



Burch Conference, June 2009
Day 5: International agreements

Formula apportionment

CCCTB

Dumping v. ETI



International agreements and intercompany pricing.

- The world has converged on income attribution based on separate accounting and the arm's length pricing principle, but there is understandable dissatisfaction with the level of tax avoidance and associated distortions created by the current system.
- As a result, there is interest in alternatives such as formulary apportionment.
- Formulary apportionment is well known (e.g., Gordon and Wilson, *Econometrica*, 1986) to convert the income tax into a profit-rate-varying tax on the factors that are used to apportion income.
- Such a tax is distortionary, and if governments want to have sales taxes or labor taxes, they are probably better off just having such taxes explicitly, and not doing so implicitly through the income allocation formulas.



Background

- There is quite a bit of interest in formulary alternatives to separate accounting, reflecting...
 - Concerns about tax avoidance
 - Concerns about various forms of tax competition (statutory rates, bases, apportionment weights)
 - General desires for unity and harmonization.
- There is a clumsy aspect to formula apportionment, in that no one actually thinks that the factors used in these formulas in fact capture income production. The question is, how bad is that? (And if it's bad, which factors are the worst?)



Ownership

- Some of the difficulties associated with formula apportionment stem from the fact that formulary methods apply to controlled groups.
 - This is sensible if the idea is to reduce incentives to reallocate taxable income from one jurisdiction to another.
 - The problem is that the ownership-based inclusion criterion then creates its own incentives for ownership.
 - [Note: in the U.S. state case, common ownership is not sufficient; a business must also be “unitary.”]
- Ownership implications: incentives for mergers and asset divestment.



More on mergers and divestitures.

- Consider an extreme example.
 - A firm with high profits in Germany (high tax).
 - Acquires an unprofitable firm with lots of employment in Ireland (low tax).
 - With separate accounting the firm's profits are taxed in Germany.
 - With formulary apportionment (based on employment) the firm's total taxes are reduced. Hence formulary apportionment creates a merger incentive.
- Gordon and Wilson (1986) note that, with zero merger costs, there are so many mergers that all firms wind up with the same tax rates.
- But: what if mergers and divestitures are costly?
 - We get incomplete tax arbitrage, and...
 - The induced ownership changes are associated with economic inefficiency.



What we know about mergers & other determinants of asset ownership.

- There is a sizeable literature on tax effects of mergers and divestments. Bottom line: there are significant tax effects.
- There is also a sizeable literature on the effects of taxation on FDI (and most FDI is acquisition-based), likewise finding significant tax effects.
- We also know that mergers are costly; we know that because many firms could improve their tax positions (e.g., take advantage of unused tax loss carryforwards) by merging with other firms, and the evidence is that many leave these tax benefits on the table.



What the Hines (2008) study does.

- The paper looks at data on separate (consolidated) companies to estimate the extent to which formulary factors (sales, property, employment) explain variation in reported profitability.
- Why do this?
- The paper shows that we can use a common (well, in my crowd) statistical procedure called a weighted Ordinary Least Squares regression to estimate coefficients on various factors explaining profitability, and that these coefficients are the ownership distortion-minimizing factor weights.
- It is not obvious that this should be so.
- This offers a theoretical justification for a procedure in that is (relatively) easy to implement and produces answers that are easy to interpret.



The evidence.

- There is evidence both using Compustat data for American firms and Amadeus data for European firms. These are financial reports.
- The results for American firms indicate that observable factors do a poor job of predicting profits (as reported by Compustat).
 - Absolute value of prediction errors exceeds predicted profits 76% of the time
 - Absolute value of prediction errors exceeds three times predicted profits 36% of the time.
 - With European data the fit is even worse.
- Employment is by far the worst factor.
 - Estimated effect is often negative.
 - This may not be surprising, given that labor costs are deductible.



Data.

- Compustat, 2004
- Income variables:
 - Taxes paid/0.35.
 - Operating income after depreciation.
 - Yearend market capitalization.
- Formulary factors:
 - Total worldwide sales.
 - Book value of property, plant and equipment.
 - Number of employees (almost 7,000 observations).
 - Employment compensation (only about 1,500 observations).
- Similar results for 5-year averages, other years.

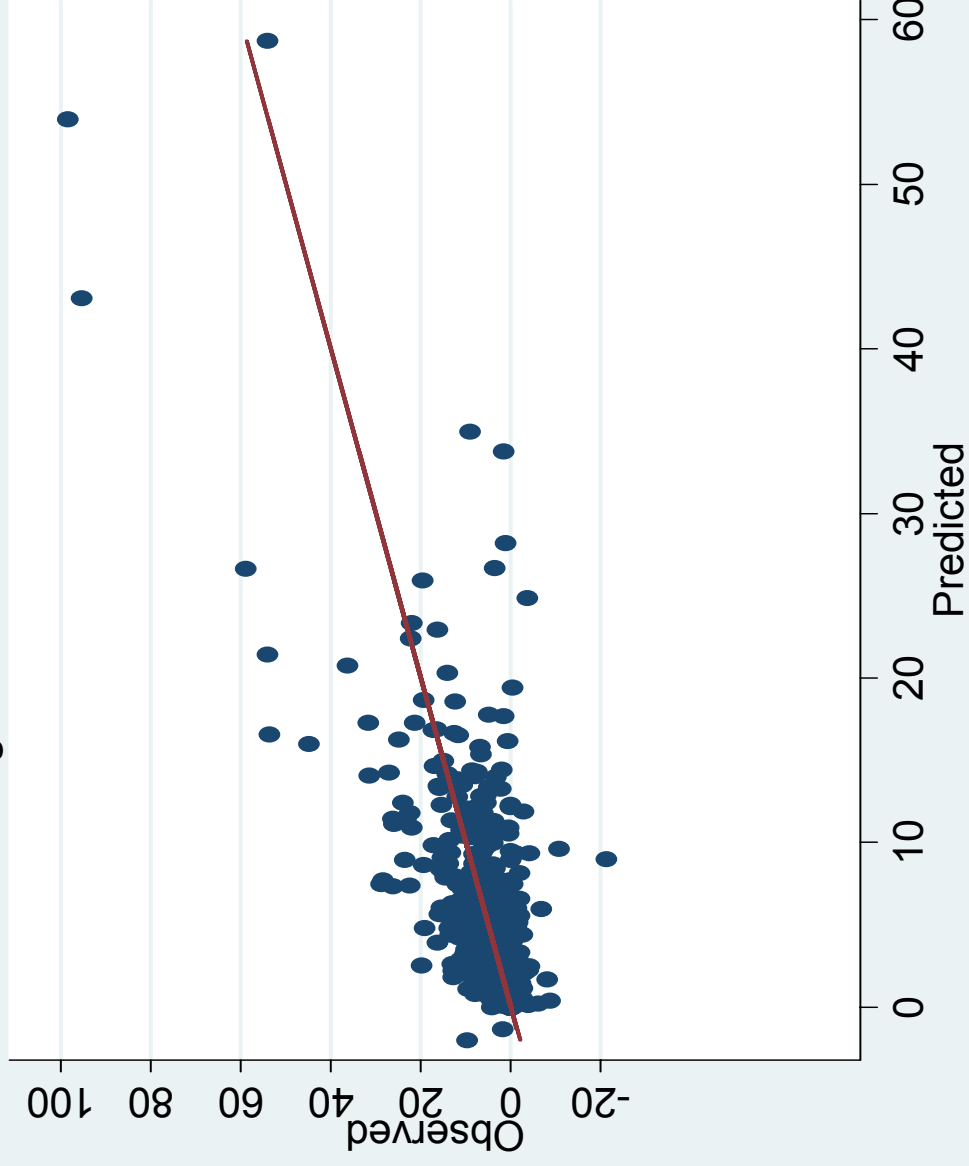
Table 2
Determinants of Profits, 2004, WLS Results

Notes: The Table presents estimated coefficients from regressions explaining 2004 profits as functions of contemporaneous sales, capital, and labor inputs. All equations are estimated using weighted least squares, with weights equal to one divided by the square root of contemporaneous firm assets. Robust standard errors are presented in parentheses.

<i>Dependent Variable:</i>	(1)	(2)	(3)	(4)	(5)	(6)
	Operating Income			Taxable Income as Reflected in Taxes Paid		Market Capitalization
Sales	0.4472 (0.0638)	0.4388 (0.0291)	0.7214 (0.1439)	0.5886 (0.0518)	0.5076 (0.0877)	0.5597 (0.0410)
Property, Plant and Equipment	0.1592 (0.0406)	0.2862 (0.0208)	0.1554 (0.0617)	0.2826 (0.0343)	0.1786 (0.0462)	0.2108 (0.0259)
Labor Compensation	0.0072 (0.0159)		-0.0349 (0.0415)		0.0948 (0.0329)	
Employment		-0.0015 (0.0027)		-0.0065 (0.0054)		0.0029 (0.0028)
No. of Obs.	1,575	6,992	1,574	6,986	1,461	6,384
R-Squared	0.5425	0.5427	0.5715	0.5004	0.5281	0.4049

Income Derived from Taxes Paid, Weighted: sam

Weight is assets raised to -0.5.



Market Capitalization, Weighted: sample 1

Weight is assets raised to -0.5.

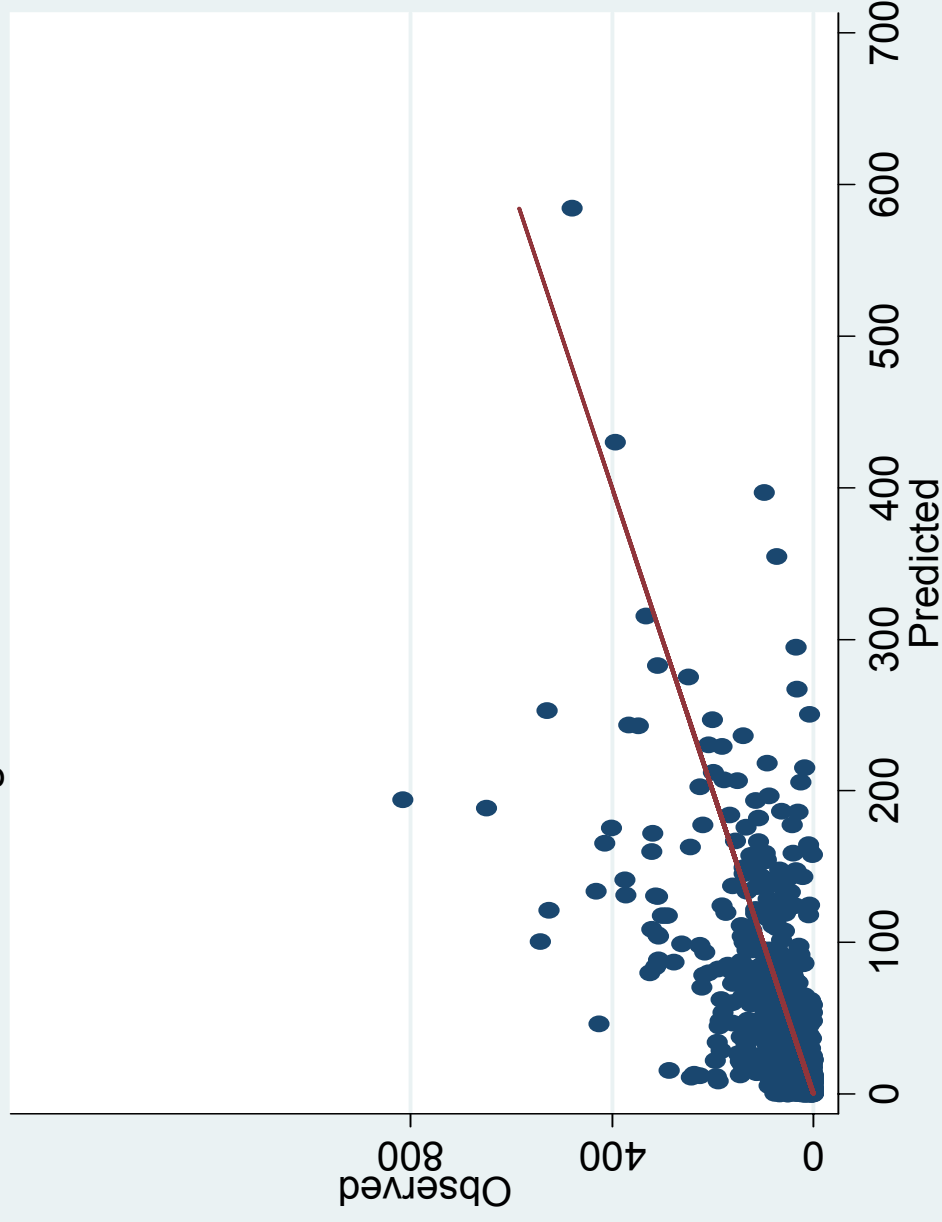


Table 8: Unconstrained - Three Factor

	Operating Income		Taxable Income Derived from Taxes		Market Capitalization	
	1	2	1	2	1	2
Sample ¹						
N (Sample) ²	1575	6992	1574	6986	1461	6384
N (0-value for $\hat{\pi}$) ^{3,4}	3	24	3	24	2	21
N (mean computation) ⁵	1572	6968	1571	6962	1459	6363
mean[$ \hat{\pi} - \hat{\pi} / \hat{\pi}$]	56.43	7822.66	2.28	-25.16	10.60	150.95
median[$ \hat{\pi} - \hat{\pi} / \hat{\pi}$]	2.08	1.11	1.00	1.00	1.51	0.98
Percent of firms for which:						
$ \hat{\pi} - \hat{\pi} > 0.05 * \hat{\pi}$	98.47%	96.96%	97.77%	97.67%	98.42%	97.16%
$ \hat{\pi} - \hat{\pi} > 0.1 * \hat{\pi}$	96.25%	94.00%	95.86%	95.65%	96.44%	94.06%
$ \hat{\pi} - \hat{\pi} > 0.2 * \hat{\pi}$	92.88%	88.09%	91.79%	91.12%	92.53%	88.70%
$ \hat{\pi} - \hat{\pi} > 0.25 * \hat{\pi}$	90.39%	85.40%	89.88%	88.75%	90.13%	85.62%
$ \hat{\pi} - \hat{\pi} > 0.5 * \hat{\pi}$	82.06%	71.48%	79.95%	77.82%	80.40%	72.31%
$ \hat{\pi} - \hat{\pi} > 0.75 * \hat{\pi}$	74.43%	60.07%	70.02%	66.83%	71.01%	59.42%
$ \hat{\pi} - \hat{\pi} > 1 * \hat{\pi}$	68.64%	53.07%	46.98%	32.28%	61.48%	49.17%
$ \hat{\pi} - \hat{\pi} > 2 * \hat{\pi}$	51.46%	37.17%	24.76%	15.66%	38.93%	35.90%
$ \hat{\pi} - \hat{\pi} > 3 * \hat{\pi}$	31.81%	29.16%	12.60%	9.41%	22.76%	27.27%
$ \hat{\pi} - \hat{\pi} > 4 * \hat{\pi}$	18.00%	23.13%	7.70%	5.90%	14.32%	21.91%
$ \hat{\pi} - \hat{\pi} > 5 * \hat{\pi}$	12.21%	19.25%	4.26%	4.45%	10.90%	18.76%
$ \hat{\pi} - \hat{\pi} > 7.5 * \hat{\pi}$	8.08%	14.85%	2.23%	2.47%	6.99%	14.25%
$ \hat{\pi} - \hat{\pi} > 10 * \hat{\pi}$	7.25%	12.94%	2.04%	1.94%	5.48%	11.99%



Application to tax policy

- We can use simple statistics to estimate the reliability of alternative factor weights for formula apportionment.
- Commonly proposed factors explain income rather poorly. The results for American firms are half way between predicting income perfectly and being completely random. For European firms the factors explain only about a quarter of the variation in income, so are just one quarter of the way from random to explaining actual (reported) income.
- Labor factors do a particularly bad job, which is probably not surprising.
- The inaccuracy of these predictions implies that adoption of formula methods would create significant efficiency losses from stimulating mergers and divestments.
- Does this all mean that formula apportionment is a bad idea, or that employment factors should not be used?
- Not necessarily. But it does suggest that there are significant costs, even with optimally chosen factors.



WTO agreements and the income tax

- A revealing episode: the U.S. FSC/ETI case before the World Trade Organization.
- 18 November 1997: the EU brings a case against the United States for having a proscribed export subsidy with its system of permitting the use of Foreign Sales Corporations to shield 15% of export profits from U.S. corporate taxation.
- This was part of a broader set of trade disputes between Europe and the United States, but wound up taking on a life of its own.
- The WTO ruled against the U.S.; then in November 2000 the U.S. replaced FSCs with the Extraterritorial Income Exclusion regime (virtually the same thing), which was also disallowed, and ultimately eliminated in the 2004 bill that gave us the Homeland Investment Act.



Desai and Hines (2008) analysis.

- Desai and Hines (*Journal of International Economics*, 2008) analyze stock price reactions of U.S. exporters to the surprise announcement on 18 November 1997 that the EU would press this matter before the WTO.
- Share prices generally fell that day, but did so most markedly for U.S. firms with:
 - Taxable income (no NOL carryforwards).
 - Lots of export sales as a fraction of total sales.
 - High profit margins.
 - Low average foreign tax rates (for whom 863(b) was not an attractive alternative to using FSC/ETI).
- The \$61 b aggregate stock market loss that day roughly equals the present value of the FSC tax subsidy (\$4b/year).
- The “event study” methodology used in this paper can be applied to study other tax reform episodes, though it is necessary to identify true surprises, which do not come along all the time.



Fig. 2. Stock price returns for major and minor exporters, by tax loss status, November 18, 1997. Note: The figure depicts stock returns of American firms on November 18, 1997, the day on which the European Union filed its complaint over the U.S. FSC program. The first two bars are for firms with net operating losses in 1997; the second two bars are for firms without net operating losses. Major exporters have export to total sales ratios exceeding 11%; minor exporters have export to total sales ratios of less than 11%. The bars depict the median daily returns of firms in each group.



Estimated magnitudes.

- The estimated regression coefficients imply that a firm that exports 100% of its output would lose 2.83% of its share value that day.
- This is about 35% of the value of FSCs to such a firm (since FSCs shelter 15% of income, worth 5.25% in tax savings, or 8% of after-tax export profits).
- The 35% figure reflects in part that nobody thought that FSCs would be eliminated immediately, and there was a chance that the U.S. could get Europe to drop the complaint.
- Note that running the same regressions on Japanese share prices that day produces no results, suggesting that there is not something just odd about how the stock market treated exporters that day.
- Furthermore, the results are significantly smaller for firms with NOL carryforwards and/or lots of highly taxed foreign income that makes 863(b) an attractive alternative to using FSCs.



Implications.

- The stock market appears to believe that there were substantial tax benefits associated with FSCs that were embedded in stock prices prior to November 1997.
- These findings are not necessarily about reality; they are about what the stock market believes.
- The fact that share values responded indicates that there is something not entirely competitive about this market.
 - In a perfectly competitive market firms simply earn normal returns and the removal of an export subsidy does not change that.
 - With perfect competition removing the subsidy causes firms to exit export industries, thereby restoring a normal rate of after-tax export profit.
 - Part of the absence of perfect competition reflects that in the short run firms have assets that are fixed in certain activities.