

## **The Stability of the FairTax as a Principal Source of Federal Revenues**

### *The Origin of the Sales Tax*

The sales tax is the most important tax for raising revenue in the states today, and has been for several decades.<sup>1</sup> Most sales taxes were initially enacted in the United States during the Depression. Faced with a sharp decline in revenue and increasing pressure on the property tax, states were forced to turn to new sources of revenue to meet the challenges of their expanding role and increased expenditures.<sup>2</sup>

As incomes and expenditures fell, the depression reduced revenues from other taxes at the same time that relief needs were increasing. Participation in many federal programs of the period necessitated additional state expenditures. Concurrently, the serious financial difficulties of the local governments, greatly aggravated by the depression, resulted in a tendency both to increase state grants to the local governments, particularly for education, and to reduce state reliance on the property tax. Most states had few major sources that could yield additional revenues. Income taxes, particularly, reflected the decline in personal incomes. The sales tax, with its low rate, large yield, and relatively painless collection, was especially attractive.

In use in 45 states (and in [one] additional state, Alaska, at the local level only), the sales tax yields 34 percent of total state tax revenue (35 percent in the case of states using the tax) and 11 percent of the local government tax revenue. The yield is exceeded by that of state personal and corporate income taxes combined, but exceeds the figure of either income tax, considered separately. For both local and state governments combined, sales taxes yield about 23 percent of total tax revenues, compared to 32 percent for the property tax.<sup>3</sup>

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<sup>1</sup> John F. Due and John L. Mikesell, *Sales Taxation, State and Local Structure and Administration*, 2<sup>nd</sup> Edition, The Urban Institute, 1994.

<sup>2</sup> Herman C. McCloud, *Sales Tax and Use Tax: Historical Developments and Differing Features*, *Duquesne Law Review*, Volume 22, Summer 1984, Number 4.

<sup>3</sup> John F. Due and John L. Mikesell, *Sales Taxation, State and Local Structure and Administration*, 2<sup>nd</sup> Edition, The Urban Institute, 1994.

## ***The Stability of the Sales Tax***

Some commentators have raised questions regarding the stability of a consumption tax as the principal source of federal revenue. They speculate that a tax on consumption might be a less steady tax base than our current income-based tax. Today, most theorists would expect to find that consumption, over time, is more stable than income. When income falls or even ceases, people borrow, dip into savings, or rely on gifts to maintain consumption levels. Similarly, when income is unusually high, people tend to either to pay down existing debts, or to save more.

It is indeed preferable to have a federal tax base that is relatively stable. A stable tax base gives rise to smaller variations in government revenue over time. A steady flow of revenue allows the government to more effectively budget and more easily avoid running deficits.

## ***Statistical Analysis***

Several statistical tests were performed to determine the stability of both the income tax and a consumption-based tax over time. These tests allowed researchers to compare the stability of the income tax to that of a consumption-based tax from 1959 to 1995.

## ***Methodology***

The FairTax has a tax base that is similar to “*personal consumption expenditures*” (PCE) as reported in the *national income product accounts* (NIPA).<sup>4</sup> The NIPA aggregates, published by the Department of Commerce, are the best data available on national income and consumption levels. PCE was used in this analysis, as a substitute for the sales tax base because PCE data is available and, with a few adjustments, is close to what the FairTax will tax.<sup>5</sup> The present law’s income tax base – taxable income – is reported in the *Internal Revenue Service Statistics of Income* (SOI).

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<sup>4</sup> There are a number of adjustments that are necessary. Imputations for the rental value of owner-occupied housing must be eliminated from the tax base, for example. Educational expenses are treated as human capital investment under a sales tax. Government consumption is added to the tax base. The sales tax definition of financial intermediation services is broader than the NIPA definition. There are other adjustments necessary. For a sales tax base to be comparable to an income tax base, it must be expressed in tax inclusive, or pre-tax, terms.

<sup>5</sup> Although the data necessary to calculate the sales tax base back to 1959 is probably available, doing so would be a major undertaking. There is no reason to suppose that the relative size of PCE compared to, for example, the imputation for the rental value of owner-occupied housing has changed substantially over the years. Nor is there any reason to suspect that the adjustments necessary would all trend in any particular direction. Accordingly, the PCE was used as a proxy sales tax base for purposes of this analysis.

Taxable Income and Personal Consumption Expenditures for the years 1959 to 1995 were examined in nominal and real terms. Real data is presented in 1992 dollars. Taxable income was converted to real (inflation adjusted) values using the GDP chain price deflator.<sup>6</sup> The PCE data was deflated with the PCE deflator.

A number of measures of variance were employed. An expected constant growth function was built for each tax base, showing what a completely steady growth rate would look like (using an exponential function). This curve takes the beginning value and the ending value and then assumes a constant, steady growth from year to year.<sup>7</sup> The growth rate used was the actual rate of growth from 1959 to 1995.<sup>8</sup> The Pearson statistic was measured, comparing the actual base to the expected steady growth rate base.<sup>9</sup> In addition, the correlation between the actual base and the expected steady growth rate base was measured.<sup>10</sup> An F test was performed comparing the actual base to the expected steady growth base.<sup>11</sup> In addition, the standard deviations of personal consumption expenditures and taxable income were normed average of the series.

### Results

Research revealed that consumption *varied less*, and was therefore *more stable* over time than with the current income tax base. This finding was confirmed using three different statistical measures.

<sup>6</sup> A separate deflator for taxable income is not available.

<sup>7</sup> The growth rate (g) was determined using actual data in accordance with note 5, *supra*, using  $X_t = X_{1959}e^{gt}$ . The  $R^2$  value on all of these regressions exceeds 0.96.

<sup>8</sup> A continuously compounding rate was used using the expression  $X_{1959}e^{gt} = X_t$  where X is the tax base being analyzed and g is the growth rate and t is the number of years of growth in year t plus 1959. Solving for g,  $X_{1959}e^{gt} = X_t$  then  $X_t/X_{1959} = e^{gt}$  then  $\ln(X_t/X_{1959}) = \ln(e^{gt}) = gt$  then  $\ln(X_t/X_{1959})/t = g$ .

<sup>9</sup> The Pearson statistic returns the product moment correlation coefficient, r, a dimensionless index that ranges from -1.0 to 1.0 inclusive. 1.0 reflects perfect correlation.

$$r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

<sup>10</sup> The correlation coefficient  $\rho_{x,y}$  between two arrays is

$$\rho_{x,y} = \frac{\text{Cov}(X,Y)}{\sigma_x \sigma_y}$$

where  $-1 \leq \rho_{x,y} \leq 1$ , and

$$\text{Cov}(X,Y) = \frac{1}{n} \sum_{j=1}^n (x_j - \mu_x)(y_j - \mu_y)$$

1.0 or 100 percent is perfect correlation.

<sup>11</sup> An F test returns the one-tailed probability that the variances in two arrays are not significantly different. 1.0 or 100% show certainty that the arrays are not different.

**Measured Variance of Tax Bases**  
Compared to Steady Growth Exponential Function

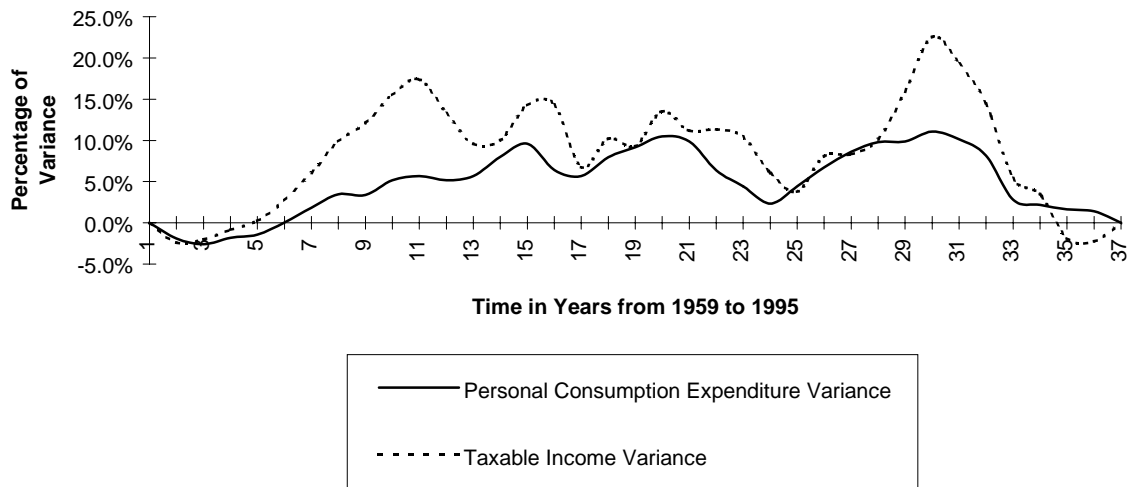
Variance Measurement	Consumption	Taxable Income
Pearson Statistic	.994	.982
Correlation (%)	99.4	98.2
F Test Result	.806	.770

The standard deviation of personal consumption normed to the average of the series was less pronounced than the standard deviation of taxable income normed to the average of the series.<sup>12</sup>

**Standard Deviation of Tax Bases**  
Normed to the average of the series

Norm	Consumption	Taxable Income
Average of Series	.24	.35

**Comparison of Taxable Income &  
Personal Consumption Expenditure Variance**



**Figure 1:** This figure compares the percentage of variation of real taxable income and real personal consumption expenditure to a steady state constant growth curve. Personal consumption expenditure (PCE) is shown to be less variable and more stable than taxable income.

<sup>12</sup> The standard deviation of consumption normed to the first in the series was 0.70 and to the last in the series was 0.21. The standard deviation of taxable income normed to the first in the series was 0.78 and to the last in the series was 0.22. Thus, consumption was less variable using these norms as well.

## *Conclusion*

The simplicity and efficiency of the sales tax caused its spread from its inception in 1932 in Mississippi, to forty-five states. Today, ninety-eight percent of the population is covered by state or – in Alaska – local sales taxes.<sup>13</sup> State governments have had more than sixty years of experience in the administration of the sales tax,<sup>14</sup> and for decades, it has provided a steady and reliable source of revenue to state and local governments. **Using several different measures of variance, consumption was found to be a more stable source of revenue than the current tax base (taxable income).**

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<sup>13</sup> John F. Due and John L. Mikesell, *Sales Taxation, State and Local Structure and Administration*, 2<sup>nd</sup> Edition, The Urban Institute, 1994.

<sup>14</sup> SAFCT: State Administered Federal Consumption Tax: The Case For State Administration Of A Federal Tax, Ernest J. Dronenburg, Jr., New York University Annual State and Local Taxation Conference, November 30, 1995.