Tax Base Differences Between Worldwide and Water's Edge Methods of Unitary Taxation: A Survey of Fortune 500 Companies

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ABSTRACT

This paper compares the worldwide method to the water's edge method of unitary taxation in terms of their differential impact on the tax bases of a large sample of multinational corporations. A survey of the Fortune 500 was used to obtain data for computing these differences. The results help explain why worldwide unitary combination for state tax purposes has been so controversial. While the worldwide method results in double taxation in many cases, it also results in under taxation in many others. Consequently it appears that in California, where companies will be able to elect either method, both methods will be widely used.
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INTRODUCTION

As a result of much controversy and some pressure from Congress, state legislatures have been reconsidering the way that multinational corporations are taxed on their "unitary" income. The income of a unitary business results from functional integration, centralization of management, and economies of scale [Mobil, 445 U.S. 438 (1980)]. Recently, California passed tax reform legislation [SB 85] that starting in 1988 will allow each "qualified taxpayer" to determine its unitary income derived from or attributable to sources within California by using "combined reporting" based upon either (1) the "worldwide" method or (2) the "water's edge" method.¹

This paper compares these two alternatives in terms of their effects on the split between domestic unitary income (i.e., the domestic tax base) and foreign unitary income (i.e., the foreign tax base) for a large sample of firms. To accomplish this, a survey of Fortune 500 companies was used to obtain confidential taxpayer information for empirical analysis. No previous study has used actual tax data to investigate these tax base differences.²

The results help explain why this legislation has been so controversial in California and elsewhere. It appears that under the new California law both methods will be widely used by multinational companies because neither method universally dominates the other in terms of its ability to lower the domestic side of the tax base (i.e., domestic unitary income).
THE ALTERNATIVES

Under the worldwide method, a corporation is required to combine the domestic and foreign portions of its unitary income for state tax purposes. This combined total is apportioned using a three-factor formula that computes the percentage of in-state unitary income by averaging with equal weighting the separate proportions of in-state sales to total worldwide sales, in-state payroll to total worldwide payroll, and in-state property to total worldwide property.

Under the water's edge method, the above three-factor formula is applied only to domestic unitary income as determined by separate accounting. Given this change, the factor proportions become in-state sales to total domestic sales, in-state payroll to total domestic payroll, and in-state property to total domestic property. To determine the split between domestic income and foreign income, intercompany allocations are made based on "arm's-length" prices in accordance with IRC Section 482.

THE CONTROVERSY

The U.S. Supreme Court has upheld the constitutionality of California's application of the worldwide method [Container Corporation of America v. Franchise Tax Board, 103 S.Ct. 2933 (1983)], but it has also conceded that unitary apportionment in some cases could result in double taxation due to differences between the California tax system and foreign tax systems. This potential for double taxation has sparked much of the controversy surrounding unitary apportionment. Due to the perceived unfairness of the worldwide method,
the U.S. Treasury Department, multinational companies, foreign governments and
the U.S. Congress have been applying pressure to force states to adopt the
water's edge method. However, imposing the water's edge method could cause
potential losses of tax revenue for a state, interfere with its fiscal
sovereignty, and increase the difficulty it has administering state taxes.⁴

Twelve states (Alaska, California, Colorado, Florida, Idaho, Indiana,
Massachusetts, Montana, New Hampshire, North Dakota, Oregon, Utah) have at one
time or another applied the worldwide method of unitary taxation. Since
Container, eight states have rescinded this method (Colorado, Florida, Idaho,
Indiana, Massachusetts, New Hampshire, Oregon, Utah), two states have not made
any changes (Alaska and Montana), and two states have offered alternatives
(California and North Dakota).⁵

Proponents of the worldwide method have argued that when there is a sharing
or exchange of value within a multinational corporation, precise income
determination becomes infeasible. They contend that it is difficult to devise
regulations to implement separate accounting and IRC Section 482 often requires
a great deal of auditing.

Opponents of the worldwide method have argued that worldwide unitary
apportionment conflicts with the position taken by the United States in the
conduct of its foreign economic policy and violates the Foreign Commerce Clause
of the U.S. Constitution. At issue here is the principle that foreign commerce
may not be subjected "to the risk of a double tax burden to which [domestic] 
commerce is not exposed" [Japan Line v. County of Los Angeles, 441 U.S. 434,
447-448 (1979), quoting Evco v. Jones, 409 U.S. 91, 94 (1972), quoting J.D.
Under the new California law [SB 85], each taxpayer electing the water's edge method must pay an annual fee of 0.03 percent of its total sales, payroll, and property in California. Corporations can reduce this fee to some extent by investing in new plants in California or increasing the number of employees located in California.

In addition to the controversy over the basic choice between the worldwide and water's edge methods, there is also some controversy over the accuracy of the three-factor formula which is used with the worldwide method to apportion worldwide unitary income. Responding to this controversy, several recent studies have empirically analyzed the allocative accuracy of the three-factor formula itself. Hreha and Silhan [1986] and Schmidt [1986] both observed that adding the payroll factor tends to inflate apportionment errors. They found that a simple two-factor formula with equal weighting on the sales and property factors performed as well as if not better than the three-factor formula. With respect to the worldwide method, Hreha and Silhan [1986, p. 17] noted that "since domestic wage rates are typically higher than foreign wage rates, use of the current three-factor formula could result in overstating domestic income because of the positive payroll factor. This overstatement increases the potential for double taxation between the states and foreign jurisdictions."

Because the new California law offers a choice between the worldwide method and the water's edge method, it appears that the controversy may continue, especially if state revenues are affected by changes in the domestic tax base. The new California law might even be challenged on constitutional grounds because of the election fee [Strier, 1986].
RESEARCH DESIGN

The current study was designed to compare the worldwide method to the water’s edge method in terms of the tax bases that result from using one method or the other. Accordingly, a survey was mailed to every company listed in the Fortune 500 for the year 1983. Due to the confidential nature of the data, no industry-by-industry analysis of the data was attempted. To examine the proposition that worldwide unitary apportionment might be improved if the payroll factor were dropped from the current three-factor formula, an alternative sales-property formula was also used as suggested by Hreha and Silhan [1986].

Data Sample

Since corporate tax returns are confidential, a questionnaire was used to obtain data for this study. Every company listed in the 1983 Fortune 500 was mailed a copy of a survey which asked for the following four items of information for the year 1983:

(Item 1) Percentage of worldwide sales sold in U.S.
(Item 2) Percentage of worldwide payroll earned in U.S.
(Item 3) Percentage of worldwide property located in U.S.
(Item 4) Percentage of worldwide income classified as U.S. Source Income

Explanations which clarified these terms accompanied the survey. California definitions were used to ensure interpretive uniformity. Sales were specified as gross receipts from services, rentals, royalties, and business operations. Payroll included any form of remuneration such as wages, salaries,
and commissions paid to employees for personal services. Property was defined as the average value of undepreciated cost for all real and tangible property. Rental property was valued at eight times the net annual rental cost in accordance with California law. Worldwide income was specified as U.S. Source Income plus foreign taxable income.

U.S. Source Income was identified specifically as the number reported on the taxpayer's Federal Form 1118, Foreign Tax Credit (Schedule B, Part II, line 9 minus line 6). This value represents income that is taxable under U.S. Federal law. The percentage of worldwide income computed for federal tax purposes represents the amount of domestic or "water's edge" income that can then be apportioned to the states using the three-factor formula. Companies use arm's-length pricing in accordance with IRC Section 482 to separate domestic and foreign income.

Foreign taxable income was defined as the total taxable income of controlled foreign corporations which is subject to foreign taxes. A controlled corporation is any foreign corporation in which U.S. shareholders own more than 50 percent of the total combined voting power of all classes of stock. In accordance with California apportionment, when a corporation based in the United States controls a foreign corporation, it must include all of the foreign corporation's income in worldwide income.

Formulas and Comparisons

To compute tax base differences between the worldwide method and the water's edge method, for each firm the percentage of unitary income apportioned under the worldwide method was computed two ways and compared to the percentage of worldwide income classified as U.S. Source Income (Item 4). For the first
comparison, the percentage of worldwide income under the current three-factor worldwide method was computed as the simple average of the percentage of sales sold in the U.S. (Item 1), the percentage of worldwide payroll earned in the U.S. (Item 2), and the percentage of worldwide property located in the U.S. (Item 3). For the second comparison, the percentage of worldwide income under a modified two-factor worldwide method was computed as the simple average of the percentage of sales sold in the U.S. (Item 1) and the percentage of property located in the U.S. (Item 3).

Notationally, these two comparisons can be represented as follows (worldwide method versus water's edge method):

\[
\frac{1}{3} (\text{Item 1} + \text{Item 2} + \text{Item 3}) \text{ vs Item 4} \quad (1)
\]

and

\[
\frac{1}{2} (\text{Item 1} + \text{Item 3}) \text{ vs Item 4} \quad (2)
\]

The first comparison was made to measure the potential effect of the new California law on the total domestic tax base of each company sampled. This could provide insights into what would happen if more states adopted the California approach to unitary taxation. The second comparison was made to explore the possibility that deleting the payroll factor might tend to reduce tax base inequities due to double taxation and under taxation. Recent studies have shown that the two-factor formula seems to perform as well as the three-factor formula [Hreha and Silhan, 1986; Schmidt, 1986]. In addition, Sheffrin and Fulcher [1983; 1984] used this two-factor formula in their research on worldwide unitary apportionment because payroll information was not available
in their database which consisted of published financial data from corporate annual reports.

Since for each firm the amount of unitary income that would be taxed under the water's edge method was determined by using arm's-length prices as specified under federal law, any difference between the worldwide method and the water's edge method reflects the degree of double taxation or under taxation occurring for a given firm.\(^7\) If, for example, the amount of income subject to state taxation were 60 percent, then 40 percent of worldwide income would be subject to foreign taxes. If, however, the percentage of income subject to state taxes were 65 percent using the worldwide method, then the amount of double taxation would be 5 percent because 40 percent of worldwide income still would be subject to foreign taxes. On the other hand, if the amount of income subject to state taxation were 55 percent, then the amount of under taxation would be 5 percent. In effect, the amount of double taxation or under taxation is measured in terms of the water's edge method, which serves as a benchmark since it uses arm's-length prices and separate accounting.

**EMPIRICAL RESULTS**

**Response to Survey**

The response rate to the questionnaire after two mailings was 25.8 percent. Of the 129 questionnaires returned, eight were from companies that had losses for 1983 and therefore could not be used. Also eliminated were 18 companies which reported that all of their sales, payroll and property were in the United States and 11 companies which were not able to supply all of the needed information. In all, there were 92 usable returns in the final sample.
Each of these companies stated that it was treated as a unitary business for state tax purposes.

Due to the extremely remote possibility of self-selection, the purpose of the questionnaire was not revealed at the time of the survey. Follow-up conversations confirmed that the underlying purpose of the study had not been revealed by the questionnaire. The resulting sample appeared to be evenly distributed throughout the Fortune 500.

Three-Factor Results

Figure 1 depicts for each firm the percentage of worldwide income taxed (i.e., the domestic tax base) under the three-factor worldwide method and under the water's edge method. The diagonal line indicates the locus of points where the percentage of worldwide income taxed under both methods was the same; points to the left of the diagonal reflect the extent to which the percentage of income taxed under the worldwide method was greater than the percentage taxed under the water's edge method (i.e., double taxation); points to the right of the diagonal reflect the extent to which the percentage of income taxed under the worldwide method was less than the percentage of income under the water's edge method (i.e., under taxation).
As can be seen from Figure 1, the percentage of income under the worldwide unitary method was generally greater than the percentage of income under the water's edge method. Sixty-one of the 92 firms fall within this category. The mean percentage of worldwide income under the three-factor formula was 80.7 percent (with a standard deviation of 19.5 percent), while the mean percentage of worldwide income under the water's edge method was 70.4 percent (with a standard deviation of 28.9 percent). Both the t-test and the Wilcoxon signed-ranks test (the non-parametric analog of the matched-pairs t-test) indicated that the difference between these two methods was statistically significant at the .001 level (two-tailed test).

Table 1 summarizes the three-factor results. It shows that 34 firms in the sample experienced double taxation in excess of ten percent, while only 7 firms in the sample experienced under taxation in excess of ten percent. There were 27 firms with double taxation less than 11 percent, 21 with under taxation less than 11 percent, and 3 firms which would be taxed the same under the two methods.

Table 1

Two-Factor Results

Comparisons of the two-factor worldwide method to the water's edge method are depicted in Figure 2 which is analogous to Figure 1. The mean percentage of income under the two-factor formula was 79.8 percent (with a standard deviation of 20.0 percent). As previously mentioned, the mean percentage of income under the water's edge method was 70.4 percent (with a standard deviation
of 28.9). Both the t-test and the Wilcoxon signed-ranks test indicated that the difference between these two methods was statistically significant at the .001 level (two-tailed test).

Figure 2

The two-factor results are summarized in Table 2. When compared with the three-factor results which appear in Table 1, the two-factor results are very similar. The two-factor formula only reduced the number of firms that would experience double taxation from 61 firms under the three-factor formula to 60 firms under the two-factor formula. The mean difference between the worldwide method and the water's edge method was reduced from 10.3 percent (three-factor formula) to 9.4 percent (two-factor formula).

The two-factor formula generated tax bases that were less than the three-factor formula in 41 cases, more than the three-factor formula in 14 cases, and the same as the three-factor formula in 37 cases. Both the t-test and the Wilcoxon rank-sum test indicated that the difference between these two apportionment formulas was statistically significant at the .001 level (two-tailed test). These results suggest that perhaps the sales-property two-factor formula should be considered as another alternative in California and elsewhere.

Table 2
Subsample Differences

Since the new California law offers each unitary business the option of choosing from a set of two alternative methods, initially there will emerge two groups of taxpayers: (1) those electing to switch to the water's edge method and (2) those electing to continue using the worldwide method. Subsequent changes after a number of years depending on the terms of the election fee paid can also be expected as taxpayer situations change.

Table 3 summarizes the results of this study partitioned by tax base differences between the current (three-factor) worldwide method and the water's edge method. It shows that the water's edge method generally produced lower tax bases for the double taxation group than for the under taxation group (61.8 percent versus 86.1 percent), but it also shows that the worldwide method tended to generate similar results across both groups (81.8 percent versus 76.4 percent). This suggests that the primary source of these tax base differences may be more related to the variability of the water's edge method than to the variability of the worldwide method which was less variable across firms. This also seems to be borne out by the differences in standard deviations which are lower for the worldwide method than the water's edge method in the double taxation group (15.7 percent versus 28.2 percent) and only slightly higher in the under taxation group (26.1 percent versus 23.2 percent).

Table 3
THE RESULTS OF THIS STUDY SUPPORT THE POSITION THAT THE WORLDWIDE UNITARY METHOD TENDS TO PRODUCE DOUBLE TAXATION IN MANY CASES. THERE WAS DOUBLE TAXATION INDICATED IN 61 OUT OF THE 92 RESPONDING FORTUNE 500 COMPANIES. DOUBLE TAXATION WAS COMPUTED BY COMPARING THE PERCENTAGE OF WORLDWIDE INCOME TAXED UNDER THE WORLDWIDE METHOD TO THE PERCENTAGE OF INCOME TAXED UNDER THE WATER'S EDGE METHOD. INTERESTINGLY, HOWEVER, THE RESULTS ALSO SHOW THAT 28 FIRMS OUT OF THE RESPONDING SAMPLE MAY BENEFIT FROM THE WORLDWIDE UNITARY METHOD AND 3 FIRMS WOULD PROBABLY BE INDIFFERENT TO EITHER METHOD. THIS IMPLIES THAT A SIGNIFICANT NUMBER OF MULTINATIONAL FIRMS OPERATING IN CALIFORNIA MAY ELECT TO KEEP THE WORLDWIDE METHOD OF TAXATION.

RESULTS BASED ON AN ALTERNATIVE WORLDWIDE METHOD THAT USED A TWO-FACTOR SALES-PROPERTY FORMULA ALSO REVEALED THE SAME GENERAL PATTERN ACROSS FIRMS. SINCE THIS FORMULA GENERATED RESULTS THAT WERE VERY SIMILAR TO THE RESULTS GENERATED BY THE CURRENT THREE-FACTOR ALTERNATIVE, SOME STATES THUS MIGHT WANT TO CONSIDER ADOPTING THIS ALTERNATIVE AS WELL.

IT APPEARS, THEN, THAT THE NEW CALIFORNIA LAW WILL INDEED TEND TO REDUCE THE UNITARY TAX BASE RELATIVE TO WHERE IT IS NOW BECAUSE IT CAN BE ASSUMED THAT EACH CORPORATION WILL MAKE EVERY EFFORT TO ESTIMATE AND CHOOSE THE ONE METHOD THAT WILL YIELD THE LOWEST POSSIBLE LONG-TERM TAX BASE. THE EXTENT OF THIS REDUCTION COULD BECOME AN INTERESTING AREA FOR FUTURE RESEARCH AS CORPORATIONS ADJUST TO THE NEW LAW AND NEW DATA BECOME AVAILABLE ON TAXPAYER PREFERENCES.
NOTES

1. A "qualified taxpayer" must file with its original state tax return certain consents agreeing to the taking of dispositions from key domestic corporate individuals, the acceptance of subpoenas, and the reasonable production of documents necessary to review or adjust income or deductions in a manner authorized under Sections 482, 861, Subpart F, or similar provisions of the Internal Revenue Code (IRC). "Combined reporting" applies to an affiliated group which is defined in California as a group of corporations interconnected with a common parent corporation by more than 50 percent stock ownership [Cal. Rev. and Tax. Code Ann. Sec. 25104].

2. Sheffrin and Fulcher [1983, 1984] attempted to approximate what these differences might be by using financial accounting information reported by geographical segment instead of using tax data. However, because payroll information is not reported by segment, they were not able to gauge the effects of using the worldwide method per se. This method requires information on unitary sales, payrolls, and property.

3. No state allows a foreign tax credit, but a few states allow deductions for foreign income taxes paid by the taxpayer [Hellerstein, 1983, p. 290].

4. See Carlson and Galper [1984] for additional discussion of the legislative, judicial, and treaty developments which produced these two competing methods of unitary taxation.

5. In North Dakota, Gov. George Sinner recently signed legislation [HB 1064] which beginning in 1989 will provide multinational corporations the option of water's edge treatment.

6. Recently, the Revenue and Taxation Committee of the California Assembly approved a technical corrections [SB 85] bill to reduce the election fee to .015 or .020 percent with accompanying stipulations that the taxpayer must retain the election for ten or five years, respectively.

7. Although IRC Section 482 differentiates between domestic and foreign income based upon arm's-length prices, firms have abused these provisions in an attempt to classify more of their income as foreign source income. It is often difficult to establish a fair arm's-length price for certain transactions. Burns [1980] provides a thorough discussion of these problems.
Figure 1: DISTRIBUTION OF FIRMS SUBJECT TO DOUBLE TAXATION OR UNDER TAXATION WHEN USING WORLDWIDE METHOD: THREE-FACTOR FORMULA.
Figure 2. DISTRIBUTION OF FIRMS SUBJECT TO DOUBLE TAXATION OR UNDER TAXATION WHEN USING WORLDWIDE METHOD: TWO-FACTOR FORMULA
# TABLE 1

**DISTRIBUTION OF FIRMS SUBJECT TO DOUBLE TAXATION OR UNDER TAXATION WHEN USING WORLDWIDE METHOD: THREE-FACTOR FORMULA**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Double Taxation</th>
<th>Under Taxation</th>
<th>No Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% to 0%</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>1% to 10%</td>
<td>27</td>
<td>21</td>
<td>-</td>
</tr>
<tr>
<td>11% to 20%</td>
<td>10</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>21% to 30%</td>
<td>9</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>31% to 40%</td>
<td>6</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>41% to 50%</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>51% to 60%</td>
<td>4</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>61% to 70%</td>
<td>3</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61</strong></td>
<td><strong>28</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

*aPercentage of worldwide income

*bDomestic tax base under worldwide method > domestic tax base under water's edge method

*cDomestic tax base under worldwide method < domestic tax base under water's edge method
### TABLE 2

DISTRIBUTION OF FIRMS SUBJECT TO DOUBLE TAXATION OR UNDER TAXATION WHEN USING WORLDWIDE METHOD: TWO-FACTOR FORMULA

<table>
<thead>
<tr>
<th>Interval $^a$</th>
<th>Double Taxation $^b$</th>
<th>Under Taxation $^c$</th>
<th>No Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% to 0%</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>1% to 10%</td>
<td>25</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>11% to 20%</td>
<td>10</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>21% to 30%</td>
<td>14</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>31% to 40%</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>41% to 50%</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>51% to 60%</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>61% to 70%</td>
<td>4</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>28</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>

$^a$Percentage of worldwide income

$^b$Domestic tax base under worldwide method > domestic tax base under water's edge method

$^c$Domestic tax base under worldwide method < domestic tax base under water's edge method
## TABLE 3

**SUMMARY OF TAX BASE DIFFERENCES**

<table>
<thead>
<tr>
<th></th>
<th>Tax Base Percentage&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Double Taxation</td>
<td>Under Taxation</td>
<td>No Difference</td>
<td>Total</td>
</tr>
<tr>
<td><strong>Unitary Method</strong></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Worldwide&lt;sup&gt;b&lt;/sup&gt;</td>
<td>81.8 (15.7)</td>
<td>76.4 (26.1)</td>
<td>98.0 (1.0)</td>
<td>80.7 (19.5)</td>
</tr>
<tr>
<td>Water's Edge</td>
<td>61.8 (28.2)</td>
<td>86.1 (23.2)</td>
<td>98.0 (1.0)</td>
<td>70.4 (28.9)</td>
</tr>
<tr>
<td>Difference</td>
<td>20.0 (18.6)</td>
<td>-9.7 (12.8)</td>
<td>0.0 (0.0)</td>
<td>10.3 (21.6)</td>
</tr>
</tbody>
</table>

| Number of Firms   | N=61                            | N=28            | N=3            | N=92            |

<sup>a</sup>Domestic tax base (U.S. Source Income) as percentage of worldwide tax base (U.S. Source Income + foreign taxable income); each firm received same weight (1/N)

<sup>b</sup>Three-factor formula (sales, payroll, property)
REFERENCES


