Computing Taxable Income for Property-Casualty Insurance Companies

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CAS Study Note

CAS EXAM STUDY NOTE:
COMPUTING TAXABLE INCOME FOR PROPERTY-CASUALTY INSURANCE COMPANIES

INTRODUCTION

Knowledge of federal income taxes is essential for policy pricing, company valuation, and financial modeling, and actuaries frequently aid tax accountants in preparing the federal tax returns. In the past, some actuaries used rules of thumb to avoid dealing explicitly with taxes, such as grossing up the underwriting profit margin by 1/(1 – 35%) and using after-tax investment yields. These short-cuts ignore significant tax effects and may lead to pricing inaccuracies and valuation errors.

For most industries, taxable income is based on the general (GAAP) financial statements, with adjustments for differences between general and taxable income. For insurers, taxable income is based on statutory income with similar adjustments, as covered here.[1]

This study note has two parts. One part covers regular and alternative minimum taxable income, with sections on tax exempt income, proration, dividends received deduction, revenue offset, and the minimum tax credit. The other part covers loss reserve discounting.

Only the basic text of this reading is on the syllabus. The end-notes and appendices have additional information for actuaries using this study note in their company work. The student workbook has practice problems to aid candidates preparing for the exam.[2]

PRORATION

For most taxpayers, municipal bond interest income is exempt from federal income taxes.[3] Insurers do not receive the full exemption: the proration provision of the 1986 Tax Reform Act adds 15% of tax-exempt income to their regular taxable income. The effective tax rate on tax exempt income is 15% × 35% = 5.25%.

We compare investment yields two ways. Given the pre-tax yield, we compare after-tax yields, or given the after-tax yield, we compare the *pre-tax equivalent yield (PTEY)*.

- For non-insurers, the PTEY is the yield / (1 – 35%) = yield × 153.85%.
- For insurers, the PTEY is the yield × (1 – 5.25%)/(1 – 35%) = yield × 145.77%.

Illustration: A 5% municipal bond yield is a 7.29% pre-tax equivalent yield for insurers and a 7.69% pre-tax equivalent yield for non-insurers.

COMMON STOCK DIVIDENDS

Dividends are paid from after-tax earnings and are taxed again (double taxation) when received by investors. Stockholder dividends received by corporate taxpayers are partially

exempt from federal income tax, to avoid triple taxation of a single income flow.[4]

Illustration: Firm B owns 1% of firm A. Firm A earns $10 million, which it pays to its shareholders, including $100,000 to firm B, which remits the money to its shareholders, who pay a 15% tax rate on stockholder dividends. Firm A pays federal income taxes of 35% × $10 million = $3.5 million; the remaining $6.5 million is paid to its owners, of which firm B receives $65,000. Were there no dividends received deduction (DRD), firm B would pay taxes of 35% × $65,000 = $22,750. The remaining $42,250 is paid to owners of firm B, who pay personal income taxes of 15% × $42,250 = $6,338. The net income is $42,250 – $6,338 = $35,913, and the effective tax rate is 1 – $35,913/$100,000 = 64.09%.[5]

High marginal tax rates degrade economic efficiency. To offset triple taxation of corporate earnings, the DRD partially exempts common stock dividends from corporate taxes. The DRD depends on the relation between the dividend paying firm and the taxpayer.

- *Unaffiliated:* If the taxpayer owns less than 20% of the dividend paying firm (by shares and voting power), 70% of dividends received are exempt from federal income taxes.
- *Affiliated:* If the taxpayer owns at least 20% of the dividend paying firm but less than 80%, 80% of the dividends received are exempt from federal income taxes.
- *Controlled:* If the taxpayer owns at least 80% of the dividend paying firm, 100% of the dividends received are exempt from federal income taxes.

For insurers, the proration provision of the tax code adds 15% of the tax exempt dividends from unaffiliated and affiliated entities (but not from controlled entities) to taxable income.[6] The effective tax rate on dividends from unaffiliated entities is 30% × 35% = 10.50% for non-insurers and (30% × 35%) + (70% × 15% × 35%) = 14.175% for insurers.[7]

Dividend Paying Company	*Percentage Ownership*	*Tax Exemption*
controlled	≥ 80%	100% tax exempt
affiliated	20% – 80%	80% tax exempt + proration
unaffiliated	< 20%	70% tax exempt + proration

Revenue Offset

For most industries, sales are revenue for GAAP and taxable income. For short-duration (property-casualty) insurance contracts, earned premium is revenue for GAAP, statutory, and taxable income. Expenses are a deduction from income. The expense portion of the unearned premium reserve (UEPR) differs by accounting system.

- GAAP has a deferred policy acquisition cost (DPAC), so the actual expenses incurred are deducted from the net reserve (UEPR – DPAC).
- Statutory accounting has no DPAC, so expenses are subtracted from income and also

coded as liability in the UEPR.
- The revenue offset provision is the tax version of the GAAP DPAC.[8] Instead of actual expenses, tax accounting uses 20% of premium for all lines and insurers.

Statutory earned premium (EP) is written premium (WP) minus the change in the unearned premium reserve (UEPR). Tax basis EP is WP minus 80% of the change in the UEPR.[9] Algebraically, WP – 80% × ΔUEPR = WP – 100% × ΔUEPR + 20% × ΔUEPR = statutory EP plus 20% of the change in the UEPR.[10] A change in WP with no change in EP affects taxable income but not statutory income.[11]

An incurred accounting entry is the paid entry plus or minus the change in the reserve.[12]

- The incurred entry is the paid amount *minus* the change in the reserve if the incurred amount is a revenue and the paid amount is a cash inflow; EP is a revenue and premium collected is a cash inflow.
- The incurred entry is the paid amount *plus* the change in the reserve if the incurred amount is an expense and the paid amount is a cash outflow: incurred losses are an expense and paid losses are a cash outflow.[13]

Statutory accounting double counts the deduction for pre-paid acquisition costs, once as an expense item and a second time in the UEPR.

Illustration: A policy for a premium of $1,000 is written on 12/31/20X4, and pays $200 of commission on that day. Statutory income for 20X4 is WP – ΔUEPR – expenses = $1,000 – ($1,000 – $0) – $200 = –$200. Before 1986 (i.e., before revenue offset), insurers incurred a tax liability of 46% × –$200 = 46% × –$200 = a $92 tax refund.[14]

The insurer has not actually lost money. The accounting loss stems from the peculiarities of statutory accounting. GAAP adds the change in the DPAC to the underwriting income: *$1000 – ($1000 – $0) + ($200 – $0) – $200 = $0.*

Illustration: Suppose that WP is $10 million, and the UEPR is $3.0 million at the beginning of the year and $3.5 million at the end of the year. The statutory EP = $10 million – ($3.5 million – $3.0 million) = $9.5 million. The tax basis earned premium is computed as (i) WP – 80% × ΔUEPR or (ii) the statutory EP + 20% × ΔUEPR.

- *Direct method* (i): $ 10 million – 80% × ($3.5 million – $3.0 million) = $9.6 million.
- *Indirect method* (ii): $9.5 million + 20% × ($3.5 million – $3.0 million) = $9.6 million.[15]

Determining Tax Liabilities

We determine taxable income from statutory underwriting income and investment income.

- Underwriting income is premium revenue minus losses and expenses.
  - Tax basis earned premium is statutory earned premium adjusted for revenue offset.[16]

    - Tax basis incurred losses are statutory incurred losses adjusted for loss reserve discounting, adjusted for tabular discounts and anticipated salvage and subrogation.
    - Tax basis expenses and other income are similar to statutory expenses and income
- Investment income
    - Taxable investment income includes bonds, mortgages, real estate, venture capital, and realized capital gains.
    - Tax exempt municipal bond income is adjusted for proration.
    - Stockholder dividends are adjusted for dividends received deduction and proration.

We determine taxable income from accounting entries or by adjusting statutory income.

- *Revenue offset:* Statutory premium revenue is written premium minus the change in the unearned premium reserve. Tax basis premium revenue is either (a) written premium minus 80% of the change in the unearned premium reserve or (b) statutory premium revenue plus 20% of the change in the unearned premium reserve.
- *Incurred losses:* Statutory incurred loss is paid loss plus the change in loss reserves. Tax basis incurred loss is either (a) paid losses plus the change in the discounted reserves or (b) statutory incurred loss minus the change in the reserve discount.
- *Tax exempt bond income:* for insurance companies, either (a) 15% of municipal bond income or (b) statutory income minus 85% of municipal bond income.
- *Common stock dividends:* for insurance companies, either (a) 40.5% of unaffiliated common stock dividends or (b) statutory income minus 59.5% of these dividends.[17]

Expenses, other income, and taxable investment income are the same for statutory and taxable income, with minor differences.

We derive taxable income from accounting entries or by adjustment to statutory income. It is simpler to start with statutory income and add or subtract adjustments; this is the method in the Internal Revenue Code (the *indirect approach*).[18] We show a *direct approach* as well because it clarifies what enters taxable income and what does not.[19]

The regular tax liability is 35% of the regular taxable income minus the existing minimum tax credit. The alternative minimum tax liability is 20% of adjusted current earnings, which are taxable income + 75% of the income that escapes regular taxation.

If the regular tax liability (RTL) exceeds the alternative minimum tax liability (AMTL), it is the final tax liability. Otherwise, the AMTL is the final tax liability and the excess of the AMTL over the RTL is the new minimum tax credit.

There are two ways to work out taxable income: the direct method and the indirect method.

- The *direct method* uses accounting entries. Tax basis underwriting income is (i) written premium minus 80% of the change in the unearned premium reserve; – (ii) paid losses plus the change in the discounted loss and LAE reserves; – (iii) underwriting expenses. Tax basis investment income uses the proration adjusted tax rate for each asset class.

- The *indirect method* is statutory income + (i) the change in the loss reserve discount +

(ii) 20% of the change in the gross unearned premium reserves – (iii) the tax-exempt investment income (after proration).[20]

Premium Revenue: Statutory earned premium is written premium minus 100% of the change in the unearned premium reserves (UEPR). The tax basis earned premium is written premium minus 80% of the change in the UEPR = WP – 100% × change in UEPR + 20% × change in UEPR = statutory earned premium + 20% × change in UEPR.

Incurred Loss Offset to Underwriting Income: The incurred loss *offset to statutory income* is the paid loss plus the change in loss reserves, so the incurred loss *addition* to statutory income is –(paid loss + change in reserves). The incurred loss addition to taxable income is –(paid loss + the change in discounted reserves) = –(paid loss + change in reserves – change in loss reserve discount) = the addition to statutory income *plus* the change in the loss reserve discount. Incurred losses are an offset to income, and a reduction in the incurred losses are an addition to income. (RES = loss reserves)

- *Statutory income:* WP – 100% × Δ(UEPR) – Pd Loss – Δ(RES) – Expenses
- *Taxable income:* WP – 80% × Δ(UEPR) – Pd Loss – Δ(Discounted RES) – Expenses
- ⇛ Taxable income = Statutory income + 20% × Δ(UEPR) + Δ(RES discount)

Illustration: We show direct and Indirect methods to compute 20X9 taxable income.

	20X8	20X9
Net written premium	850	1,000
Unearned premium reserve (year ending)	500	600
Loss and LAE paid	500	400
Undiscounted loss and LAE reserve (year ending)	900	1,000
Discounted loss and LAE reserve (year ending)	700	900
Tax deductible other expenses		300
Taxable investment income		200

For the *direct method*, taxable income = taxable earned premium
– tax deductible incurred losses – tax deductible expenses + taxable investment income

The tax basis earned premium = written premium – 80% of the change in the unearned premium reserves = $1,000 – 80% × ($600 – $500) = $920. The tax basis incurred losses = paid losses + change in discounted loss reserves = $400 + ($900 – $700) = $600. The taxable income = *$920 – $600 – $300 + $200 = $220.*

For the *indirect method*, statutory underwriting income = earned premium – incurred losses – expenses = (written premium – change in unearned premium reserves) – (paid losses + change in undiscounted loss reserves) – expenses = $1000 – ($600 – $500) – $400 – ($1000 – $900) – $300 = $100. We adjust for revenue offset and loss reserve discounting.

- 20% × the change in the unearned premium reserves = 20% × $600 – $500 = $20.
- The loss reserves discount is $900 – $700 = $200 for 20X8 and $1000 – $900 = $100 for 20X9; the change in the loss reserves discount is $100 – $200 = –$100.

The taxable underwriting income is $100 + $20 + (–$100) = $20. Add taxable investment income to get $220 as the taxable income.

Illustration: We use the indirect method for taxable underwriting income, since we start with statutory underwriting income, and the direct method for taxable investment income.

Statutory Underwriting Profit	($4,00,000)
Taxable Investment Income	$30,000,000
Tax-exempt Investment Income	$6,000,000
Dividends Received from unaffiliated entities	$2,000,000
Realized Capital Gains	$3,000,000
Unrealized Capital Gains	($1,000,000)
Unearned Premium Reserves (Beginning of the year)	$110,000,000
Unearned Premium Reserves (End of the year)	$105,000,000
Loss and LAE Reserves (Beginning of the year)	$500,000,000
Loss and LAE Reserves (End of the year)	$490,000,000
Average Reserve Discount Factor (Beginning of the year)	0.90
Average Reserve Discount Factor (End of the year)	0.92

To the statutory underwriting income of –$4,000,000 we add 20% of the change in the unearned premium reserves plus the change in the loss reserve discount. 20% of the change in the unearned premium reserve is 20% × ($105 million – $110 million) = –$1,000,000. The loss reserve discount is (1 – 90%) × $500 million = $50 million at the beginning of the year and (1 – 92%) × $490 million = $39.2 million at the end of the year for a change of $39.2 million – $50 million = –$10.8 million. Taxable underwriting income is *–$4,000,000 + (–$1,000,000) + (–$10,800,000) = –$15,800,000.*

- The fully taxable investment income is $30,000,000.
- The proration portion of tax-exempt interest income is 15% × $6,000,000 = $900,000.
- 40.5% of dividends received is taxable: 40.5% × $2 million = $810,000.
- Realized capital gains of $3 million are fully taxable.
- Unrealized capital losses of –$1 million does not provide a tax refund.

Taxable investment income is $30,000,000 + $900,000 + $810,000 + $3,000,000 = $34,710,000. The regular taxable income is –$15,800,000 + $34,710,000 = $18,910,000.

We check for the limitation on the DRD. The DRD is 59.5% × $2 million = $1,190,000. The taxable income before the DRD is $18,910,000 + $1,190,000 =$20,100,000. This is greater than the dividends received of $2 million, so the limit does not apply.

The regular income tax is 35% × $18,910,000 = $6,618,500.[21]

ALTERNATIVE MINIMUM INCOME TAX

A firm with tax exempt investments might have high book income but little taxable income. To prevent high income firms from escaping too much tax, the alternative minimum income tax (AMIT) sets a lower bound on the tax payments.

- All regular taxable income is included in alternative minimum taxable income (AMTI).
- 75% of income that *escapes* regular income taxation is included in AMTI.[22]
- 20% of the AMIT is the alternative minimum income tax. Alternative minimum taxable income is more than regular taxable income, but its tax rate is lower.
- The regular income tax liability is reduced (adjusted) by the previous year's minimum tax credit (see below).
- If the AMIT exceeds the adjusted regular income tax (RIT), the excess is added to the current tax liability and becomes the new minimum tax credit.

The alternative minimum income tax applies to firms and high income personal taxpayers. Insurers are the primary clientele for municipal bonds, so they have much tax exempt income and often pay the AMIT.[23]

Illustration: An insurer with an investment portfolio of $10 billion of 6% municipal bonds has –$100 million of underwriting income. Its municipal bond interest income is $600 million, of which proration adds 15% to regular taxable income. Its regular income tax is

$$35\% \times (\$600 \text{ million} \times 15\% - \$100 \text{ million}) = \$-3.50 \text{ million}.$$

The insurer's book (GAAP and statutory) income is $600 million – $100 million = $500 million, but its taxable income is negative.[24] The income that escapes taxation is (1 – 15%) of the municipal bond interest. The alternative minimum taxable income is

$$-\$100 \text{ million} + 15\% \times \$600 \text{ million} + 75\% \times (1 - 15\%) \times \$600 \text{ million} = \$372.50 \text{ million}.$$

The alternative minimum income tax is $372.50 million × 20% = $74.50 million. The minimum tax credit is $74.50 million – (35% × –$100 million) = $109.50 million.

The effective tax rates in the alternative minimum tax environment are[25]

- *Municipal bond interest income:* 20% × (15% + 85% × 75%) = 15.75%.
- *Stockholder dividends:* 20% × (30% + 15% × 70% + 85% × 70% × 75%) = 17.025%.

Illustration: When municipal bond interest income and stockholder dividends dominate the insurer's income, AMIT may exceed the regular income tax. This illustration shows 20X1 income in millions of dollars.[26] Premium volume is growing 10% a year, with no changes in policy types or premium booking practices. The average loss reserve discount factor is 90% for valuation dates of both 12/31/20X0 and 12/31/20X1.

Statutory Underwriting Gain (Loss)	($400)
Taxable interest income	400

Municipal bond interest income	600
Dividends Received	200
Realized Capital Gains	100
Unearned Premium Reserve at December 31, 20X1	2,200
Loss and Loss Adjustment Expense Reserve at Dec 31, 20X0	4,000
Loss and Loss Adjustment Expense Reserve at Dec 31, 20X1	4,200

We use the direct method for investment income, and the indirect method for underwriting income, which shows statutory income. Taxable investment income is the sum of

- taxable interest income: $400 million
- the prorated portion of tax exempt interest income = 15% × $600 million: $90 million
- the taxable portion of dividends received = 30% × $200 million: $60 million[27]
- the prorated portion of the DRD = 15% × ($200 million – $60 million): $21 million
- net realized capital gains: $100 million

Taxable underwriting income equals statutory underwriting income plus 20% of the change in the unearned premium reserve plus the change in the loss reserve discount. Premium has grown 10% a year, with no change in policy forms or booking practices. The unearned premium reserve is $2,200 million at 12/31/20X1, implying that it was $2,000 million at 12/31/20X0; the change is $200 million, of which 20% is $40 million.

The loss reserve discount is $4,000 million × (1 – 90%) = $400 million at 12/31/20X0, and $4,200 × (1 – 90%) = $420 at 12/31/20X1, for a change of $420 – $400 = $20 million. The regular taxable income is

–	$ 400 million	[Underwriting loss]
+	$ 400 million	[Taxable interest income]
+	$ 100 million	[Realized capital gains]
+	$ 60 million	[Taxable portion of dividends received]
+	$ 90 million	[Prorated portion of tax-exempt interest income]
+	$ 21 million	[Prorated portion of dividends received deduction]
+	$ 40 million	[Revenue offset: 20% of increase in UEPR]
+	$ 20 million	[Adjustment for loss reserve discounting]
=	$ 331 million	

The investment income that has escaped taxation is (a) municipal bond interest income of $600 million – $90 million = $510 million + (b) dividends received of $200 million – $60 million – $21 million = $119 million; the total is $629 million. The ACE adjustment is 75% × $629 million = $471.75 million. The alternative minimum taxable income is the regular taxable income + the ACE adjustment = $331 million + $471.75 million = $802.75 million.

The tax liability is the greater of

- 35% × the regular taxable income = 35% × $331 million = $115.85 million, and
- 20% × alternative minimum taxable income = 20% × $802.75 million = $160.55 million.

The tax liability is $160.55 million. The alternative minimum tax credit is $160.55 million – $115.85 million = $44.70 million.

MINIMUM TAX CREDIT

The *adjusted* regular income tax (ARIT) is the regular income tax minus the previous year's minimum tax credit.

- If the ARIT exceeds the alternative minimum income tax (AMIT), it is the tax liability.
- Otherwise, the AMIT is the tax liability and the excess of the AMIT over the adjusted regular income tax is the new minimum tax credit.

The minimum tax credit may be carried forward indefinitely, but it can not be carried back.[28]

In Table 1, the taxpayer has a minimum tax credit of $2,000 in 20X1 which it uses in 20X2.

Table 1: Alternative Minimum Tax Credit

Tax Year	*Regular Tax*	*AMIT*	*Tax Liability*	*Tax Credit*
20X1	$10,000	$12,000	$10,000 + $2,000 = $12,000	$2,000
20X2	$11,000	$7,000	$11,000 – $2,000 = $9,000	$0

In Table 2, the company has a $2,000 minimum tax credit in 20X1. It can use only $500 in 20X2, since the tax liability can not be lower than the AMIT. $1,500 of the credit is carried over to the next year, and it is used to reduce the 20X3 tax by $1,500.

Table 2: Alternative Minimum Tax Credit

Tax Year	*Regular Tax*	*AMIT*	*Tax Liability*	*Tax Credit*
2001	$10,000	$12,000	$10,000 + $2,000 = $12,000	$2,000
2002	$11,000	$10,500	$11,000 – $500 = $10,500	$1,500
2003	$13,000	$10,000	$13,000 – $1,500 = $11,500	$0

Proficiency in computing taxable income requires practice. The first two exercises below show the computation of regular and alternative minimum income tax. The third exercise how to back into an input item from the final taxable income. These exercises show the types of problems on the CAS exam; they do not contain new material.

Exercise 1.1: *Taxable Income, Mixed Method*: The 20X4 accounting entries for a property-casualty insurer are shown below ($000,000):

Statutory Underwriting Profit/Loss	(10.0)
Taxable Interest Income	14.4
Tax-Exempt Interest Income	5.0

Dividends Received from unaffiliated corporations	4.0
Realized Capital Gains	8.0
Unrealized Capital Gains	7.5

	12/31/20X3	12/31/20X4
Unearned Premium Reserve	210.0	225.0
Loss and LAE Reserves	420.0	450.0
Average Reserve Discount Factor	0.900	0.900

All investments were made after August 7, 1986. We calculate statutory pre-tax income, regular federal income tax, alternative minimum income tax, and after-tax net income.

Solution 1.1: Statutory pre-tax income includes underwriting gain, investment gain with the exception of unrealized capital gains and losses, and other income, such as agents' balances charged off, finance and service charges, and policyholder dividends. Unrealized capital gains and losses are direct charges or credits to surplus; they do not flow through the income statement. The statutory pre-tax income is *–$10 million + $14.4 million + $5.0 million + $4.0 million + $8.0 million = $21.4 million.*

Regular taxable income = statutory underwriting income
+ taxable investment income
+ the prorated portion of tax-exempt investment income
+ the revenue offset adjustment
+ the loss reserve discounting adjustment

- Underwriting income is –$10 million.
- Taxable interest income is $14.4 million.
- Realized capital gains are $8.0 million.
- The prorated portion of tax exempt interest income is 15% × $5.0 = $0.75 million.
- The taxable portion of dividends received is 30% × $4.0 million, and the prorated portion of the DRD is 15% × 70% × $4.0 million. The dividend income included in regular taxable income is (30% + 15% × 70%) × $4.0 million = $1.62 million.

By the revenue offset provision, 20% of the increase in the unearned premium reserve is included in regular taxable income: 20% × ($225.0 million – $210.0 million) = $3 million.

The increase in the reserve discount is added to taxable income: (1 – 90%) × $450 million at 12/31/X4 – (1 – 90%) × $420 million at 12/31/X3 = $45 million – $42 million = $3 million.

–	$10.00 million	[Underwriting loss]
+	$14.40 million	[Taxable interest income]
+	$ 8.00 million	[Realized capital gains]
+	$ 1.20 million	[Taxable portion of dividends received]
+	$ 0.75 million	[Prorated portion of tax-exempt investment income]
+	$ 0.42 million	[Prorated portion of dividends received deduction]
+	$ 3.00 million	[Revenue offset]
+	$ 3.00 million	[Adjustment for loss reserve discounting]

= $20.77 million [Regular taxable income][29]

The regular federal income tax is 35% of the regular taxable income, or $7,269,500.

ALTERNATIVE MINIMUM TAXABLE INCOME = regular taxable income + 75% of the income that has escaped taxation.

- Regular taxable income (after proration) = $20.77 million.
- Interest income not in regular taxable income = 85% × $5.0 million = $4.25 million.
- The dividends received not in regular taxable income = 59.5% × $4.0 = $2.38 million.
- Alternative minimum taxable income = $20.77 million + 75% × ($4.25 million + $2.38 million) = $25.7425 million = $25,742,500.

The alternative minimum tax (AMT) = 20% × $25,742,500 = $5,148,500.

The federal income tax liability is the greater of the regular tax and the alternative minimum tax, or $7,269,500. The after-tax net income is statutory income (not taxable income) minus the tax liability, or $21,400,000 – $7,269,500 = $14,130,500.

Exercise 1.2: *Regular Taxable Income*: The following information is available for a company which began operations in 20X0.

20X6 Earned Premiums	$2,000,000
20X6 Written Premiums	$2,500,000
Loss and LAE Reserves at December 31, 20X5	$2,000,000
Loss and LAE Reserves at December 31, 20X6	$2,500,000
20X6 Paid Loss and LAE	$1,000,000
20X6 Underwriting Expenses Incurred	$800,000
Average Reserve Discount Factor at December 31, 20X5	0.900
Average Reserve Discount Factor at December 31, 20X6	0.920
Taxable Interest Income	$1,000,000
Tax-Exempt Interest Income	$500,000
Dividends Received from unaffiliated entities	$200,000
Realized Capital Gains	$100,000
Unrealized Capital Gains	$50,000

We calculate the regular taxable income, the alternative minimum taxable income, and the tax liability for 20X6.

Solution §A.2: *Underwriting Income*: The tax basis premium revenue is written premium minus 80% of the change in the unearned premium reserve. This change is the written premium minus earned premium: $2,500,000 – $2,000,000 = $500,000. The tax basis premium revenue is $2,500,000 – 80% × $500,000 = $2,100,000.

The change in discounted reserves is 92% × $2,500,000 – 90% × $2,000,000 = $500,000.

The tax basis incurred loss equals the paid losses plus the change in discounted reserves: $1,000,000 + $500,000 = $1,500,000. Incurred expenses are $800,000. Taxable underwriting income is $2,100,000 – $1,500,000 – $800,000 = ($200,000).

Investment Income: Taxable interest income is $1,000,000. The tax-exempt interest income is $500,000, of which 15% is added to taxable income: 15% × $500,000 = $75,000. Since the company began operations in 20X0, all of its securities were purchased after August 7, 1986, and there is no grand-fathering of old securities.

Dividends received from unaffiliated entities are $200,000, of which 70% are tax-exempt and 30% are included in taxable income; by the proration provision,15% of the tax-exempt portion is included in taxable income. The taxable dividend income is 30% + 70% × 15% = 40.5% × $200,000 = $81,000.[30]

Realized capital gains are $100,000. Unrealized capital gains are not included in taxable income. Taxable investment income is $1,000,000 + $75,000 + $81,000 + $100,000 = $1,256,000. Total taxable income is –$200,000 + $1,256,000 = $1,056,000.

The investment income excluded from regular taxable income is 85% of the tax exempt interest income, or 85% × $500,000 = $425,000, plus 59.5% of the dividends received, or 59.5% × $200,000 = $119,000. The total income excluded is $425,000 + $119,000 = $544,000. The ACE adjustment is 75% of this amount: 75% × $544,000 = $408,000. The alternative minimum taxable income is $1,056,000 + $408,000 = $1,464,000.

The tax liability is the greater of 35% × $1,056,000 = $369,600 and 20% × $1,464,000 = $292,800. This is $369,600.

Exercise 1.3: *Backing Into Input Data*: Some exam problems back into input data to test your mastery of the relations. We have the following information for tax year 20X7:

Statutory Income	$20.2 million
Dividends Received	$9.6 million
Tax Exempt Interest Income	$3.3 million
Unearned Premium Reserve at December 31, 20X7	$90.5 million
Loss and LAE Reserve at December 31, 20X6	$80.0 million
Loss and LAE Reserve at December 31, 20X7	$91.0 million
Change in Loss and LAE Reserve Discount	+$1.5 million
Regular Taxable Income	$15.3 million

All investments were acquired after August 1986, and all dividends are from unaffiliated entities. We calculate the unearned premium reserve at December 31, 20X6.

Solution 1.3: Regular taxable income = statutory income
– tax exempt portion of dividend income – tax exempt portion of interest income
+ change in loss reserve discount + 20% of the change in the unearned premium reserve.

Dividend income from unaffiliated entities is $9.6 million, of which 30% is included in

regular taxable income and 70% is tax exempt. By proration, 15% of tax exempt income is included in taxable income, so 30% + 15% × 70% = 40.5% is taxed and 59.5% is not taxed. The tax exempt dividends received is 59.5% × $9.6 million = $5.712 million.

Tax-exempt interest income is $3.3 million: 15% is added to taxable income and 85% is tax exempt. The deduction from statutory income is 85% × $3.3 million = $2.805 million.

The change in the loss reserve discount is $1.5 million. The regular taxable income equals $15.3 M = $20.2 M – $5.712 M – $2.805 M + $1.5 M + 20% × ΔUEPR; 20% × ΔUEPR = $2.117 million, and ΔUEPR = $10.585 million. The UEPR at 12/31/20X7 is $90.5 million, so the UEPR at 12/31/20X6 is $90.5 million – $10.585 million = $79.915 million.

Appendix: Dividends Received Deduction

Pre-Tax Equivalent Yields

We derive the pre-tax equivalent yields for common stock dividends as the stated yield × (1 – the effective tax rate on dividends) / (1 – the tax rate on taxable investments).

- For non-insurance company taxpayers, the factor to adjust the dividend yield to the pre-tax equivalent yield is (1 – 10.50%)/(1 – 35%) = 137.69%. A 2% dividend yield is a 2.7538% pre-tax yield. The effective tax rate for the three layers of tax (two corporate and one personal) is 1 – (1 – 35%) × (1 – 10.5%) × (1 – 32%) = 60.44%.
- For insurance company taxpayers, the factor to adjust the dividend yield to the tax equivalent yield is (1 – 14.175%)/(1 – 35%) = 132.04%. A 2% dividend yield is a 2.64% pre-tax equivalent yield. The effective tax rate for the three layers of tax (two corporate and one personal) is 1 – (1 – 35%) × (1 – 14.175%) × (1 – 32%) = 62.07%.[31]

Limit on Dividends Received Deduction

The dividends received deduction (DRD) is limited to 70% of the taxable income before the DRD.[32] The limit does not apply if taxable income before the DRD is less than the full DRD (before proration).[33] No limit applies to dividends from controlled entities (80% or more owned by the taxpayer); these entities are considered like branches of the taxpayer, not like separate entities. If the firms are affiliated (between 20% and 80% ownership by the taxpayer), the limit is 80% of the taxable income before the DRD.

For insurance companies, the taxable income before the DRD is the final taxable income plus 59.5% of dividends received. The limit applies only if final taxable income + 59.5% of dividends received < DRD before proration < 1.42857 × (final taxable income + 59.5% of dividends received), or

$$\text{TINC} + 59.5\% \times \text{DIVS} < \text{DRD} < 1.42857 \times (\text{TINC} + 59.5\% \times \text{DIVS}).$$

Illustration: ABC receives $500,000 of shareholder dividends from non-affiliated entities and $1.2 million of taxable investment income. We determine the DRD and taxable

income in six scenarios: ABC is an non-insurance company vs an insurance company taxpayer, and ABC has operating income of –$1.1 million, –$1.3 million, or –$1.5 million.

If ABC has operating income of –$1.1 million, its taxable income before the DRD is –$1.1 million + $1.2 million + $500,000 = $600,000. This is more than the dividends received, and no limit applies to the DRD. If ABC is a non-insurance company, the DRD is 70% of $500,000 = $350,000, and taxable income is $600,000 – $350,000 = $250,000. If ABC is an insurance company, 15% of the DRD is added to taxable income by proration, and taxable income is $250,000 + 15% × $350,000 = $302,500.

If ABC has operating income of –$1.3 million, its taxable income before the DRD is –$1.3 million + $1.2 million + $500,000 = $400,000. This is less than the dividends received but more than the unlimited DRD. The DRD is 70% of taxable income before the DRD.

If ABC is a non-insurance company, the limited DRD is 70% of $400,000 = $280,000, and taxable income is $400,000 – $280,000 = $120,000. If ABC is an insurer, 15% of the DRD is added to taxable income by proration, and taxable income is $120,000 + 15% × $280,000 = $162,000. Proration applies to the limited deduction, not the unlimited deduction, since only the limited deduction is actually deducted from taxable income.

If ABC has operating income of –$1.5 million, its taxable income before the DRD is –$1.5 million + $1.2 million + $500,000 = $200,000. This is less than the unlimited DRD, and the limit does not apply. If ABC is a non-insurance company taxpayer, the DRD is 70% of $500,000 = $350,000, and taxable income is $200,000 – $350,000 = –$150,000. If ABC is an insurer, 15% of the DRD is added to taxable income by proration, and taxable income is –$150,000 + 15% × $350,000 = –$97,500.

Illustration: We compute the tax liability given the following information. All securities were purchased after August 1986, and dividends are from unaffiliated entities.

Statutory Underwriting Loss	$ 180,000,000
Taxable Interest Income	$ 120,000,000
Tax-exempt Interest Income	$ 0
Dividends Received	$ 40,000,000
Realized Capital Gains	$ 10,000,000
Unearned Premium Reserve (beginning of the year)	$ 450,000,000
Unearned Premium Reserve (end of the year)	$ 500,000,000
Loss and LAE Reserve, beginning of the year	$ 1,000,000,000
Loss and LAE Reserve, end of the year	$ 1,100,000,000
Previous year Reserve Discount Factor	0.92
Current Average Reserve Discount Factor	0.90

Solution: Regular Taxable Income = statutory underwriting income +taxable investment income + the prorated portion of tax-exempt investment income + the revenue offset adjustment + the loss reserve discounting adjustment

- The statutory underwriting income is –$180 million.
- The taxable interest income is $120 million.

- There is no tax exempt interest income.
- The realized capital gains are $10 million.
- The taxable portion of the dividends received is 40.5% × $40 million = $16.2 million.

The adjustments to underwriting income are revenue offset and loss reserve discounting:

- 20% of the change in the UEPR is 20% × ($500 million – $450 million) = $10 million.
- The change in the loss reserve discount is [(1 – 90%) × $1,100 million – (1 – 92%) × $1,000 million] = $30 million.

The dividends received are $40 million, so taxable income before the DRD is

$$–\$180 + \$120 + \$10 + \$40 + \$10 + \$30 = \$30 \text{ million}$$

This amount lies between the dividends received of $40 million and the DRD of 70% × $40 million = $28 million. The limited DRD is 70% × $30 million = $21 million. Of this amount, 15% is added back to regular taxable income: 15% × $21 million = $3.15 million.

The regular taxable income is $30 million – $21 million + $3.15 million = $12.15 million, and the regular tax liability is 35% × $12.15 million = $4.2525 million.

Alternative Minimum Income Tax: The income excluded from regular taxable income is the DRD after proration = $21 million – $3.15 million = $17.85 million. The alternative minimum taxable income is the regular taxable income + 75% × ACE adjustment = $12.15 million + 75% × $17.85 million = $25.5375 million.

The alternative minimum tax is 20% × $25.5375 million = $5.1075 million. The tax liability is $5,107,500, and the minimum income tax credit is $5,107,500 – $4,252,500 = $855,000.

For exam problems, you need not check the limit on the dividends received deduction. For actual tax filings, the limit (or removal of the limit) can greatly shift the tax liability.

Appendix: Cost of the Alternative Minimum Income Tax

We measure the cost of the alternative minimum income tax. Suppose an insurer has zero tax basis underwriting income and invests in corporate bonds yielding 7% and municipal bonds yielding 5.5%. If there were no AMIT, the insurer might invest fully in municipal bonds for an after-tax yield of 5.5% × (1 – 5.25%) = 5.21%. If Z is the percentage of municipal bonds, the portfolio which maximizes after-tax income with the AMIT is

$$Z \times 5.5\% \times (15\% + 85\% \times 75\%) + (1–Z) \times 7\% = 175\% \times [Z \times 5.5\% \times 15\% + (1–Z) \times 7\%]$$
$$Z \times 4.3313\% + (1 – Z) \times 7\% = 175\% \times [Z \times 0.825\% + (1 – Z) \times 7\%]$$
$$Z \times -2.66875\% + 7\% = Z \times -10.80625\% + 12.25\%$$
$$Z = (12.25\% – 7\%) / (10.80625\% – 2.66875\%) = 64.52\%$$

The after-tax yield is 64.52% × (1–5.25%) × 5.5% + (1– 64.52%) × (1–35%) × 7% = 4.98%. The cost of the AMIT is the difference between the after-tax yield of 5.21% and the after-tax yield with Z% of municipal bonds: 5.21% – 4.98% = 0.23% of the asset portfolio each year. This is a continuing cost.

The cost of the AMIT depends on the volatility of underwriting income.

Illustration: An insurer has $500 million of common stocks with dividend yields of 4% per annum and capital accumulation of 8% per annum. The regular income tax from the asset portfolio is 35% × 4% × 40.5% = 0.567% × $500 million = $2.84 million and in the AMIT environment is 4% × (40.5% + 59.5% × 75%) × 20% = 0.681% × $500 million = $3.41 million. We compare three scenarios.

- *Scenario A:* The insurer has underwriting income and realized capital gains of $3.80 million each year, so that its regular income tax just equals its AMIT.
- *Scenario B:* The insurer has $0 the first year and $7.60 million the second year. The extra tax paid the first year and recouped the second year is $3.41 million – $2.84 million = $0.57 million. The cost of the AMIT is the present value of the investment income on $0.57 million. If the after-tax investment yield is 5.2% per annum, the cost is $0.57 million × 5.2% / 1.052 = $2,817.49.
- *Scenario C:* The insurer has $7.60 million the first year and $0 the second year. The taxes paid the first year are not recouped the second year, though the insurer has a minimum tax credit for future years.

The cost of the alternative minimum income tax depends on the volatility of underwriting income and the investments the insurer would have otherwise used.

[1] The tax computation begins with statutory pre-tax income from the Underwriting and Investment Exhibit: Part 1 for investment income, Parts 2, 2A, and 3 for underwriting income, and Part 2 for the additional tax liability from revenue offset. See the Treasury regulations, 2001FED 26,153, §1.832-4(a)(1): "Gross income means the gross amount of income earned during the taxable year from interest, dividends, rents, and premium income, computed on the basis of the underwriting and investment exhibit of the annual statement." The computation of loss reserve discount factors uses Schedule P figures.

[2] This study note is in response to Wendy Germani's call at the November 2006 Syllabus Committee meeting for a succinct reading on computing federal income taxes geared to actuarial candidates that accurately and efficiently covers the CAS learning objectives. The exam tests the concepts and techniques in the text, which are repeated in outline form in the Guides. The student workbook illustrates the types of problems that may be asked.

[3] Municipal bonds are exempt from federal income taxes and from state taxes of their *domestic* state, but they are subject to state income taxes from other states.

[4] *Double* taxation of common stock dividends is the imposition of both corporate income taxes and personal income taxes on the same income. *Triple* taxation of dividends received by one firm from another is the imposition of two layers of corporate income tax and one layer of personal income tax on the same income.

[5] The dividends received deduction was enacted when marginal tax rates were higher, particularly for tax bracket of insurance company investors. With a 46% corporate tax rate, and an individual marginal tax rate approaching 70% for the highest tax bracket investors, the tax rate from triple taxation without the dividends

received deduction would be 1 – (1 – 46%) × (1 – 46%) × (1 – 70%) = 91.25%. Marginal income tax rates of 80% to 90% are not uncommon in European countries and they affect some U.S. types of income as well. For each dollar of income earned on capital supplied by property-casualty insurance company owners, the IRS takes about 70 to 80¢, partly from the owners of the capital and partly from the policyholders of the insurance company. Some people approve of this, mistakenly thinking that these are progressive taxes that affect the wealthy. But the economic incidence of the tax does not follow the legal incidence; prices in the economy adjust based on elasticities, not on statutes. The tax on insurance company owners, for instance, is paid (primarily) by insurance company policyholders. This is a highly regressive tax, since the poor spend more of their incomes on property-casualty insurance. A middle aged adult earning $300,000 a year and living in the suburbs may spend $4,000 a year on auto insurance for two cars, high limits, and both liability and physical damage coverages. A young unmarried male living in an inner city and earning $15,000 a year may spend $3,000 a year for one car with basic limits liability coverage only. Because the trial bar raises the costs of the compensation system, auto insurance is one of the most regressive costs among basic needs. The U.S. Treasury and the states exacerbate the problem by heavily taxing this product. The tax on workers' compensation is even more regressive, since it is paid primarily by manufacturing and construction workers.

[6] The tax code may not discriminate against specific taxpayers. Instead, 15% of tax exempt dividends are a reduction to the loss reserve offset to taxable income. Only insurers have this offset.

[7] A non-affiliated entity is an entity that is less than 20% owned by the taxpayer. Compare SFAS 35, which uses the same 20% rule, and contrast SSAP 46, which uses a 10% rule.

[8] For long-duration insurance contracts, premium due is the GAAP, statutory and tax revenue. GAAP has a DPAC; statutory accounting does not. The *DAC tax* for life insurance, annuities, and group health insurance contracts is the equivalent of the revenue offset provision for property-casualty companies.

[9] See the Treasury regulations, 2001FED 26,153, §1.832-4(a)(3): "The determination of premiums earned on insurance contracts during the taxable year begins with the insurance company's gross premiums written on insurance contracts during the taxable year, reduced by return premiums and premiums paid for reinsurance. This amount is increased by 80 percent of the unearned premiums on insurance contracts at the end of the preceding taxable year, and is decreased by 80 percent of the unearned premiums on insurance contracts at the end of the current taxable year."

[10] GAAP uses actual pre-paid acquisition costs, which may vary from 5% for renewal auto policies issued by direct writers to 45% for new fire policies; the IRS uses an average 20% pre-paid acquisition expense ratio.

[11] This is most important for earned but unbilled and accrued retrospective premiums. Statutory accounting requires insurers to estimate net earned premium but permits them to use booked written premium. The IRS requires insurers to re-estimate written premium as well, giving a 20% increase in taxable income.

[12] In *Annual Statement* terms, the incurred entry on the earnings statement (page 4) is the paid entry on the cash flow statement (page 5) plus the change in reserve on the balance sheet (page 3).

[13] Policyholder dividends and federal income taxes are like incurred losses.

[14] The corporate income tax before the Tax Reform Act of 1986 was 46%.

[15] The direct method is more intuitive; the indirect method is commonly used to compute taxable income.

[16] We also adjust for the difference between statutory and tax treatment of earned but unbilled premiums, accrued retrospective premiums, premiums that are booked as billed, and non-admitted premiums receivable. Statutory accounting (SSAP 53) allows expected premium audits and retro adjustments as direct charges or credit to earned premium and a reduction in the unearned premium reserve, with no effect on written premium. Tax accounting requires a credit or debit to written premium. If the expected audit or retro adjustment is positive, revenue offset increases the tax liability.

[17] The percentage that is tax exempt depends on the dividend paying company: unaffiliated, affiliated, or controlled; the dividends received deduction is limited in some instances.

[18] The data sources for taxable income are the Underwriting and Investment Exhibit for the components of income and Schedule P for the loss reserve discounts. Some figures are also on the statutory balance sheet or income statement.

Statutory income is on the income statement, page 4, line 17, "net income, after dividends to policyholders but before federal and foreign income taxes." We examine each component separately to see the sources of taxable income.

Earned premium is on page 4, line 1 (income statement), and the revenue offset adjustment is determined from the unearned premium reserves for the current and previous year (page 3, line 9); the premium figures are also in the Underwriting and Investment Exhibit, Part 2. Written premiums (for the direct method) are in the Underwriting and Investment Exhibit, Part 2, "Premiums Earned," column 1, "net premium written," either by line or the total on line 34.

Incurred loss and LAE is on the income statement, page 4, lines 2 and 3. The change in the discount is taken from Schedule P, Part 1, column 24 (by line and accident year), grossed up for tabular discounts and anticipated salvage and subrogation, along with the IRS loss reserve discount factors. For the direct method, paid losses are in the Underwriting and Investment Exhibit, Part 3, "Losses Paid and Incurred," column 3, "total payments."

Expenses incurred are on the income statement, page 4, lines 3, 4, and 5; *other income* is on lines 11, 12, and 13.

Investment income is in the Underwriting and Investment Exhibit, Part 1, Interest, Dividends, and Real Estate Income, page 6, line 15. The tax exempt municipal bond income is on line 1.1, and stock dividends received are on lines 2.1, 2.11, 2.2, and 2.21; the taxable investment income is the remainder.

[19] The direct and indirect approaches are defined further below.

[20] The two methods are equivalent. When we have revenue and expense items, the direct method is easier. When we begin with statutory income, the indirect method is easier.

[21] As discussed below, we must compare alternative minimum taxable income, which is regular taxable income plus 75% of the investment income that escaped regular taxation.

The investment income that escaped regular taxation is 85% × \$6,000,000 = \$5,100,000 for municipal bond income and \$2,000,000 – \$810,000 = \$1,190,000 for dividends received. The ACE adjustment is 75% × (\$5,100,000 + \$1,190,000) = \$4,717,500.

The alternative minimum taxable income is \$18,910,000 + \$4,717,500 = \$23,627,500. The alternative minimum income tax is 20% × \$23,627,500 = 4,725,500. The regular taxable income is greater, so the tax liability = \$6,429,400.

[22] *Escapes* refers to permanent tax differences, not timing differences.

[23] Optimal tax strategy implies that insurers maximize their net after-tax income by have an AMIT equal to or higher than their RIT. See the module on investment strategy. This study note focuses on municipal bond income and stockholder dividends, which are large parts of insurers' income. Other tax differences are important for manufacturers and high technology firms.

[24] The insurer pays an implicit tax by the lower yield on municipal bonds. The tax is paid to the states, not to the Treasury, but the insurer has not escaped taxation. The IRS Code does not consider implicit taxes.

[25] For municipal bonds, 20% is the tax rate, 15% is added to regular taxable income by proration, and 85% escapes taxation. For dividends, 30% is taxed for all firms, 15% × 70% is added to regular taxable income by proration, and 85% × 70% escapes taxation.

[26] All investments are acquired after August 7, 1986, and all dividends are from unaffiliated companies.

[27] The limit on the DRD is not on the exam syllabus. For actual tax work, we check the limit. Before proration, the DRD is $200 million × 70% = $140 million. Regular taxable income before the DRD is $331 million + $140 million – $21 million = $450 million. This is more than the dividends received, so the limit does not apply.

[28] The minimum tax credit is sometimes conceived of as no-interest loan to the U.S. Treasury.

[29] For the actual tax filing, we check the limit on the DRD. Taxable income before the DRD is $20.77 + $4.0 – $1.20 – $0.42 = $23.15 million. This exceeds the dividends received, so the limit does not apply.

[30] For completeness, we check the limit on the DRD (not on the exam). The DRD is 70% × $200,000 = $140,000. The taxable income before the DRD is $1,056,000 + $140,000 – $21,000 = $1,175,000. ($21,000 is the proration portion of the DRD.) Since $1,175,000 is greater than the dividends received, no limit applies.

[31] Since the funds used to pay the tax on investment income come from policyholders, they are subject to tax on underwriting income. If the average personal tax rate of insurance company investors is 32%, the effective tax rate is 1 – (1 – 35%) × (1 – 35%) × (1 – 14.175%) × (1 – 32%) = 75.34%. For the commercial casualty lines of business, the effective tax rate on the profit margin in the policyholder premium is between 70% and 80% when both personal and corporate income taxes are included. This underscores the need to be cognizant of tax effects when pricing insurance products.

[32] The dividends received deduction here is the full amount before proration.

[33] The Internal Revenue Code says that if the taxable income before the dividends received deduction would place the taxpayer in a loss position after the full dividends received deduction, the limit is removed.