The Required Tax Rate in a National Retail Sales Tax

William G. Gale The Brookings Institution 1775 Massachusetts Avenue, NW Washington, DC 20036 (202) 797-6148 wgale@brook.edu

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ABSTRACT

This paper examines the required tax rate in a national retail sales tax (NRST). I show that recent proposals, such as one to replace virtually all federal revenues with a 23 percent taxinclusive NRST, are based on assumptions that real government spending would decline by \$480 billion per year, and that there would be no tax avoidance, evasion or political erosion of the tax base in an NRST. Correct for these assumptions indicates that the required tax-inclusive rate would be over 50 percent and the required tax-exclusive rate would be over 100 percent. Over the last few years, proposals to replace much or all of the federal tax system with a national retail sales tax (NRST) have attracted increased attention. The most prominent proposals include those by Rep. Dan Schaefer (R-CO) and Billy Tauzin (R-LA) and by a group called Americans for Fair Taxation. Schaefer and Tauzin (hereafter S-T) would replace existing personal and corporate income taxes, the estate tax, and some excise taxes with what they call a 15 percent national retail sales tax, levied on a broad consumption base and on government spending. Americans for Fair Taxation (AFT) would replaces taxes on personal and corporate income taxes income, estates, and payroll with what they call a 23 percent national retail sales tax, on a base similar to that proposed by S-T.¹

This paper examines the required tax rate in a national retail sales tax. A necessary precursor to the analysis is noting the difference between tax-inclusive and tax-exclusive sales tax rates. Suppose a good has a sticker price of \$100, not including taxes, and there is a \$30 sales tax placed on the good. The tax-*exclusive* sales tax rate would be 30 percent, or T/P, where T is the tax payment and P is the price of the good, not including the tax. Sales taxes are usually quoted in tax-exclusive terms, which correspond to the "mark-up at the cash register." The tax-*inclusive* tax rate would be about 23 percent, or T/(P+T). Income taxes are typically quoted in tax-inclusive terms. Although there is no "true" method of reporting tax rates, it is crucial to understand which approach is being used, since the tax-inclusive rate will always be lower than the tax-exclusive rate, and the difference becomes quite large as the tax rate rises.² The tax rates

¹See H.R. 2001, "The National Retail Sales Act of 1997," and Americans for Fair Taxation (1997).

²If the tax-exclusive rate is t, the tax-inclusive rate is t/(1+t). At t=.01, the difference is negligible, but a 100 percent tax-exclusive rate corresponds to a 50 percent tax-inclusive rate.

quoted by advocates of the S-T and AFT plans are in tax-inclusive terms. The corresponding tax-exclusive rates would be about 17.6 percent and 30 percent, respectively.

This paper draws together several issues relating to a NRST and shows that the tax rates quoted above are based on a series of problematic assumptions. First, the rates quoted above require either large reductions (on the order of \$300-\$500 billion per year) in the real size of government spending, or similar-sized increases in the deficit (or reductions in the surplus). This hidden effect occurs because of inconsistent assumptions made in calculating the required revenue. Second, the proposals make the incredibly optimistic assumptions that, under a national retail sales tax, there would be *no* erosion of the statutory tax base for political, economic, or administrative reasons, *no* tax avoidance behavior (legal behavior that reduces taxes), and *no* tax evasion (illegal behavior that reduces taxes).

My estimates show that holding the real size of government constant in the AFT proposal would require a 35 percent tax-inclusive sales tax rate, or a 53 percent "mark-up" at the cash register, even if there is no base erosion, avoidance, or evasion. If, in addition, one makes what I view as conservative, but realistic, assumptions about statutory base erosion, avoidance and evasion--stipulating that each factor would be positive, but *smaller* in the NRST than it is in the existing system-- the required tax-inclusive tax rate in the AFT proposal would be over 50 percent and the required tax-exclusive tax rate would be over 100 percent. The required tax-exclusive rate in the S-T proposal would be about 60 percent as high.

Section I reviews major features of the sales tax proposals. Section II models and discusses the treatment of government. Section III examines erosion of the statutory tax base, avoidance and evasion. Section IV presents estimates of the required sales tax rate under a variety of circumstances. Section V is a short conclusion.

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I. Overview of the sales tax proposal

<u>Replacement Taxes</u> As proposed by the AFT, the sales tax would replace the individual income tax, corporate income tax, payroll tax, and estate tax. The S-T proposal would replace the individual and corporate income taxes, estate tax, and certain excise taxes. The revenues generated by these taxes in 1995 are shown in table 1.

<u>Tax Base</u> As shown in table 2, the tax bases in the two plans are quite similar. The tax base would include all goods or services purchased for consumption purposes in the United States. All personal consumption outlays would be taxed, other than college education, on the grounds that it is an investment, and food produced and consumed on farms, for administrative reasons. The proposed base includes the imputed value of financial intermediation services (e.g., household purchases of banking services via reduced interest rates on checking accounts).

The treatment of housing merits comment. Retail sales occur when businesses sell goods or services to households. Thus, sales of newly constructed homes to families that intend to live in the home would be subject to tax. But sales of an already existing owner-occupied home would not be taxable, and sale of a newly constructed home to businesses or individuals that intend to rent the home would not be taxed.

In a pure retail sales tax, business-to-business transactions would not be included either, because the purchase is used as an input, not as household consumption. The AFT proposal, however, would include business-to-business sales in the gross tax base and have businesses apply to government to receive rebates of the taxes they paid on their purchases. Thus, business purchases would not enter the net tax base, shown in table 2.

Domestic expenditures by U.S. non-residents would be taxed, but the base would exempt expenditures abroad and half of foreign travel expenditures by U.S. residents. The S-T proposal would include state sales taxes in the base, while the AFT proposal would not.

Households consume, directly and indirectly, goods and services that are produced by the government. Some of these occur via sales, such as national park admissions, but many occur in the absence of any specific household-government transaction, such as police and fire protection. Thus, the proposals adopt a "pre-payment" approach to taxing consumption of government-provided goods and services, and would tax all federal, state, and local government purchases of inputs, materials, services, wages, and all new government investment. Government would not pay taxes on transfer payments. If and when the transfer payments were spent on consumption, they would be subject to tax.

<u>Demogrants</u> The AFT proposal would provide an annual demogrant to each household, equal to the sales tax rate times the Health and Human Services poverty guideline.

<u>Proposed tax rates</u> The proposals calculate the required tax-exclusive tax rate as simply the ratio of revenues to be replaced divided by the sum of taxable purchases by consumers and government less the consumption demogrant:

(1)
$$s = R/(C+G-X)$$

where s = the required *tax-exclusive* tax rate *as calculated in the proposals*,

R = current nominal revenue raised by taxes that are to be replaced by the sales tax, C = current nominal expenditures on private consumption that would be subject to the sales tax,

G = current nominal expenditures on government outlays that would be subject to the sales tax, and

X = the amount of consumption to which the demogrant applies (=0 in the pre-sales tax economy).

Using this formula and the data in table 3, the implied tax-exclusive rates are 16.6 percent for S-T and 29.6 percent for AFT (Table 3). The implied tax-inclusive rates are given by (2) $s_I = s/(1+s)$,

and equal 14.2 percent for S-T and 22.8 percent for AFT. The proposal sponsors rounded these figures up to 15 percent and 23 percent, respectively, implying tax-exclusive rates of 17.6 percent and 30 percent, as shown in Table 3.

The central theoretical point of the paper is that the required tax rate in equation (1) is incorrectly specified.³ The central empirical point is that making the appropriate adjustments has a large effect on the estimated rates. These points are explored in the following sections. II. Holding the Real Size of Government Fixed⁴

Virtually everyone agrees it is appropriate to hold the real size of government constant while analyzing fundamental tax reform plans. To examine the role of government, I add the following definitions:

T = current nominal government transfers to households,

 α = the proportion of such transfers that are untaxed (0< α <1), and

D = the current nominal cash-flow budget deficit (D<0 represents a surplus),

Note that G and T include the tax payments that government workers and transfer recipients, respectively, make under the existing income tax, and that C, G and T represent expenditures rather than physical quantities. Also, for future reference, in the pre-sales tax

³Equation (2) correctly shows the relation between the tax-exclusive and tax-inclusive rate, but of course gives the wrong answer for the tax-inclusive rate if the tax-exclusive rate is misspecified.

⁴This section is based on Gale, Koenig, Rogers and Sabelhaus (1998).

economy, the government budget constraint is given by

$$R = G + T - D,$$

which indicates that government purchases of goods and services and transfer payments are financed by a combination of tax revenues and borrowing.

To hold the real size of government fixed after tax reform requires three changes. First, nominal government expenditures on goods and services must be adjusted for any change in prices that the government has to pay as a purchaser of those goods and services. Since, in the AFT and S-T proposals, all federal, state and local government purchases of goods and services would be subject to federal sales taxation, nominal government spending has to be adjusted to allow for any changes in the consumer price level (including the sales tax) if the sales tax were to replace the existing system and the real size of government were held fixed.

Second, to retain their real, after-tax purchasing power, transfer payments need to be adjusted for changes in prices. This is complicated by the fact that some transfers are currently subject to income taxation--which would be removed in the switch to a sales tax--and some are not. It is straightforward, however, to show that transfers that are currently *untaxed* should be adjusted with changes in the *producer* price level, while transfers that are currently *taxed* at the same tax-inclusive rate as would occur under the sales tax should be adjusted with changes in the *consumer* price level.⁵

If all transfers were currently taxed in the income tax at either a zero rate or the rate that

⁵For example, a household that currently receives \$100 in transfers and pays 20 percent in income taxes has a net-of-tax transfer of \$80. If, in a switch a sales tax with a tax-inclusive rate of 20 percent, the producer price level stays constant, the household could make the same net-of-tax purchase as before with a gross-of-tax nominal transfer of \$100. That is, changing nominal taxed transfers in line with the producer price level retains the after-tax value of the transfers.

would prevail in a sales tax, α could be thought of as the proportion of transfers that are currently untaxed. In the more general case, where transfers are currently taxed at a variety of rates in the income tax, the notion of the proportion of transfers that is untaxed is given by 1-(t_Y^{I}/t_S^{I}), where t_Y^{I} is the average tax-inclusive income tax rate on all transfers currently received, including those taxed at zero rates, and t_S^{I} is the tax-inclusive sales tax rate.

Third, to hold the real deficit constant, the nominal deficit should change in proportion to changes in the consumer price level. To model these factors, I examine two cases, one where nominal wages and the producer price level stay constant after tax reform, the other where nominal wages and the producer price level fall by the full amount of the previously existing taxes. In each case, the procedure is the same: (a) develop an equation for tax revenues by multiplying the tax-exclusive sales tax rate by the statutory tax base, (b) develop a government budget constraint that equates revenues with government spending on goods and services, transfers, the demogrant, less the deficit (plus a surplus), all adjusted to hold the real size of government constant; (c) combine the two equations to solve for the required tax rate.

(A) Nominal wages and producer prices are constant

When nominal wages and producer prices are constant after a switch to a sales tax, the consumer price level will rise by the full amount of the sales tax; that is, consumer prices, including the sales tax, will rise by t_1 percent, where t_1 is the required tax-exclusive sales tax rate.

The statutory tax base is the sum of private consumption and government spending on goods and services, so the tax revenue equation is

(4)
$$R_1 = t_1(C+G),$$

where R_1 is the nominal revenue requirement under a sales tax.

Since government spending is part of the statutory tax base, to maintain real government spending on goods and services, nominal spending must rise by the same percentage as the consumer price level; that is, it must rise from G to $(1+t_1)G$. Nominal government spending on transfers must rise from T to $(1+\alpha t_1)T^6$ To maintain the real deficit, the nominal deficit can rise from D to $(1+t_1)D$. The budgetary cost of the demogrants is t_1X . Thus, the government budget constraint is given by

(5)
$$R_1 = (1+t_1)G + (1+\alpha t_1)T + t_1X - (1+t_1)D.$$

Using (3), (4), and (5) to solve for t_1 yields:

(6)
$$t_1 = R/(C-X-\alpha T+D).$$

Equation (6) holds the real size of government constant and differs in several ways from equation (1) which does not hold government constant. First, (6) does not have a G term in the denominator. The simple reason why is that *adding government spending to the tax base, but maintaining the real size of government, does not affect the required tax rate.* That is, even though the *statutory* tax base includes government spending (G), the *effective* tax base omits G, because to hold real government spending constant requires an increase in nominal spending that exactly offsets the tax revenues collected on government spending. This point is both fundamental and easy to derive: If government purchases were not subject to taxation under the sales tax, the revenue equation would be $R_1 = t_1C$ instead of (4), and the spending equation would be $R_1 = G + (1+\alpha t_1)T + t_1X - (1+t_1)D$, instead of (5). Solving these equations for t_1 gives the same result as in (6).

⁶Nominal spending on currently untaxed transfers would have to rise to $(1+t_1)\alpha T$ from αT to retain their purchasing power. Nominal spending on currently taxed transfers would remain constant at $(1-\alpha)T$. The sum of the two is given in the text.

The second difference is that (6) contains terms representing government transfers and the deficit, which (1) omits. Consumption that is financed with currently untaxed transfers is not part of the effective tax base because, in order to retain their real purchasing power, such transfers must be changed with changes in the consumer price level. The effective tax base also includes the pre-sales-tax deficit. Smaller deficits (or larger surpluses) require higher sales tax rates.

Thus, all three adjustments--to G, T, and D--that are required to hold government constant show up in the differences between (6) and (1). A simple, special case occurs when all transfers are untaxed (α =1), and there is no deficit. In that case, the required tax rate is just t₁ = R/(C-X-T). Thus, even when government purchases are included in the statutory tax base, the effective base excludes government purchases, and includes only the portion of consumption that is *not* financed by currently untaxed government transfers or demogrants, as long as the size of government is maintained.

(B) Nominal wages and producer prices decline

The same tax rate formula results when nominal wages and producer prices decline by the full amount of the removed income tax. In this case, the consumer price level (including the sales tax) would remain constant after switching to a sales tax. The statutory tax base includes government spending on goods and services as well as private consumption, but since wages and producer prices have fallen, each component is deflated by the factor $(1+t_2)$, where t_2 is the required tax-exclusive tax rate. Thus, the tax revenue equation is

(7)
$$R_2 = t_2(C+G)/(1+t_2).$$

Since the consumer price level remains constant, to maintain real government spending on goods and services, nominal government spending, including the sales tax payments on government spending, is held constant. Nominal transfers fall from T to $(1+\alpha t_2)T/(1+t_2)$.⁷ Nominal deficits remain constant since the consumer price level is constant. The demogrant would exempt X/(1+t_2) worth of consumption. Thus, the government budget constraint is given by

(8)
$$R_2 = G + t_2 X/(1+t_2) + (1+\alpha t_2)T/(1+t_2) - D.$$

Equating (7) and (8) yields:

(9)
$$t_2 = R/(C-X-\alpha T+D)$$

the same expression as in (6). This indicates that the required tax rate is not a function of what happens to the price level after tax reform, as long as the real size of government is held constant after tax reform.⁸

(C) Why is equation (1) wrong?

At this point, it is easy to show why the sales tax advocates' calculation of the required tax rates is flawed. Equation (1) can be derived by solving for s using a revenue equation

and a government budget constraint

(11)
$$R^* = G + T + sX - D.$$

The key point is that (10) and (11) are mutually inconsistent. The budget constraint (10) treats government variables the same as in (4), which assumes that nominal wages and producer prices are *constant* after tax reform. The government budget constraint (11) treats government

⁷Taxed transfers should fall to $(1-\alpha)T/(1+t_2)$. Untaxed transfers remain at αT . The sum of these two is $(1+\alpha t_2)T/(1+t_2)$.

⁸It is easy to verify that--when the producer price level falls after tax reform--taxing or not taxing government does not change the required rate, as long as the real size of government is held constant.

variables (G, T and D) the same way as the budget constraint (9) (and makes the additional assumption that α =1) which assumes that nominal wages and producer prices *fall* after tax reform. These assumptions are obviously inconsistent. As shown in equations (6) and (9), making either assumption on a consistent basis leads to the same tax rate, and one that is higher than in (1).

The implied decline in government spending using the tax rate implied by equation (1) is given by

(12)
$$G+T - [G/(1+t) + \alpha T/(1+t) + (1-\alpha)T] = \{t/(1+t)\} [G+T]$$

where t is the tax-exclusive sales tax rate. The intuition for this equation is easiest to see in the case where the producer price level stays constant after the switch to a sales tax. In the pre-sales tax economy, government spending on goods and services and on transfers is G+T. Under the AFT and S-T proposals, nominal government spending on goods and services, including sales tax payments, and untaxed transfers is fixed. Therefore, real purchases and the real value of currently untaxed transfers fall by the factor 1/(1+t). Nominal taxed transfers are also held fixed, but they retain their original real value, since the producer price level is constant and the income tax on such transfers has been removed.⁹

III. Erosion of the Statutory Tax Base, Tax Avoidance, and Tax Evasion¹⁰

Incorporating erosion of the statutory base, avoidance and evasion into the tax rate formula is straightforward. Let

⁹The last statement is approximate; it assumes that the income tax rate is the same as the tax-inclusive sales tax rate would be.

¹⁰More detailed analysis of the findings in this section may be found in Gale and Hotlzblatt (1999) and Gale (1998).

a = the rate of tax avoidance in a NRST,

e = the rate of tax evasion in a NRST, and

p = the rate of erosion of the statutory sales tax base for "political" reasons, broadly defined.

Define the actual private consumption tax base in an NRST as

(13)
$$C^* = (1-a)(1-e)(1-p)C$$

Then the required tax rate is given by (6) or (9), with C* substituted for C:

(14)
$$t = R/(C^*-X-\alpha T+D).$$

Comparing the tax rates in equations (1) and (14) will indicate the sensitivity of the required tax rate to various assumptions and specifications. Before turning to that exercise, I review issues surrounding base erosion, evasion and avoidance in order to help determine reasonable values to employ for the parameters in (13). In examining these issues, it is worth noting here--and will be shown below--that adjusting the tax rate just to hold the real size of government constant would require a tax-inclusive tax rate of 35 percent in the AFT proposal and a tax-exclusive rate of 53 percent. For the S-T proposals, the comparable rates are 24 percent and 31 percent respectively. Thus, considerations of the likely amount of base erosion, avoidance, and evasion should made in light of these required rates, not the ones in the AFT or S-T proposals.

(A) Erosion of the Statutory Tax Base

The sales tax proposals do not allow for any erosion of the statutory tax base; virtually all consumption is assumed to be taxable. In practice, no income or consumption tax comes close to meeting that standard. Some items are difficult to tax, some are exempted for reasons of economic and social policy, and some are exempted due to powerful political constituencies.

For example, the AFT proposal, net of demogrants, would tax 93 percent of personal consumption expenditures (PCE), or 63 percent of GDP, in 1995. In contrast, European valueadded taxes (VATs) tax only about 41 percent of GDP (Tanzi, 1995). Feenberg, Mitrusi and Poterba (1997) use a taxable private consumption base that constitutes 83 percent of personal consumption expenditures (PCE). Metcalf (1997) develops a taxable sales tax base that is about 80 percent of PCE. The Congressional Budget Office (1997) defines a "broad" consumption tax base that is about 80 percent of PCE. This base covers all transactions that could be easily taxed on the product side. A narrower base, that restores some of the preferential treatment that exists in the income tax is only 60 percent of PCE. Likewise, the sales taxes that already exist in 45 states tax only about half of private consumption of goods and services (Musgrave and Musgrave 1989). No state retail sales tax imposes taxes on imputed financial services, or on housing. None tax health at the level envisioned in the NRST. Many states exempt food, services and other items. In light of these considerations, and in light of 53 percent mark-ups even in the absence of any statutory base erosion, I consider the assumption that political lobbies, administrative factors, or the desire to introduce economic incentives will reduce the proposed consumption tax base by 10 percent to be very conservative.

(B) Avoidance

Tax avoidance could arise in several ways. First, taxpayers could combine business activity--which is generally exempt from retail sales taxation--with personal consumption. For example, individuals may seek to register as firms, individuals may seek to purchase their own consumption goods using a business certificate, or employers might buy goods for their workers in lieu of wage compensation (GAO, 1998).

Second, up to \$2,000 per year of goods imported from overseas would be exempt from

taxation. Thus, buyers could avoid high sales taxes for the first \$2,000 of purchases by purchasing from firms that set up nominal off-shore affiliates. Sales by catalogue, mail or phone order, or internet may prove especially easy to move off-shore.

Third, because the HHS poverty guideline rises less than proportionally with the number of family members, the demogrant will, too. This will create incentives in many households for citizens to try to claim the demogrant as individuals rather than families. For example, if the (tax-inclusive) sales tax rate were 35 percent, a three-generational family, sharing common living space, would find that total annual demogrants would increase by over \$1,800 if it claimed the existence of two households (a one-person household consisting of grandpa and a three-person household consisting of his daughter and her children) rather than one household (containing all three generations).¹¹ Likewise, unrelated adults living in the same household, whether as a couple or simply as roommates, would have large incentives to try to claim their demogrants as individuals rather than as a two-person household.¹²

For all of these reasons, it is implausible to assume that the avoidance rate will be zero in a NRST. I assume it will be 5 percent, which seems relatively low compared to the amount of avoidance and sheltering that occurs in the income tax and other systems.

(C) Evasion

Sales tax proponents point to several factors that they believe imply that evasion will be lower under the sales tax than under the income tax (Mastromarco 1998). These include the

¹¹Using 1998 data, with 4 persons in the households, the demogrant would be 35 percent of \$16,450, or \$5,758. With a 1-person and a 3-person household, the demogrant would be 35 percent of \$8,050 (for the individual) plus 35 percent of \$13,650, for a total of \$7,595.

¹²For the same reasons, every married couple would face a sizable marriage penalty in the sales tax (Gale 1998).

presence of fewer taxpayers, which implies a higher proportion of taxpayers could be audited, and a simpler tax system, which implies fewer unintentional errors. However, these claims are probably overstated. Gale and Holtzblatt (1999), for example, note that if taxpayers have to file monthly under an NRST, as has been proposed, the number of filings will rise, offsetting gains from fewer taxpayers. In addition, the majority of filing requirements that would be eliminated under the NRST would cover relatively simple returns that were already effectively completely audited by the IRS because of information reporting requirements and withholding.

The presence of off-shore sales could pose evasion problems as well as the avoidance problems mentioned above. For example, buyers could purchase more than \$2,000 from off-shore entities and not pay taxes on the purchases. Experience with state-level "use" taxes and voluntary filings has been "dismal at best" (Murray 1997). The importation of services, especially direct delivery of electronic and information services could cause additional evasion problems.

Another potential problem is the appearance of many small, tax-evading retailers, who are able to set up businesses with low overheads, and are effectively created by the prospect of being able to undercut legitimate retailers by large margins. It will also prove very difficult to collect high-rate sales taxes from a number of small-scale service industries--taxi cab drivers, plumbers, handy men, painters, maids, etc. are classic examples. More generally, the two parties to a sale will have incentives to report lower-than-accurate transaction prices to the government coupled with side payments. The true transaction price and the side payments could easily be shielded via complex financing arrangements.

One of the most important determinants of the level of evasion in the current system is whether anyone other than the taxpayer withholds taxes or reports the tax to the government. The rate of evasion is currently around 17 percent in the income tax, but varies greatly by withholding and reporting arrangements. For income where taxes are withheld and reported to government by a third-party, the evasion rate is about 1 percent. This is predominantly withholding of taxes on wages. At the other extreme, for income where taxes are not withheld and there is no reporting, the evasion rate is 30 percent or more. In contrast, the pure retail sales tax would be collected only from businesses that make retail sales, and there would be no withholding or reporting by anyone other than the business itself. That is, the entity reporting the tax payment would also be the entity legally responsible for the tax liability. Because the pure retail sales tax would feature no third-party withholding or reporting, the possibility of high rates of evasion needs to be taken quite seriously.

Sales tax advocates sometimes claim that the NRST would be more effective than the current system at raising revenue from the underground economy. The classic example is that of a drug dealer who currently does not pay income tax on the money he earns, but would be forced to pay sales taxes under an NRST if he took the funds and bought, for example, a Mercedes. The problem with this argument is laid out by Armey (1995). "If there is an income tax in place, he [the drug dealer] won't report his income. If there is a sales tax in place, he won't collect taxes from his customers" and send the taxes to government. In the end, to a first order approximation, neither system taxes the drug trade. Some additional effects, though, may complicate the analysis. For example, the effective tax rate on drug dealers and their customers may differ, and the drugs may be purchased with income generated illegally.

Many other countries have attempted to implement some variant of a sales tax such as wholesale level taxes or "ring" taxes (retail sales taxes with business exemptions certificates for businesses "in the ring.") Almost all of these countries have switched to a value-added tax. In 1967, 19 OECD countries had some form of wholesale, retail or turnover tax. By 1995, all 19 of these countries had converted to value-added taxes. Developing countries as well have largely abandoned retail sales taxes in favor of value-added taxes. Countries that have relied on RSTs tend to charge around 4-6 percent of the tax exclusive value of goods, while standard VAT rates tend to range between 14 percent and 25 percent. No country has maintained a sales tax rate above 30 percent.

Ultimately, my reading of the evidence is that the interaction of (a) incentives to evade taxes, caused by the lack of third-party withholding and the high marginal tax rates that would be required even if there were no evasion, and (b) the political pressure to exempt certain goods, given the high sales tax rate, will create somewhat of a vicious cycle: each factor raises the required rate and increases incentives to raise the other factor, which in turn raises required rates again, and so on. Thus, it is quite likely that evasion in the sales tax would be at least as high as in the current system and it is quite possible that the sales tax would prove to be unworkable. It is worth emphasizing that these conclusions are by no means extreme relative to the literature. Concern and doubt about the adminstrability and enforceability of a high-rate national retail sales tax have also been expressed by: Bartlett (1995), Casanegra (1987), McLure (1987), Mikesell (1997), Murray (1997), OECD (1998), Slemrod (1996), Tait (1988), Tanzi (1995), and the Wall Street Journal (1996).¹³

Possible administrative improvements in the administration of a NRST, discussed by

¹³Unfortunately, there is little evidence from the states to gauge how extensive evasion would be under a NRST. Evasion in a federal sales tax would likely be significantly higher than in existing state taxes, because state sales tax rates have substantially lower rates than an NRST would, and states can piggyback on federal enforcement efforts, which are in turn aided by the existence of an income tax with its various reporting requirements.

Zodrow (1999), would likely reduce evasion, as would a VAT, compared to a retail sales tax. But no one would argue seriously that the changes would eliminate tax evasion.

In light of these considerations, I assume below that the rate of evasion in an NRST would be 15 percent. It should be emphasized that this is significantly lower than what I would regard as a plausible evasion rate in a sales tax, but the goal here is to provide conservative assumptions that, if anything, understate the required tax rate. Note also that this evasion rate is lower than in the existing system, even though most revenues in the existing system are collected via withholding of taxes on wages for the income and payroll taxes, a type of income for which the evasion rate is very low.

III. Estimates of the required rate

A. Parameter Estimates

The data needed to generate tax rate estimates are provided in table 4 for the AFT proposal.¹⁴ All data refer to 1995.The proposed consumption base and government spending are taken from table 2. The demogrant estimate is taken from Americans for Fair Taxation (1997). I consider two specifications of government: one where real federal, state and local government is held constant, and one where only the federal government is held constant. In the latter case, purchases by state and local governments are taxable and thus are placed in consumption.¹⁵

¹⁴To simplify calculations, I use the same tax base for the AFT and the S-T proposals. In practice, the proposed bases differ somewhat in their treatment of state and local taxes, housing, and tax-exempt organizations, and their calculation of the demogrant. Because the differences between the proposals largely offset each other in terms of their effects on the size of the tax base, incorporating the differences would have only small effects on the results.

¹⁵When holding only the size of federal government constant, the consumption figure is the sum of private consumption (\$4,381.7 billion) plus state and local purchases of \$787.5 billion. The state and local purchase figure does not equal the sum of state and local consumption and gross purchases shown in table 2, because the latter figure includes

To estimate T, note that federal transfers to individuals totaled \$709.4 billion in 1995 and state and local transfers totaled \$280.6 billion, for total transfers to persons of \$990 billion. The federal government made net interest payments of \$224.8 billion, while state and local governments made net interest payments of -\$59.6 billion (that is, they received net interest). Thus, total net interest payments were \$165.2 billion, total transfers were \$1,152.7 billion, and total federal transfers were \$934.2 billion (NIPA, Tables 3.1, 3.2 and 3.3).

Estimating α precisely is difficult and only a rough calculation is provided. The following transfers can be subject to federal income taxation: net interest payments (\$181.7 billion), 50 percent to 85 percent of social security benefits (\$163.8 billion to \$278.5 billion), unemployment insurance (\$21.7 billion), federal employee retirement (\$67.3 billion), and state and local employee retirement (\$66.3 billion) (NIPA table 3.12). If only 50 percent of social security benefits are subject to taxation, these transfers total \$501 billion in 1995 or 43.5 percent of total transfers, suggesting α =0.565. If 85 percent of social security benefits are taxed, taxed benefits equal \$616 billion in 1995, suggesting that α =0.466.

These figures should be raised, however, for two reasons. First, not all taxable transfers are actually taxed (because of the zero tax rate bracket in the income tax). For example, only 15 percent of social security benefits and two-thirds of net interest paid on government debt are taxed (Congressional Budget Office 1997, p. 16). Making these adjustments would reduce taxable social security benefits by \$114 billion and taxable net interest by \$60 billion. Thus, only \$327 billion, or 28 percent, of transfers would be taxable, suggesting that α =.72. Likewise, preliminary calculations using the Joint Committee on Taxation (JCT) individual tax model

depreciation of government capital, which would not be taxed under a sales tax.

suggest that over three quarters of transfers are not taxed.

Second, some--presumably large--proportion of taxed transfers face the 15 percent rate in the existing system, which is below the rate that would apply in a national retail sales tax. Preliminary calculations from the JCT model indicate an average tax-inclusive tax rate of roughly 21 percent on the small minority of transfers that are actually taxed.¹⁶ This is below what would be required in the AFT proposal, which should raise α further. Thus, setting α =0.75 may understate the true value. Higher values of α would generate higher sales tax replacement rates than reported below.

To estimate D, note that the federal budget deficit measured on a current basis was \$174.4 billion in 1995. To this figure, we add federal gross investment (\$66.1 billion) and subtract depreciation of federal capital (\$68.2 billion), for a federal cash flow deficit of \$172.3 billion. The corresponding state and local figures are a current surplus of \$103.1 billion, gross investment of \$147.4 billion, and depreciation of \$54.2 billion, for a cash flow surplus of \$9.9 billion. The overall government cash flow deficit was therefore \$162.4 billion (NIPA tables 3.1, 3.2, 3.3, and 3.7).

To hold only federal government constant, we use estimates of G (or G*, as noted), T, and D based on federal statistics only. State and local spending on goods and services is placed in C--that is, it is treated just like private consumption. This raises C to \$5169.2 billion. In this case, state and local transfers are not protected against price changes.

B. Estimates of the Required Tax Rate

The required tax rate estimates are presented in table 5. The first panel shows the rates

¹⁶I thank Pamela Moomau for providing the estimates using the JCT model.

required to replace taxes in the AFT proposal: personal and corporate income taxes, the estate tax, and payroll taxes. The first row shows the AFT proposal would require a tax-inclusive rate of about 23 percent and a tax-exclusive rate of about 30 percent. But it also notes that this would involve a reduction in real federal, state, and local spending of \$483 billion (using equation (12)) and does not allow for any evasion, avoidance, or erosion of the base. The second row shows that holding the real size of federal, state and local government constant would raise the tax-inclusive rate to 35 percent, and the tax-exclusive rate to 54 percent. The third row shows that the relatively conservative parameter choices used--a 5 percent rate of tax avoidance, a 15 percent rate of tax evasion, and a 10 percent rate of erosion of the statutory tax base--boosts the required tax rates markedly, to over 100 percent on a tax-exclusive basis and over 50 percent on a tax-inclusive basis.

The last two lines of the first panel show the effect of preserving only the size of the federal government, letting real state and local spending fall by \$219 billion (or about 22 percent). With conservative (but positive) rates of avoidance, evasion, and statutory base erosion, the required tax-inclusive rate would be 39 percent, while the required tax-exclusive rate would be 65 percent.

The second panel shows the required rates when replacing only the taxes specified in the S-T proposal: individual and corporate income taxes, estate taxes, and selected excise taxes. The required tax-exclusive rates are roughly 60 percent as high as in the first panel, because the revenue target is lower (as shown in table 1).

These estimates could be extended in a number of ways. For example, if the sales tax spurred economic growth, the rates would be lower in the long run. If consumption grew by 10 percent, which is on the optimistic end of forecasts for the economic growth due to *realistic* tax

reforms, the tax-exclusive tax rate in case (c) in the top panel of table 5 would fall from 101 percent to 82 percent, while the tax-inclusive tax rate would fall from 50 percent to 45 percent. However, in the short run, as consumption fell (saving increased), the required tax rate would have to increase.

On the other hand, in 1995, state sales taxes and personal and corporate income taxes raised about \$410 billion in revenues. Moving to a NRST would likely require states to abandon or significantly alter their income taxes and modify their sales tax. A plausible outcome would be that states converted their income taxes to sales taxes (otherwise there would be little net simplification from a national sales tax) and conformed their sales taxes to the federal sales tax base. If this were done, the average combined federal and state sales tax-exclusive tax rates would be about 30 percent (not percentage points) higher in the top panel of table 5 and more than 50 percent higher in the bottom panel.

V. Conclusion

Proposals to replace the existing federal tax system have received increased attention in recent years, but the claims made on behalf of some of these proposals are not credible. In particular, claims that a national retail sales tax could replace the income tax system, the estate tax and payroll taxes at a 23 percent tax-inclusive (30 percent tax-exclusive) tax rate are fundamentally flawed. This paper shows that such claims hinge on hidden reductions in real government spending of almost half a trillion dollars per year, and on the impossibly optimistic assumptions that there will be no tax avoidance, no tax evasion, and no statutory erosion of the proposed tax base. Corrections for these problems show that plausible national retail sales taxes will require--at the federal level--tax-inclusive rates on the order of 50 percent and tax-exclusive rates on the order of 100 percent. Accounting for economic growth would reduce this rate, but

consideration of state and local taxes would raise the rate by even more than growth would reduce it. Finally, given the experience of other countries with high-rate retail sales taxes, there have to be serious questions about whether a sales tax with rates that high could actually be enforced.

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Taxes to be Replaced by Major Sales Tax Proposals, 1995 (billions of dollars)

_	Schaefer- Tauzin	Americans for Fair Taxation
Personal Income Tax	598.1	598.1
Corporate Income Tax	161.1	161.1
Estate and Gift Tax	14.8	14.8
Excise Taxes	28.0*	
Payroll Taxes		588.0
Total	803.0	1362.0

*Estimated

Source: Burton and Mastromarco (1997, Table 2) and Americans for Fair Taxation, "Revenue Neutrality".

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Proposed Tay Ra	so for Nation	al Salas Tax	(hillions	of dollars)
rroposeu rax da	se for mation	al Sales Tax	. (DHHOHS	of uonars)

Description of Taxable Item	Tax Base (1995)
Personal consumption expenditures	4924.9
Less: Education expenditures	-97.5
Less: Food produced and consumed on farms	-0.4
Purchases of new homes	156.4
Improvements to single-family homes	73.9
Less: Inputed rent on housing	-534.3
Additional financial intermediation services	53.0
Less: Expenditures abroad by U.S. residents	-2.7
Less: One half of Foreign travel by U.S. residents	-26.4
Expenditures in U.S. by nonresidents	73.1
(1) Private Consumption Tax Base	4620.0
State and local government consumption	682.6
State and local government gross purchases	159.1
Federal government consumption	453.8
Federal government gross purchases	62.7
(2) Total Government Tax Base	1358.2
(3) S-T tax base = $(1) + (2)$	5978.2
(4) Less: State sales taxes	-238.3
(5) AFT tax base = $(3) - (4)$	5739.9

Source: National Income Product Accounts, Survey of Current Business, August 1996.

Calculation of Proposed Tax Rates in Major Sales Tax Proposals, 1995 Data

	Schaefer-Tauzin	Americans for Fair Taxation
(1) Revenue Target ¹	803.0	1362.0
(2) Proposed Gross Tax $Base^1 = (a) + (b)$	5978.2	5739.9
(a) Private Consumption	4620.0	4381.7
(b) Government Consumption	1358.2	1358.2
(3) Less Demogrants ¹	1137.1	1137.1
(4) Net Tax $Base^1 = (2) - (3)$	4841.1	4602.8
(5) Implied Tax-Exclusive Tax Rate =(1)/(4)	16.6%	29.6%
(6) Implied Tax-Inclusive Tax Rate = $(1)/[(1) + (4)]$	14.2%	22.8%
(7) Proposed Tax-Inclusive Tax Rate	15.0%	23.0%
(8) Proposed Tax-Exclusive Tax Rate	17.6%	29.9%

¹ In billions of dollars.

Parameter Values

Parameter	Holding federal, state, and local government constant	Holding federal government constant		
C ¹	4,381.7 ²	5,169.2 ³		
X ¹	1,137.1	1,137.1		
G^1	1,358.2	516.5		
T ¹	1,155.2	934.2		
\mathbf{D}^1	162.4	172.3		
α	0.75	0.75		

¹ Billions of Dollars
² Total consumption tax base (\$4,620.0B) - state sales taxes (\$238.3B)
³ Includes state and local government spending as consumption.

Required Tax Rates in a NRST, 1995 Data

	Specifications					Required Tax Rates	
	Real Change in Federal Spending	Real Change in State and Local Spending	Rate of Avoidance	Rate of Evasion	Statutory Base Erosion	Tax- Inclusive	Tax- Exclusive
	(A) Replacer	nent for Individual :	and Corporate]	Income Taxes	s, Payroll Taxe	s, and the Est	ate Tax
(a)	-\$264B	-\$219B	0	0	0	22.8	29.6
(b)	0	0	0	0	0	34.9	53.6
(c)	0	0	.05	.15	.10	50.4	101.4
(d)	0	-\$219B	0	0	0	28.0	38.9
(e)	0	-\$219B	.05	.15	.10	39.4	65.1
(a)	(B) Replace	ment for Individual	and Corporate	Income Taxe	s, Excise Taxes	s, and the Esta	ite Tax
(a)	-\$1/2D	-\$143D	0	0	0	14.9	17.5
(b)	0	0	0	0	0	24.0	31.6
(c)	0	0	.05	.15	.10	37.4	59.8
(d)	0	-\$143B	0	0	0	18.6	22.9
(e)	0	-\$143B	.05	.15	.10	27.7	38.4