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REVENUE FORECASTING METHODOLOGY

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January 12, 2004

Discussion of the forecast

After an uneven start, economic growth has returned for the United States. Personal income growth has resumed for Indiana as well, though at a slower rate than was predicted when the April 10, 2003 revenue forecast was prepared. This is expected to continue through the first quarter of 2004. The forecast for personal income growth in FY 2005 is essentially unchanged from the April 2003 forecast.

Through the first six months of FY 2004, General Fund and Property Tax Replacement Fund revenues were $153.9M or 3.0% below forecast. Sales tax collections, which accounted for over one-half of this error, were of particular concern to the Committee. After taking into account slower growth than was predicted in April 2003, revenues from the other major taxes were in line with the Committee's expectations.

Discussion of the equations used in the forecast

Sales Tax

As noted above, the sales tax forecast was of particular concern to the Committee. The Committee determined that rapidly increasing wealth during the late 1990's and the abrupt destruction of much of that wealth was having a lasting effect on its ability to forecast sales taxes. The Committee adopted an equation that uses fiscal year nominal Indiana Nonfarm Personal Income (FY_NFIPI) and a dummy variable (D1) to account for the rapid increase and destruction of wealth that occurred. The equation used is replicated as Equation (1) below.

Equation (1) Sales Tax = 164.957819 + 0.020949(FY_NFIPI) +

122.892157(D1) + Adjs.

D1 = 1 if year >1995 and < 2002

Individual Income Tax

The Committee retained the equation for individual income tax collections that it used in April 2003. This equation uses fiscal year nominal Indiana Nonfarm Personal Income (FY_NFIPI) and a DSLOPE variable to account for the effects of capital gains on individual income tax revenue during the years of 1996 through 2001. The model used by the Committee is replicated as Equation (2) below.

Equation (2) Individual Income Tax = -49.922391 + 0.022137(FY_NFIPI) + 0.002251(DSLOPE) + Adjs.

DSLOPE = (FY_NFIPI) if year is > 1995 and < 2002

Corporate Income Tax

The corporate income tax has historically been the most difficult for the Committee to forecast. However, the approach adopted by the Committee in December 2002 has yielded exceptional results. The Committee elected to retain this approach. The equation employed by the Committee is replicated as equation (3) below.

Equation (3) Corporate Adjusted Gross Income = 3,605.267949 + 0.680100(CY_RGDP) – 26,382.328143 (Rate Differential) – 2,854.729794(D1) + Utility Receipts Tax + Adj.

Where D1 = 1 if year > 2001

Cigarette & Tobacco Products Tax

The Committee adopted two equations to estimate the Cigarette Tax and Tobacco Products Tax. Cigarette Sales, measured in packs of 20, depend upon fiscal year real Indiana Nonfarm Personal Income (RFY_NFIPI), an estimate of the sum of the four surrounding states real prices (RALLPRICE), the real Indiana price (RINPRICE), a dummy variable for 1993 and years after (D93), a variable which takes the real Indiana price multiplied by D93 (PRICED93), the real cigarette excise tax rate (CIGRATE) and a trend variable equal to the fiscal year forecasted minus 1,965 (TREND). Tobacco Product sales are estimated based on fiscal year real Indiana Nonfarm Personal Income (RFY_NFIPI), a price index for tobacco products (PRICE), and the excise tax on tobacco products (TOBRATE). The sales, income, price, and tobacco product excise tax variables are expressed in natural logarithms.

Equation (4) Cigarette Sales = 1.302 + 0.673 (RFY_NFIPI) + 0.062 (RALLPRICE) – 0.749 (RINPRICE) – 1.694 (D93) + 0.331 (PRICE 93) -0.119 (CIGRATE) -0.010 (TREND)

Equation 4(a) Cigarette Tax = 0.555 (Cigarette Sales)

Equation (5) Tobacco Product Sales = -1.823 + 0.101 (RFY_NFIPI) + 1.105 (PRICE) – 0.501 (TOBRATE).

Equation (5a) Tobacco Products Tax = 0.18 (Tobacco Products Sales)

Alcoholic Beverage Taxes

The alcoholic beverage tax model includes three equations: one for beer, one for liquor, and one for wine. All three equations include fiscal year real Indiana Nonfarm Personal Income (RFY_NFIPI) and the real beverage price (BPRICE, LPRICE, WPRICE). The beer and liquor equations also include the lagged sales of the beverage in gallons (BLAGSALE, LLAGSALE) and a trend variable (TREND). For all equations, the income and price variables were adjusted by the Gross Domestic Product price deflator. The sales, income and price variables are expressed in terms of natural logarithms.

Equation (6)	Beer sales = -2.660 + 0.939(LAGSALE) + 0.327(RFY_NFIPI) – 0.135(BPRICE) - 0.009(TREND)
Equation (6a)	Beer tax = 0.115(Beer sales)
Equation (7)	Liquor sales = - 2.780 + 0.670(RFY_NFIPI) - 0.496(LPRICE) - 0.013(TREND) + 0.587(LAGSALE)
Equation (7a)	Liquor tax = 2.68(Liquor sales)
Equation (8)	Wine sales = 8.877 + 0.097(RFY_NFIPI) - 0.932(WPRICE)
Equation (8a)	Wine tax = 0.47(Wine sales)

Riverboat Wavering Tax

The Committee adopted a riverboat wagering receipts equation to estimate the riverboat wagering tax base. The tax base forecast is then used to forecast wagering tax collections. The equation uses quarterly nominal Indiana Nonfarm Personal Income (Q_NFIPI). The equation also contains dummy variables (DIL) to account for the impact of Illinois dockside gaming on wagering in Indiana; (DIN) to account for the impact of Indiana dockside gaming on wagering in Indiana; (DQ4_00) to account for unusually poor weather conditions during the 4th Quarter of 2000; and (DQ1_02) to account for facilities changes and other economic impacts on wagering during the 1st Quarter of 2002. The equation chosen is replicated as Equation (8) below.

Equation (9) $(\text{Total Wagering Receipts})^2 = -764{,}824{,}342{,}818 + (5{,}938 * Q\_NFIPI) - (20{,}726{,}050{,}297 * DIL) + (30{,}023{,}830{,}319 * DIN) - (31{,}542{,}825{,}371 * DQ4\_00) + (27{,}292{,}698{,}309 * DQ1\_02)$

Where DIL = 1 if calendar quarter = 4th Quarter 1999 or after

Where DIN = 1 if calendar quarter = 3rd Quarter 2002 or after

Where DQ4_00 = 1 if calendar quarter = 4th Quarter 2000

Where DQ1_02 = 1 if calendar quarter = 1st Quarter 2002

SPECIFIC METHODOLOGY
(Forecast January 12, 2004)

GENERAL FUND

Sales Tax:

For Each Fiscal Year to be Forecast

1. Multiply 0.020949 times fiscal year Indiana Nonfarm Personal Income.

2. Add 164.957819 to the results of Step 1.

3. Divide the results of Step 2 by 0.05 and multiply the results by 0.06 to account for the sales tax rate increase effective December 1, 2002 under HEA 1001-2002ss.

4. Subtract 21.8 in FY 2004 and 22.8 in FY 2005 from the results of Step 3 to account for reduced sales tax revenues as a result of the tax rate increase.

5. Multiply the results of Step 4 by 0.49192 to account for the percentage of sales taxes deposited in the General Fund under HEA 1001-2002ss.

Individual Income Tax:

For Each Fiscal Year to be Forecast

1. Multiply 0.022137 times fiscal year Indiana Nonfarm Personal Income.

2. Subtract 49.922391 from the results of Step 1.

3. Subtract 187.9 for FY 2004 and 192.5 for FY 2005 from the results of Step 2 to account for tax reductions signed into law in 1997 and 1999.

4. Subtract 13.4 in FY 2004 and subtract 14.9 in FY 2005 from the results of Step 3 to account for tax measures enacted in HEA 1001-2002ss.

5. Multiply the results of Step 4 by 0.86 to account for the percentage of individual income tax deposited in the General Fund under HEA 1001-2002ss.

Corporate Income Tax:

For Each Fiscal Year to be Forecast

1. Multiply 0.6801 times calendar year U.S. Real Gross Domestic Product

2. Add 3,605.267949 to the results of Step 1.

3. Multiply -2,6382.328143 times 0.051 and subtract the result from the results of Step 2 to account for the impact of a differential between corporate income taxes and individual income taxes.

4. Subtract 2,854.729794 from the results of Step 3.

5. Multiply the results of Step 4 by 0.96 to account for the impact of Net Operating Loss Deductions on corporate income taxes.

6. Multiply the results of Step 5 by the statutory corporate income tax rate of 0.085.

7. Subtract 47.9 in FY 2004 and subtract 51.5 in FY 2005 from the results of Step 6 for the impact of changes to the Research and Development Expense Credit contained in HEA 1001-2002ss.

8. Add 107.8 to the results of Step 7 to account for the revenues from the Utility Receipts Tax.

9. Add 20 to the results of Step 8 to account for General Fund revenues from the Financial Institutions Tax.

Cigarette Tax:

For each fiscal year in the forecast:

1. Multiply 0.673 by the logarithm of fiscal year real nonfarm Indiana personal income.

2. Add 1.302 to the result of step one.

3. Multiply 0.062 by the logarithm of the sum of the real cigarette prices in the four surrounding states.

4. Add the result of step 3 to the result of step 2.

5. Multiply -0.749 by the logarithm of the real cigarette price in Indiana.

6. Add the result of step 5 to the result of step 4.

7. Subtract -1.694 from the results of step 6 for years after 1993.

8. Multiply 0.331 by the logarithm of real Indiana prices for years after 1993.

9. Add the result of step 8 to the result of step 9.

10. Multiply -0.119 by the logarithm of the real cigarette tax excise tax rate.

11. Add the result of step 10 to the result of step 9.
12. Subtract 1965 from the fiscal year forecasted.
13. Multiply the result of step 11 by -0.010.
14. Add the result of step 12 to the result of step 11.
15. Take the exponential of step 13, to get sales.
16. Multiply the result of step 14 by 0.555 to get total revenue.
17. Multiply the result of step 15 by 0.8397 to get general fund revenue.

Tobacco Products Tax:

For Each Fiscal Year to be Forecast

1. Multiply 0.101 by the logarithm of fiscal year real nonfarm Indiana personal income.
2. Subtract -1.823 from the result of step 1.
3. Multiply 1.105 by the logarithm of the of the real tobacco product price.
4. Add the result of step 3 to the result of step 2.
5. Multiply 100 by the tobacco products excise tax rate.
6. Multiply -0.501 by the logarithm of the result of step 5.
7. Add the result of step 6 to the result of step 4.
8. Take the exponential of step 7, to get sales.
9. Multiply the result of step 8 by 0.8397 to get general fund revenue.

Alcoholic Beverage Tax - Beer:

For Each Fiscal Year to be Forecast

1. Multiply 0.327 by the logarithm of fiscal year real non-farm Indiana personal income.
2. Subtract 2.660 from the result of step 1.
3. Multiply -0.135 by the logarithm of the real beer price.
4. Add the result of step 3 to the result of step 2.

5. Multiply -0.009 by a trend term.

6. Add the result of step 5 to the result of step 4.

7. Multiply 0.939 by the logarithm of beer sales, lagged one year.

8. Add the result of step 7 to the result of step 6.

9. Take the exponential of the result of step 8 to get sales.

10. Multiply the result of step 9 by 0.115, to get total revenue; multiply the result of step 9 by .04 to get general fund revenue.

Alcoholic Beverage Tax - Liquor:

For Each Fiscal Year to be Forecast

1. Multiply 0.670 by the logarithm of fiscal year real non-farm Indiana personal income.

2. Subtract 2.780 to the result of step 1.

3. Multiply -0.496 by the logarithm of the real liquor price.

4. Add the result of step 3 to the result of step 2.

5. Multiply -0.013 by a trend term.

6. Add the result of step 5 to the result of step 4.

7. Multiply 0.587 by the logarithm of liquor sales, lagged one year.

8. Add the result of step 7 to the result of step 6.

9. Take the exponential of the result of step 8 to get sales.

10. Multiply the result of step 9 by 2.68, to get total revenue; multiply the result of step 9 by 1.00 to get general fund revenue.

Alcoholic Beverage Tax - Wine:

For Each Fiscal Year to be Forecast

1. Multiply 0.097 by the logarithm of fiscal year real non-farm Indiana personal income.

2. Add 8.877 to the result of step 1.

3. Multiply -0.932 by the logarithm of the real wine price.

4. Add the result of step 3 to the result of step 2.

5. Take the exponential of the result of step 4 to get sales.

6. Multiply the result of step 5 by 0.47, to get total revenue; multiply the result of step 5 by 0.20 to get general fund revenue.

PROPERTY TAX REPLACEMENT FUND

Sales Tax:

For Each Fiscal Year to be Forecast

1. Multiply the results of Step 4 of the General Fund Sales Tax calculation by 0.5 to account for the percentage of sales tax deposited in the Property Tax Replacement Fund under HEA 1001-2002ss.

Individual Income Tax:

For Each Fiscal Year to be Forecast

1. Multiply the results of Step 4 of the General Fund Individual Income Tax calculation by 0.14 to account for the percentage of sales tax deposited in the Property Tax Replacement Fund under HEA 1001-2002ss.

Riverboat Wagering Tax:

For Each Fiscal Year to be Forecast

1. Multiply 5,938 by quarterly nominal Indiana Nonfarm Personal Income in thousands.

2. Subtract 764,824,342,818 from the result of Step One.

3. Subtract 20,726,050,297 from the result in Step Two for the 4th Quarter of 1999 and each calendar quarter thereafter.

4. Add 30,023,830,319 to the result in Step Three for the 3rd Quarter of 2002 and each calendar quarter thereafter.

5. Take the square root of the result in Step 4 to obtain quarterly total wagering receipts.

6. Sum the quarterly totals from Step 5 for the fiscal year to obtain fiscal year total wagering receipts.

7. Distribute fiscal year total wagering receipts from Step 6 among the ten riverboats based on FY 2002 actual distribution of wagering receipts.

8. Use the fiscal year wagering receipts distributed to each riverboat from Step 7 to compute the fiscal year wagering tax for each riverboat.

9. Sum the fiscal year wagering tax totals for each riverboat from Step 8 to obtain fiscal year total wagering tax collections.

10. Subtract 2.1 each year to account for reimbursement to the Indiana Gaming Commission for administrative expenses; 33.0 each year to account for local revenue sharing; and 95.0 each year to account for wagering tax distributions to riverboat communities.

11. Add 71.3 in FY 2004 to adjust for revenue distribution timing changes and collection of unpaid wagering taxes from FY 2003.

12. Add 16.3 in FY 2005 to adjust for collection of unpaid wagering taxes from FY 2003.