tax. However, the fringe benefits they provide to their employees represent taxable compensation under the flat tax. Governments and nonprofit institutions must file business tax forms to pay the flat tax due on their fringe benefits. We therefore add these (\$479 billion) to the business tax base.

The flat tax base needs a few final adjustments. First, purchases of new homes are counted as investment in the NIPA accounts, and since we subtract private investment from the base, we need to add the purchase of new homes back in. Finally, as outlined in the calculation of the flat tax, we deduct from the base government spending for services on which it will not pay the flat tax, but on which the recipient does pay income tax under current law. See section II. E for a full explanation. Now we are ready to total the flat tax base.

The computations outlined above produce a 2007 business tax base of \$3.291 trillion dollars which, combined with the individual tax base of \$3.966 trillion and untaxed government spending of \$276 billion, produces a total flat tax base of \$7.533 trillion. The tax base provides half the information necessary to compute the appropriate rate for the flat tax, the other being the amount of tax revenue to be replaced by the flat tax.

⁵⁸ Reference used for the Consumer Price Index is from U.S. Bureau of Labor Statistics, Consumer Price Index 2004; available from <http://www.bls.gov/cpi/home.htm>.

⁵⁹ NIPA Table 5.3.5, “Private Fixed Investment.” Line 1 includes the construction of single-family housing structures (\$377.6 billion in 2004), which are not part of the production process and are subtracted from total fixed private investment.

⁶⁰ Business inventories would also be deducted under the flat tax. While the year-on-year change in business inventories is relatively small – \$55 billion in 2004 – the total stock of business inventories, at \$1.712 trillion at the end of 2004, poses a significant problem for the implementation of the flat tax. If all business inventories were allowed to be deducted from the business side of the flat tax base, the base would be reduced significantly, to \$841 billion in 2004. This would cause a tremendous loss of tax revenue in the first year of implementation. The flat tax could be implemented in the first year, allowing only new business inventories to be deductible or only 10 percent of business inventories to be deductible. We have only included the change in private inventories in the base calculation for both the flat tax and BTT.

Table 16. Flat Tax Base*

Line	Description of Taxable Item	2007	Source
	Business Tax Base		
1	Gross Business Value Added	10,779	NIPA Table 1.35, line 2
2	Less: Indirect Business Taxes	-1,009	NIPA Table 1.10, line 9
3	Less: Wages and Salaries	-4,840	NIPA Table 1.13 lines 5, 12, 21, 30
4	Less: Pension Contributions	-236	NIPA Table 7.8, line 11
5	Less: Business Investment	-2,331	NIPA Table 5.3.5, line 1
6	Less: Change in Private Inventories	-21	NIPA Table 5.6.5B, line 1
7	Plus: Single-Family Structures	470	NIPA Table 5.3.5, line 20
8	Fringe Benefits (Government and Non-Profit)	479	NIPA Table 1.13 lines 39, 46, 53, 59
9	Total Business Tax Base (\$billions)	3,291	
	Individual Tax Base		
	Private Business	4,840	
	Government	1,006	
	Non-Profit and Households	544	
10	Total Wages and Salaries	6,390	NIPA Table 1.12, lines 4, 5
11	Plus: Pensions	480	IRS, SOI Table 1
12	Subtotal	6,870	
13	Less: Standard Deduction	-2,904	*See Note
14	Total Individual Tax Base (\$ billions)	3,966	
15	Plus: Untaxed Federal Government Spending	276	NIPA Table 3.2, line 28 (57.23%), IRS, SOI Table 1.4
16	Total Net Tax Base (\$ billions)	7,533	

*From Robert E. Hall and Alvin Rabushka, *The Flat Tax* (Second Edition: 1995). Using the authors' base calculation, we inflate their calculation with CBO projections of CPI for 2007.
Note: Totals may not add due to rounding.

C. The Flat Tax Rates

The authors of the flat tax call for the replacement of the federal taxes on personal and corporate income and the gift and estate taxes while leaving the payroll tax, excises, and other sources of federal government revenue intact.⁶¹ However, the FairTax plan calls for the replacement of federal payroll taxes as well. We therefore calculate two flat tax rates: One that includes federal payroll taxes in the total taxes to be replaced and one that does not. The revenues generated by these taxes are projected by the CBO to total \$2.236 trillion for the federal year of 2007, the total amount of revenue the flat tax would need to replace.

The calculation of the flat tax rate takes two forms: A tax-exclusive and a tax-inclusive rate. As explained in section II. D, the tax-exclusive rate is simply the ratio of tax revenues to the tax base, while the tax-inclusive rate is the ratio of tax revenues to the tax base plus the revenues. Table 17 shows that, in 2007, the tax-inclusive rate would be 29.68 percent, and the tax-exclusive rate for the flat tax would be 42.21 percent. As stated above, the flat tax does not call for the replacement of federal payroll taxes. If we calculate the rate, assuming the flat tax does not replace payroll taxes, then the tax-inclusive rate is 18.12 percent and the tax-exclusive rate is 22.13 percent. These rates prove consistent with those called for by Hall and Rabushka.

⁶¹ Forbes (2005) p. 34.

Table 17. Proposed Revenue-Neutral Flat Tax Rate	
Revenues to be Replaced (billions)	2007
Personal Current Taxes	\$1,101
Less: Earned Income Tax Credit and Child Tax Credit	-\$52
Corporate Income Tax	\$290
Estate and Gift Tax	\$26
Payroll Taxes	\$871
Total Revenue (billions)	\$2,236
Gross Tax Base (billions)	\$10,437
Less: Total Standard Deduction	\$2,904
Net Tax Base (billions)	\$7,533
Revenue-Neutral Rate Calculation (included payroll taxes)	
Tax-Inclusive Rate (2,236 / 7,533)	29.68%
Tax-Exclusive Rate (2,236 / 7,533 – 2,228)	42.21%
Rates Without Replacing the Payroll Taxes	
Total Revenue Excluding Payroll Taxes (billions)	\$1,365
Tax-Inclusive Rate (1,365 / 7,533)	18.12%
Tax-Exclusive Rate (1,365 / 7,533 – 1,365)	22.13%
<i>Note: Totals may not add due to rounding.</i>	

D. Distributional Effects

Tables 18 and 19 show the average tax rates for households within specific income and expenditure deciles.

When we sort the data set by income deciles, the flat tax appears regressive, as the tax burden takes a higher percentage of income of those individuals in the lower income deciles and a lower percentage of the income of those in the top deciles. The results are displayed in Table 18.

For example, those in the second decile pay a tax-inclusive rate of 28 percent measured by income compared to a rate of 14 percent for those in the highest decile. Like the FairTax, we ignore those in the lowest decile for the reasons outlined in section II. H above. The flat tax proves to be more progressive on an expenditure basis, when sorted by income deciles. Taxpayers in the second decile pay an 18 percent rate, while those in the highest decile face a tax-inclusive rate of 20 percent measured by expenditure.

**Table 18. Average Tax Rates by Income Groups for the Flat Tax
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Income Per Capita Deciles	Average Annual Income	Average Annual Expenditure	Flat Tax Paid	Standard Deduction	Tax Liability	By Annual Income	By Annual Expenditures
1 (lowest)	\$3,045	\$24,868	\$7,781	\$1,760	\$6,021	198%	24%
2	\$9,973	\$15,235	\$4,407	\$1,624	\$2,783	28%	18%
3	\$13,375	\$17,933	\$5,054	\$1,858	\$3,196	24%	18%
4	\$16,662	\$19,219	\$5,239	\$1,801	\$3,439	21%	18%
5	\$20,165	\$21,586	\$5,780	\$1,852	\$3,928	19%	18%
6	\$24,605	\$24,293	\$6,387	\$1,962	\$4,425	18%	18%
7	\$30,177	\$27,742	\$7,143	\$1,940	\$5,203	17%	19%
8	\$37,600	\$34,282	\$8,860	\$1,883	\$6,977	19%	20%
9	\$50,380	\$41,747	\$10,439	\$1,915	\$8,523	17%	20%
10 (highest)	\$124,541	\$85,842	\$18,876	\$1,932	\$16,944	14%	20%
Average	\$33,052	\$31,275	\$7,996	\$1,853	\$6,144	19%	20%

Note: Totals may not add due to rounding.

The flat tax displays distributional characteristics similar to the FairTax; when taxpayers are sorted by expenditure the tax demonstrates progressiveness and when sorted by income the flat tax shows regressive characteristics.

Table 19 shows the distributional results when individuals within our data set are sorted into deciles based on expenditure. The flat tax is shown to be solidly *progressive* when measured against average expenditures and income. Taxpayers in the lowest expenditure decile would experience a negative average tax rate, owing to the large standard deduction proscribed by Hall and Rabushka; those in the highest decile would pay 26 percent of their annual expenditures under the flat tax. Taxpayers at the bottom of the income scale also pay a negative flat tax, and those in the bottom deciles pay lower tax rates compared to taxpayers with higher incomes – ranging from an average of 2 percent in the bottom decile to 35 percent at the top.

The distributional burden of the flat tax demonstrates that it is progressive when measured by expenditure class or lifetime income and regressive when measured by temporary income.

**Table 19. Average Tax-Inclusive Rates by Expenditure Groups for the Flat Tax
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Expenditure Per Capita Deciles	Average Income	Average Annual Expenditure	Flat Tax Paid	Standard Deduction	Net Tax Liability	By Annual Income	By Annual Expenditure
1 (lowest)	\$13,311	\$6,436	\$1,210	\$1,543	\$-333	-3%	-5%
2	\$19,238	\$10,150	\$2,069	\$1,753	\$316	2%	3%
3	\$21,128	\$12,793	\$2,795	\$1,795	\$999	5%	8%
4	\$23,756	\$15,689	\$3,560	\$1,831	\$1,729	7%	11%
5	\$27,470	\$19,079	\$4,435	\$1,860	\$2,576	9%	13%
6	\$29,364	\$22,995	\$5,566	\$1,882	\$3,684	13%	16%
7	\$31,613	\$27,874	\$7,008	\$1,882	\$5,126	16%	18%
8	\$36,711	\$35,319	\$9,040	\$1,941	\$7,099	19%	20%
9	\$43,847	\$47,832	\$12,748	\$1,985	\$10,763	25%	23%
10 (highest)	\$84,084	\$114,592	\$31,538	\$2,056	\$29,482	35%	26%
Average	\$33,052	\$31,276	\$7,997	\$1,853	\$6,144	19%	20%

Note: Totals may not add due to rounding.

V. The Business Transfer Tax

A. Introduction

The business transfer tax (BTT) is another form of a consumption tax that uses the subtraction method VAT. Like an indirect or sales tax, a pure VAT is levied at the business level only, and individuals pay the tax as a portion of the sale price on their purchase of products or services.⁶² The BTT as outlined in S. 1921 filed by Senator Jim DeMint serves as the basis for the base and rate estimates in this section.

The BTT requires business owners to subtract the total of all their purchases from other businesses from total net sales and receipts including capital expenditures; the tax is levied on the difference. The destination principle BTT aims to improve the international competitiveness of domestic producers by taxing all imports of goods and services while exempting exports.⁶³

The BTT taxes government through two avenues. Like the purchases made by individuals, the tax is included in the price of goods and services that government purchases from private business – items such as pencils and aircraft. In addition, the BTT taxes the total compensation (wages, salaries, and benefits) of government employees. The taxation of government employees' compensation and government purchases places the provision of public services on the same level as the provision of private goods and services.

⁶² S. 1921 filed by Senator DeMint is a combination 8.4 percent national sales tax plus an 8.4 percent business transfer tax.

⁶³ The Michigan Single Business Tax is the only subtraction method VAT currently employed in the United States, though it will be phased out by 2009. See Michigan Single Business Tax, Detroit Regional Chamber of Commerce, available at http://www.detroitchamber.com/public_affairs/index.asp?cid=4&scid=&rcid=498.

B. The BTT Base

The calculation of the BTT base follows a similar process to that used to compute the flat tax base. In a pure form of the BTT, businesses deduct their costs of doing business, including their purchases of goods and services and their investment in capital equipment and buildings used in the production process. In the absence of any explicit tax on government wages and salaries, the BTT would only tax government purchases it makes from the private sector. Leaving government mostly untaxed would produce a huge cost advantage over private enterprises, described in the FairTax section above, reducing the size of the tax base. However, our calculation of the BTT base includes the total compensation received by government employees in the tax base. The calculations outlined in Table 20 produce a tax base of \$11.211 trillion for 2007.

Like the FairTax, the BTT as proposed in S. 1921 also provides a monthly rebate mechanism based on the Department of Health and Human Services Poverty Level Guidelines. The rebate base is calculated using data from the poverty thresholds and *Current Population Survey* of the U.S. Census Bureau and results in a \$2.112 trillion rebate for 2007.⁶⁴ In addition, we make the same adjustment for nontaxable government expenditures made to the FairTax and flat tax to keep the size of government constant in real terms. See section II. E for a detailed explanation. After accounting for the rebate base reduction and non-taxable government spending, the BTT base is \$9.099 trillion.

Table 20. Business Transfer Tax Base Calculations (billions)

Line	Description	2007	Source
1	Gross Business and Non-Profit Value Added	\$11,501	NIPA Table 1.35, lines 2, 7
2	Plus: Government Employee Compensation	\$1,513	NIPA Table 6.2D, line 86
3	Less: Gross Domestic Investment - Business	-\$2,331	NIPA Table 5.3.5, line 2
4	Less: Change in Private Inventories	-\$21	NIPA Table 5.6.5B, line 1
5	Plus: Single-Family Structures	\$470	NIPA Table 5.3.5, line 20
6	Plus: Net Imports of Goods and Services	\$812	NIPA Table 1.1.5, line 13
7	Less: Indirect Business Taxes	-\$1,009	NIPA Table 1.10, line 9
8	Plus: Untaxed Federal Government Spending	\$276	NIPA Table 3.2, line 28 (57.23%), IRS, SOI Table 1.4
9	Total Tax Base	\$11,211	
10	Less: Family Allowance	-\$2,112	
11	Total Net Tax Base	\$9,099	

Note: Totals may not add due to rounding.

⁶⁴ U.S. Department of Commerce (2004) available at <http://www.census.gov/hhes/poverty/threshld/thresh03.html>.

C. The BTT Rates

For the purposes of estimating a business transfer tax rate, we assume that the BTT would replace the same revenues as the FairTax plan, totaling \$2.228 trillion in 2007, since S. 1921 also calls for the elimination of the IRS. The computations, outlined in Table 21, produce a tax-inclusive rate of 24.51 percent and a tax-exclusive rate of 32.46 percent for calendar year 2007.

Like the flat tax, the BTT has been proposed to eliminate only some of the federal taxes. If the BTT were not to replace the federal payroll taxes, the tax-inclusive rate would be 14.93 percent, and the tax-exclusive rate 17.55 percent.

Revenues to be Replaced (\$ billions)	2007
Personal Current Taxes	1,101
Corporate Income Tax	290
Estate and Gift Tax	26
Payroll Taxes	871
Less: Earned Income Tax Credit and Child Tax Credit	-52
Less: IRS Savings	-8
Total Revenue (\$ billions)	2,228
Revenue-Neutral Rate Calculation	
Gross Tax Base	11,211
Base Reduction Equivalent for Rebate	-2,112
Less: IRS Spending	-8
Net Tax Base (\$ billions)	9,091
Tax-Inclusive Rate (2,228 / 9,091)	24.51%
Tax-Exclusive Rate (2,228 / 9,091 – 2,228)	32.46%
Rates Without Replacing the Payroll Taxes	
Total Revenue (\$ billions)	1,357
Tax-Inclusive Rate (1,357 / 9,091)	14.93%
Tax-Exclusive Rate (1,357 / 9,091 – 1,357)	17.55%
<i>Note: Totals may not add due to rounding.</i>	

D. Distributional Effects

Tables 22 and 23 show the average tax rates for households within specific income and expenditure deciles.

Table 22 shows the distributional results when individuals within our data set are sorted into deciles based on income. The BTT appears regressive, as the tax burden takes a higher percentage of income of those individuals in the lower income deciles and a lower percentage of the income of those in the higher deciles. Households in the second and third deciles, respectively, pay a tax-inclusive rate of 26 percent and 22 percent measured by income and 17 percent when measured by expenditure. Meanwhile, taxpayers in the highest income decile face a tax-inclusive rate of 14 percent measured by income and a rate of 20 percent measured by expenditure. Therefore, when sorted by income, the BTT is shown to be regressive when the

taxpayers' burden is calculated as a percentage of their income, but more progressive when their tax burden is measured against their expenditures.

Table 23 displays the distributional results of the BBT for individuals within our data set sorted into deciles based on expenditure. Like the FairTax and flat tax, taxpayers in the first expenditure decile experience a negative tax rate because they receive more money in the form of a rebate or prebate than they pay in taxes.

**Table 22. Average Tax-Inclusive Rates by Income Groups for the BTT
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Income Per Capita Deciles	Average Annual Income	Average Annual Expenditure	BTT Tax Paid	Rebate	Tax Liability	By Annual Income	By Annual Expenditures
1 (lowest)	\$3,436	\$25,260	\$8,182	\$2,151	\$6,031	175%	24%
2	\$10,334	\$15,596	\$4,634	\$1,985	\$2,649	26%	17%
3	\$13,788	\$18,347	\$5,314	\$2,271	\$3,043	22%	17%
4	\$17,062	\$19,620	\$5,510	\$2,201	\$3,308	19%	17%
5	\$20,577	\$21,998	\$6,078	\$2,264	\$3,813	19%	17%
6	\$25,042	\$24,729	\$6,716	\$2,398	\$4,318	17%	17%
7	\$30,609	\$28,174	\$7,511	\$2,371	\$5,139	17%	18%
8	\$38,019	\$34,701	\$9,316	\$2,302	\$7,014	18%	20%
9	\$50,806	\$42,173	\$10,977	\$2,341	\$8,635	17%	20%
10 (highest)	\$124,970	\$86,272	\$19,849	\$2,362	\$17,487	14%	20%
Average	\$33,464	\$31,687	\$8,409	\$2,265	\$6,144	18%	19%

Note: Totals may not add due to rounding.

The BTT proves to be solidly *progressive* when measured against both individuals' average expenditures and income. Taxpayers in the third and fourth expenditure deciles would experience average tax rates between 6 percent and 9 percent, while those in the highest would pay between 23 percent and 27 percent. Taxpayers at the lower end of the income scale pay a lower BTT compared to taxpayers with a higher income, ranging from an average of 3 percent in the bottom decile to 36 percent at the top.

**Table 23. Average Tax-Inclusive Rates by Expenditure Groups for the BTT
(Replacing Current Income, Payroll, and Estate and Gift Taxes)**

Expenditure Per Capita Deciles	Average Income	Average Annual Expenditure	BTT Tax Paid	Rebate	Net Tax Liability	By Annual Income	By Annual Expenditure
1 (lowest)	\$13,654	\$6,779	\$1,272	\$1,886	\$-614	-4%	-9%
2	\$19,628	\$10,540	\$2,176	\$2,142	\$33	0%	0%
3	\$21,527	\$13,193	\$2,939	\$2,195	\$744	3%	6%
4	\$24,164	\$16,097	\$3,743	\$2,238	\$1,505	6%	9%
5	\$27,883	\$19,492	\$4,664	\$2,273	\$2,390	9%	12%
6	\$29,782	\$23,414	\$5,853	\$2,301	\$3,552	12%	15%
7	\$32,031	\$28,293	\$7,369	\$2,300	\$5,069	16%	18%
8	\$37,142	\$35,750	\$9,506	\$2,372	\$7,134	19%	20%
9	\$44,289	\$48,274	\$13,405	\$2,427	\$10,979	25%	23%
10 (highest)	\$84,542	\$115,049	\$33,163	\$2,513	\$30,650	36%	27%
Average	\$33,464	\$31,688	\$8,409	\$2,265	\$6,144	18%	19%

Note: Totals may not add due to rounding.

The distributional burden of the BTT resembles those of the other consumption taxes (FairTax and flat tax). The analysis demonstrates that the BTT would be progressive when measured by expenditure class or lifetime income and regressive when measured by temporary income, as one would expect.

VI. Comparing the Tax Bases

A. Comparing the Rates and Bases of the Four Tax Systems

Table 24 displays the tax base for all four tax systems and includes their differences. On a net basis, the FairTax has the largest tax base; at \$9.355 trillion it is \$256 billion higher than the BTT base (\$9.099 trillion), \$1.822 trillion larger than the flat tax base (\$7.533 trillion), and \$2.322 trillion more than the current system (\$7.033 trillion).⁶⁵

The FairTax base is largest because it avoids the exemptions and deductions characteristic of the other systems. Moreover, the FairTax exempts only state and local sales taxes, while the flat tax and BTT allow for the deduction of other excise taxes and import duties.

The current system, FairTax, flat tax and the BTT tax the wages, salaries, pensions, and fringe benefits of government and nonprofit workers. The fringe benefits of workers in private corporations are captured through the business tax under the flat tax. Furthermore, the flat tax is not a destination principle tax and therefore net imports have not been included in the base.

Table 25 presents tax rates for the four tax systems that would apply under alternative assumptions. The first set of rates uses the base BHI calculated in each of the previous sections and displayed in Table 24; their bases differ for the reasons stated above. The differences in the

⁶⁵ The total gross tax base for the current tax system includes wages, salaries, and other income for the tax base of the personal income tax and the payroll tax. To avoid double counting them in the gross base calculation, all components of the personal, corporate, payroll, and estate and gift taxes were added together and then the components of the payroll tax base were subtracted out.

tax rates for each system are also caused by the tax revenues to be raised by each system and the prebate/rebate for each system.

The text of both H.R. 25 and S. 1921 explicitly calls for the elimination of the IRS, and therefore we eliminate \$8 billion, or 73 percent, from the \$11 billion of the FY 2007 IRS budget. Several functions of the IRS would need to be retained, but on a much smaller scale, due to the fact that the states would provide most of the administrative functions of the FairTax and BTT. Thus the \$8 billion is subtracted from the revenues to be replaced. As we have explained in previous sections, this drop in consumption at the federal level will be picked up fully by the taxpayer, so this adjustment is not necessary when calculating the base for these tax reform proposals.

For the three tax reform proposals, we have eliminated the cost of the earned income tax credit and the child tax credit, which the federal government counts as spending and which represents revenue that would not be raised under the FairTax, flat tax or BTT. As a result, \$52 billion is removed from the revenue that would be replaced by the three proposals.

The second set of rates displayed in Table 25 show the tax rates that would apply if the three proposals did not replace the federal payroll taxes of \$871 billion in 2007 – a relevant exercise because the flat tax and BTT (in S. 1921) do not call for the replacement of the federal payroll taxes. The result is to lower the tax rates for all three systems substantially, as one would expect since the payroll taxes will represent about 36.6 percent of total federal revenues in 2007.

Note that the flat tax-inclusive rate is now at 18.12 percent, or almost a full percentage point lower than the 19 percent called for by Hall and Rabushka. This difference is primarily due to our adjustment of untaxed government spending and without the adjustment the tax-inclusive rate would be 18.81 percent – very close to the 19 percent Hall and Rabuska rate.

For the last set of rates listed in Table 25 we normalized the revenues to be raised and the exemptions across all four tax systems. The rates for all four systems are within 3.1 percentage points of each other on a tax-inclusive basis. The FairTax and BTT tax-inclusive rates are the lowest and within 1 percentage point of one another due to the similarity of their bases, especially their taxation of net imports. Meanwhile, the rates for the current tax system and the flat tax, neither of which taxes net imports, are also within 0.5 percentage point of one another. These similarities between the tax bases of the FairTax, flat tax, and BTT are explored further in the next section.

Table 24. Comparison of the Tax Bases 2007 (\$ billions)

Taxable Items	Current Law	FairTax	Flat Tax	BTT
National Income	12,224			
Personal Consumption Expenditures		9,772		
Gross Value Added (BTT includes non-profits)			10,779	11,501
Business				
Business Income	2,356			
Adjustments				
Gross Private Domestic Investment			-2,331	-2,331
Change in Private Inventories			-21	-21
Single-Family Structures			470	470
Net Imports of Goods and Services				812
Indirect Business Taxes			-1,009	-1,009
Financial Services		288		
Wages and Salaries			-4,840	
Pension Contributions			-236	
Personal				
Private Wages and Salaries			4,840	
Total Wages and Salaries	4,685			
Other Income (Flat tax = pension income)	1,440		480	
Taxable Estate and Gift	134			
Adjustments				
Education		-221		
Travel		53		
Other (Self-consumed farm output)		-0.6		
Housing		-382		
Salaries and Wages of Non-Profits		-68		
Non-Profit Investment		58		
State and Local Sales Tax		-263		
Government and Non-Profit Institutions				
State and Local Government Spending		1,093		
Federal Government Spending		916		
Wages and Salaries (BTT only government)	1,091		1,549	1,513
Fringe Benefits			479	
Adjustments				
Administrative Credit to Merchants and States		-54		
Untaxed Federal Government Spending		276	276	276
Payroll				
Private Wages and Salaries (Adjusted for Social Security)	4,157			
Government Salaries and Wages*	593			
Contributions to Employee Pension Funds	990			
Proprietors' Income	1,034			
Gross Tax Base	9,706	11,467**	10,437	11,203
Total Exemption/Deductions, Prebate, Standard Deduction,	-2,673	-2,112	-2,904	-2,112
Net Tax Base	\$7,033	\$9,355	\$7,533	\$9,099

*About 72 percent of state and local workers do not pay into Social Security.

**Figure includes adjustment for untaxed federal government spending (+ \$276 billion) and the administrative credit paid to retailers (- \$57 billion). Note: Totals may not add due to rounding.

Table 25. Comparison of the Tax Rates 2007

	Current Law	FairTax	Flat Tax	BTT
Net Tax Base (\$ billions)	7,033	9,355	7,533	9,099
Revenues to be replaced (\$ billions)	2,288	2,228	2,236	2,228
Tax-Inclusive Rate (%)	32.53	23.82	29.68	24.49
Tax-Exclusive Rate (%)	48.22	31.27	42.21	32.43
Tax Rates Without Replacing Payroll Taxes				
Revenues to be replaced (\$ billions)	NA	1,357	1,365	1,357
Tax-Inclusive Rate (%)	NA	14.51	18.12	14.91
Tax-Exclusive Rate (%)	NA	16.96	22.13	17.55
Tax Rates with the Same Exemption and Revenue				
Gross Tax Base	10,268	11,467	10,437	11,211
Prebate/Exemption	2,112	2,112	2,112	2,112
Net Tax Base (\$ billions)	8,156	9,355	8,325	9,099
Revenues to be replaced (\$ billions)	2,228	2,228	2,228	2,228
Tax-Inclusive Rate (%)	26.51	23.82	26.76	24.49
Tax-Exclusive Rate (%)	36.07	31.27	36.54	32.43

Note: Totals may not add due to rounding.

B. Comparing the Theoretical Base of the FairTax, Flat Tax, and BTT

In principle the FairTax, flat tax, and BTT are virtually identical forms of taxation that target consumption spending in the economy. These tax systems not only provide a much simpler system to administer than the current federal tax system, but also remove the penalties on labor and investment inherent in the current system that distort incentives to work and save and ultimately slow economic growth. Table 26 contains a comparison of the three tax bases that illustrates their similarities.

We start with GDP (Y), the broadest measure of the U.S. economy, consisting of private consumption spending (C), investment (I), government purchases of goods and services (G), and exports minus imports of goods and services (X-M). This is illustrated so:

$$(50) \quad Y = C + I + G + (X - M)$$

All three tax systems exempt private investment, including business inventories, from taxation so that we need subtract it from their bases. This gives us our estimated gross tax base of \$11.607 trillion in 2007, which is the same for all three systems.

The tax bases for the three systems begin to diverge in their treatment of exports and imports. Both the FairTax and the BTT exempt exports from taxation and tax imports. The FairTax accomplishes this by taxing only those goods sold in the United States, while the BTT exempts exports from taxation and taxes imported goods and services at the border. The flat tax, through the taxation of wages and corporate income, taxes exports but not imports. Since imports exceed exports (by \$812 billion 2007) and the trade deficit subtracts from GDP in equation (44) and thus the gross tax base for all three systems, we add the value of net exports back into the base for the FairTax and BTT.

Further adjustments need to be made to the base of each system. The flat tax and BTT allow companies to deduct the full value of indirect business taxes, comprising sales and excise taxes, import duties, and other taxes. The FairTax only deducts the portion of state and local sales taxes applying to sales at the retail level (\$263 billion in 2007); since the FairTax does not apply to wholesale transactions (businesses-to-business sales), state and local sales taxes that apply to these transactions are automatically excluded from the base. Finally, the FairTax exempts personal education spending on tuition and job training and government education expenditures for the salaries of employees that directly provide educational services, such as teachers and trainers. These two items total an estimated \$624 billion in 2007.

Table 26. The FairTax, Flat Tax and Business Transfer Tax Bases in Principle, 2007
(\$ billions)

Line	Taxable Items	FairTax	Flat Tax	BTT
1	Gross Domestic Product [C + I + G+(X-M)]	13,959	13,959	13,959
2	Less: Gross Private Domestic Investment (I)	-2,331	-2,331	-2,331
3	Less: Change in Private Inventories (I)	-21	-21	-21
	Total Gross Tax Base	11,607	11,607	11,607
	Adjustments			
4	Plus: Net Imports of Goods and Services (X-M)	812		812
6	Indirect Business Taxes*	-263	-1,009	-1009
7	Education	-624		
8	Net Tax Base Before Prebate or Standard Deduction	\$11,532	\$10,598	\$11,410

*FairTax – only state and local sales taxes that apply to retail sales.

Note: Totals may not add due to rounding.

The final tax bases, net of the adjustments outlined above, for all three systems are displayed on line 8 of Table 26. The base for the FairTax is slightly higher than the BTT, primarily due to the smaller portion of indirect business taxes that is subtracted from the FairTax base and in spite of the subtraction of \$624 billion in education expenditures. Nevertheless, the net value of the two bases is remarkably similar, differing by only \$122 billion, or 1.1 percent. The flat tax base is smaller than the other two systems because of its treatment of exports and imports, making the net base \$812 billion lower. The net flat tax base remains within \$934 billion, or 8.1 percent of the FairTax base.

The three tax systems use consumption as the primary means to raise revenue. As a result, their tax bases, in principle, use the same starting points and are similar after making major adjustments.

VII. Conclusion

As federal tax reform makes its way through Congress, both legislators and organizations have proposed competing plans. H.R. 25: The Fair Tax Act essentially aims to replace most current federal taxes with a national retail sales tax. A number of other plans, including publisher Steve Forbes's flat tax proposal and a BTT plan outlined in the bill S. 1921 filed by Senator DeMint, have also come forward. In considering different proposals for tax reform, policy makers should determine what they are going to tax (the tax base) and by how much they are going to tax it (the tax rate).

As we have seen, the three tax systems under consideration to replace the current tax law target consumption in the economy as the base for taxation, and therefore, in principle, their bases are equal. However, due to the differences in the details of each proposal, the tax bases and tax rates ultimately diverge. Through a careful accounting of the details of each proposal, we conclude the following:

- The revenue-neutral FairTax rate is 23.82 percent, on a tax-inclusive basis, and 31.27 percent, on a tax-exclusive basis. This is only 0.82 percent higher than the 23 percent tax-inclusive rate called for in H.R. 25.
- To implement a FairTax rate of 23 percent, 2007 expenditures, excluding Social Security, would need to be reduced by \$76 billion, or 2.73 percent, representing the difference between the spending that would be necessary with a 23 percent rate and the revenue that would actually be raised. The \$76 billion reduction in non-Social Security spending would keep this portion of federal expenditure almost at the 2006 level in nominal terms and represents a 0.5 percent cut in spending between calendar years 2006 and 2007.
- The FairTax does not necessarily impose a burden on state and local government; rather, a portion of purchasing power is fully transferred to individual consumers from state and local government. It would be up to state and local government, under the FairTax, to decide whether to permit the transfer to take place or to recapture the lost revenue by raising tax rates or otherwise changing their tax laws.
- The FairTax has the largest base because it avoids exemptions and deductions characteristic of the current tax law. Moreover, the FairTax exempts only a portion of state and local sales taxes, while the flat tax and BTT allow for the deduction of other excise taxes and import duties. The current tax law and the flat tax bases provide for large personal exemptions and do not specifically tax imports.
- The large tax bases of the FairTax and BTT translate into the lowest tax-inclusive rates (23.82 percent and 24.49 percent, respectively), while the current tax law and flat tax have the highest inclusive rates at 30.15 percent and 29.68 percent, respectively. These rates are calculated assuming that all plans replace the same taxes as the FairTax, including the federal payroll tax.
- An analysis of the distribution of the tax burden of each system, across households grouped by income and expenditure deciles, shows that the FairTax, flat tax, and BTT, all consumption taxes, are progressive when measured by expenditure or lifetime income and regressive or less progressive when measured by current income. The current tax law is progressive when measured against current income but much less progressive when measured against current expenditure or lifetime income.

- A theoretical comparison of the tax bases of each of the four systems reveals that the FairTax, the BTT, and the flat tax bases are very similar. The differences lie in the details of the specific proposals.

Policy makers have several options to move the current tax system, operating under a maze of laws and rules, toward a simpler system. The FairTax, flat tax, and business transfer tax each offer simpler and more efficient systems than the current one. They also offer the added bonus of relieving private savings from taxation. Of these three options, the FairTax offers the broadest tax base and the lowest tax rate to replace the current tax law.

Appendix A: The Mathematics of State and Local Finance under the FairTax

In this appendix we provide a more detailed demonstration of why ΔC and ΔGS would be identical in absolute value but with opposite signs. We start with consumption. Using equations (34) and (43) from section II. F,

$$\begin{aligned} \Delta C &= C_{FT} - C_{07} = Y_{07} \frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} - Y_{07} \frac{1-t_i-sit}{1+sst} \\ \Delta C &= Y_{07} \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} - \frac{1-t_i-sit}{1+sst} \right] \\ \Delta C &= Y_{07} \frac{(1-sit)(1-t_i)(1+sst) - (1-t_i-sit)[1+sst(1-t_i)]}{[1+sst(1-t_i)](1+sst)} \\ \Delta C &= Y_{07} \frac{(1-sit-t_i+sit \times t_i)(1+sst) - (1-t_i-sit) - (1-t_i-sit)sst(1-t_i)}{[1+sst(1-t_i)](1+sst)} \\ \Delta C &= Y_{07} \frac{sit \times t_i + (1-sit-t_i+sit \times t_i)sst - (1-t_i-sit) - (1-t_i-sit)sst(1-t_i)}{[1+sst(1-t_i)](1+sst)} \\ \Delta C &= Y_{07} \frac{sit \times t_i + sit \times t_i \times sst + (1-t_i-sit)sst \times ti}{[1+sst(1-t_i)](1+sst)} \\ (A.1) \quad \Delta C &= Y_{07} \frac{sit \times t_i + sst \times t_i (1-t_i)}{[1+sst(1-t_i)](1+sst)}. \end{aligned}$$

We now refer to equations (35) and (45) from section II. F to derive the change in state and local government spending:

$$\begin{aligned} \Delta GS &= GS_{FT} - GS_{07} = Y_{07} \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} sst(1-t_i) + sit(1-t_i) - \frac{1-t_i-sit}{1+sst} sst - sit \right], \\ \Delta GS &= Y_{07} \left\{ \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} (1-t_i) - \frac{1-t_i-sit}{1+sst} \right] sst - sit \times t_i \right\}, \\ \Delta GS &= Y_{07} \left\{ \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} (1-t_i) - \frac{1-t_i-sit}{1+sst} \right] sst - \frac{sit \times t_i (1+sst)}{1+sst} \right\}, \end{aligned}$$

$$\Delta GS = Y_{07} \left\{ \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} (1-t_i) - \frac{1-t_i-sit+sit \times t_i}{1+sst} \right] sst - \frac{sit \times t_i}{1+sst} \right\},$$

$$\Delta GS = Y_{07} \left\{ \left[\frac{(1-sit)(1-t_i)}{1+sst(1-t_i)} (1-t_i) - \frac{(1-t_i)(1-sit)}{1+sst} \right] sst - \frac{sit \times t_i}{1+sst} \right\},$$

$$\Delta GS = Y_{07} \left\{ \left[\frac{1-t_i}{1+sst(1-t_i)} - \frac{1}{1+sst} \right] (1-sit)(1-t_i) sst - \frac{sit \times t_i}{1+sst} \right\},$$

$$\Delta GS = Y_{07} \left\{ \left[\frac{1-t_i+sst(1-t_i)-1-sst(1-t_i)}{[1+sst(1-t_i)](1+sst)} \right] (1-sit)(1-t_i) sst - \frac{sit \times t_i}{1+sst} \right\},$$

$$\Delta GS = -Y_{07} \left\{ \frac{t_i(1-sit)(1-t_i)sst}{[1+sst(1-t_i)](1+sst)} + \frac{sit \times t_i}{1+sst} \right\},$$

$$\Delta GS = -Y_{07} \left\{ \frac{t_i(1-sit)(1-t_i)sst + [1+sst(1-t_i)]sit \times t_i}{[1+sst(1-t_i)](1+sst)} \right\}.$$

Hence:

$$(A.2) \quad \Delta GS = -Y_{07} \frac{sit \times t_i + (1-t_i)sst \times t_i}{[1+sst(1-t_i)](1+sst)}.$$

Comparing the right-hand side of equations (A.1) and (A.2) we observe that they have the same absolute value but opposite signs, so that:

$$(A.3) \quad \Delta C = -\Delta GS.$$

Appendix B: Methodology

Distributional Analysis

The distributional analysis contained in Tables 7, 8, 14, 15, 18, 19, 22, and 23 was derived from the paper by David G. Tuerck, Jonathan Haughton, Paul Bachman, and Phuong Viet Ngo entitled, “A Distributional Analysis of Adopting the FairTax.” For a detailed methodological discussion please refer to the report.

Inflating the Base to 2007

All calculations were completed using the year in which the most recent data were available, in most cases 2004 or 2005. For those data series for which 2004 data were not available the numbers were inflated to 2004 using CPI or the average growth rate over the preceding three years.

Forecasts from the CBO, “The Budget and Economic Outlook for Fiscal Years 2007 to 2017,” were used to obtain estimates for the year 2007. That CBO publication provides forecasts of several economic indicators and their growth rates from 2005 through 2016, and the growth rates of the CBO projections were used to estimate our data series from 2004 to 2007.

The CBO estimates of wages and salaries were adjusted down slightly (5 percent in 2005 and 4 percent in 2006 and 2007) to reflect the negative influence of higher short-term interest rates that already exist today and should persist through 2007. The CBO estimated that the three-month Treasury bill rate would be 2.8 percent in 2005 and 4.0 percent in 2006, while the rate as of November 18, 2005 had already reached 4 percent, according to Bloomberg.com.⁶⁶

The CBO-projected growth rate of gross domestic product served as the default to estimate each component of the tax bases, unless a CBO forecast of another series proved more appropriate, or if the behavior of the GDP and the data series indicated an inappropriate match. In the absence of an appropriate series for estimating the tax base component, the component’s own growth for the preceding three to five years was used to forecast to 2007. The table below contains the components of the four tax bases and the variable or other method used to inflate the component to 2007. The CBO projections for the 2007 components of federal tax revenue collections were used to calculate the tax rates for each proposal. The revenue figures were adjusted to reflect the CBO estimates of total revenue if the 2001 and 2003 tax relief packages do not expire as scheduled.

⁶⁶ Bloomberg.com, Market Data: Rates and Bonds, available at <http://www.bloomberg.com/markets/rates/index.html>.

Inflating the Prebate, Allowance, and Deduction

The prebate for the FairTax and BTT was inflated to 2007 using the CBO estimate of CPI to inflate the Health and Human Services 2004 poverty level guideline figures. The number of households was inflated using The U.S. Census Bureau estimate of population growth from 2004 to 2007 (2.77 percent). The increase was distributed evenly across all households, assuming that the composition of households will remain constant between 2004 and 2007.

The flat tax deduction was inflated to 2004 using actual CPI figures for “all urban consumers” and applied to the Hall and Rabushka figures cited in the 1995 edition of their book. The deduction was inflated to 2007 using the CBO estimates of CPI. The Census projection for U.S. population growth (2.77 percent) between 2004 and 2007 was also applied to increase the number of households; the increase was also evenly distributed to all household sizes.

Variables Used to Inflate Data Points to 2007 Dollars.

Fair Tax		
<i>Line</i>	<i>Taxable Items</i>	<i>Source</i>
1	Personal Consumption Expenditures	GDP
2	Purchase of New Homes	GDP
3	Purchases of New Mobile Homes	CPI
4	Improvements to Single-Family Homes	GDP
5	Brokers' Commissions on Housing	GDP
6	Imputed Rent on Housing	GDP
7	Imputed Rent on Farm Dwellings	GDP
8	Education Expenditure	GDP
9	Taxable Home Mortgage Interest	10-year Treasury bond, adjusted to a 3-year bond rate, assuming a 150 basis point difference between the 10- and 3- year bonds.
10	Taxable Nonprofit Interest	Same as above
11	Taxable Personal Interest	Same as above
12	Expenditure in U.S. by Nonresidents	CPI
13	Expenditure Abroad by U.S. Residents	GDP
14	Foreign Travel by U.S. Residents (services)	GDP
15	Food Produced and Consumed on Farms	Prior 3-year average growth rate
16	State Sales Taxes	GDP
17	Salaries and Wages of Non-Profits	GDP
18	Capital Spending by Non-Profits	GDP
20	State and Local Government Consumption	GDP
21	Current Education Spending	Federal Government Spending
22	Gross Purchases of New Structures	GDP
23	Gross Purchases of Equipment	GDP
24	Capital Consumption Allowance	Federal Government Spending
26	Federal Government Consumption	Federal Government Spending
27	Subsidies	Federal Government Spending
28	Gross Purchases of New Structures	Federal Government Spending
29	Gross Purchases of Equipment and Software	Federal Government Spending
30	Capital Consumption Allowance	Federal Government Spending
34	Untaxed Federal Government Spending	Federal Government Spending

Variables Used to Inflate Data Points to 2007 Dollars. (Cont.)

Current System		
<i>Line</i>	<i>Taxable Items</i>	<i>Source</i>
1	Net National Income	GDP
2	Cash Wages	Wages and Salaries
3	Profits Before Taxes	Corporate Profits
4	Corporate Dividends Paid to Households	CPI
5	Proprietors' Income with IVA, CCAdj	Wages and Salaries
6	Rental Income of Persons with CCAdj	Average prior 10-year growth rate
7	Net Interest Paid by Business to Households	10-year Treasury Bond
8	Private Pension Benefits	Average 8-year annual growth rate
9	Taxable IRA Distributions	Average 8-year annual growth rate of "private"
10	Social Security Benefits	Average 8-year annual growth rate
11	Unemployment Insurance Benefits	Average 8-year annual growth rate
12	State and Local Refunds	CPI
13	Taxable Interest Income	Average 8-year annual growth rate
14	Realized Capital Gains	CBO projection, Table 4-3, p. 84
16	Standard Deduction	CPI
17	Itemized Deduction	Average 8-year annual growth rate
18	Personal Exemptions	Average 8-year annual growth rate
19	Unused Deductions and Exemptions	Average 8-year annual growth rate
27	Gross Estate for Tax Purposes	Wages and Salaries
28	Total Allowable Deductions	Wages and Salaries, increased by 33% in 2006 due to increase in exemption from \$1.5 million to \$2.0 million
29	Taxable Estate	Wages and Salaries
30	Taxable Gifts	Wages and Salaries
32	Private Wages and Salaries	Wages and Salaries
33	Government Salaries and Wages (approx. 72%)	Wages and Salaries
34	Contributions to Employee Pension Funds	Wages and Salaries
35	Proprietors' Income	Wages and Salaries
The Flat Tax		
<i>Line</i>	<i>Description of Taxable Item</i>	<i>Source</i>
1	Gross Business Value Added	GDP
2	Indirect Business Taxes	GDP
3	Wages, Salaries, and Pensions	Wages and Salaries
4	Pension Contributions	GDP
5	Business Investment	GDP
6	Change in Private Inventories	GDP
7	Single-Family Structures	GDP
8	Fringe Benefits	Federal Spending
10	Wages and Salaries	Wages and Salaries
11	Pensions	Average growth rate from 1999-2003
13	Family Allowance	CPI and population growth
15	Untaxed Government Spending	Federal Government Spending

Variables Used to Inflate Data Points to 2007 Dollars. (Cont.)

The Business Transfer Tax		
<i>Line</i>	<i>Description</i>	<i>Source</i>
1	Gross Business and Non-Profit Value Added	GDP
2	Government Employee Compensation	GDP
3	Gross Domestic Private Investment	GDP
4	Change in Private Inventories	GDP
5	Single-Family Structures	GDP
6	Net Imports of Goods and Services	CPI
7	Indirect Business Taxes	Corporate Profits
8	Untaxed Federal Government Spending	GDP

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