

# INTEREST EARNINGS INTRODUCTION

## Revenue Description

The state earns interest on several trust funds and on invested cash balances. Interest on the Coal Severance Tax Permanent Fund and most interest on cash balances is deposited in the general fund. Interest on other trust funds and some invested cash is earmarked and deposited in special revenue accounts.

The Board of Investments manages the trust funds and agency cash balances. Most trust fund and agency balances are held as shares in one of two mutual funds that the Board of Investments manages, the Trust Fund Bond Pool (TFBP) and the Short Term Investment Pool (STIP). The individual trust funds hold most of their assets in the form of TFBP shares. The TFBP holds a portfolio consisting primarily of long-term bonds and is managed to provide consistent interest earnings. Most agency funds and a small part of trust fund balances are held in STIP shares. The STIP holds a portfolio of short-term bonds and is managed to allow daily deposits and withdrawals while still paying interest.

## Historical and Projected Yields

Table 1 shows actual annual percentage yields of the Trust Fund Bond Pool and Short Term Investment Pool for FY 1997 through FY 2004 and projections for FY 2005 through FY 2007. The TFBP yield is forecast to increase in FY 2005, and then decrease in FY 2006. The STIP yield is forecast to increase in FY 2005, FY 2006 and FY 2007, driven by projected increases in the general rate of interest.

<b>Table 1</b>		
<b>TBFP and STIP Yields</b>		
Fiscal Year	Trust Fund Bond Pool	Short Term Investment Pool
A 1998	7.63%	5.89%
A 1999	7.51%	5.43%
A 2000	7.06%	5.95%
A 2001	7.04%	6.64%
A 2002	6.97%	2.84%
A 2003	6.84%	1.54%
A 2004	7.05%	1.10%
<b>F 2005</b>	<b>7.16%</b>	<b>2.12%</b>
<b>F 2006</b>	<b>6.23%</b>	<b>3.28%</b>
<b>F 2007</b>	<b>6.21%</b>	<b>3.68%</b>

## Short Term Investment Pool

The Short Term Investment Pool holds a portfolio of short-term corporate and government bonds. A statistical analysis was performed comparing STIP yields to interest rates on combinations of a few corporate and government bonds. The best

statistical fit was found to be a model which predicts the STIP yield to be 98.6% of a weighted average of the rate on three-month commercial paper, the rate on two-year treasury notes, and the previous year's two-year treasury note rate. The weights are 31.3% on commercial paper; 39.0% on treasury notes; and 29.7% on the previous year's treasury notes.

Table 2 shows actual interest rates on three-month commercial paper and two-year treasury notes, and the STIP yield for FY 2001 through FY 2004 and forecasts for FY 2005 through FY 2007.

<b>Table 2</b>				
<b>Short Term Investment Pool Yield</b>				
<u>Fiscal Year</u>	<u>Three-Month Commercial Paper</u>	<u>Current Two-Year Treasury Notes</u>	<u>Last Year's Two-Year Treasury Notes</u>	<u>Short Term Investment Pool</u>
A 2001	5.52%	5.18%	6.17%	6.64%
A 2002	2.21%	3.24%	5.18%	2.84%
A 2003	1.39%	1.80%	3.24%	1.54%
A 2004	1.04%	1.92%	1.80%	1.10%
<b>F 2005</b>	<b>2.26%</b>	<b>2.90%</b>	<b>1.92%</b>	<b>2.12%</b>
<b>F 2006</b>	<b>3.46%</b>	<b>3.99%</b>	<b>2.90%</b>	<b>3.28%</b>
<b>F 2007</b>	<b>3.59%</b>	<b>4.04%</b>	<b>3.99%</b>	<b>3.68%</b>

Rates on three-month commercial paper and two-year treasury notes fell in FY 2002 and FY

2003. The rate on commercial paper fell in FY 2004 but the rate on two-year treasuries rose 0.12 percentage points. Both rates are projected to rise substantially in FY 2005. The STIP yield decreased steadily through FY 2004 but is projected to increase about 2.5 percentage points from FY 2004 through FY 2007.

### **Trust Fund Bond Pool**

The Trust Fund Bond Pool holds a portfolio of long-term government and corporate bonds. Income the trust funds receive comes from several sources. The most important of these sources is interest paid on the bonds. This interest accumulates monthly according to the coupon rate printed on the bond. Interest income is fairly consistent from month to month, but it does vary with the average coupon rate of the pool. The average coupon rate of the pool varies due to replacement of older issues in the pool with newer issues. Interest income generally accounts for 70% to 95% of the income received by the bond pool.

The accretion of discount prices and amortization of premium prices is another important source of investment income. A bond is issued with a par value, a maturity date and a coupon rate that is a percentage of the par value. The par value is the price for which the bond may be redeemed at maturity. The coupon rate is the percentage of par that will be distributed annually as interest payments. For instance, a bond may be issued with a par value of \$10,000, a maturity of 20 years and a coupon of 5%. This bond will provide interest income of \$500 annually until its redemption for \$10,000 in 20 years. The holder may sell the bond at any time between the date of issue and the date of redemption. The bond may sell at a premium or at a discount. Selling at a premium means the bond sells for more than

the \$10,000 par value. For a bond to sell at a premium means the promise of \$10,000 at redemption plus the promise of annual interest payments of \$500 until redemption is worth more to the buyer than \$10,000 in hand. If the bond is purchased at a premium (discount) the price must be amortized (accrued) until the expected date of maturity, sale or call. This means the difference between the purchase price and the par price is divided by the number of years until expected disposal to accrue the expected difference annually. This accrual is counted as income. Net accretion is the sum of accruals over all issues in the pool. Net accretion accounted for 7.3% of investment income in FY 2004, increasing from 0.12% in FY 1998.

Capital gains (losses) realized when bonds are sold from the pool are another component of investment income. A capital gain is the difference between the book price and the sale price of the bond. The book price of the bond is the purchase price adjusted for net accretion since the time of purchase. The sale price reflects current market perceptions of the risk of default and the attraction of the coupon. As the coupon rate of new issues decreases, the coupons of bonds currently held in the portfolio appear more attractive, so the market price of these older bonds rises. As the coupon rate of new issues increases, the interest rate on bonds currently held appears less attractive and their price falls. Thus capital gains income tends to move inversely with the average coupon rate of new issues of similar risk. Capital gains income was 14% of investment income in FY 2004, though generally capital gains contribute a much smaller proportion of bond pool income. In FY 2001 this contribution was negative.

Bonds are rated according to their risk of default. Bonds default when the issuer fails to pay coupon obligations or fails to redeem the notes at maturity. "BAA" is a rating attached to some bonds to identify them as investment grade bonds of moderate risk. Securities purchased by the Board of Investments for the trust fund bond pool are of this quality or better, so forecasts of average BAA coupon rates were used to forecast interest and capital gains income.

Securities lending income is a minor source of bond pool investment income. Securities held in the bond pool are occasionally loaned to broker/dealers and other entities to provide security for transactions. Fees are charged for the use of the securities and collateral is collected to protect the pool from the associated investment risk. This collateral may be cash, government securities or irrevocable bank letters of credit. Cash collateral is invested in a collective investment pool, the Securities Lending Quality Trust. Income from investment in this pool combined with the lending fees obtained from the borrowers of the securities make up lending income. This income has contributed less than 0.5% of bond pool investment income in every year since FY 1998.

Bond pool investment income is the sum of interest accruals, net accretion, net capital gains and miscellaneous income after deducting administrative expenses. Miscellaneous income is generally very small and unpredictable, so it was assumed

to be zero in FY 2005 through FY 2007. Administrative expenses tend to be constant within a fiscal year. Since the first two months of FY 2005 showed administrative expenses of \$18,177.00 per month, expenses in the remaining months were forecast at that level. Administrative expenses in FY 2006 and FY 2007 were forecast to be \$18,356.50 per month, the average of FY 2002 through FY 2005.

Net accretion grew steadily from FY 1998 through FY 2002, and then jumped up almost \$3 million to \$6.83 million for FY 2003. Net accretion then declined slightly to \$6.40 million for FY 2004. Net accretion for July and August of FY 2005 are known at this time. The remaining months in FY 2005 and all months in FY 2006 and FY 2007 were forecast at the monthly average for FY 2003 and FY 2004. This forecast net accretion of \$6.55 million for FY 2005 and \$6.62 million for FY 2006 and FY 2007.

Interest income was forecast with an autoregressive model using one lag on interest and the average new issue BAA rated bond coupon rate as predictive variables. This means the value of interest income in January 2005 was assumed to be a function of the value of interest income in December 2004 and the value of the BAA bond rate in January 2005. Since the future values of the BAA bond rate were unknown, a commercial forecast of these values was used instead. Lending income was also forecast using an autoregressive model, but in this case the BAA bond rate was not used as a predictive variable. The sole predictor of lending income was the value of lending income in the previous month. Net capital gains income was forecast with a simple model using the BAA bond rate as the sole predictor. No lags on net gains were included in the model.

Table 3 shows the components of investment income, total investment income, and the BAA bond rate for FY 1998 through FY 2007.

<b>Table 3</b> <b>Components of Income</b> <b>(\$ millions)</b>								
Fiscal Year	Admin Expense	Interest Income	Other Income	Net Accretion Income	Security Lending Income	Net Capital Gains	Total Investment Income	BAA Bond Rate
A 1998	-0.137	71.848	0.005	0.094	0.203	3.671	75.684	7.43%
A 1999	-0.149	72.450	0.014	0.111	0.331	4.559	77.315	7.38%
A 2000	-0.197	78.891	0.001	1.898	0.304	0.697	81.594	8.32%
A 2001	-0.186	82.175	0.000	3.616	0.193	-1.747	84.050	8.11%
A 2002	-0.234	79.317	0.001	3.888	0.392	0.145	83.508	7.96%
A 2003	-0.225	73.217	0.240	6.835	0.138	1.115	81.320	7.21%
A 2004	-0.204	68.053	0.063	6.403	0.159	12.315	86.789	6.60%
<b>F 2005</b>	<b>-0.218</b>	<b>67.891</b>	<b>0.000</b>	<b>6.550</b>	<b>0.205</b>	<b>18.583</b>	<b>93.011</b>	<b>6.74%</b>
<b>F 2006</b>	<b>-0.220</b>	<b>70.939</b>	<b>0.000</b>	<b>6.619</b>	<b>0.240</b>	<b>6.126</b>	<b>83.703</b>	<b>7.33%</b>
<b>F 2007</b>	<b>-0.220</b>	<b>71.437</b>	<b>0.000</b>	<b>6.619</b>	<b>0.241</b>	<b>7.947</b>	<b>86.024</b>	<b>7.12%</b>

The \$18.58 million of realized capital gains income forecast in FY 2005 includes \$3.52 million observed in July and \$6.04 million observed in August. These were the second and third highest monthly gains observed since FY 1998.

The rate of return on the Trust Funds Bond Pool is given by the ratio of income per share and the par value of one share. Income per share is given by the ratio of annual investment income and the number of shares outstanding. Par value of one share is \$100. The number of shares outstanding was modeled using a time trend and one lag on shares as predictor variables.

Table 4 shows investment income, shares outstanding and rate of return for FY 1998 through FY 2007.

Investment income and the rate of return are forecast to:

- increase in FY 2005 due primarily to the high gains observed in July and August of 2004; and
- decrease in FY 2006 and FY 2007 from the FY 2005 level.

<b>Table 4</b>				
<b>Income, Shares Outstanding and Rate of Return</b>				
Fiscal Year	Investment Income (\$ millions)	Shares Outstanding (millions)	Income Per Share (\$ dollars)	Rate of Return; Par = 100
A 1998	\$75.684	9.917	\$7.631	7.63%
A 1999	\$77.315	10.296	\$7.509	7.51%
A 2000	\$81.594	11.552	\$7.063	7.06%
A 2001	\$84.050	11.936	\$7.042	7.04%
A 2002	\$83.508	11.985	\$6.968	6.97%
A 2003	\$81.320	11.890	\$6.840	6.84%
A 2004	\$86.789	12.314	\$7.048	7.05%
<b>F 2005</b>	<b>\$93.011</b>	<b>12.991</b>	<b>\$7.160</b>	<b>7.16%</b>
<b>F 2006</b>	<b>\$83.703</b>	<b>13.430</b>	<b>\$6.233</b>	<b>6.23%</b>
<b>F 2007</b>	<b>\$86.024</b>	<b>13.857</b>	<b>\$6.208</b>	<b>6.21%</b>