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REVENUE FORECASTING METHODOLOGY

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Discussion of the forecast
Through February 2003, General Fund and Property Tax Replacement Fund revenues were $31.6M or 0.5% above the December 2002 forecast. However, as the threat of war in Iraq gained momentum and the U.S. economic recovery slowed, sales tax revenues began to show significant signs of weakness. Against this backdrop the Committee began its deliberations.

Discussion of the equations used in the forecast
The Committee retained the sales tax equation it adopted in December 2002 with one modification. This equation uses quarterly nominal Indiana Nonfarm Personal Income (FY_NFIPI) and the percent change in quarterly real U.S. Gross Domestic Product (% Change FY_RGDP) from the same quarter in the prior year. HEA 1001-2002ss increased the sales tax rate effective December 1, 2002. The Committee estimated the impact this effective price increase will have on consumer spending and reduced the results of Equation (1) accordingly. Additionally, because the rate increase will only be in effect for one-half of FY 2003, sales tax revenues for that year must be forecasted in a two-step process. This process is detailed in the Specific Methodology section of the document. The equation used is replicated as Equation (1) below.

Equation (1)   Sales Tax = 25.386331 + 0.005399(QTRLY_NFIPI) + 259.717261(% Change in RGDP from the same quarter prior year) + Adjs.

The Committee retained the equation for individual income tax collections that it adopted in December 2002. 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 1995 through 2001. The model used by the Committee is replicated as Equation (2) below.

Equation (2)   Individual Income Tax = -49.434006 + 0.022134(FY_NFIPI) + 0.002180(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 yielded exceptional results through February 2003. 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 = 3,472.74621 + 0.74165(CY_RGDP) – 2,633.774(Rate Differential) – 2,321.503(D1) + Utility Receipts Tax + Adj.

Where D1 = 1 if year > 2001

The Committee adopted two equations to estimate Cigarette Tax and Tobacco Products Tax revenue. 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 cigarette price (RINPRICE), a dummy variable for 1993 and years after (D93) and a variable which takes the real Indiana price multiplied by D93 (PRICED93). Tobacco Product sales are estimated based on fiscal year real Indiana Nonfarm Personal Income (RFY_NFIPI) and a price index for tobacco products (PRICE). The sales, income, and price variables are expressed in natural logarithms.

Equation (4)   Cigarette Sales = 4.473 + 0.446(RFY_NFIPI) + 0.090(RALLPRICE) - 0.974(RINPRICE) – 1.912(D93) + 0.372(PRICED93)

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

Equation (5)   Tobacco Product Sales = -5.414 + 0.338(RFY_NFIPI) + 1.003(PRICE)

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

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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 (5)   Beer sales = -2.660 + 0.939(LAGSALE) + 0.327(RFY_NFIP) – 0.135(BPRICE) - 0.009(TREND)

Equation (5a)   Beer tax = 0.115(Beer sales)

Equation (6)   Liquor sales = - 2.780 + 0.670(RFY_NFIP) - 0.496(LPRICE) - 0.013(TREND) + 0.587(LAGSALE)

Equation (6a)   Liquor tax = 2.68(Liquor sales)

Equation (7)   Wine sales = 8.877 + 0.097(RFY_NFIP) - 0.932(WPRICE)

Equation (7a)   Wine tax = 0.47(Wine sales)

The Committee adopted a riverboat wagering receipts equation to estimate the riverboat wagering tax base. The tax base estimate is then used to compute estimated wagering tax collections. The equation uses the natural log of 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; (DQ4_00) to account for unexplained changes in wagering during the 4th Quarter of 2000; and (DQ1_02) to account for unexplained changes in wagering during the 1st Quarter of 2002. The equation chosen is replicated as Equation (8) below.

Equation (8) $(\text{Total Wagering Receipts})^2$ = -1.629E+13 + (8.719E+11 * Ln(Q_NFIPI)) – (1.903E+10 * DIL) – (3.523E+10 * DQ4_00) + (3.133E+10 * DQ1_02)

Where DIL = 1 if calendar quarter = 4th Quarter 1999 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 of April 10, 2003)

<u>GENERAL FUND</u>

Sales Tax:
FY 2004 = CY 2003:Q3 – CY 2004:Q2
FY 2005 = CY 2004:Q3 – CY 2005:Q2

1. For FY 2003, multiply 0.005399 times 2003:Q2 Indiana Nonfarm Personal Income.

2. Add 25.386331 to the results of Step One.

3. Multiply 259.717261 by the percent change in real Gross Domestic Product from 2002:Q2 to 2003:Q2.

4. Add the results of Step 3 to the results of Step 2.

5. Divide the results of Step 4 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.

6. Subtract 5.2 from the results of Step 5 to account for reduced sales tax revenues as a result of the tax rate increase.

7. Multiply the results of Step 6 by 0.49192 to account for the new percentage of sales taxes deposited in the General Fund under HEA 1001-2002ss.

8. Add 1709.55 to the results of Step 7 to account for sales tax collections deposited in the General Fund through March.

9. For FY 2004 and FY 2005, multiply 0.005399 times Indiana Nonfarm Personal Income for each fiscal year quarter.

10. Add 25.386331 to each fiscal year quarter in Step 9 for the respective fiscal year.

11. Multiply 259.717261 by the percent change in real Gross Domestic Product from the same quarter prior year for each fiscal year quarter.

12. Add the FY 2004 and FY 2005 quarterly results in Step 11 to the corresponding FY 2004 and FY 2005 quarterly results in Step 10.

13. Add the quarterly results in Step 12 for FY 2004 and FY 2005.

14. Divide the results of Step 13 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.

15. Subtract 21.8 in FY 2004, and 22.8 in FY 2005 from the result of Step 14 to account for reduced sales tax revenues as a result of the tax rate increase.

16. Multiply the results of Step 14 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 0.022134 by fiscal year Indiana Nonfarm Personal Income.

2. Subtract 49.434006 from the result of Step One.

3. Subtract 183.3 for FY 2003, 187.9 for FY 2004, and 192.5 to account for tax reductions signed into law in 1997 and 1999.

4. Add 10.2 in FY 2003, subtract 13.4 in FY 2004, and subtract 14.9 in FY 2005 to account for tax measures enacted in HEA 1001-2002ss.

5. For FY 2003, multiply the results of Step 4 by 0.9206 to account for the percentage of individual income tax deposited in the General Fund under HEA 1001-2002ss.

6. For FY 2004 and FY 2005, 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 0.741649 times calendar year real Gross Domestic Product.

2. Add 3,472.7462 to the results of step 1.

3. Subtract 2,436.4790 from the result of Step 2 to account for the impact of a differential between corporate income taxes and individual income taxes.

4. Subtract 2,321.503 from the results of Step 3.

5. For FY 2004 and FY 2005, 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 0.085.

7. Subtract 47.9 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. For FY 2003, divide the results of Step 8 by 2 and add 257.4 to account for corporate income tax collections through December.

10. For FY 2003, multiply the results of Step 9 by 0.9114 to account for the percentage of corporate income taxes deposited in the General Fund.

11. Add 20 for General Fund revenues from the Financial Institutions Tax.

Cigarette Tax:

For each fiscal year in the forecast:

1. Multiply 0.446 by the logarithm of fiscal year real non-farm Indiana personal income.

2. Add 4.473 to the result of step one.

3. Multiply 0.090 by the logarithm of the sum of real cigarette prices in the four surrounding states.

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

5. Multiply -0.974 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 1.912 from the results of step 6 for years after 1993.

8. Multiply 0.372 by the logarithm of the real Indiana price for years after 1993.

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

10. Take the exponential of step 8, to get sales.

11. Multiply the result of step 9 by 0.555 to get total revenue.

12. Multiply the result of step 10 by 0.8397 to get general fund revenue.

Tobacco Products Tax:

For each fiscal year in the forecast:

1. Multiply 0.338 by the logarithm of fiscal year real non-farm Indiana personal income.

2. Subtract 5.414 from the result of step one.

3. Multiply 1.003 by the logarithm of the real tobacco product price.

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

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

6. Multiply the result of step 5 by 0.18 to get total revenue.

7. Multiply the result of step 6 by 0.8397 to get general fund revenue.

Alcoholic Beverage Tax - Beer:

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:

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:

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. For FY 2003, multiply the results of Step 6 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.

2. Add 1326.49 to the results of Step 1 to account for sales tax collections deposited in the Property Tax Replacement Fund through March.

3. For FY 2004 and FY 2005, multiply the results of Step 15 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. For FY 2003, multiply the results of Step 4 of the General Fund Individual Income Tax calculation by 0.0794 to account for the percentage of income tax deposited in the Property Tax Replacement Fund under HEA 1001-2002ss.

2. For FY 2004 and 2005, multiply the results of Step 4 of the General Fund Individual Income Tax equation by 0.14 to account for the percentage of income tax deposited in the Property Tax Replacement Fund under HEA 1001-2002ss.

Corporate Adjusted Gross Income:

1. For FY 2003, multiply the results of Step 9 by 0.0886 to account for the percentage of corporate income taxes deposited in the Property Tax Replacement Fund under HEA 1001-2002ss.

Riverboat Wagering Tax:

For each fiscal year to be forecast:

1. Multiply 8.719E+11 by the natural log of quarterly nominal Indiana Nonfarm Personal Income.

2. Subtract 1.629E+13 from the result of Step One.

3. Subtract 1.903E+10 from the result of Step Two for the 4th Quarter of 1999 and each calendar quarter thereafter.

4. Take the square root of the result of Step 3 to get quarterly total wagering receipts.

5. Sum the quarterly totals from Step 4 for the fiscal year to get annual total wagering receipts.

6. Distribute annual total wagering receipts from Step 5 between the ten riverboats based on the FY 2002 actual distribution.

7. Adjust each riverboat total from Step 6 to account for dockside gaming based on September-November, 2002 performance.

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

9. Sum the annual wagering tax totals for each riverboat from Step 8 to get annual total wagering tax collections.

10. Subtract 35.0 from FY 2003 to account for reductions due to implementation.

11. Subtract 1.9 each year to account for reimbursement to the Indiana Gaming Commission for administrative expenses; 33.0 each year to account for the set aside for local revenue sharing; and 95.0 each year to account for wagering tax distributions to riverboat communities.

12. Subtract 34.9 from FY 2003 to account for the 1-month lag in wagering tax distributions.