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**An Improved Method for Estimating  
The Total Taxable Resources  
Of the States**

by

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## **ABSTRACT**

Under current law, the Department of the Treasury is responsible for calculating estimates of States' "total taxable resources" (TTR). TTR is one of several potential measures of States' fiscal capacities, i.e., their ability to raise revenues from their own sources. These estimates of the State's TTR's are currently used in formulas that allocate funds among the states for the Community Mental Health Services and Substance Abuse Prevention and Treatment block grants. The potential for more widespread use of this measure in other grant programs suggests that a review of the current methodology is appropriate. This paper presents an analysis of the Treasury Department's current methodology to estimate States' total taxable resources, and proposes an alternative methodology that more accurately reflects the underlying theory of the original conceptual framework of TTR.

JEL Classifications: H70, H71, H77

## INTRODUCTION

Under current law, the Department of the Treasury is responsible for estimating total taxable resources (TTR) for each of the states. TTR is one of several potential measures of a state's fiscal capacity - its ability to raise revenue from its own sources - and is an outgrowth of a 1985 Treasury study on the fiscal relations between the Federal, State, and local governments.

Measures of fiscal capacity are incorporated in formulas that allocate funds among the states for a variety of Federal grant and block grant programs. Per capita personal income is the most frequently used measure of fiscal capacity, and is used in the largest grant program to the states, Medicaid (\$95 billion in FY 1997). The arguably better, though less frequently relied on measure of fiscal capacity -- TTR -- is used in the formulas that allocate Federal grants among the states for the Community Mental Health Services and Substance Abuse Prevention and Treatment block grants. The amount of funds allocated using TTR has increased from \$805 million in FY 1989 to \$1.6 billion in FY 1997.

The level of funding that TTR affects has increased and could increase dramatically further if TTR were incorporated into other Federal grant programs as has been proposed in the recent past (i.e., the Medicaid block grant proposal). Moreover, TTR has been more widely used over the years. For example, several GAO studies and a recent Department of Transportation study on the level of state effort on highway spending have used TTR as a base to measure states efforts in the provision of public goods. In addition, several GAO studies have recommended that TTR be incorporated into a new Medicaid formula to measure the fiscal capacity of the states.

Like any statistical measure, TTR should be reviewed periodically to ensure it generates the best possible estimates. A review of the current methodology for estimating TTR at this time is especially important given the increased use of TTR and the potential for significant increases in the amount of funds allocated using TTR. Our review reveals several shortcomings in the current method for estimating TTR. As a result, we propose an alternative method for estimating TTR that better accounts for cross-border income flows and more closely reflects the original conceptual framework for TTR.

## MEASURING FISCAL CAPACITY

Fiscal capacity is defined as a state's potential ability to raise revenue from its own sources.<sup>1</sup> There are a variety of measures used to estimate a state's fiscal capacity, each with its own limitations. There are two general categories for the various measures of fiscal capacity: indices of the relative economic resources or income in a state, and, indices of the relative

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<sup>1</sup> Some have used the term fiscal capacity to refer to a state's ability to raise revenue *relative* to its cost of providing services. A state's relative need for services and the costs associated with those services is beyond the scope of this analysis.

revenues that can be raised under a standard fiscal policy<sup>2</sup>.

A relative income index is an accounting exercise that measures the relative aggregate income within a state, however income is measured. There are three different measures of state income that can be used as relative income indices: State Personal Income (SPI) which accounts for all of the income flows received by the residents of a given state, Gross State Product (GSP) which accounts for all of the income produced within a state, and TTR, which is defined as the unduplicated sum of the income flows produced within a state and the income flows received by its residents that a state can potentially tax.

Within the relative income framework, all income flows are given equal weight, precluding any attempt to discriminate among them on the basis of their taxability or the actual fiscal choices made by the states. The primary argument is that the aggregate income flows (however measured) and the political constraints within a state ultimately determine the actual fiscal choices made by states.

Unlike the relative income indices, the relative revenue indices attempt to measure the “taxability” of the various income flows within a state. As such, revenue indices attempt to analyze the composition of resources within a state as well as the total levels of resources. Revenue indices apply different tax rates to the various economic bases of a state to generate an estimate of a state’s potential tax revenues. Fiscal capacity is measured by the state’s potential tax revenues, relative to the potential of the other states. This is quite distinct from the income indices, which say nothing about potential tax revenues. Revenue indices include: the Representative Tax System (RTS) and the Representative Revenue System (RRS)<sup>3</sup>.

TTR was designed to overcome the problems associated with using SPI and GSP as a measure of fiscal capacity, since neither is a comprehensive measure of the income flows that a state can potentially tax. Given this, an overview of these two measures and their shortcomings is essential to understanding the concept of TTR.

### **State Personal Income and Gross State Product**

State Personal Income (SPI) is currently used in the Federal Medical Assistance Percentage<sup>4</sup> (FMAP) formula to determine the Federal matching rate for Medicaid and several

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<sup>2</sup>Much of the discussion is drawn from the 1985 Treasury study: *Federal-State-Local Fiscal Relations: Report to the President and Congress*, that was commissioned by Congress to examine the key issues of Federal-State-Local fiscal relations.

<sup>3</sup>See *Measuring State Fiscal Capacity*, 1987.

<sup>4</sup> This formula uses per capita income to measure both a state's need to provide services and its fiscal capacity. GAO studies have concluded that per capita income is not a good proxy for measuring either a state's needs or its fiscal capacity. This analysis is only concerned with the shortcomings of SPI to measure a state’s fiscal capacity.

other programs. It is widely recognized that SPI is an incomplete measure of a state's fiscal capacity because it does not include, and by definition is not intended to include, all of the potentially taxable income flows produced in a state. For example, many corporations retain a portion of their profits for investment purposes. These retained profits are not part of personal income by definition, but may be subject to tax through corporate income taxes. Also, business income received by out-of-state residents (dividends for example) are not reflected in SPI at the location of the business, but may be subject to taxation through state business taxes. In addition, commuter income - income earned in one state by residents of another state - may be subject to taxation in the state where it is earned but is not included in that state's measure of personal income. Given these potentially large income flows that are not accounted for, SPI could significantly understate the fiscal capacity of some states.

The essential shortcoming of SPI is that it is not a comprehensive measure of the income flows that a state can potentially tax. The lack of completeness is illustrated by comparing the income received by Alaska's residents (SPI) and the income produced within Alaska (GSP). The ratio of SPI to GSP for Alaska in 1994 was 62 percent, indicating that a large portion of the income produced in Alaska is earned by individuals who do not reside in Alaska. The ratio reveals that SPI does not fully account for all of the oil and natural gas produced within Alaska, omitting significant flows of potentially taxable income.

Gross State Product (GSP) has also been suggested as a measure of fiscal capacity. It, however, suffers from the same basic handicap as SPI in that it is not comprehensive. GSP, by definition, does not include income earned by residents from out-of-state sources. Specifically, resident earnings (wages, salaries, proprietor's income, etc.) from out-of-state, and resident dividend and interest income earned from out-of-state sources, by definition, are not included in GSP. According to unpublished BEA estimates, the commuter income inflows of 10 states (including the District of Columbia) were more than 4 percent of GSP in 1994. Not accounting for these inflows would significantly understate the fiscal capacity of these states. TTR was designed to overcome the lack of completeness associated with SPI and GSP by accounting for the cross-border income flows.

### **Total Taxable Resources (TTR)**

It should be noted at the outset that the name total taxable resources is somewhat of a misnomer since it implies that the measure includes all of the taxable resources within a state. This is not true since TTR does not capture wealth, i.e., property and real estate. Instead, TTR is defined as the unduplicated sum of the income flows produced within a state and the income flows received by its residents which a state can potentially tax. The distinction between flows which a state can potentially tax and the actual fiscal choices made by states is critical. TTR says nothing about, nor does it consider, the actual fiscal choices made by the states. In sum, TTR is a flow concept, a comprehensive measure of all the income flows a state can potentially tax.

The development of TTR was a direct response to Congressional concerns about the

inadequacy of SPI as a measure that accurately reflects the relative ability of state and local governments to raise revenues to provide public services. TTR was designed as a comprehensive measure of all the sources of income that a state could conceivably tax, without regard to states' actual tax policies. The initial definers of TTR recognized, for the reasons discussed previously, that neither SPI nor GSP, considered separately, is a comprehensive measure of a state's potential taxable resources. Their solution was to address the deficiencies of each of these measures by capturing the cross-border income flows that are not accounted for in GSP.

The experimental estimates by Carnevale (1986) attempted to reflect the conceptual framework laid out by Sawicky (1986) as closely as possible. The methodology for estimating TTR set forth in the 1985 Treasury study had the following basic framework: it started with GSP as the base, subtracted certain components of GSP that were deemed not to be subject to State taxation, such as employer contributions for social insurance, and then added the components of SPI that were not already captured in GSP, namely the various components of income derived from out-of-state sources.

Figure 1 illustrates the underlying methodology for the experimental estimates of TTR and the proposed methodology. Scenario 1 depicts two states with closed economies; i.e., there are no cross-border income flows. Under this scenario, TTR would equal GSP less the amount deemed not to be subject to State taxation. In this case, TTR would be less than GSP for both states and total TTR would be less than total GSP. Scenario two assumes that some of the income produced in state B is earned by residents in state A. Under this scenario, TTR for state A would equal GSP less the amount of income deemed not to be subject to State taxation, plus the income flows earned by its residents in state B. Including the cross-border income flows causes state A's estimate for TTR to be greater than GSP. While the estimate for state B remains the same, accounting for the cross-border flows causes aggregate TTR to be greater than aggregate GSP.

The possibility that TTR for a given state may be greater than its GSP and that aggregate TTR could be greater than aggregate GSP may generate some confusion. How can a state tax more than what is produced within its borders? And, how can the sum of the fiscal capacity of the states be greater than what is produced in the country?

Given that GSP does not account for all of the income flows that a state can potentially tax, the fact that TTR might exceed GSP for a given state is not a problem in-and-of-itself. The simple answer to the questions above is that states have the ability to tax income flows earned by its residents from sources outside of its borders and these flows are not accounted for in GSP. The key issue is whether states can tax those income flows, not whether they actually do so, which is irrelevant within the TTR framework. It is important to remember that we are not

**Figure 1 -- General Framework for Estimating TTR Under the Experimental  
and the Proposed Methodologies**

**Scenario 1 -- Income Produced Equals Income Received  
No Cross-Border Income Flows**

STATE A GSP=\$50		STATE B GSP=\$200
<b>\$50</b>	<b><u>GSP</u></b>	<b>\$200</b>
<b>\$5</b>	<b>Less: components not taxable by states</b>	<b>\$20</b>
<b>\$0</b>	<b>Plus: Income Flows Not Accounted for in GSP</b>	<b>\$0</b>
<b>\$45</b>	<b>Equals: <u>TTR</u></b>	<b>\$180</b>
<b>Sum of GSP = \$250</b> <b>Sum of TTR = \$220</b> <b>Sum of GSP &gt; Sum of TTR</b>		

**Scenario 2 -- Income Produced Does Not Equal Income Received  
Cross-Border Income Flows From State B to State A -- Dividend (\$25) & Interest (\$10)**

STATE A GSP=\$50		STATE A GSP=\$200
<b>\$50</b>	<b><u>GSP</u></b>	<b>\$200</b>
<b>\$5</b>	<b>Less: components not taxable by states</b>	<b>\$20</b>
<b>\$35</b>	<b>Plus: Income Flows Not Accounted for in GSP</b>	<b>\$0</b>
<b>\$80</b>	<b>Equals: <u>TTR</u></b>	<b>\$180</b>
<b>Sum of GSP = \$250</b> <b>Sum of TTR = \$260</b> <b>Sum of GSP &lt; Sum of TTR</b>		

attempting to measure the output of a given state. Rather, we are measuring the relative fiscal capacity of the states, which by definition includes all potentially taxable income flows. Accounting for these potentially taxable cross-border income flows is the keystone of TTR since it addresses the lack of completeness associated with SPI and GSP.

Although this general framework for estimating TTR is straightforward, there is not universal agreement on the precise items to subtract from, or add to, GSP. The proposed methodology, discussed later in this report, adopts the same basic framework with some modifications.

TTR required an operational definition as a result of legislation requiring the Secretary of Treasury to generate estimates of TTR for use in the allocation of the Drug, Alcohol Abuse and Mental Health Services block grant in FY 1989. The method devised to estimate TTR was an attempt to capture the essential principle underlying the definition of TTR put forth in the 1985 Treasury study--to account for all income flows that a state could legally tax without any double counting. As discussed below, the method devised then, and which is currently in use, does not fully accord with this principle.

## **CURRENT TTR METHODOLOGY**

The present Treasury methodology for calculating each state's TTR is to allocate national GSP according to the state's average share of national Personal Income and aggregate GSP:

$$TTR_s = 0.5(PI_s/PI_n + GSP_s/GSP_n) GSP_n$$

where

$TTR_s$  = state total taxable resources for a given state

$PI_s$  = state personal income

$PI_n$  = U.S. personal income

$GSP_s$  = gross state product

$GSP_n$  = aggregate gross state product (actually use GDP)

The heart of the current methodology is the averaging of a state's share of SPI and its GSP share and allocating aggregate GSP according to those shares. The averaging is intended to account for the phenomenon of cross-border income flows which render SPI and GSP incomplete measures of fiscal capacity. Table 1 presents Treasury's most recent national and state estimates for TTR, per-capita TTR, and an index of relative per-capita TTR. An index number above 100 indicates that a state's capacity to raise revenues is greater than the national average. A number below 100 indicates that a state's capacity to raise revenues is less than the national average.



**Table 1 -- Most Recent Estimates of Total Taxable Resources (TTR)**

	Total \$ Billions			Per Capita \$			Per Capita Index		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Alabama	91.6	95.7	100.2	21,725	22,535	23,450	81.4%	81.5%	81.5%
Alaska	20.0	20.7	21.4	33,324	34,343	35,282	124.9%	124.3%	122.6%
Arizona	95.9	101.8	108.3	23,478	23,647	24,456	88.0%	85.6%	85.0%
Arkansas	51.0	53.5	56.3	20,780	21,545	22,426	77.9%	78.0%	77.9%
California	879.3	917.8	965.2	28,036	29,076	30,277	105.1%	105.2%	105.2%
Colorado	101.6	107.3	113.6	27,741	28,640	29,722	104.0%	103.6%	103.3%
Connecticut	116.1	121.3	127.0	35,470	37,087	38,801	132.9%	134.2%	134.8%
Delaware	24.1	25.3	26.8	34,052	35,269	36,907	127.6%	127.6%	128.2%
District of Columbia*	35.1	36.2	37.7	61,808	65,262	69,493	231.6%	236.1%	241.4%
Florida	346.0	363.1	383.1	24,773	25,597	26,602	92.8%	92.6%	92.4%
Georgia	180.9	190.7	201.8	25,611	26,456	27,442	96.0%	95.7%	95.3%
Hawaii	35.8	37.0	38.2	30,514	31,401	32,294	114.4%	113.6%	112.2%
Idaho	24.8	26.1	27.4	21,787	22,374	23,047	81.7%	81.0%	80.1%
Illinois	340.2	355.5	373.3	28,988	30,148	31,513	108.6%	109.1%	109.5%
Indiana	142.2	147.9	155.0	24,730	25,513	26,532	92.7%	92.3%	92.2%
Iowa	68.9	71.3	75.6	24,313	25,078	26,520	91.1%	90.7%	92.1%
Kansas	63.3	66.1	69.6	24,829	25,781	27,060	93.1%	93.3%	94.0%
Kentucky	85.3	89.0	93.6	22,283	23,079	24,102	83.5%	83.5%	83.7%
Louisiana	98.4	102.4	106.9	22,819	23,607	24,566	85.5%	85.4%	85.3%
Maine	27.6	28.6	30.0	22,295	23,116	24,091	83.6%	83.6%	83.7%
Maryland	143.8	149.7	156.6	28,768	29,708	30,887	107.8%	107.5%	107.3%
Massachusetts	191.0	200.8	210.9	31,612	33,068	34,624	118.5%	119.7%	120.3%
Michigan	251.6	263.6	275.3	26,526	27,638	28,692	99.4%	100.0%	99.7%
Minnesota	126.3	132.0	140.0	27,629	28,594	30,067	103.5%	103.5%	104.5%
Mississippi	51.3	53.6	56.4	19,217	19,881	20,758	72.0%	71.9%	72.1%
Missouri	131.1	137.2	144.3	24,849	25,800	26,929	93.1%	93.4%	93.6%
Montana	17.7	18.5	19.4	20,633	21,283	22,031	77.3%	77.0%	76.5%
Nebraska	41.0	42.7	45.4	25,220	26,065	27,485	94.5%	94.3%	95.5%
Nevada	43.0	45.8	49.1	29,345	29,881	30,641	110.0%	108.1%	106.4%
New Hampshire	31.5	33.1	34.6	27,742	28,815	29,804	104.0%	104.3%	103.5%
New Jersey	265.3	277.0	289.9	33,557	34,841	36,289	125.8%	126.1%	126.1%
New Mexico	36.4	38.3	40.1	21,925	22,678	23,411	82.2%	82.1%	81.3%
New York	578.4	602.8	631.6	31,783	33,139	34,732	119.1%	119.9%	120.7%
North Carolina	177.3	186.8	197.2	25,048	25,934	26,928	93.9%	93.8%	93.6%
North Dakota	13.9	14.2	15.3	21,684	22,125	23,760	81.3%	80.1%	82.5%
Ohio	282.3	294.6	307.9	25,439	26,463	27,561	95.3%	95.8%	95.7%
Oklahoma	68.9	71.5	75.0	21,187	21,827	22,715	79.4%	79.0%	78.9%
Oregon	76.1	80.2	85.1	24,588	25,483	26,560	92.1%	92.2%	92.3%
Pennsylvania	312.6	325.1	340.6	25,924	26,958	28,255	97.2%	97.5%	98.2%
Rhode Island	25.5	26.6	27.7	25,638	26,839	27,940	96.1%	97.1%	97.1%
South Carolina	80.3	84.0	88.2	22,068	22,914	23,840	82.7%	82.9%	82.8%
South Dakota	16.9	17.4	18.7	23,402	23,909	25,466	87.7%	86.5%	88.5%
Tennessee	126.8	133.3	139.5	24,543	25,414	26,219	92.0%	92.0%	91.1%
Texas	469.0	492.1	519.1	25,441	26,174	27,138	95.3%	94.7%	94.3%
Utah	41.1	43.5	46.4	21,488	22,235	23,176	80.5%	80.5%	80.5%
Vermont	13.8	14.5	15.2	23,833	24,818	25,842	89.3%	89.8%	89.8%
Virginia	181.4	189.2	198.4	27,699	28,604	29,724	103.8%	103.5%	103.3%
Washington	146.3	153.6	162.5	27,349	28,196	29,363	102.5%	102.0%	102.0%
West Virginia	36.2	37.4	38.9	19,888	20,466	21,301	74.5%	74.1%	74.0%
Wisconsin	128.5	134.4	140.9	25,271	26,248	27,306	94.7%	95.0%	94.9%
Wyoming	13.7	14.3	14.9	28,763	29,761	30,863	107.8%	107.7%	107.2%
United States	6,947.0	7,265.4	7,636.0	26,683	27,637	28,784	100.0%	100.0%	100.0%

\*TTR is not a valid indicator of the fiscal capacity of the District of Columbia.

Note: Calculated using the most recent data from Census and BEA: population, GDP, and personal income for 1994 to 1996, and GSP for 1994. Released September 30, 1997.

## **Rationale for the Current Methodology**

The underlying rationale for the current methodology is based on two criticisms of the experimental method for estimating TTR<sup>5</sup>. The primary concern with the experimental methodology is the equal weighting of income just produced in the state, income just received within a state, and the income that is both produced and received within the state. “In other words, there is an implicit assumption that both producing and receiving states can, with impunity, tax interstate income flows at the same rate as flows that remain entirely within their boundaries. Even casual observation of the fiscal behavior of the states suggests that this is simply not the case.” It is argued that the double counting of the cross-border flows, once where the income is produced and again where it is received, causes the experimental methodology to distort the estimates of the fiscal capacity of states.

The second concern relates to the impact that the treatment of cross-border income flows has on the fiscal capacity of two states that are combined. The observation was made that combining 2 states into one state would reduce the estimated fiscal capacity because of the treatment of cross-border flows. “Thus, given the experimental method, TTR is to a significant degree an artifact of how political boundaries are drawn.”

To address these concerns, the current methodology assumes that the cross-border income flows are equally shared among the states and aggregate TTR is constrained to equal aggregate GSP (GDP). Figure 2 presents three hypothetical scenarios to illustrate how the estimates of TTR are currently generated. In scenario one, aggregate TTR equals \$250 (the sum of GSP) which is allocated among the states according to their average shares of national SPI and GSP. Thus, state A’s TTR is \$43 and states B’s is \$207.

Constraining aggregate TTR to equal aggregate GSP, and allocating aggregate GSP according to the average shares of SPI and GSP addresses the concerns about the impact that combining two states has on the estimates of TTR. Scenarios two and three illustrates the impact of combining two states (A and B) into one state (D) under the current methodology. Combining the states has no impact on total TTR since it is constrained to equal aggregate GSP. The TTR estimates for state D is equal to the combined estimates of state A and C since the combined average shares of SPI and GSP are the same as the sum of the separate shares.

A review of the criticisms of the experimental estimates of TTR, which serve as the underlying rationale for the current methodology, reveals that they are not justified within the conceptual framework. The assumptions made to resolve the perceived shortcomings of the

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<sup>5</sup> See *Estimating Total Taxable Resources*, memo, Office of Economic Policy, Department of Treasury, July 7, 1991.

**Figure 2 -- General Framework for Estimating TTR Under Current Methodology**

**Scenario 1 -- Two States**

STATE A SPI=\$20 GSP=\$50		STATE B SPI=\$120 GSP=\$200
14.3%	Share of SPI	85.7%
20.0%	Share of GSP	80.0%
17.1%	Average Share	82.9%
\$43	TTR	207.1
\$250	Total TTR	\$250

**Scenario 2 -- Three States**

STATE A SPI=\$20 GSP=\$50	STATE B SPI=\$120 GSP=\$200	STATE C SPI=\$70 GSP=\$75
9.5%	57.1%	33.3%
15.4%	61.5%	23.1%
12.5%	59.3%	28.2%
\$40	192.9	91.7
\$325	\$325	\$325

**Scenario 3 -- States A & C are Combined to Equal State D**

STATE B SPI=120 GSP=\$200		STATE D SPI=\$90 GSP=\$125
57.1%	Share of SPI	42.9%
61.5%	Share of GSP	38.5%
59.3%	Average Share	40.7%
\$193	TTR	132.1
\$325	Total TTR	\$325

experimental methodology are arbitrary and yield results that are inconsistent with the original conceptual TTR framework.

## **Shortcomings of the Current Methodology**

### ***Taxability and Weighting***

Recall that TTR is intended to be an unduplicated comprehensive measure of all of the potentially taxable income flows within a state, regardless of the fiscal choices made by states. Thus, to be consistent with the original conceptual framework, any measure of TTR must disregard the fiscal choices made by states, i.e., the fact some income flows are not taxed at all (other labor income) and other flows are given preferential treatment (credit for income taxes paid on wages earned in other states) is not relevant.

A critical shortcoming of the current methodology is that it does not attempt to identify the specific cross-border income flows that states can potentially tax. Instead, the current method relies on a state's share of the aggregate income flows produced (GSP) and received (SPI) within a state. The current methodology contends that averaging a state's share of GSP and SPI accounts for the cross-border income flows. In reality, this does not reflect a rational accounting for cross-border flows since the specific cross-border flows are not identified. In addition, the weighting scheme is arbitrary, the average of a State's GSP and SPI shares has no real meaning -- it is simply the average of those two numbers.

Figure 3 presents two hypothetical scenarios to illustrate the arbitrariness of the current methodology. The first scenario presents the estimates of TTR for states A and B (identical to scenario one in Figure 2). Scenario two shows how these estimates are affected when individuals who worked and resided in state B in scenario one, move to state A but continue to work in state B. In this scenario, the GSPs for both states remain unchanged, but the income received by the residents of both states (SPI) changes. Assuming that the shift in SPI amounts to \$20, consider what happens to the estimates for TTR. State A's share of SPI doubles to nearly 29 percent and its average share increases to 24 percent. As a result, state A's TTR increases \$18 to \$61 and state B's TTR decrease by the same amount. As a result of the movement of residents from state B to state A, the States' TTRs change by an arbitrary amount that is not uniquely related to the changed flow of resources among them. Rather, the change in estimates is also partly a function of the fact that SPI and GSP differ in size because they measure different concepts.

In addition to the problem just noted, the current methodology is also limited in the sense that it only considers the taxability of the cross-border income flows. The current method provides no rationale for why the concern about taxability should be limited to cross-border income flows. If one wanted to assign different weights to the various income flows, the lack of a relatively straightforward theoretical model or empirical findings to determine a weighting

**Figure 3 -- The Impact of Shifting \$20 in State Personal Income from State B to State A**

**Scenario 1 -- Two States**

STATE A SPI=\$20 GSP=\$50			STATE B SPI=\$120 GSP=\$200	
14.3%		Share of SPI		85.7%
20.0%		Share of GSP		80.0%
17.1%		Average Share		82.9%
\$43		TTR		207.1
\$250		Total TTR		\$250

**Scenario 2 -- Individuals from State B move to State A but continue to work in State B**

STATE A SPI=\$40 GSP=\$50			STATE B SPI=\$100 GSP=\$200	
28.6%		Share of SPI		71.4%
20.0%		Share of GSP		80.0%
24.3%		Average Share		75.7%
\$61		TTR		189.3
\$250		Total TTR		\$250

scheme is a significant drawback<sup>6</sup>. If one wanted to use “taxability” as a means of determining weights, the taxability of identical income flows could vary significantly across the states for a variety of reasons. It would be nearly impossible for any measure of fiscal capacity to accurately reflect the varying degrees of taxability of income flows across states. As a result, any attempt to assign weights to the various income flows is likely to be arbitrary and result in distortions among the estimates for states.

At first blush, the inability of TTR (as envisioned in the conceptual framework) to discriminate among income flows can be seen as a shortcoming. However, by generating a comprehensive measure of income flows, with all flows given equal weight, TTR (within conceptual framework) does not rely on arbitrary decisions or rules to determine the taxability of income to estimate the fiscal capacity of states. A comprehensive measure precludes the possibility of attempting to assign weights to one or two income flows which would logically lead to an evaluation of the taxability of all income flows. It is critical to remember that TTR addresses the incompleteness of both SPI and GSP as measures of fiscal capacity by accounting for all the cross-border flows that states can potentially tax. It is the aggregate income flows and the political constraints that ultimately determine the fiscal choices made by states.

### ***Constraining Aggregate TTR***

It is widely recognized that GSP does not account for all of the income flows that a state can potentially tax. Given this, there is no reason that the aggregate measure of TTR should be constrained to equal aggregate GSP. It was previously noted that the components added to GSP could be greater than the components subtracted from GSP, yielding an estimate for TTR greater than GSP. This outcome is logical once one recognizes the cross-border flows associated with open state economies and that states can tax these cross-border flows. Constraining aggregate TTR to the level of output in the U.S. does not account for the cross-border flows. In sum, there is no theoretical rationale why aggregate per capita TTR should equal aggregate per capita GSP. If total TTR equals total GSP, then one should simply use GSP as a measure of fiscal capacity.

The current methodology implicitly assumes that all of GSP is taxable by the states. This assumption is made at two points - first by constraining aggregate TTR to equal aggregate GSP, and second, by distributing aggregate GSP amongst the states by a formula that depends in part on a state's share of aggregate GSP. The conceptual TTR framework argues that some of the components of GSP are not taxable by the states - such as Federal indirect business taxes and social insurance taxes. As a result, the conceptual framework would argue that these income flows should not be included in any estimate of TTR.

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<sup>6</sup> The Representative Tax System and the Representative Revenue Systems apply different weights (the average national tax rates for various statutory tax bases) to the estimated state tax bases. These approaches apply the weights to statutory tax bases, not the income flows utilized in TTR. For a discussion of the shortcomings associated with this approach and the use of weights, see Barro.

It should be noted that the consideration of taxability has nothing to do with the actual fiscal choices of the states. Instead, taxability is evaluated on the basis of whether the Federal government has the first claim on those resources (social insurance taxes) or if states are precluded from taxing those flows (Federal indirect business taxes).

### ***No Adjustment for the District of Columbia***

No adjustments are made to account for the unique status of the District of Columbia in regard to its ability to tax. The underlying premise of TTR is that states have the authority to tax the various income flows within their borders. However, the District of Columbia does not have the same legal right as the states to tax certain resources. As a result, using the same methodology to derive TTR estimates for the District of Columbia is flawed. All of the previous per capita TTR index estimates for DC were over 200, indicating that DC had twice the national ability to raise revenues from its own sources. It is clear that some adjustments must be made to account for DC's limited ability to tax resources within its borders.

## **PROPOSED TTR METHODOLOGY**

Given the shortcomings of the current method of estimating TTR, we returned to the original TTR framework for guidance in pursuit of a consistent, theoretically based measure of TTR. The theoretically "ideal" estimate entails a direct attempt at identifying the income flows that each state could tax, avoiding any double counting of income flows within a given state. The original framework begins with in-state production, i.e. GSP, and subtracts components that are presumed not taxable by the states to derive modified GSP (MGSP). Various components of income that are derived from out-of-state sources are added to MGSP to yield estimates for TTR. Table 2 compares the theoretically ideal measure of TTR and the proposed method for estimating TTR.

### **Subtractions from GSP**

BEA publishes state estimates of GSP and SPI on a regular basis. Unfortunately, data for all of the components that should be removed from or added to GSP are not available. These data limitations prevent attainment of the theoretically ideal measure of TTR. The following components of GSP were deemed not available to the states to tax and hence, were subtracted from GSP:

(1) **Federal Indirect Business Taxes:**

Federal indirect business taxes (such as excise taxes on gasoline, alcohol, tobacco, etc., ) and nontax liabilities (grazing fees, miscellaneous rents and royalties, etc) are argued to not be a part of TTR on the grounds that they are sums paid to the Federal government, and thus are not taxable by the states.

**Table 2 -- Comparison of the Theoretically Ideal Measure of TTR with the Proposed Method for Estimating TTR**

<u>Theoretical Measure of TTR</u>	<u>Estimated Measure of TTR</u>
<b><u>Gross State Product</u></b>	<b><u>Gross State Product</u></b>
<b>Less:</b> Employer and Employee Contributions to Social Insurance	<b>Less:</b> Same
Federal Indirect Business taxes	Same
Depreciation	Not subtracted -- not estimated on a GSP consistent basis
Federal Personal Income Taxes	Not subtracted -- not estimated on a GSP consistent basis
Federal Corporate Taxes	Not subtracted -- not estimated on a GSP consistent basis
<b><u>Equals: MGSP</u></b>	<b><u>Equals: Estimated MGSP</u></b>
<b>Plus:</b> Federal transfers	<b>Plus:</b> Social insurance transfers only -- lack of GSP consistent tax data
Wages and salaries earned outside of state	Same
Interest earned outside of state	Includes all interest income reported in SPI
Dividends earned outside of state	Includes all dividend income reported in SPI --
Rents & Royalties earned outside of state	Not subtracted - BEA assumes they are intrastate, already in GSP
Accrued capital gains	Net capital gains
<b><u>Equals: TTR</u></b>	<b><u>Equals: Estimated TTR</u></b>



(2) Employer and Employee contributions for Social Insurance:

The employer and employee portions of Federal social insurance contributions are viewed in a manner analogous to Federal indirect business taxes--as payments to the Federal government not available to the states for taxation. Specifically, these transfers include: old age, survivors, and disability payments, railroad retirement and disability payments, Federal civilian employee retirement payments, military retirement payments, state and local government employee retirement payments, worker's compensation payments (Federal and State), and other government disability insurance and retirement payments. It was not possible to separate out the contributions to state employee retirement plans.

(3) Federal civilian enterprise surpluses:

This is a minor item, consisting of Federal nonmilitary civilian enterprises surpluses, but is accounted for because the data permits. The majority of the surpluses is from insurance premiums less payouts for flood and crop insurance. States cannot tax the profits of a Federal enterprise operating within their borders.

The removal of these components from GSP yields MGSP.

### **Additions to MGSP**

As previously noted, MGSP does not account for all of the income flows that states could potentially tax. The following income flows are added to MGSP to derive TTR:

(1) dividends, and monetary interest income earned from sources outside the state

Ideally, we would only add dividend, interest, rental and royalty income that was earned from sources outside of the state. The data however, does not distinguish this income by source, and thus we choose to add this income to GSP on the presumption that most of this income comes from out-of-state sources and is thus not accounted for in GSP. This implies some double counting of income flows to the extent that the dividends and interest stem from home state production. We had originally intended to add rents and royalties under the same assumption. However, in generating their estimates for rents and royalties, BEA assumes that all rents and royalties are intrastate. As a result, the GSP and SPI estimates are identical and adding them to MGSP would just be double counting.

Dividend income consists of dividends received by individuals and nonprofit institutions and the dividends that are received, retained, and reinvested by fiduciaries. Monetary interest income consists of reportable interest income; interest income from municipal bonds; interest received by nonprofit institutions; and, interest income retained by fiduciaries.

(2) select transfers from the Federal government

These transfers are those related to contributions for social insurance that were subtracted from GSP. Specifically, these transfers are: old age, survivors, and disability payments, railroad retirement and disability payments, Federal civilian employee retirement payments, military retirement payments, state and local government employee retirement payments, worker's compensation payments (Federal and State), and other government disability insurance and retirement payments.

(3) Net realized capital gains

The net realized capital gains are added because they are not accounted for in GSP and they have an impact on the ability of a state's residents to pay taxes. The estimates come from various Statistics of Income Bulletins and unpublished IRS estimates.

(4) the earnings of state residents who work outside the state borders

We add resident earnings from out-of-state employment to TTR on the grounds that these earnings are not accounted for in the resident's "home" state estimates of GSP. See the discussion below regarding specific modifications for the District of Columbia. The BEA estimates for resident earnings from out-of-state employment includes wage and salary income plus other labor income, less personal social insurance contributions.

Since the District of Columbia is proscribed by Federal law from taxing the earnings of commuters from outside its borders, we have also subtracted the earnings of non-residents. The adjustment for the District of Columbia is equal to the net residence adjustment and results in a substantial reduction in the MGSP of the District of Columbia. Given the complex tax circumstances in the District, the resulting estimates of TTR should be used with caution.

Some have argued that adding commuter income to the resident's "home" state overstates the fiscal capacity of that state for two reasons. First, the state where the income is earned has first claim on those resources and hence, they are not available to the resident's home state for tax purposes. Second most, not all states, give a credit for income taxes paid in other states. The response to these arguments is simple and has been stated throughout this paper: TTR is defined as the unduplicated sum of income flows that a state can potentially tax, regardless of the fiscal choices made by the states. Since states are not precluded from taxing wage and salary income earned in other states, commuter income is included in TTR.

The proposed methodology for estimating TTR does not account for all of the components in the theoretically ideal measure of TTR. The components that are not included in the proposed methodology are discussed below.

### **Federal Government---Income Taxes and Transfers**

The appropriate measure of a State's TTR ought to exclude all taxes paid to the Federal government and include all transfers from the Federal government. This treatment would capture the net flow of resources between a given state and the Federal government and accurately reflect a state's fiscal capacity. The presumption for excluding Federal tax payments is that these resources are not available to the state to tax while the transfers are assumed to augment a state's ability to raise revenues. While Federal transfers can be readily accounted for, the data on Federal income and corporate taxes by state, particularly that for the corporate income tax, is not estimated on a GSP basis, by state of production. Federal individual income tax figures by state of residence may be more consistent with GSP data than corporate income tax data, but it still

can't identify the true sources of dividend or interest income, or even employment income. Given the data limitations, the proposed methodology does not adjust for income tax payments to the Federal government and only includes Federal transfer payments for which the corresponding taxes can be identified (e.g. social insurance contributions).<sup>7</sup>

The decision not to account for all transfers is predicated on the decision not to adjust for Federal taxes. If the outflow of resources from a given state to the Federal government are not accounted for, incorporating all of the inflows from Federal transfer payments would overestimate TTR for all of the states. The key problem is that there could be wide divergences in the extent of the overestimation depending on the differences in the net flow among the states. For example, take two hypothetical states, A and B. Assume that state A makes \$100 in Federal tax payments and receives \$50 in Federal transfers and state B makes \$50 in Federal tax payments and receives \$100 in Federal transfers. If one fully accounts for the net flow, state A's TTR would be reduced by \$50 and B's would be increased by \$50. However, if only the transfers are accounted for, State A's TTR would be overestimated by \$100, while state B's TTR would be overestimated by \$50. This hypothetical example illustrates the potential impacts on TTR of not incorporating the net flow of resources between the states and the Federal governments. Studies estimating the net flow of resources indicate large variation across the states which would imply serious shortcomings to estimates of TTR that only include Federal transfers<sup>8</sup>.

The original theoretical TTR framework included all Federal transfers except grants-in-aid in TTR. Although the original estimates of TTR excluded grants-in-aid, the analysis argued that all Federal transfers should be included in TTR.<sup>9</sup> Under either of these methods it is conceivable that a state making relatively large Federal tax payments (not accounted for in TTR) that also receives relatively large Federal transfer payments (counted in TTR) could be adversely affected. Such a state would be making relatively large tax payments and be required to pay more for block grants because of a higher measure of fiscal capacity.

### **Capital Consumption**

It would be desirable to subtract capital consumption from GSP in determining TTR.

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<sup>7</sup> An additional issue is the deductibility of state and local income taxes and property taxes from Federal income tax liabilities. As a result, state fiscal choices have an impact on the Federal income taxes paid by its residents. Even if the Federal income tax data was measured on a GSP consistent basis and hence, could be removed from GSP, the relative state advantages of deductibility would not be reflected. Since we are unaware of any method for estimating the relative deductibility among states, one would have to assume that states are equally inclined to levy deductible taxes to finance the provision of public goods. Thus, accounting for the effect of Federal taxes on the state tax base (TTR) is not particularly straightforward even on theoretical grounds, and thus the decision to ignore Federal income taxes and transfers may be best.

<sup>8</sup> See Jay Walder and Herman Leonard, The Federal Budget and the States Fiscal Year 1996.

<sup>9</sup> See Sawicky pages 66 and 92 and Carnevale page 129 for further details of this issue.

However, we are unable to do so because we do not have data on capital consumption by state. As a result, we have implicitly assumed there is a proportional relationship between GSP, the income produced within a given state, and capital consumption.

### **Other Labor Income**

Some might argue that our measure of TTR is too high because some of the components of labor income, such as employer contributions for pensions or health insurance, are not taxed by states. Since states are not prohibited from taxing these sources of income, these income flows are potentially taxable, and therefore included in TTR.

### **THE PROPOSED ESTIMATES OF TTR**

Under the proposed new method, TTR estimates for a given year will only be made when both GSP and SPI data are available for that year. This contrasts with the current method, which produces TTR estimates for the latest year for which SPI data is available, even though GSP data for that year is not available.<sup>10</sup> The primary reason for this change is that the new method uses GSP as a base, and adds to and subtracts from that base various components. The mixing of different years of data for the various components would be inappropriate.

Table 3 reveals the data used to estimate TTR under the current methodology and the proposed method. Each year, the current methodology generates estimates of TTR for three years using the last three years of available data for SPI and the most recent available year of data for GSP. For example, the TTR estimates for 1992-1994, which were released on September 22, 1995, used 1992-94 SPI estimates and 1992 estimates for GSP. As a result of this three-year estimate procedure and the lagged release of GSP data, the current methodology will, over time, generate three different estimates of TTR for a given year.<sup>11</sup> For example, estimates for 1992 TTR were generated in 1993, 1994, and 1995. However, the estimates produced in 1995 are the only ones where SPI and GSP are from the same year. The proposed method will, by contrast, release TTR figures for a given year only when both GSP and SPI data are available. As a result, the estimates will not change in future years unless the underlying series are revised, creating a consistent time series of estimates. The advantages of the proposed methodology relative to the current method for estimating TTR are summarized in Table A1 in the appendix.

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<sup>10</sup> Although BEA usually estimates GSP and SPI on a yearly basis, there is typically a one year lag in the SPI estimates and a three year lag in the GSP estimates. As a result, the latest estimate for GSP is typically two years behind the latest estimate for SPI.

<sup>11</sup>This makes it very difficult to generate a consistent time series of TTR estimates.

**Table 3 -- Source and Year of Data Used to Estimate TTR**

**Data Used in Current Methodology for Estimating TTR**

<b>Release Date</b>		<b><u>August 24, 1994</u></b>			<b><u>September 22, 1995</u></b>				<b><u>September 27, 1996</u></b>			
<b>Estimate Year</b>	<b>TTR</b>	1991	1992	1993	<b>TTR</b>	1992	1993	1994	<b>TTR</b>	1993	1994	1995
<b><u>Based on</u></b>												
<b>Data Source/Year</b>	<b>PI</b>	1991	1992	1993	<b>PI</b>	1992	1993	1994	<b>PI</b>	1993	1994	1995
	<b>GSP</b>	1991	1991	1991	<b>GSP</b>	1992	1992	1992	<b>GSP</b>	1992	1992	1992

**Data Used in Proposed Methodology for Estimating TTR**

<b>Release Date</b>		<b><u>August 1994</u></b>			<b><u>September 1995</u></b>			<b><u>September 1997*</u></b>		
<b>Estimate Year</b>	<b>TTR</b>	1991			<b>TTR</b>	1992			<b>TTR</b>	1993
<b><u>Based on</u></b>										
<b>Data Source/Year</b>	<b>PI</b>	1991			<b>PI</b>	1992			<b>PI</b>	1993
	<b>GSP</b>	1991			<b>GSP</b>	1992			<b>GSP</b>	1993

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\* BEA released the 1993 estimates for GSP in June 1997 and the most recent estimates for SPI in September 1997.

Table 4 presents the TTR estimates generated from the proposed methodology. This method is likely to cause some initial confusion since the new estimates would be for 1992-94 and the most recent estimates using the current methodology (released September 30, 1997) are for 1994-96. The users of the TTR estimates are probably unaware of the use of dated GSP estimates in the current methodology for generating TTR, and questions will undoubtedly be raised. One could argue that by not using the most recent SPI data, the proposed method will not reflect the present economic conditions of a state as well as the current method. However, the current method does not fully reflect the present economic conditions of a state since it too, relies on lagged GSP data. Given the use of various components of GSP and SPI in the new methodology, it is important to use consistent same year data to generate TTR estimates.<sup>12</sup>

Table 5 shows how the proposed methodology for estimating TTR would affect the per capita TTR index estimates. A comparison of the proposed estimates (1992-1994) and the most recent estimates using the current methodology (1994-1996) would involve different years of data which would have an obvious impact on the estimates. To isolate the impact of the differences in methodologies, a new set of estimates was generated using the current methodology and same year data for GSP and SPI (1992-1994).

Table 5 shows the estimated per capita TTR index under the current and proposed method, as well as the difference between the two estimates. A positive number implies that a state's relative TTR per capita index has risen, a negative number implies that it has fallen. Some states, such as Alaska, Wyoming, and Delaware show large increases in TTR because their GSP relative to SPI is disproportionately large, and the current methodology simply splits this difference by averaging a state's GSP and SPI shares.<sup>13</sup> Others, such as New Hampshire and New Jersey, show increases due to sizable cross-border inflows from residents working in other states. Few states show a substantial decrease other than the District of Columbia, whose TTR is calculated differently from the States, as discussed previously.

## CONCLUSION

The review of Treasury's current methodology for estimating TTR reveals that it is inconsistent with the original theoretical framework and the experimental estimates of TTR. The assumptions made in the current method to address the perceived shortcomings of the

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<sup>12</sup> An alternative approach to estimating TTR would be to follow the proposed methodology, only gross up the GSP data to the year of the SPI data by the growth in SPI over the same period. This would eliminate the transition problem (i.e., retracting some outstanding TTR estimates) from the current method. However, it would not correct other problems present in the current method, such as the generation over time of several different estimates of TTR for a given year, as actual GSP figures replace estimated ones in the older estimates. An advantage of the proposed method is that TTR estimates for a given year would only change if the underlying data series were revised by BEA.

<sup>13</sup> Table A2 in the appendix presents the states' shares of SPI, GSP, and the proposed estimates of TTR as a percentage of the state's GSP.

**Table 4 -- Proposed Estimates of Total Taxable Resources (TTR)**

	Total \$ Billions			Per Capita \$			Per Capita Index		
	1992	1993	1994	1992	1993	1994	1992	1993	1994
Alabama	85.2	88.5	94.3	20,366	20,994	22,206	79.3	78.8	79.4
Alaska	21.8	24.6	22.4	36,426	40,880	37,255	141.8	153.5	133.2
Arizona	86.0	92.5	102.5	21,802	22,662	23,821	84.9	85.1	85.1
Arkansas	48.0	50.5	54.6	19,793	20,566	21,987	77.1	77.2	78.6
California	866.8	883.5	918.0	27,808	28,170	29,083	108.3	105.8	104.0
Colorado	90.1	98.1	105.7	25,250	26,790	28,210	98.3	100.6	100.8
Connecticut	116.4	120.7	125.0	35,527	36,892	38,219	138.3	138.5	136.6
Delaware	25.6	26.6	29.0	36,638	37,608	40,506	142.7	141.2	144.8
District of Columbia*	23.3	24.2	24.3	40,291	42,620	43,830	156.9	160.1	156.7
Florida	329.0	350.0	371.0	23,991	25,066	26,159	93.4	94.1	93.5
Georgia	164.2	175.7	189.2	23,774	24,882	26,242	92.6	93.4	93.8
Hawaii	35.8	37.1	37.6	30,828	31,625	31,920	120.0	118.8	114.1
Idaho	22.2	24.4	26.5	20,167	21,493	22,705	78.5	80.7	81.2
Illinois	322.3	337.0	358.6	27,616	28,721	30,410	107.5	107.9	108.7
Indiana	130.1	137.4	148.6	22,805	23,903	25,641	88.8	89.8	91.7
Iowa	66.3	68.1	74.8	23,472	24,049	26,304	91.4	90.3	94.0
Kansas	63.3	65.5	69.2	24,997	25,687	27,008	97.3	96.5	96.5
Kentucky	81.1	85.4	91.3	21,369	22,320	23,670	83.2	83.8	84.6
Louisiana	93.5	97.0	104.1	21,808	22,483	23,997	84.9	84.4	85.8
Maine	26.5	27.6	28.8	21,393	22,303	23,279	83.3	83.8	83.2
Maryland	142.7	149.4	159.0	28,816	29,881	31,545	112.2	112.2	112.8
Massachusetts	179.7	189.6	201.3	29,861	31,374	33,153	116.3	117.8	118.5
Michigan	217.9	232.7	256.5	23,055	24,535	26,894	89.8	92.1	96.1
Minnesota	117.1	121.5	131.1	25,881	26,576	28,404	100.8	99.8	101.5
Mississippi	47.3	50.0	54.7	17,912	18,740	20,291	69.7	70.4	72.5
Missouri	125.9	129.7	139.8	24,066	24,590	26,279	93.7	92.3	93.9
Montana	17.0	18.1	19.0	20,218	21,151	21,795	78.7	79.4	77.9
Nebraska	39.9	40.9	43.9	24,706	25,175	26,772	96.2	94.5	95.7
Nevada	39.5	43.2	47.8	28,458	29,537	31,197	110.8	110.9	111.5
New Hampshire	32.0	33.4	35.7	28,509	29,397	31,071	111.0	110.4	111.1
New Jersey	268.4	282.2	293.1	34,150	35,693	36,867	133.0	134.0	131.8
New Mexico	33.7	36.3	40.0	20,796	21,902	23,645	81.0	82.3	84.5
New York	567.7	586.7	615.9	31,244	32,241	33,861	121.7	121.1	121.0
North Carolina	165.7	174.1	186.6	23,808	24,590	25,914	92.7	92.3	92.6
North Dakota	13.6	13.7	14.6	21,294	21,437	22,732	82.9	80.5	81.3
Ohio	265.3	277.1	295.5	23,988	24,969	26,541	93.4	93.8	94.9
Oklahoma	66.5	69.1	72.1	20,581	21,236	22,008	80.1	79.8	78.7
Oregon	69.7	75.7	81.3	22,914	24,458	25,821	89.2	91.9	92.3
Pennsylvania	300.3	314.1	327.8	24,956	26,048	27,180	97.2	97.8	97.2
Rhode Island	26.0	27.0	27.7	25,954	27,090	27,933	101.1	101.7	99.8
South Carolina	75.5	79.8	85.2	20,822	21,918	23,223	81.1	82.3	83.0
South Dakota	16.3	17.6	18.7	22,755	24,265	25,636	88.6	91.1	91.6
Tennessee	115.3	122.2	132.5	22,657	23,642	25,248	88.2	88.8	90.2
Texas	442.2	465.1	497.1	24,476	25,231	26,438	95.3	94.8	94.5
Utah	36.6	39.4	43.2	19,631	20,611	22,059	76.4	77.4	78.9
Vermont	13.5	14.1	14.8	23,413	24,306	25,240	91.2	91.3	90.2
Virginia	177.5	187.4	196.8	27,416	28,616	29,742	106.8	107.5	106.3
Washington	139.4	147.5	155.6	26,495	27,564	28,555	103.2	103.5	102.1
West Virginia	35.3	36.9	39.4	19,386	20,266	21,597	75.5	76.1	77.2
Wisconsin	120.6	127.9	135.9	23,903	25,152	26,531	93.1	94.5	94.8
Wyoming	14.8	15.6	16.4	31,491	32,825	34,228	122.6	123.3	122.4
United States	6,620.2	6,932.7	7,354.5	25,681	26,628	27,975	100.0	100.0	100.0

\* Caution should be used when interpreting the estimates for Washington D.C. See text for discussion of DC estimates.

**Table 5 -- Comparison of TTR Per Capita Index Between  
Current Method Using Same Year Data and Proposed Method**

	Current Method Same Year Data				Proposed Method				Proposed Less Current Method				
	1992	1993	1994	1992-94	1992	1993	1994	1992-94	1992	1993	1994	1992-94	
Alabama	81.0	80.6	81.4	81.0	79.3	78.8	79.4	79.2	(1.7)	(1.8)	(2.0)	(1.9)	
Alaska	132.3	137.2	124.9	131.5	141.8	153.5	133.2	142.8	9.6	16.3	8.3	11.4	
Arizona	85.7	86.5	88.0	86.7	84.9	85.1	85.1	85.0	(0.8)	(1.4)	(2.8)	(1.7)	
Arkansas	76.8	77.0	77.9	77.2	77.1	77.2	78.6	77.6	0.3	0.2	0.7	0.4	
California	109.6	106.9	105.1	107.2	108.3	105.8	104.0	106.0	(1.3)	(1.1)	(1.1)	(1.2)	
Colorado	102.3	104.4	104.0	103.6	98.3	100.6	100.8	99.9	(4.0)	(3.8)	(3.1)	(3.6)	
Connecticut	134.1	133.9	132.9	133.6	138.3	138.5	136.6	137.8	4.3	4.6	3.7	4.2	
Delaware	126.8	125.6	127.6	126.7	142.7	141.2	144.8	142.9	15.9	15.6	17.2	16.2	
District of Columbia	229.8	234.1	231.6	231.9	156.9	160.1	156.7	157.9	(73.0)	(74.1)	(75.0)	(74.0)	
Florida	91.6	93.5	92.8	92.7	93.4	94.1	93.5	93.7	1.8	0.6	0.7	1.0	
Georgia	94.6	95.6	96.0	95.4	92.6	93.4	93.8	93.3	(2.1)	(2.1)	(2.2)	(2.1)	
Hawaii	119.2	118.5	114.4	117.4	120.0	118.8	114.1	117.6	0.8	0.3	(0.3)	0.3	
Idaho	79.5	82.1	81.7	81.1	78.5	80.7	81.2	80.1	(1.0)	(1.3)	(0.5)	(0.9)	
Illinois	107.7	107.9	108.6	108.1	107.5	107.9	108.7	108.0	(0.2)	(0.0)	0.1	(0.0)	
Indiana	89.8	91.0	92.7	91.2	88.8	89.8	91.7	90.1	(1.0)	(1.2)	(1.0)	(1.1)	
Iowa	88.9	87.2	91.1	89.1	91.4	90.3	94.0	91.9	2.5	3.1	2.9	2.8	
Kansas	93.8	93.4	93.1	93.4	97.3	96.5	96.5	96.8	3.5	3.1	3.5	3.4	
Kentucky	82.7	83.0	83.5	83.1	83.2	83.8	84.6	83.9	0.5	0.8	1.1	0.8	
Louisiana	84.0	84.3	85.5	84.6	84.9	84.4	85.8	85.0	1.0	0.1	0.3	0.4	
Maine	84.2	84.0	83.6	83.9	83.3	83.8	83.2	83.4	(0.9)	(0.3)	(0.3)	(0.5)	
Maryland	107.6	107.5	107.8	107.7	112.2	112.2	112.8	112.4	4.6	4.7	4.9	4.7	
Massachusetts	117.1	117.8	118.5	117.8	116.3	117.8	118.5	117.5	(0.8)	(0.0)	0.0	(0.3)	
Michigan	93.3	95.7	99.4	96.1	89.8	92.1	96.1	92.7	(3.5)	(3.6)	(3.3)	(3.5)	
Minnesota	102.8	101.6	103.5	102.6	100.8	99.8	101.5	100.7	(2.0)	(1.8)	(2.0)	(1.9)	
Mississippi	68.9	70.0	72.0	70.3	69.7	70.4	72.5	70.9	0.9	0.4	0.5	0.6	
Missouri	92.5	91.8	93.1	92.5	93.7	92.3	93.9	93.3	1.2	0.6	0.8	0.9	
Montana	78.3	79.8	77.3	78.5	78.7	79.4	77.9	78.7	0.5	(0.4)	0.6	0.2	
Nebraska	94.7	93.8	94.5	94.3	96.2	94.5	95.7	95.5	1.5	0.7	1.2	1.1	
Nevada	109.0	109.4	110.0	109.4	110.8	110.9	111.5	111.1	1.8	1.5	1.5	1.6	
New Hampshire	102.8	102.2	104.0	103.0	111.0	110.4	111.1	110.8	8.2	8.2	7.1	7.8	
New Jersey	126.8	127.3	125.8	126.6	133.0	134.0	131.8	132.9	6.2	6.8	6.0	6.3	
New Mexico	80.0	81.5	82.2	81.2	81.0	82.3	84.5	82.6	1.0	0.8	2.4	1.4	
New York	120.6	119.6	119.1	119.8	121.7	121.1	121.0	121.3	1.0	1.5	1.9	1.5	
North Carolina	93.3	93.8	93.9	93.7	92.7	92.3	92.6	92.6	(0.6)	(1.5)	(1.2)	(1.1)	
North Dakota	82.1	79.9	81.3	81.1	82.9	80.5	81.3	81.6	0.8	0.6	(0.0)	0.5	
Ohio	93.7	94.1	95.3	94.4	93.4	93.8	94.9	94.0	(0.3)	(0.3)	(0.5)	(0.4)	
Oklahoma	80.7	80.6	79.4	80.2	80.1	79.8	78.7	79.5	(0.5)	(0.8)	(0.7)	(0.7)	
Oregon	89.6	91.3	92.1	91.0	89.2	91.9	92.3	91.1	(0.4)	0.5	0.2	0.1	
Pennsylvania	97.7	98.0	97.2	97.6	97.2	97.8	97.2	97.4	(0.5)	(0.2)	0.0	(0.2)	
Rhode Island	97.0	97.8	96.1	97.0	101.1	101.7	99.8	100.9	4.0	3.9	3.8	3.9	
South Carolina	81.1	81.8	82.7	81.9	81.1	82.3	83.0	82.1	(0.0)	0.5	0.3	0.3	
South Dakota	85.5	86.8	87.7	86.7	88.6	91.1	91.6	90.5	3.1	4.3	3.9	3.8	
Tennessee	89.5	90.4	92.0	90.6	88.2	88.8	90.2	89.1	(1.3)	(1.6)	(1.7)	(1.5)	
Texas	95.8	95.7	95.3	95.6	95.3	94.8	94.5	94.9	(0.5)	(1.0)	(0.8)	(0.8)	
Utah	78.4	79.5	80.5	79.5	76.4	77.4	78.9	77.6	(2.0)	(2.1)	(1.7)	(1.9)	
Vermont	90.2	90.1	89.3	89.9	91.2	91.3	90.2	90.9	0.9	1.2	0.9	1.0	
Virginia	104.0	104.6	103.8	104.1	106.8	107.5	106.3	106.8	2.8	2.9	2.5	2.7	
Washington	104.1	103.8	102.5	103.5	103.2	103.5	102.1	102.9	(0.9)	(0.3)	(0.4)	(0.6)	
West Virginia	73.3	73.7	74.5	73.9	75.5	76.1	77.2	76.3	2.2	2.4	2.7	2.4	
Wisconsin	93.1	94.1	94.7	94.0	93.1	94.5	94.8	94.1	(0.0)	0.4	0.1	0.2	
Wyoming	108.8	109.5	107.8	108.7	122.6	123.3	122.4	122.7	13.8	13.8	14.6	14.1	
<b>United States</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>						
	<b>Basic statistics including Washington DC</b>								Minimum	(72.96)	(74.05)	(74.97)	(73.99)
									Maximum	15.89	16.35	17.17	16.23
									Average	(0.10)	(0.00)	(0.13)	(0.08)
									Median	0.46	0.38	0.26	0.28
	<b>Basic statistics excluding Washington DC</b>								Minimum	(4.00)	(3.78)	(3.28)	(3.63)
									Maximum	15.89	16.35	17.17	16.23
									Average	1.36	1.48	1.37	1.40
									Median	0.46	0.39	0.28	0.35
	<b>Number of States with Percentage Point Change in Index</b>								Less (+-) 1	20	21	21	20
									(+) 1 to less than (+) 2	12	12	9	14
									(+) 2 to less than (+) 3	6	4	8	4
									(+) 3 to less than (+) 5	7	8	7	7
									(+) 5 and above	6	6	6	6



experimental estimates of TTR are arbitrary and lack any theoretical foundation. As a result, this analysis proposes a new, better methodology for estimating TTR that more accurately reflects the underlying theory of the original conceptual framework of TTR.

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## **Table A1 -- Comparison of the Current and Proposed Methodologies**

### **Advantages of Proposed Methodology over Current Method**

- Consistent with the original conceptual framework for TTR
- Comprehensive measure of potentially taxable income flows, addresses the lack of completeness associated with SPI and GSP.
- Does not consider the actual fiscal policies of states. A key rationale for the current methodology was the improper treatment of cross-border income flows in the experimental estimates of TTR.
- Does not mix years of data for GSP and SPI. Estimates will only change if the underlying data series is revised, generating a consistent time series of estimates.
- Makes specific adjustments to account for the unique tax status of the District of Columbia.

### **Shortcomings of Proposed Methodology**

- Unable to identify all of the separate components needed to derive the theoretically ideal measure of TTR. Some assumptions had to be made regarding the treatment of dividend and interest income earned outside the state. Relative to the current methodology, this is not a shortcoming since the current method does not attempt to identify the cross-border income flows.

**Table A2 -- State Shares of SPI, GSP, and TTR as a Share of GSP**

	<u>Current Methodology</u>						<u>Proposed Method</u>		
	State Share of Total SPI			State Share of Total GSP			TTR as a Share of the State's GSP		
	1992	1993	1994	1992	1993	1994	1992	1993	1994
Alabama	1.33%	1.33%	1.34%	1.30%	1.28%	1.30%	106.8%	107.1%	106.3%
Alaska	0.25%	0.25%	0.24%	0.36%	0.39%	0.33%	97.9%	98.3%	98.8%
Arizona	1.30%	1.34%	1.38%	1.28%	1.31%	1.38%	109.7%	109.5%	109.0%
Arkansas	0.72%	0.72%	0.73%	0.72%	0.73%	0.74%	108.6%	108.2%	108.0%
California	13.06%	12.75%	12.50%	13.47%	13.09%	12.81%	104.9%	104.9%	104.8%
Colorado	1.39%	1.44%	1.47%	1.39%	1.45%	1.46%	105.4%	105.3%	106.0%
Connecticut	1.77%	1.75%	1.73%	1.67%	1.65%	1.62%	113.4%	113.6%	113.2%
Delaware	0.30%	0.30%	0.30%	0.38%	0.38%	0.39%	109.4%	109.4%	108.8%
District of Columbia	0.32%	0.32%	0.31%	0.74%	0.74%	0.70%	51.6%	51.2%	50.6%
Florida	5.15%	5.31%	5.31%	4.56%	4.64%	4.65%	117.6%	117.3%	116.7%
Georgia	2.44%	2.48%	2.53%	2.59%	2.65%	2.68%	103.4%	103.3%	103.3%
Hawaii	0.50%	0.50%	0.49%	0.57%	0.56%	0.54%	102.2%	102.3%	102.5%
Idaho	0.34%	0.36%	0.36%	0.33%	0.35%	0.35%	110.5%	109.8%	109.5%
Illinois	4.93%	4.91%	4.92%	4.86%	4.86%	4.87%	108.0%	107.8%	107.7%
Indiana	2.02%	2.05%	2.07%	1.96%	1.98%	2.02%	108.2%	107.9%	107.6%
Iowa	0.98%	0.95%	0.98%	0.98%	0.96%	1.00%	110.7%	110.5%	109.5%
Kansas	0.93%	0.93%	0.92%	0.92%	0.90%	0.90%	112.7%	112.7%	112.1%
Kentucky	1.20%	1.19%	1.19%	1.24%	1.25%	1.27%	106.6%	106.2%	105.6%
Louisiana	1.33%	1.34%	1.35%	1.48%	1.47%	1.48%	103.0%	102.8%	103.0%
Maine	0.42%	0.42%	0.41%	0.39%	0.39%	0.38%	110.3%	110.1%	110.6%
Maryland	2.20%	2.19%	2.20%	1.94%	1.94%	1.94%	119.8%	119.9%	119.8%
Massachusetts	2.81%	2.78%	2.77%	2.70%	2.72%	2.72%	108.4%	108.4%	108.1%
Michigan	3.59%	3.64%	3.73%	3.30%	3.38%	3.52%	107.6%	107.2%	106.7%
Minnesota	1.80%	1.78%	1.81%	1.80%	1.79%	1.82%	105.9%	105.5%	105.2%
Mississippi	0.70%	0.72%	0.74%	0.71%	0.72%	0.74%	109.1%	108.6%	108.1%
Missouri	1.90%	1.88%	1.90%	1.87%	1.84%	1.88%	109.8%	109.4%	109.0%
Montana	0.26%	0.27%	0.26%	0.25%	0.25%	0.25%	112.8%	112.3%	112.5%
Nebraska	0.59%	0.58%	0.58%	0.61%	0.59%	0.61%	107.4%	107.1%	106.1%
Nevada	0.55%	0.57%	0.59%	0.59%	0.61%	0.64%	109.5%	110.1%	108.8%
New Hampshire	0.47%	0.47%	0.48%	0.43%	0.42%	0.43%	122.6%	122.6%	121.4%
New Jersey	4.00%	3.95%	3.91%	3.77%	3.81%	3.73%	116.0%	115.3%	115.0%
New Mexico	0.48%	0.49%	0.49%	0.52%	0.53%	0.55%	106.0%	105.7%	105.6%
New York	8.56%	8.41%	8.30%	8.57%	8.44%	8.35%	108.0%	108.1%	107.9%
North Carolina	2.38%	2.43%	2.45%	2.63%	2.64%	2.66%	102.6%	102.6%	102.8%
North Dakota	0.20%	0.20%	0.20%	0.21%	0.20%	0.20%	107.8%	108.4%	108.1%
Ohio	4.09%	4.09%	4.11%	3.99%	3.98%	4.02%	108.3%	108.2%	107.5%
Oklahoma	1.03%	1.03%	1.02%	1.00%	0.99%	0.97%	108.5%	108.0%	108.9%
Oregon	1.06%	1.08%	1.10%	1.03%	1.07%	1.09%	110.0%	109.9%	109.3%
Pennsylvania	4.79%	4.76%	4.69%	4.39%	4.39%	4.31%	111.5%	111.4%	111.3%
Rhode Island	0.40%	0.40%	0.39%	0.36%	0.36%	0.35%	115.9%	115.8%	116.1%
South Carolina	1.13%	1.13%	1.14%	1.16%	1.17%	1.17%	106.1%	106.3%	106.5%
South Dakota	0.23%	0.23%	0.24%	0.24%	0.25%	0.25%	109.3%	109.0%	108.4%
Tennessee	1.74%	1.77%	1.80%	1.78%	1.79%	1.85%	105.7%	105.9%	104.7%
Texas	6.36%	6.45%	6.48%	6.94%	6.97%	7.02%	103.8%	103.7%	103.6%
Utah	0.54%	0.56%	0.57%	0.58%	0.59%	0.61%	103.6%	103.8%	103.7%
Vermont	0.21%	0.20%	0.20%	0.20%	0.20%	0.19%	110.6%	110.8%	111.1%
Virginia	2.59%	2.62%	2.62%	2.62%	2.63%	2.60%	110.6%	110.6%	110.7%
Washington	2.10%	2.11%	2.11%	2.10%	2.12%	2.10%	108.2%	108.0%	108.1%
West Virginia	0.54%	0.54%	0.54%	0.50%	0.50%	0.51%	115.1%	115.0%	113.8%
Wisconsin	1.85%	1.85%	1.87%	1.80%	1.83%	1.83%	109.2%	108.6%	108.4%
Wyoming	0.17%	0.17%	0.16%	0.23%	0.23%	0.23%	104.7%	105.3%	104.7%
<b>United States</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>107.9%</b>	<b>107.8%</b>	<b>107.6%</b>
Minimum	0.17%	0.17%	0.16%	0.20%	0.20%	0.19%	51.57%	51.19%	50.61%
Maximum	13.06%	12.75%	12.50%	13.47%	13.09%	12.81%	122.56%	122.61%	121.38%
Average	1.96%	1.96%	1.96%	1.96%	1.96%	1.96%	107.75%	107.64%	107.37%
Median	1.20%	1.19%	1.19%	1.24%	1.25%	1.27%	108.37%	108.21%	108.10%