

## ESTIMATING FLAT TAX INCIDENCE AND YIELD: A SENSITIVITY ANALYSIS

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**Abstract** - *This research estimates the distributional effects of replacing existing federal income taxes with a flat tax as proposed by Representative Richard Armey and Senator Richard Shelby. Different assumptions about tax incidence and how the flat tax would be implemented yield somewhat different estimates of the distribution of gains and losses. Nevertheless, our main conclusions appear to be quite robust. Switching to the proposed flat tax would increase the tax burdens of a majority of taxpayers and would significantly redistribute tax burdens, mainly from the top decile to other taxpayers. This pattern of redistribution persists, although the top decile's gains are lessened, even if the flat tax is modified to make it more progressive.*

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Few would step forward to defend the existing system of federal individual and corporation income taxes, and few

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would argue against the need for tax reform. The question is not whether the federal tax system needs changing, but how best to do so. Representative Richard Armey and Senator Richard Shelby have set out one answer to that question in a bill that would replace existing federal income and estate and gift taxes with a flat tax on the income of individuals and businesses. The Armey–Shelby (AS) bill would implement the flat tax described and advocated by Hall and Rabushka (1995).

The U.S. Treasury estimated how enacting the AS bill would redistribute tax burdens among income classes (U.S. Treasury, 1996). The Treasury study concluded that the AS bill would increase the tax burdens of all but the highest income class (1996 family income of \$200,000 or more). In contrast, Hall and Rabushka (1995, pp. 92–93) reached a very different conclusion: “The current personal and corporate taxes tax wages heavily and business income lightly. The flat tax would reverse this inequity and benefit the great majority of Americans, whose income comes almost entirely in the form of wages.”

These sharply divergent views of the incidence of a flat tax motivate the

present study. We identify some of the main issues that arise when estimating the effects of switching to a flat tax. Then, for alternative assumptions about how these issues are resolved, we estimate the amount that each taxpayer in a representative sample would gain or lose if existing federal income taxes were replaced by the AS flat tax. We estimate the number of winners and losers in each income class and their individual gains and losses, as well as the aggregate gain or loss for the class as a whole. We also address the question of whether gains and losses are quantitatively significant, and we estimate gains and losses for modified, more progressive versions of the flat tax.

Estimates of *individual* taxpayer gains and losses are needed because switching to a flat tax will not have the same effect on all taxpayers within a given income class; the effect will depend on such characteristics as a taxpayer's income sources, number of exemptions, and use of itemized deductions.<sup>1</sup> For example, we estimate that switching to the AS flat tax would decrease the *average* tax burdens of the richest 10 percent of taxpayers and increase the *average* tax burdens of the remaining 90 percent of taxpayers. These changes in average burdens do not tell the full story, however, because we estimate that the AS flat tax would mean *higher*, not lower, taxes for over half of the richest ten percent of taxpayers.

Although it is unclear whether the AS bill or similar legislation will be considered in the 1998 session of Congress, a fuller understanding of the potential effects of switching to a flat tax is needed. Congress and the public continue to express support for changes that a flat tax promises: consumption-based taxation, a flatter rate structure, a broader tax base, and simplified filing.

Further, Congressional leaders have stated that they plan to make tax reform a major issue in 1998.<sup>2</sup>

In the next section, we briefly explain how a flat tax works and how it differs from existing taxes. Then, we describe the data and procedures used to estimate the distributional and revenue effects of adopting the AS bill. In the remainder of the paper, we present our main findings and highlight some of their policy implications. An important feature of our estimates is that they can be readily replicated and extended because they are derived from data that are available to academic researchers. In contrast, the Treasury (1996) study uses data and simulation models that are not available to the public.<sup>3</sup>

#### THE FLAT TAX COMPARED TO EXISTING TAXES

As defined by the AS bill, the flat tax has two parts—an *individual wage tax* and a *business tax*. The individual flat tax is levied on wages, salaries, and pensions minus standard deductions. The proposed standard deduction is \$21,400 for couples filing a joint return or for a surviving spouse, \$14,000 for a head of household, and \$10,700 for an individual who is not married and who is not a surviving spouse or head of household or who is a married individual filing a separate return. The proposed exemption for each dependent, which AS refers to as the additional standard deduction, is \$5,000. These amounts are for the 1996 tax year. For subsequent years, the amounts increase by the percentage increase in the consumer price index (CPI) during the preceding year.

The business flat tax is levied on total revenue from sales of goods and services less costs. Costs consist of

purchases of inputs including investment goods, wages and salaries, pension expenses, and taxes on purchases of inputs. Other taxes, mainly payroll, income, and property, are not deductible.

The business tax base can also be calculated as the sum of *nondeductible compensation costs* and *business cash flow*. Nondeductible compensation costs are outlays for nonpension fringe benefits and employers' share of payroll taxes. Business cash flow<sup>4</sup> is total receipts minus total deductions as calculated under current law *minus* excluded receipts, *plus* disallowed deductions, and *minus* investment expenditures. Excluded receipts are interest, dividends, and capital gains. Nondeductible expenses include interest paid, bad debts, gifts and contributions, taxes other than levies on the purchase of inputs, and charges for depreciation, depletion, and amortization.

All forms of business are taxed the same way. The flat tax applies only to domestic production. Negative business income can be carried forward indefinitely to offset positive income in future periods; the amount carried forward earns interest at the 3-month Treasury bill rate.

Revenue from the flat tax is the tax rate multiplied by the wage and business tax bases. The tax rate in the AS bill is 20 percent, dropping to 17 percent for tax years beginning after December 31, 1997.

#### DATA AND METHODS

Data on individual taxpayers were obtained from U.S. Treasury Statistics of Income files for 1988 and 1991, distributed by the University of Michigan and Ernst & Young.<sup>5</sup> The files are

stratified samples of tax returns, with each return having a weighting factor that allows inferences about the population of returns filed in 1988 and 1991. The years were chosen to represent a high employment year (1988) and a recession year (1991).

We used all returns on these files except (1) returns filed for other years; (2) dependent returns, which were eliminated because the AS bill would tax them with parent returns that we could not identify; and (3) special tax returns. The final samples correspond to 90 and 89 percent of the returns filed for the 1988 and 1991 tax years, respectively. The samples represent 97 million tax returns (216 million individuals) in 1988 and 102 million tax returns (225 million individuals) in 1991. They account for 97 percent of adjusted gross income (AGI), taxable income, and individual income tax liabilities in both 1988 and 1991.

For each sample taxpayer, we estimated a tax change that shows the combined effect of eliminating existing individual and corporation income taxes and imposing a revenue-neutral flat tax on individuals and businesses. Aggregating individual gains and losses by income class provided estimates of how the distribution of tax burdens would be altered by adoption of the AS flat tax. We estimated existing-law tax liabilities by applying 1996 individual income tax and earned income tax credit (EITC) parameters to incomes reported on 1988 and 1991 tax returns. With the tax law held approximately constant in this manner, differences in results for the two years reflect mainly differences in economic conditions.

#### *Taxpayer Set*

All revenues from production that would be reportable under a flat tax are

also reportable under the present system, and all of the businesses that would be required to file under the flat tax are now required to file. We have assumed that the set of filers is the same for the flat tax as for existing taxes, since there is no reason to expect that changing to a flat tax would induce filing by taxpayers who are not filing under present law. Neither is there reason to expect that revenues not reported under existing taxes would be reported under the flat tax.<sup>6</sup>

### *The Flat Tax Base*

We have followed as nearly as possible the same procedures in estimating the flat tax base for our "benchmark" case as the Treasury study (U.S. Treasury, 1996).<sup>7</sup> The wage tax base, consisting of wages, salaries, and pensions in excess of standard deductions and exemptions, was estimated directly from the sample tax returns.<sup>8</sup> The two components of the business tax base, nondeductible compensation and business cash flow, were estimated separately. Nondeductible compensation, which consists of employers' share of payroll taxes and outlays for nonpension fringe benefits, was estimated from National Income and Products Account (NIPA) data.<sup>9</sup> To estimate business cash flow, we made the following adjustments to business income as reported on the sample tax returns (Schedules C, E, and F) and corporate taxable income as reported in the Statistics of Income for both nonfinancial and financial corporations. We subtracted receipts that would not be included in the flat tax base (interest received, dividends, and capital gains) and added deductions that would not be allowed under the flat tax (interest paid, bad debts, contributions, taxes other than levies on purchases of inputs, charges for amortization, depreciation and depletion, net operating loss

carryovers, and dividends-received deduction).<sup>10</sup> Because the AS flat tax base includes the value of the services that financial intermediaries provide in lieu of paying interest, our estimate of interest paid includes imputed interest, as reported in the NIPA, as well as monetary interest.<sup>11</sup> We also subtracted an assumed value for capital outlays, which would be deductible in calculating the flat tax base.

Estimating the flat tax base as above assumes that the flat tax is fully phased in. In the years immediately following adoption of a flat tax, the base of the tax could be less than estimated if businesses are allowed to deduct depreciation, operating losses, and credits built up under existing law.<sup>12</sup>

Table 1 presents estimates of the flat tax base for benchmark assumptions about the size of the components of the base.<sup>13</sup> For the benchmark case, we assumed that capital expenditures were equal to the sum of deductions for depreciation, depletion, and amortization and that business losses carried over from previous years were equal (in present value) to the losses generated in the current year.<sup>14</sup>

### *Incidence Assumptions*

Our benchmark estimates of changes in the distribution of tax burdens are based on the following assumptions about the incidence of the flat tax and the existing corporation and individual income taxes, which are the incidence assumptions made in the recent Treasury study (U.S. Treasury, 1996).<sup>15</sup>

- (1) The existing individual income tax, including the tax on income from unincorporated businesses and S corporations, is borne by the payers of the tax.

TABLE 1  
COMPONENTS OF FLAT TAX BASE: BENCHMARK CASE<sup>a</sup> (\$ BILLION)

|                                       | 1988             | 1991             |
|---------------------------------------|------------------|------------------|
| Wages, salaries, and pensions         | \$2,444.9        | \$2,833.6        |
| Less standard deductions <sup>b</sup> | -1,177.6         | -1,370.9         |
| <b>Wage flat tax base</b>             | <b>\$1,267.3</b> | <b>\$1,462.7</b> |
| Employer share of payroll taxes       | 167.4            | 194.3            |
| Fringe benefits                       | 159.5            | 225.0            |
| <b>Nondeductible compensation</b>     | <b>326.9</b>     | <b>419.3</b>     |
| Form 1040 business cash flow          | 360.7            | 427.1            |
| Corporate cash flow (C corporations)  | 404.9            | 404.1            |
| <b>Business cash flow</b>             | <b>\$765.5</b>   | <b>\$831.2</b>   |
| <b>Business flat tax base</b>         | <b>\$1,092.4</b> | <b>\$1,250.5</b> |
| <b>Total flat tax base</b>            | <b>\$2,359.7</b> | <b>\$2,713.2</b> |

<sup>a</sup>The components of the flat tax base were estimated from tax return data and NIPA data reported by U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Vol. 72, No. 1, January, 1992; Vol. 76, No. 1, January–February, 1996; and Vol. 76, No. 3, April, 1996. Table 1 reports prorated amounts allocated to the sample; the sample includes approximately 96 percent of total wages, salaries, and pensions and business cash flow.

<sup>b</sup>Standard deductions totaling \$1,500 billion (\$1,752 billion) were available to taxpayers in 1988 (1991), but \$322 billion (\$381 billion) was not used by taxpayers whose deductions exceeded their wage income.

- (2) The existing corporation income tax is borne in proportion to receipt of capital income (interest, dividends, and capital gains).
- (3) The flat tax on wages and pensions is borne in proportion to wages and pensions in excess of standard deductions.
- (4) The flat tax on nondeductible compensation, although collected from employers, is borne by employees in proportion to the amount of such compensation.<sup>16</sup>
- (5) The flat tax on the business cash flow of C corporations is borne in proportion to receipt of all capital income; the tax on the business cash flow of S corporations and 1040 businesses is borne in proportion to receipt of such income.

#### *Assumptions Used in Sensitivity Analysis*

Any analysis of the effects of switching to a flat tax is necessarily conditional on

assumptions about tax incidence and the size and components of the flat tax base. Alternative assumptions used in our sensitivity analysis are summarized in Table 2. A key incidence issue is how the burden of taxes collected from businesses is distributed between capital and labor income. Among the main issues that come up in estimating the flat tax base are the amount of capital spending, the value of financial services provided in lieu of interest, and the extent to which operating losses incurred in any given period will be deducted from future business cash flow. The benchmark assumptions represent likely resolutions of these issues. The other cases modify the benchmark assumptions; each case incorporates a different assumption about either tax incidence or the size of the flat tax base. Following the Treasury study, we have not attempted to estimate the effects of tax-induced behavioral changes, such as changes in labor supply or saving.

TABLE 2  
ESTIMATED FLAT TAX BASES AND RATES

| Tax Incidence and Base Assumptions   | Flat Tax Base (\$ Billions) |         | Revenue-Neutral Tax Rate (%) |       |
|--|-----------------------------|---------|------------------------------|-------|
|  | 1988                        | 1991    | 1988                         | 1991  |
| 1. Benchmark<br><i>Incidence assumptions modified by subsequent cases:</i><br>Corporate income tax and flat tax borne by capital income<br><br><i>Base assumptions modified by subsequent cases:</i><br>All business losses are deducted from current period tax base; taxpayers with multiple sources of Form 1040 business income allowed to offset losses from one source against income from other sources<br><br>Standard deductions cannot be applied against nonwage income<br><br>Imputed interest is fully taxed<br><br>Capital expenditures equal sum of amortization, depreciation, and depletion | 2,359.7                     | 2,713.2 | 21.13                        | 19.13 |
| 2. Benchmark except existing tax on corporate income and flat tax on corporate cash flow are borne 50% by capital income and 50% by wage income  | 2,359.7                     | 2,713.2 | 21.13                        | 19.13 |
| 3. Benchmark except no business losses are deducted  | 2,543.5                     | 2,924.5 | 19.60                        | 17.75 |
| 4. Benchmark except allow Form 1040 business net income to be offset by standard deductions  | 2,296.8                     | 2,646.0 | 21.71                        | 19.62 |
| 5. Benchmark except imputed interest is not taxed  | 2,249.8                     | 2,567.4 | 22.16                        | 20.22 |
| 6. Benchmark except deduction for capital expenditures as reported in NIPA   | 2,161.1                     | 2,501.8 | 23.07                        | 20.75 |

Reflecting the lack of consensus about the incidence of taxes on corporations, case 2 assumes that the existing corporation income tax and the flat tax on corporation cash flow are borne equally by wage and capital income. This assumption implies that corporation income taxes, in part, are shifted to workers through lower wages.

Cases 3 through 6 alter assumptions regarding the size of the flat tax base. Case 3 varies the assumption regarding the amount of operating loss carryover. In the benchmark case, loss carryover is assumed to equal the current year

losses. In contrast, case 3 makes the extreme assumption that none of the current year losses are ultimately deductible and that no losses are carried over from previous periods. Comparing it to the benchmark case shows the maximum effect of loss-carryover rules on tax collections.

Under the flat tax, business owners will have an incentive to pay themselves enough in wages to assure full utilization of their standard deductions. Case 4 allows for such conversion of business to wage income, which is not prohibited by the AS bill.

The AS bill does not spell out how the difficult task of taxing imputed interest is to be carried out.<sup>17</sup> Comparing Case 5 with the benchmark case shows the effect of failing to tax such interest.

The AS flat tax is essentially a tax on consumption. Switching to that tax therefore may increase investment above levels prevailing under existing taxes. Case 6 shows the effects of investment outlays exceeding the level assumed in the benchmark case.<sup>18</sup>

## RESULTS

Table 2 presents estimates of the flat tax base and revenue-neutral tax rate for alternative assumptions about tax incidence and how the AS bill is implemented. The estimates are for replacement of only the portion of the existing individual and corporation income taxes that could be allocated to individual returns—96 and 98 percent of the tax liability reported by individuals and corporations in 1988 and 1991, respectively. Full allocation was not possible because the sample does not include all tax returns. Similarly, estimates of the flat tax base were adjusted for the fact that the full amount of the flat tax base (wages, nondeductible compensation, and business cash flow) would not accrue to the sample taxpayers.

The amount of revenue being replaced was calculated using 1996 parameters for the individual income tax and the EITC, with tax brackets and phase-out thresholds adjusted for the inflation that occurred between 1988 and 1996. Revenue replaced is the same for all cases—\$498.5 billion in 1988 and \$519.1 billion in 1991.

The revenue-neutral rate is lower in 1991 than in 1988 for all cases. This

difference reflects the fact that 1988 was a high employment year, while 1991 was a recession year. As the economy moved into recession from 1988 to 1991, the flat tax base grew more rapidly than the bases of existing taxes, mainly because business cash flow is less sensitive than business net income to cyclical swings and because nondeductible fringe benefits increased rapidly from 1988 to 1991 (Table 1).<sup>19</sup> Also, as the economy moved into recession, the *average* rates of individual and corporation income taxation fell and the deficit increased. This is the “automatic stabilizing” effect of these taxes.<sup>20</sup> The estimates based on 1988 data therefore may be better approximations of the full employment revenue-neutral rates.

Cases 3, 5, and 6 show that the flat tax base and revenue-neutral rate can be significantly affected by several factors about which there is considerable uncertainty: deductibility of losses, taxation of financial services (imputed interest), and capital spending. Rates as low as those for case 3 seem very unlikely because a major share of the losses generated in any given year will ultimately be deducted in computing flat tax liabilities.<sup>21</sup> The benchmark rates also are probably too low. Investment spending is likely to exceed charges for depreciation, depletion, and amortization; and the full amount of imputed interest reported in the NIPA may not be taxed. The revenue-neutral rates implied by the combined assumptions of cases 5 and 6 (investment at the levels reported in the NIPA and imputed interest not taxed) are perhaps more realistic—24.3 percent for 1988 and 22.0 percent for 1991.

The revenue-neutral rates in Table 2 do not allow for revenue that would be lost if the estate and gift taxes are repealed

as called for by the AS bill. We cannot allocate those taxes among income classes, but we can calculate how much higher the flat tax rate would have to be to offset the loss of estate and gift tax revenue, which totaled \$8.13 billion in 1988 and \$11.47 billion in 1991. For the benchmark case, offsetting these revenue losses would require flat tax rates of 21.5 percent in 1988 and 19.6 percent in 1991.

The revenue actually collected under laws in effect in 1988 and 1991 was less than the amounts calculated using 1996 tax parameters. The flat tax rates that would have been required to replace *actual* revenue therefore are lower than those reported in Table 2—20.5 and 19.0 percent for the benchmark case in 1988 and 1991, respectively.

#### *Redistribution among Income Classes*

Table 3 presents estimates of how adopting the AS flat tax would redistribute tax burdens and shares among income classes. Taxpayers were placed in income classes on the basis of their “flat income”—their share of wages, salaries, and pensions, nondeductible compensation, and business cash flow. Flat income, which totaled \$3,537 billion in 1988 (Table 1), is a broader measure of income than AGI, but it is not as broad as “family economic income,” the measure used in the Treasury (1996) study.<sup>22</sup> These estimates, based on the benchmark assumptions, show that switching to the AS flat tax would increase taxes for all but the top and bottom deciles. Further, within the top decile, the top-percentile taxpayers would gain more than the decile as a whole. For example, in 1988, the top decile’s taxes would be reduced by \$54.3 billion, and the top percentile’s taxes would be reduced by \$60.8 billion.

The bottom and top deciles would gain in part because a relatively large share of their income is capital income, which the flat tax would tax more lightly than does the present system.<sup>23</sup> Top-decile taxpayers would also gain because their marginal tax rate would be lower. Note that the estimated gain for the top decile would be somewhat larger if we could include the effects of eliminating the estate and gift taxes, which would benefit mainly higher income taxpayers.

Under the existing system, available deductions for the bottom decile totaled \$64.3 billion in 1988, of which \$27.4 billion was used to offset taxable income. Under the flat tax, available deductions would be significantly larger—\$111 billion for 1988. But taxpayers would have enough wage income to use only \$25 billion of those deductions, less than the deductions taken under current law. The estimates for 1991 are similar. Deductions are greater under current law than they would be under a flat tax because current law allows deductions to offset business income, while the flat tax does not. Although one might expect otherwise, the bottom decile therefore does not benefit from the flat tax’s higher standard deductions (tax-free thresholds).

Table 4 compares the Treasury’s estimates of the distributional effects of switching to the AS tax with our benchmark estimates. The estimates are not strictly comparable because the Treasury study used family economic income to define income classes and to calculate changes in income, while we used flat income. Also, we lacked the data needed to precisely duplicate the procedures that the Treasury followed in estimating the flat tax base. Notwithstanding these differences, the estimates of gains and losses by income class are quite similar: all imply lower tax





TABLE 3  
DISTRIBUTIONAL EFFECTS OF SWITCHING TO A FLAT TAX BENCHMARK CASE, 1988 AND 1991

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TABLE 4  
TREASURY ANALYSIS OF AS PROPOSAL COMPARED WITH 1988 AND 1991 ESTIMATES

|                                      | Percent Change in After-Tax Income |                |                |
|--------------------------------------|------------------------------------|----------------|----------------|
|                                      | Treasury <sup>b</sup>              | Benchmark 1988 | Benchmark 1991 |
| <b>Income percentile<sup>a</sup></b> |                                    |                |                |
| Lowest 20%                           | -6.7                               | -5.0           | -5.1           |
| Second 20%                           | -5.4                               | -4.8           | -4.2           |
| Third 20%                            | -2.9                               | -2.7           | -1.3           |
| Fourth 20%                           | -2.4                               | -1.9           | -0.9           |
| Highest 20%                          | 2.1                                | 2.7            | 1.7            |
| Top 10%                              | 4.2                                | 5.1            | 3.4            |
| Top 5%                               | 6.4                                | 8.1            | 5.3            |
| Top 1%                               | 11.7                               | 16.6           | 11.4           |

<sup>a</sup> Income percentiles based on family economic income in the Treasury case and flat income in the benchmark cases. Family economic income "is constructed by adding to AGI unreported and underreported income; IRA and Keogh deductions; nontaxable transfer payments, such as social security and AFDC; employer-provided fringe benefits; inside build-up on pensions, IRAs, Keoghs, and life insurance; tax-exempt interest; and imputed rent on owner-occupied housing" (U.S. Treasury, 1996, p. 454).

<sup>b</sup> Source: U.S. Treasury (1996, Table 3). Treasury change includes replacement of estate and gift taxes; benchmark changes do not include this. Treasury flat tax estimates are for 1996 income levels and a revenue-neutral flat tax rate of 20.8 percent.

burdens for taxpayers in the top income decile and percentile at the expense of taxpayers in the other income deciles.

Would this pattern of redistribution persist if different assumptions were made about tax incidence and the components of the flat tax base? To answer this question, Table 5 shows how adopting the AS flat tax would change tax shares for the assumptions listed in Table 2. For example, the "Decile 10" entry in the benchmark case row for 1988 indicates that adopting the flat tax would decrease the tax share of the top decile of taxpayers by 10.9 percentage points. The changes for all deciles in a given row sum to zero. The sum of the positive (or negative) changes indicates the share of taxes that would be redistributed by the AS bill. For example, 11.01 percent of 1988 taxes would be redistributed under the benchmark assumptions. Since flat tax shares do not depend on the *level* of taxation, showing how tax shares vary with assumptions about incidence and tax base allows us to focus on the *structure* of taxation.

The estimates in Table 5 show that major changes in assumptions about incidence and the size of the flat tax base *do not* alter the basic pattern of redistribution. For all cases in both years, the flat tax would decrease the tax shares of the top decile and the top percentile and increase the shares for deciles 2 through 9. Taxpayers with business losses are concentrated in the bottom decile. The ability to deduct these losses in calculating flat tax liabilities accounts for the fact that the bottom decile would gain from a switch to the flat tax in all except case 3, in which no business losses are deducted.

One might expect that the top-decile gains would be significantly diminished if taxes on corporations were partly borne by wage income, but that is not the case. Allocating 50 percent of the taxes on corporation income and corporation cash flow to wage income (case 2) only slightly reduces the estimated redistribution of tax burdens from decile 10 to deciles 4–9. The reason is that the existing tax on corporation income exceeds the flat tax



TABLE 5  
CHANGE IN TAX SHARES: FLAT TAX MINUS EXISTING TAX

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on corporate cash flow by a relatively small amount (\$5.8 billion in 1988 and \$11.4 billion in 1991); changing the allocation of such small amounts can have only a small effect on the overall distribution of tax burdens.

The estimates in Tables 3 and 5 assume 1996 tax parameters and use flat income to define income classes. But very similar patterns of redistribution emerge when estimates are based on actual 1988 and 1991 tax parameters rather than 1996 parameters, and when income classes are based on AGI rather than flat income, as shown in panel C of Table 3. Further, *all* of the alternative assumptions yield the same pattern of redistribution as the Treasury study.

Altig et al. (1997) also reach conclusions similar to those reported in Table 3, even though they use a computable general equilibrium simulation model instead of simulations based on actual taxpayer data drawn from the Statistics of Income files. Specifically, their estimates show that “the highest relative gains (from switching to a flat tax) are for the richest and poorest lifetime-income groups” (p. 22). The reason higher income taxpayers enjoy larger gains is the same for both our study and the Altig et al. study: higher income taxpayers benefit more from lower marginal and average tax rates. The reduced tax rate on capital income is also the main reason lower income taxpayers gain in our study. In contrast, lower income taxpayers gain in the Altig et al. study because their wages increase and because they own little capital and therefore bear little of the implicit levy that the flat tax imposes on existing capital (p. 23). The only losers in the Altig et al. study are current taxpayers of two types: older taxpayers who own capital and therefore suffer from the levy on existing capital, and middle-

income taxpayers who enter the labor force close to the time of reform. The latter lose because “they face relatively high tax rates of 20 to 22 percent on labor income for 20 to 25 years of their working life before the growth of the capital stock becomes fully effective” (p. 23).

Another recent study, Gentry and Hubbard (GH, 1997), reinforces the conclusion that switching to a flat tax would reduce the tax share of high-income taxpayers at the expense of middle-income taxpayers. But GH also emphasize that the gains of high-income taxpayers will be overstated if they are estimated on the assumption that a flat tax exempts all capital income from taxation. They explain that a flat tax, or any other broad-based consumption tax, exempts only the opportunity cost of capital (the return on riskless investments), while taxing the above-normal return (the return in excess of opportunity cost). GH argue that above-normal returns, which consist of inframarginal returns (economic profits) and returns to risk taking, are skewed toward the top of the income distribution (p. 2). Failing to include such returns in the flat tax base therefore will understate the taxes borne by higher income taxpayers.

We have followed the GH prescription for estimating the distributional implications of switching to a flat tax. Our measure of business cash flow *does* include the above-normal returns to capital because it consists of *all* capital income minus expenditures on capital goods. As GH explain, expensing of capital outlays removes only the opportunity cost of capital from the tax base (pp. 5–7). Also, we have distributed the tax on the business cash flow of S corporations, partnerships, and proprietorships to taxpayers in propor-

tion to their receipt of income from such businesses. GH show that ownership of these businesses is concentrated in high-income and high-wealth households (pp. 19–21). Consequently, our distribution of the flat tax on the cash flow of these businesses is more progressive than it would be if we distributed the tax in proportion to all capital income, as the Treasury study does. There is still the possibility, of course, that our estimates understate the progressivity of the flat tax on business cash flow and therefore overstate the gains of higher income taxpayers.

#### *Share of Taxpayers Gaining/Losing*

Large though it is, the *between-decile* redistribution described above understates the realignment of tax burdens that the AS bill would generate. As Table 6 shows, there would also be significant *within-decile* redistribution. Some taxpayers in each decile would have lower average tax rates and therefore gain from the substitution. But a majority of taxpayers would face higher average tax rates and lose—71.2 and 65.2 percent, respectively, for 1988 and 1991 data. Losers would outnumber winners in all deciles except 3. Further, taxpayers in the top decile would capture the lion's share of gains. The estimates for 1988 show 3.3 million top-decile taxpayers gaining \$84.2 billion of the total \$113.0 billion gained by 27.6 million winning taxpayers. For top-decile winners, 1988 gains average \$25,600, far exceeding the average gains of winners in other deciles. Losses are more evenly distributed, averaging \$1,632 (about four percent of flat income) over all losers. The tax increases faced by lower decile losers would be large relative to their incomes, averaging 25, 13, and 13 percent of income for deciles 1–3, respectively.

Within the top decile, gains are concentrated in the top 2 percentiles. In each

of the 91st through 98th percentiles, losses exceed gains and losers outnumber winners. The top-percentile taxpayers are the big winners. Benchmark estimates for 1988 show 72 percent of top percentile taxpayers gain an average of \$95,001; 1991 estimates show 68 percent gain an average of \$76,679. Winners in the top decile differ from losers mainly in the source of their capital income. Top-decile winners receive a large share of their capital income from C corporations that are subject to the existing corporation income tax. In contrast, losers receive most of their capital income from S corporations, partnerships, and proprietorships. Top-decile winners therefore gain much more from the elimination of the corporation income tax than top-decile losers. Fifty-five percent of the gains from eliminating the corporation income tax accrue to top-decile winners, while only four percent of those gains accrue to top-decile losers.

Although the average losses shown in Table 6 are substantial, losses may not be significant for some taxpayers. To check for this possibility, we estimated the percentage of taxpayers facing tax increases exceeding specific amounts. Benchmark estimates for 1988 show 67 percent of taxpayers with tax increases of \$100 or more, 49 percent with increases exceeding \$500, and 36 percent with increases exceeding \$1,000; for 1991, the corresponding estimates are 61, 44, and 30 percent. With more than 40 percent of taxpayers facing increases in excess of \$500 and 30 percent or more facing increases exceeding \$1,000, the tax increases implicit in the AS bill are clearly significant.

Our estimates of taxpayer gains and losses necessarily reflect assumptions

TABLE 6  
 WINNERS AND LOSERS UNDER THE FLAT TAX SYSTEM BENCHMARK CASE, 1988 AND 1991  
 (\$ TAX IN BILLIONS AND \$ GAIN (LOSS) PER WINNER (LOSER) IN ACTUAL \$)

|                         | Decile 1 | Decile 2 | Decile 3 | Decile 4 | Decile 5 | Decile 6 | Decile 7 | Decile 8 | Decile 9 | Decile 10 | Top 1%    | All Deciles <sup>a</sup> |
|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|--------------------------|
| <b>1988</b>             |          |          |          |          |          |          |          |          |          |           |           |                          |
| <i>Winners</i>          |          |          |          |          |          |          |          |          |          |           |           |                          |
| Total gain              | \$4.4    | \$1.2    | \$2.0    | \$2.3    | \$2.8    | \$3.4    | \$4.0    | \$4.1    | \$4.6    | \$4.2     | \$6.2     | \$113.0                  |
| Percentage of taxpayers | 2.00     | 4.10     | 5.09     | 2.65     | 2.52     | 2.71     | 2.89     | 1.71     | 1.39     | 3.38      | 0.72      | 28.45                    |
| Gain per winner         | \$2,263  | \$299    | \$406    | \$894    | \$1,161  | \$1,304  | \$1,434  | \$2,442  | \$3,385  | \$25,600  | \$95,001  | \$4,084                  |
| <i>Losers</i>           |          |          |          |          |          |          |          |          |          |           |           |                          |
| Total loss              | -\$3.8   | -\$6.6   | -\$8.4   | -\$8.8   | -\$9.4   | -\$8.5   | -\$8.7   | -\$12.0  | -\$16.9  | -\$29.8   | -\$5.4    | -\$113.0                 |
| Percentage of taxpayers | 7.79     | 5.83     | 4.88     | 7.34     | 7.48     | 7.27     | 7.10     | 8.29     | 8.61     | 6.62      | 0.28      | 71.20                    |
| Loss per loser          | -\$507   | -\$1,171 | -\$1,765 | -\$1,238 | -\$1,288 | -\$1,198 | -\$1,263 | -\$1,493 | -\$2,018 | -\$4,633  | -\$19,481 | -\$1,632                 |
| <b>1991</b>             |          |          |          |          |          |          |          |          |          |           |           |                          |
| <i>Winners</i>          |          |          |          |          |          |          |          |          |          |           |           |                          |
| Total gain              | \$5.0    | \$1.6    | \$2.4    | \$2.7    | \$3.9    | \$4.9    | \$5.4    | \$5.2    | \$6.4    | \$7.7     | \$5.4     | \$111.2                  |
| Percentage of taxpayers | 2.12     | 4.23     | 5.52     | 3.26     | 2.88     | 3.75     | 3.79     | 2.58     | 2.23     | 4.09      | 0.68      | 34.44                    |
| Gain per winner         | \$2,297  | \$369    | \$433    | \$811    | \$1,308  | \$1,265  | \$1,400  | \$1,971  | \$2,789  | \$17,642  | \$76,679  | \$3,156                  |
| <i>Losers</i>           |          |          |          |          |          |          |          |          |          |           |           |                          |
| Total loss              | -\$4.6   | -\$7.8   | -\$9.7   | -\$8.5   | -\$7.9   | -\$7.2   | -\$7.2   | -\$10.5  | -\$16.3  | -\$31.5   | -\$6.8    | -\$111.2                 |
| Percentage of taxpayers | 7.65     | 5.69     | 4.47     | 6.73     | 7.12     | 6.25     | 6.20     | 7.40     | 7.77     | 5.91      | 0.32      | 65.18                    |
| Loss per loser          | -\$584   | -\$1,344 | -\$2,115 | -\$1,237 | -\$1,082 | -\$1,121 | -\$1,140 | -\$1,384 | -\$2,056 | -\$5,216  | -\$20,738 | -\$1,668                 |

<sup>a</sup>Switching to a flat tax would leave burdens of some taxpayers unchanged—0.35 percent in 1988 and 0.37 percent in 1991 have zero tax liability under both tax systems.

made about the incidence of the flat tax collected from businesses. While these assumptions are consistent with those used in other studies, different assumptions could yield different estimates of the number of winners and losers. For example, the incidence of the flat tax on business cash flow may be more uneven than we have assumed, and the percentage of taxpayers with higher tax burdens therefore may be less than reported above. Of course, we would prefer to test the sensitivity of our results to these assumptions, but we lack the taxpayer-specific data on asset ownership and the receipt of fringe benefits required to do so.

#### *Do Workers Gain?*

Hall and Rabushka (1995: 90–93) conjecture that Americans whose income is primarily from wages and salaries would gain if existing income taxes were replaced with a flat tax. As a check on the plausibility of this hypothesis, Table 7 reports estimates of how switching to a flat tax would affect taxpayers who have 95 percent or more of their income from labor—62.3 percent of taxpayers in 1988. Eighty-two percent of the 60 million taxpayers whose income is primarily from labor would lose a total of \$58.3 billion. Losses would exceed gains in all deciles, with net losses totaling \$49.4 billion for all deciles. Estimates based on 1991 data show the same pattern of redistribution: 75 percent of worker-taxpayers would lose (face higher average tax rates) under the flat tax. Contrary to the view expressed by Hall and Rabushka, switching to a flat tax would entail massive redistribution of tax burdens from capital to labor income. The most important reason for this outcome is that workers lose their tax break on fringe benefits. Many in the three lowest deciles also lose because of the elimination of the EITC.

#### *Modifications to Increase Progressivity*

The fact that switching to a flat tax would shift tax burdens to middle-income taxpayers greatly reduces its political attractiveness. Therefore, we have estimated the effects of several modifications that would make the flat tax more progressive while retaining its main advantages—a single rate and taxing more income at its source. Table 8 lists these modifications along with the corresponding tax bases and revenue-neutral tax rates. The common characteristic of the modifications is that they reduce the flat tax burden on labor income. All modifications increase the flat tax rate, and all reduce the flat tax base except retaining the EITC.

Table 9 shows how switching to these modified flat taxes would change tax shares. Since 1988 and 1991 data yield similar results, we report only estimates for 1988. Interpretation of the entries is the same as for Table 5. To illustrate, the first entry in row 1 indicates that switching to the benchmark flat tax would reduce the tax share of the bottom decile by 0.11 percentage points. The first entry in row 2 indicates that the bottom decile's tax share would be reduced more, by 0.29 percentage points, if employers were allowed to continue deducting payroll taxes and fringe benefits. Compared to the benchmark case, retaining the EITC is advantageous for deciles 1–6. The other modifications imply lower tax shares than the benchmark case for deciles 1–9, but taxpayers in deciles 2–9 still lose as a group, while top-decile taxpayers gain. Even when both employees and employers are allowed to deduct their payroll taxes and employers can deduct all fringes (row 4), switching to a flat tax would reduce the tax share of the top decile at the expense of all deciles except 1 and 7,

TABLE 7  
WINNERS AND LOSERS UNDER THE FLAT TAX SYSTEM  
1988 WAGE EARNERS\* (\$TAX IN BILLIONS AND \$GAIN (LOSS) PER WINNER (LOSER) IN ACTUAL \$)

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TABLE 8  
ESTIMATED FLAT TAX BASES AND RATES FOR A MODIFIED FLAT TAX

| Tax Base Assumptions   | Flat Tax Base (\$ Billions) |         | Revenue-Neutral Tax Rate (%) |       |
|--|-----------------------------|---------|------------------------------|-------|
|  | 1988                        | 1991    | 1988                         | 1991  |
| 1. Benchmark   | 2,359.7                     | 2,713.2 | 21.13                        | 19.13 |
| 2. Benchmark except employer deducts payroll taxes and fringe benefits                                 | 2,032.9                     | 2,293.9 | 24.53                        | 22.63 |
| 3. Benchmark except employee deducts payroll taxes   | 2,219.1                     | 2,541.8 | 22.47                        | 20.42 |
| 4. Benchmark except employer deducts payroll taxes and fringe benefits; employee deducts payroll taxes | 1,892.3                     | 2,122.5 | 26.35                        | 24.46 |
| 5. Benchmark except keep EITC  | 2,359.7                     | 2,713.2 | 22.39                        | 20.27 |

whose tax shares would decrease slightly. The modifications thus alter the magnitude but not the pattern of redistribution: top-decile taxpayers still gain as a group at the expense of other taxpayers. Further, in all but modification 4, a majority of taxpayers would lose, although the number of losers would decrease. In case 4, which entails the least redistribution of tax burdens, estimates for 1988 imply 57 percent of taxpayers would pay higher taxes and lose; estimates for 1991 imply 49 percent would lose.

#### *Effect of Growth*

We have not attempted to estimate effects of behavioral responses to the change in tax systems.<sup>24</sup> Potentially important responses are changes in aggregate factor (labor and capital) supplies and changes in the allocation of given factor supplies among alternative uses. One of the main arguments for consumption-based taxation, such as would be achieved by switching to a flat tax, is that behavioral changes, on balance, would increase aggregate income.

How much would incomes have to increase to offset the losses of those

taxpayers who lose when income is assumed to be static, as in our calculations? The answer for the benchmark case and 1988 data is that incomes would have to increase about 6.4 percent to offset the \$113 billion increase in tax burdens of the taxpayers who would lose from the switch to the flat tax.<sup>25</sup> That is, if their incomes were to increase 6.4 percent *the instant a flat tax was instituted*, these taxpayers would as a group break even. Of course, any increase in income attributable to a change in tax systems would not materialize instantaneously; instead, years would pass before favorable growth effects would be fully realized. Because of this delay, the ultimate increase in income would have to be considerably larger than 6.4 percent to offset the losses of taxpayers who would face tax increases under a flat tax.<sup>26</sup> It therefore seems quite unlikely that losing taxpayers would as a group see their incomes grow enough to offset their higher tax payments.

#### **Conclusions**

The effects of switching to a flat tax cannot be estimated precisely. Different assumptions about tax incidence and

TABLE 9  
CHANGE IN 1988 TAX SHARES: MODIFIED FLAT TAX MINUS EXISTING TAX

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about how the flat tax would be implemented and complied with yield different estimates of the distribution of gains and losses. Nevertheless, our main conclusions appear to be quite robust. Switching to the AS flat tax would increase the tax burdens of a majority of taxpayers, and it would significantly redistribute tax burdens, mainly from the top decile to other taxpayers. This pattern of redistribution emerges when estimates are based on actual 1988 and 1991 tax parameters as well as 1996 parameters, and when income classes are based on AGI as well as flat income. Further, this redistribution of tax burdens would occur even if the AS version of the flat tax were modified, as some have suggested, to allow both employers and employees to deduct their payroll taxes and employers to deduct all fringe benefit expenses. The flat tax therefore would be less progressive than the present system, even if it is significantly modified to favor lower income taxpayers. These findings are at odds with the views of Hall and Rabushka (1995) and Representative Richard Arme (1996), the most persistent and articulate proponents of the flat tax, who argue that switching to a flat tax would benefit a majority of Americans, but they are consistent with those of a recent Treasury study (U.S. Treasury, 1996).

Adopting the AS flat tax would decrease the marginal tax rate for higher income taxpayers, and it would tax capital income more lightly and labor income more heavily than the present system. The result would be a redistribution of tax burdens from recipients of capital income and higher income taxpayers to recipients of labor income and lower income taxpayers, with gains being concentrated in the top decile. Lighter taxation of capital income would combine with workers' loss of tax-free fringe benefits to increase the tax

burdens of more than three-fourths of those who receive most of their income from labor.

Tax-free thresholds would be increased under the flat tax, but the increases included in the AS bill would not protect lower income taxpayers from losses. Many would lose the EITC. Most would bear the burden of flat taxes on nonpension fringe benefits and employers' share of payroll taxes. Further, the benefits of expanded tax-free thresholds would often go unrealized by lower income taxpayers because their incomes are below the thresholds provided by the existing tax system.

In addition to examining the effects of a specific change in tax policy, this paper illustrates an approach to analyzing major tax policy changes that, we believe, has several advantages over previous studies. First, because we use data that are readily available to other researchers, our results can be replicated and extended. Second, our analysis pertains to the population that would actually be affected by the policy change, namely, taxpayers. Finally, and most important, we identify some of the main issues that arise in estimating the effects of the policy change and show how results depend on the resolution of those issues. Our results clearly illustrate a point that is often overlooked by advocates of major tax policy changes: the potential consequences of a change in the tax system cannot be well understood and explained with "single-value" estimates of how the policy may change tax bases, tax rates, and the distribution of tax burdens.

#### ENDNOTES

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- <sup>1</sup> Enis and Craig (1984, 1990) examine how switching to a flat individual tax would redistribute tax burdens within income classes, but they do not consider the consequences of changing to a flat tax on both individuals and businesses.
- <sup>2</sup> "Leaders of GOP Seek to Overhaul Federal Tax Code," *New York Times*, Sept. 28, 1997, p. A1.
- <sup>3</sup> Gale, Houser, and Scholz (1996) estimate the effects of a flat tax using a microsimulation model based on Survey of Income and Program Participation data on a sample of families. Compared to our procedure, the main disadvantage of this model is that the SIPP data do not include income actually reported on tax returns and the taxes paid on that income. Various adjustments therefore have to be made so that the model generates a distribution of tax liabilities that corresponds to the observed distribution as reported by the Internal Revenue Service. The main advantage of the model is that households can be classified according to a measure of income that includes transfer payments. See Gale, Houser, and Scholz for more discussion of the model.
- <sup>4</sup> Business cash flow as used here measures the pretax amount of income available for distribution to suppliers of debt and equity capital, net of the investment outlays. This is also the definition used in U.S. Treasury (1996). It is not cash flow as that term is ordinarily used.
- <sup>5</sup> A detailed description of data and methods is available on request.
- <sup>6</sup> Hall and Rabushka (1995) emphasize that capital income will be taxed more effectively with a flat tax because it will be taxed at its source (businesses) rather than being taxed to recipients. But the flat tax changes the point of collection from individuals to businesses only in the case of interest and dividend income. All other capital income is now taxed at its source. Thus, revenue gains from increased compliance would have to come from collecting more of the taxes due on interest and dividends. This is precisely what Hall and Rabushka (1995, p. 60) expect: "Collecting business income tax at the source of the income avoids one of the biggest causes of leakage in the tax system today: Interest can pass through many layers where it is invariably deducted when it is paid out but frequently not reported as income." Hall and Rabushka may, however, be overly optimistic in their assessment of the potential for increasing taxes collected on interest income. Because businesses are now required to report their payments of interest and dividends, it is difficult for individuals to escape taxation of that income. Underreporting of interest income, in particular, appears to be small; see Park (1992). The Bureau of Economic Analysis estimated that in 1988 only 3.1 percent, \$6.1 billion, of taxable personal interest income was unreported.

- <sup>7</sup> We were unable to follow the Treasury approach in full detail because key assumptions, such as how business loss carryovers and capital spending were estimated, were not reported. Also, the Treasury used data that are not available to academic researchers.
- <sup>8</sup> The amounts of the flat tax standard deductions were reduced in dollar value to correct for inflation occurring since 1988 and 1991. We used the inflation adjustments that have been incorporated into the existing individual income tax, which are based on the CPI. For example, the regular standard deduction for single taxpayers was \$3,000 in 1988 and \$3,900 in 1995. To adjust for inflation, the AS 1995 standard deduction was multiplied by the factor  $0.7692 = 3000/3900$ .
- <sup>9</sup> Our estimates of nondeductible compensation include nonpension fringe benefits provided by government and tax-exempt employers, which the AS bill includes in the flat tax base.
- <sup>10</sup> The flat tax does not apply to foreign source income. The amount of such income, reported in NIPA as receipts of factor income from the rest of the world, was \$144.7 billion in 1988 and \$156.2 billion in 1991. It consisted "mainly of receipts by U.S. residents of interest and dividends and reinvested earnings of foreign affiliates of U.S. corporations." (*Economic Report of the President*, February, 1996, p. 304.) Since we subtracted all receipts of interest and dividends, foreign and domestic, from taxable income when calculating the flat tax base, we have removed the main components of foreign source income from the base. (Earnings reinvested by foreign affiliates do not have to be subtracted because they are not included in taxable income.) Despite these adjustments, our estimate of the flat tax base is somewhat overstated by the amount of foreign branch income, which is not separately reported in the Statistics of Income data and therefore could not be subtracted when calculating the flat tax base.
- <sup>11</sup> The value of the "free" services that financial institutions provide to their *nonbusiness* customers escapes taxation under the present system, but it would be taxed as imputed interest under the flat tax as defined by the AS bill and by Hall and Rabushka (1995). As reported in NIPA, the value of "services furnished without payment by financial intermediaries other than life insurance carriers and private noninsured pension plans" totaled \$114.3 billion and \$151.1 billion in 1988 and 1991, respectively. We include these amounts in the flat tax base as estimates of the value of financial services provided without direct charge to nonbusiness entities. They are conservative estimates since free financial services are also provided by life insurance carriers and pension plans. The NIPA total for all imputed interest paid by domestic corporate businesses was \$319.8

billion in 1988 of which \$45.1 billion was received by domestic businesses. The corresponding amounts for 1991 were \$402.5 and \$51.7 billion. Therefore, the *maximum* amounts of imputed interest that might be added to the flat tax base are \$274.7 billion in 1988 and \$350.8 billion in 1991. Source: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Vol. 72, No. 1, January, 1992, p. 79; and Vol. 76, No. 1 January–February, 1996, p. 103.

- <sup>12</sup> Failing to allow such deductions essentially imposes a tax on owners of existing capital. For more discussion of this issue, see CBO (1997) and references cited there.
- <sup>13</sup> Amounts in Table 1 and throughout the paper are current-dollar amounts—not adjusted for inflation.
- <sup>14</sup> The flat tax allows unlimited carryforward of operating losses. Further, losses accrue interest until deducted. Losses incurred in any given period therefore imply lower tax revenue in future periods. The present value of the loss of future revenue is the amount of current losses times the flat tax rate, assuming all current losses ultimately will be offset against future income.
- <sup>15</sup> See Toder (1995) for further discussion of flat tax incidence. For a detailed discussion and comparison of the incidence assumptions made in Treasury and Congressional tax analyses, see U.S. Congress, Joint Committee on Taxation (1991).
- <sup>16</sup> Nondeductible compensation was allocated among sample taxpayers as follows. Each taxpayer's share of FICA taxes was the amount actually paid. Other payroll taxes were allocated in proportion to wages. Fringe benefits were allocated in proportion to wages for workers receiving benefits. We assumed that 50 percent of taxpayers with AGI less than \$10,000, 75 percent of taxpayers with AGI between \$10,000 and \$20,000, and 100 percent of taxpayers with AGI exceeding \$20,000 received fringe benefits. This assumption was based on information from a Government Accounting Office (GAO) report on fringe benefits (GAO/GGD-92-43), which shows how the percentage of workers with health benefits varies with annual earnings.
- <sup>17</sup> The AS bill simply states: "In the case of the business activity of providing financial intermediation services, the taxable income from such activity shall be equal to the value of the intermediation services provided in such activity." Hall and Rabushka (1995) explain the principles involved in taxing imputed interest, but offer little insight into how to implement those principles.
- <sup>18</sup> The benchmark case assumes investment of \$385 billion in 1988 and \$404 billion in 1991. Case 6 assumes investment equal to gross private domestic investment as reported in the NIPA, exclusive of investment in owner-occupied housing and investment by nonprofit institutions; the

amount of such investment was \$584 billion in 1988 and \$615 billion in 1991.

- <sup>19</sup> From 1988 to 1991, net income of incorporated and unincorporated businesses reported under existing taxes increased 0.5 percent, while business cash flow for the benchmark case increased 8.6 percent.
- <sup>20</sup> From 1988 to 1991, the federal deficit increased about \$75 billion, from 2.4 to 3.3 percent of GDP. The automatic stabilizing effect of the flat tax would be less than that of the present system.
- <sup>21</sup> Loss carryovers are likely to fall between the two extremes assumed by cases 1 and 3. Current law limits the extent to which losses of an acquired firm can be deducted from the income of the acquiring firm. If such limits are continued, some of the losses generated in any given year may never be offset against future cash flow.
- <sup>22</sup> Deciles based on flat income correspond fairly closely to those based on AGI. When reclassified by AGI, 97 percent or more of taxpayers either remain in the same decile or move up or down by only one decile.
- <sup>23</sup> The ratio of interest, dividends, and capital gains to wage income averaged 0.17 for all taxpayers in the 1988 sample. In contrast, that ratio was 0.43 for the bottom decile and 0.33 for the top decile. The corresponding ratios were similar in the 1991 sample.
- <sup>24</sup> Treasury (1996) and Gale, Houser, and Scholz (1996) similarly assume no changes in macroeconomic aggregates.
- <sup>25</sup> The flat income of the taxpayers who would lose is \$2,225 billion. Their income would have to increase \$143 billion, or 6.4 percent, to yield an increase in after-tax income equal to the \$113 billion increase in taxes they would face under a flat tax. The break-even increase in income would be slightly smaller if income growth results in a lower flat tax rate. Although a 6.4 percent increase in income would be sufficient to offset taxpayer losses on average, taxpayers with relatively high losses could still be made worse off by the switch to a flat tax.
- <sup>26</sup> Hall and Rabushka (1995) do not foresee this large of a growth effect; they conclude "... 6 percent is our best estimate of the improvement in real incomes after the economy has had 7 years to assimilate the changed economic conditions brought about by the simple flat tax (italics added)." Summers (1996) questions whether a flat tax would have the strong effects on saving and growth that its advocates claim. A CBO review of recent studies of the growth effects of switching to consumption taxation concludes: "Simulation models suggest increases (in output) ranging from 1 percent to 10 percent, and other factors suggest that the upper end of that range is less likely. Nonetheless, even with significant changes in the level of output, tax reform is unlikely to raise the

growth rate of the economy permanently" (CBO, 1997). Lucas (1990) concludes that reducing taxes on physical capital would have little or no effect on the U.S. growth rate. Stokey and Rebelo (1995) confirm this conclusion in their analysis of the growth effects of flat rate taxes.

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