

Formula Apportionment: Revenue Implications

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Change in Taxable Income

$$\Delta T_t = T_t - T_{t-1} = (\phi_t \pi_t + \alpha_t) - (\phi_{t-1} \pi_{t-1} + \alpha_{t-1})$$

$$\phi_t = s \frac{\text{Local Sales}}{\text{Total Sales}} + p \frac{\text{Local Payroll}}{\text{Total Payroll}} + r \frac{\text{Local Property}}{\text{Total Property}}$$

$$\alpha_t = \text{Net Allocated Locally}$$

Decomposing Changes in Taxable Income

$$\Delta T_t = T_t - T_{t-1} = (\phi_t \pi_t + \alpha_t) - (\phi_{t-1} \pi_{t-1} + \alpha_{t-1})$$

add and subtract :

$$\phi_{t-1} \pi_t, \phi_t^E \pi_t, \phi_{t-1}^E \pi_t$$

$$\Delta T_t = \left[\underbrace{(\phi_t - \phi_t^E)}_{[1]} + \underbrace{(\phi_t^E - \phi_{t-1}^E)}_{[2]} + \underbrace{(\phi_{t-1}^E - \phi_{t-1})}_{[3]} \right] \pi_t + \underbrace{\phi_{t-1}}_{[B]} (\Delta \pi_t) + \underbrace{\Delta \alpha_t}_{[C]}$$

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Technical Apportionment Effect [1] and [3]

$$\left[\underbrace{(\phi_t - \phi_t^E)}_{[1]} + \underbrace{(\phi_t^E - \phi_{t-1}^E)}_{[2]} + \underbrace{(\phi_{t-1}^E - \phi_{t-1})}_{[3]} \right] \pi_t$$

[A]

- Initial Year: [3] is zero and [1] depends on market vs. production orientation
- Subsequent Years: [1] and [3] approximately cancel out

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Technical Apportionment Effect

"Market State" if and only if :

$$\sum_i \pi_i \left[\left(\frac{\text{Local Sales}}{\text{Total Sales}} \right)_i - \frac{1}{2} \left(\frac{\text{Local Property}}{\text{Total Property}} + \frac{\text{Local Payroll}}{\text{Total Payroll}} \right)_i \right] > 0$$

- "Market State" → revenue positive
- "Production State" → revenue negative

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Estimating the Technical Apportionment Effect

- Is very easy to do
- For the last year of available data, calculate the tax liability of all multistate corporations under new regime and subtract actual tax liability for that year
- Inflate the number as appropriate to reflect likely growth in taxable income

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Location of Factors Effect [2]

$$\left[\underset{[1]}{(\phi_t - \phi_t^E)} + \underset{[2]}{(\phi_t^E - \phi_{t-1}^E)} + \underset{[3]}{(\phi_{t-1}^E - \phi_{t-1})} \right] \pi_t$$

[A]

- Arises because property and payroll are stimulated by the change and sales are discouraged by the change
- See Edmiston (2002, June, NTJ)

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Location of Factors Effect Effects on Corporate Income Tax Collections

- The net effect on corporate income tax revenues will depend on how strongly the location of additional payroll and property are encouraged and how strongly sales are discouraged
- If moving to single factor, the location of factors effect will be revenue negative with respect to the corporate income tax base

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Location of Factors Effect

Effects on Other Tax Bases

- Increases in corporate payroll should expand the individual income and sales tax bases
- Increases in corporate property should expand the property tax base and may have a moderate positive impact on individual income and sales tax bases
- Decreases in corporate sales should reduce the sales tax base

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Estimating the Location of Factors Effect

- If a previous change has been made, the elasticity of the factors can be estimated via regression of the factors on tax differentials
- See Edmiston and Arze (2002) for a suggested procedure [will be presented at the 2004 NTA Conference in Minneapolis]
- Or perhaps use the Edmiston and Arze estimates for the State of Georgia

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Edmiston and Arze (2002) Elasticity Estimates

Factor	Elasticity	Change from EWF to DWS
Sales	-0.116	-5.8%
Payroll	-0.040	+1.0%
Property	-0.035	+0.9%

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**Edmiston, 2004, STN, Table 2
Analysis of Personal Income Tax Collections (from payroll)**

Item	2004	2005	2006	2007	2008
Payroll (Benchmark)	58,026,299,561	60,706,644,368	63,386,989,176	66,067,333,983	68,747,678,791
Payroll (SFS)	59,399,732,259	63,614,402,264	67,995,310,102	70,870,519,648	73,745,729,194
Payroll Gain	1,373,432,698	2,907,757,896	4,608,320,926	4,803,185,665	4,998,050,403
Additional PIT (Low)	32,413,012	68,623,086	108,756,374	113,355,182	117,953,990
Additional PIT (High)	65,883,567	139,485,146	221,061,155	230,408,816	239,756,478

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**Edmiston, 2004, STN, Table 3
Net Revenue Effects**

Item	2004	2005	2006	2007	2008
Corporate Income Tax	(101,721,495)	(109,444,350)	(117,433,696)	(125,495,449)	(133,732,061)
Personal Income Tax (low)	32,413,012	68,623,086	108,756,374	113,355,182	117,953,990
Personal Income Tax (high)	65,883,567	139,485,146	221,061,155	230,408,816	239,756,478
Net Revenue Effect (low)	(69,308,484)	(40,821,264)	(8,677,322)	(12,140,267)	(15,778,071)
Net Revenue Effect (high)	(35,837,929)	30,040,796	103,627,459	104,913,367	106,024,417
Net Revenue Effect (likely)	(52,573,206)	(5,390,234)	47,475,069	46,386,550	45,123,173

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