

 **ACTEX Learning**

**Study Manual for
General Insurance Financial
& Regulatory Environment
US Exam**

10th Edition

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An SOA Exam

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NOTES

This study manual (“the manual”) is written with the purpose of assisting the candidates for the SOA Financial and Regulatory Environment Exam in US (GIFREU).

According to the syllabus, two textbooks and a large volume of readings are required for this exam. The two textbooks are *General Insurance Financial Reporting Topic, 5th edition* (SOA) and *Insurance Regulation* (Porter, K.). The manual is intended to follow the structure of the syllabus as closely as possible. The first two parts correspond to those textbooks, respectively. The rest readings are covered in the same order as they appear on the syllabus.

Relevant practice questions and answers are provided at the end of each reading. Past exam and answers have been taken from SOA’s GIFREU (**up to 2019 fall, and relevant question numbers for 2020 spring/fall, and 2021 spring/fall**), which are identified with “(SOA GIFREU Year Spring/Fall Qi)” in the manual. When there is insufficient exercise, past exams and answers of the CAS exam 6US are included. All the past exam questions and answers are copyrighted by the Society of Actuaries and Casualty Actuarial Society. I appreciate the SOA for its permission to use this material. The SOA, however, is in no way responsible for the structure or accuracy of the manual.

The last part consists an original practice exam, with questions based on the required study materials. Many of those questions are inspired by the past SOA GIFREU and CAS exam 6US. Although I have made a conscientious effort to eliminate mistakes in questions and answers, errors may exist. I encourage candidates who find errors to bring them to my attention. You can send your comments to my email address - syl9810@gmail.com. Any other feedback is also warmly welcome.

As a final suggestion, practice is important! Among all the reasons for failures, not taking past exams seriously is the No.1 issue. In addition to my mock exam, candidates are strongly encouraged to at least attempt the **2022 spring/fall and 2023 spring/fall GIFREU exams (which are intentionally excluded in this manual)** within the time requirement (and closed-book!) to achieve the maximum likelihood of passing.

I would like to thank Stephen Camilli, FSA and President of ACTEX Learning, for his insightful comments.

Best of luck with your studies!!!

Part I

General Insurance Financial Reporting Topics, 5th edition, Society of Actuaries

Chapter 1

Accounting Concepts for General Insurance

Learning Outcomes

(1a) Understand and apply the concepts of insurance accounting.

§1a Introduction

- Accounting addresses valuation and performance
 - Valuation deals with a company's assets, liabilities, and equity
 - Performance deals with the company's earnings and cash flows
- Financial statements may include
 - 2 primary financial statements in accounting:
 - * Balance sheet (BS): also referred to as the statement of financial position, addresses valuation
 - * Income statement (IS): also referred to as the statement of earnings or statement of profit and loss, addresses performance
 - Notes and disclosures
 - * Provide additional information that can assist the user of the financial statements in interpreting them
 - * Information may include accounting policies, reliability of estimates, key risks of the business and catastrophe exposure
 - The statement of changes in equity: report changes in equity over the reporting period breaking it down into its components (e.g., operating income or loss, capital injections or distributions, and direct charges to capital)
 - Cash flow (CF) statement
 - * To summarize flows of cash over reporting period
 - * It can be used to identify any potential issues with a company's ability to pay its bills in the short term
 - * Not important for general insurers (GI), as CF is generally not an issue for GI, since they receive premiums before paying claims and tend to have significant levels of liquid assets

- Accrual accounting is important for insurers, they don't use cash accounting
 - Cash accounting: income is recognized when cash is received, expenses are recognized when they are paid
 - Accrual accounting
 - * Income is shifted to better match earning patterns
 - * Expenses can be shifted to reflect the income
 - * Premium revenue is accrued, unearned premiums are deducted from written premium to form earned premium
 - * Losses are recognized when they are incurred, not when they are paid
 - Premiums (i.e., insurer revenue) are recognized as they are earned over the policy period
 - Losses (i.e., insurer expense) are recognized as they are incurred

§1b Accounting systems

- Accounting systems are geared to different purposes and to the different users of financial statements
 - Those users include corporate managers, investors, financial rating agencies and regulators
 - For insurers, also include policyholders
- Accounting systems differ in their valuation of assets and liabilities and have different patterns of recognizing underwriting income
- Attributes of accounting system
 - Reliable and unbiased
 - Consistent
 - Transparent and understandable
- Some typical systems
 - Generally accepted accounting principles (GAAP): SEC designates Financial accounting standards board (FASB) to set standards for GAAP
 - International accounting standards board (IASB) established International financial reporting standards (IFRS)
- National Association of Insurance Commissioners (NAIC) set the US statutory accounting (SAP) for insurers
 - Those are detailed within the NAIC Accounting Practices and Procedures Manual including the NAIC Statements of Statutory Accounting Principles (SSAP)
 - Individual states may include variations to U.S. statutory accounting
 - SAP was created to assist state insurance departments in regulating insurers for solvency, and is overseen by state insurance department
 - Main users of SAP is state insurance supervisor
 - SAP is a more conservative measure of solvency than GAAP
 - * SAP provide valuation on a liquidation basis (focus on solvency)
 - * GAAP is based on a going concern (focus on profitability)
 - * The conservatism of SAP provides a level of protection to policyholders and claimants against adverse fluctuations in an insurer's results

- * E.g. some assets are not admitted (such as goodwill, furniture)
- US insurers must also complete financial accounts on a US tax accounting basis as set by the Internal Revenue Service (IRS)
- IASB has issued IFRS 17 to replace IFRS 4 Phase II
- In Canada, financial reporting system has been based upon traditional GAAP, with modifications, which known as Canadian GAAP (CGAAP)
 - In 2006, the Canadian Accounting Standards Board decided to converge CGAAP to IFRS
 - IFRS 17 will now require Canadian insurers to change some practices from those used in CGAAP
- US has investigated but not set out any plans to adopt IFRS, US insurers will continue with
 - US GAAP: for reporting to the SEC
 - SAP: for reporting to state insurance supervisors
 - US tax accounting: for reporting to the IRS
 - As many US insurers are part of holding companies with global operations, they may need to use IFRS standards for operation in other countries

§1c Double-entry bookkeeping

- BS shows a company's value at a point in time
- IS shows the company's performance over a period of time
- Double-entry bookkeeping uses debits and credits to measure both value and performance
- Basic accounting equation that ties together the balance sheet and income statement
 - $\text{Assets} = \text{liabilities} + \text{equity} + \text{income}$
 - $\text{income} = \text{revenue} - \text{expenses}$
 - Hence, $\text{Assets} + \text{expenses} = \text{liabilities} + \text{equity} + \text{revenue}$
 - Increase to an asset or an expense, or a decrease to a liability, equity or revenue, represents a debit record (Dr)
 - Increase to a liability, equity or revenue, or a decrease to an asset or expense, represents a credit record (Cr)
 - When there is an increase (or decrease) to the left side of the equation, there must be a matching increase (or decrease) to the right side of the equation
 - Dr must always equal Cr in a bookkeeping transaction
- Firms use accrual accounting, which focuses on economic activity, not cash payments:
 - Receivables are like cash already received
 - Payables are like cash already paid

Example 1

Jacob mows a lawn, spends 15 on gas and receives 50 when the work is done. Jacob mows the lawn and buys gas on Sunday, but he is paid on Monday by the lawn owner and he pays the gas station on Monday.

		Dr	Cr
Sunday			
Cr: Income statement (revenue)	Mowing lawns		50
Dr: Balance sheet (asset)	Cash receivable	50	
Dr: Income statement (expense)	Gas for lawn mower	15	
Cr: Balance sheet (liability)	Cash payable		15
Monday			
Cr: Balance sheet (asset)	Cash receivable		50
Dr: Balance sheet (asset)	Cash	50	
Dr: Balance sheet (liability)	Cash payable	15	
Cr: Balance sheet (asset)	Cash		15

§1d BS and IS

- BS shows a firm's value: $\text{equity} = \text{assets} - \text{liabilities}$
- IS assigns revenue and expenses to periods: $\text{income} = \text{revenue} - \text{expenses}$
- By convention, the balance sheet typically shows the assets on the left side of the statement and liabilities and capital on the right side
 - An asset's value is the economic benefits it provides, measured by future cash flows and similar methods
 - Liabilities are the cash flows the insurer must pay
- For GI, typical assets/liabilities found in a balance sheet are

Assets	Liabilities
Cash and investments	Unpaid loss and loss adjustment expenses (L/LAE)
Receivables	Unearned premiums (UEP)
Reinsurance recoverable	Payables
Other assets (e.g., owned property)	Borrowed amounts

- The insurer's value (i.e., equity), computed as total assets minus total liabilities, generally consists of capital stock and surplus funds
- Value can be assessed in diverse ways
 - Each accounting system has developed a methodology for the valuation of BS items
 - For insurance companies, unpaid losses are usually the most significant liability item in BS
 - Unpaid losses are valued depending on valuation rates, and implicit accounting margins, explicit risk margins or explicit accounting margins
 - Diversity of valuation methodology for GI unpaid losses
 - * SAP and GAAP: nominal value (full value loss reserve)
 - * CGAAP: discount at investment yield on assets (adjusted for risk margins)
 - * US tax accounting: discount at mid-term risk-free rates with no margins
 - * IFRS 17 (both IASB and FASB): discounts unpaid claims at a company-specific rate

- † The rate is principle-based to reflect the risk characteristics of the insurance liabilities and not be based upon the financial instruments held by the insurer
- † The unpaid claims estimate is to include an explicit risk adjustment for insurance risk
- There can also be presentation differences: e.g. for reinsurance
 - * SAP: the unpaid L/LAE are displayed on a net-of-reinsurance basis on the liabilities side of the BS
 - * GAAP and CGAAP: the unpaid L/LAE are displayed before any reinsurance on the liabilities side of the balance sheet with any recoverable amounts on these unpaid amounts displayed on the asset side of BS
- For IS, many accounting systems split income into three components: underwriting, investment and other
- By convention, IS shows revenue on the left side and expenses on the right side
- IS helps investors and creditors predict future cash flows: An insurer that earned high income this past year is likely to earn high income the next year
 - Separating operating income from other income may improve the prediction
 - Operating income from the insurer’s normal activities is more likely to be repeated than operating income (or losses) from unusual events
- Typical IS items for GI

Underwriting Revenue	Underwriting Expenses
Premiums earned (EP)	L/LAE incurred
	Underwriting expenses incurred (acquisition and general operating expenses)

Investment Revenue	Investment Expenses
Investment interest earned	Investment expenses
Investment dividends earned	
Capital gains (losses)	

Other Revenue	Other Expenses
Finance and service charges assessed by insurer	Interest charged to insurer
Miscellaneous income	Dividends to policyholders
	Income taxes

- BS entries are in units that are different from IS entries
 - BS entries (assets, liabilities, surplus) are accumulations of value at year-end
 - IS entries (revenue, expenses) are flows of value during the year
 - Double-entry bookkeeping does not mix accumulations of value and flows
 - * Dr and Cr are flows, not accumulations of value
 - * Revenues and expenses are flows that result in Cr and Dr
 - * The change in an accumulation of value for a BS item from one year-end to the next is a flow during the year

- * An increase in an asset is a Dr, and an increase in a liability is a Cr
- o On IS:
 - * Cr are activities (revenue) that increase income, such as earning premium or investment income
 - * Dr are activities (expenses) that decrease income, such as incurring expenses or claims
- o Some IS entries are simply the change in the corresponding BS entries (e.g. an increase in premium deficiency reserves is a Cr on BS that is matched by an IS expense called increase in premium deficiency reserves)

§1d(i) Insurance terminology

- Accounting and insurance use the terms expenses and losses with different meanings
 - o Insurance losses are payments to claimants
 - o Insurance expenses are acquisition, underwriting, and LAE
 - o All these items are accounting expenses (operating costs)
 - o Accounting losses are non-operating costs

§1d(ii) Relationship between BS and IS

- As shown above, revenues, expenses, assets and liabilities are linked
- Each accounting system shows the same relation of loss valuation on the BS with loss recognition on the IS
 - o An accounting system that recognizes revenue more slowly also reports assets at lower values (or liabilities at higher values)
- The relationship between the BS and IS is that there is a mathematical correspondence of the derived equity (in BS: assets - liabilities; in IS: revenue - expenses)
- BS and IS articulation
 - o Change in equity from the current year's IS = change from the prior year's BS equity to the current year's BS equity
 - o For revenues, the simplified articulation expression is: $\text{Accrued revenue} + \Delta\text{liabilities} = \Delta\text{assets}$
 - * Accrued revenue is a CR on IS
 - * $\Delta\text{liabilities}$ is a Cr on BS
 - * Δassets is a DR on BS
 - * Articulation expression says that CR=Dr for any transaction

§1d(iii) Accounting for flows of value

- Flows of value are from operating income (revenue and expenses), non-operating income (gains/losses) and owners' transactions
 - o Revenue/expenses in IS are operating income of the firm, including both underwriting income and investment income
 - o Gains/losses are from non-operating activities (e.g. damage to an insurer's home office suffered in a fire)
 - o Capital disbursements (to owners) and capital contributions (from owners) are not income, leading to changes in assets and liabilities, with no revenue or expenses

* Thus, Cr and Dr appear on appear on BS, not IS

- Distinction between revenue/expenses and gains/losses differs by accounting system
- Within the IS, extraordinary items, nonrecurring items, and discontinued operations are separated from normal operating income, allowing readers to identify the basic, recurring operations of the firm to predict future income
 - Distinctions between normal income and nonrecurring, extraordinary or discontinued income can create issues
 - The FASB is seeking to undo the distinction between revenue/expenses and gains/losses by using comprehensive income, not net income, as the determinant of a firm's performance
 - GAAP includes revenue and expenses in the IS and places most gains and losses in other comprehensive income; net income + other comprehensive income = comprehensive income

§1e Accrual accounting

- Insurance contracts cover long periods, and premium is generally paid before the insurer provides most insurance protection
 - GI policyholders (PH) often pay the premium at the beginning of the policy period
 - Claims may be incurred at any time during the policy period actually and may be paid years later due to reporting lag and settlement lag
- If cash accounting were used, GI would show high income when a policy was written, followed by years of high expenses for any block of business
 - This does not reflect the true economic activity
 - Insurance contracts are measured by services provided, not by cash transactions
 - Accounting systems must estimate values and assign income to periods in order to provide a more appropriate measure of profitability
 - Income from the business of insurance is more appropriately measured by the insurance protection provided and the benefits or losses incurred in each period
 - Thus, insurance uses accrual accounting for income measurement
- Written premium (WP) is generally recognized at inception of the policy, whether it is paid in cash, billed to the insured but not yet paid, or not even billed
- Accounts receivable from PH and agents are assets, just like cash already received
- Money not paid but owed to others for insurance claims is treated as a liability
- Collected premium is in the cash flow statement, whereas accrued premium (earned premium, or EP) is on IS
 - Premium collected at the inception of a policy is prepaid
 - The insurer has the increase in cash (a Dr on BS) but has not yet provided insurance protection (a Cr on the IS)
 - Cash asset is offset by a BS liability called the unearned premium reserve (UEPR)
 - UEPR is a liability because the insurer has not yet earned the premium
 - If the insurer cancels the policy, it must return the unearned premium
 - As the insurance services are provided over the term of the policy, UEPR is reduced appropriately and the reduction is recognized as EP on IS
 - As premium is earned, EP (a revenue account) is credited, and the UEPR (a liability account) is debited

- Differences between EP and WP
 - Advance and prepaid premiums are not revenue
 - * If the insurer begins operations, UEP are deducted from WP to form EP
 - * If the insurer began operations in a previous year, the change in UEP is deducted from WP to form EP
 - Premium receivables are revenue, so the change in premium receivables is added to WP to form EP
 - * Premium receivables may be billed (agents' balances) or unbilled
 - * Unbilled premium receivables are generally from audits or from loss sensitive contracts (e.g., earned but unbilled [EBUB] and accrued retrospective premiums [ARP])
 - Accrued premium is matched to services provided
 - * Most insurance contracts use pro rata accrual of premium
 - * If the cost of coverage varies over the contract period, the premium accrual pattern may be matched to the cost of coverage pattern
- For insurance premiums, we have that: $EP = WP + \Delta \text{premium receivable} - \Delta \text{UEPR}$
- For losses: $\text{Incurred losses} = \text{paid losses} + \Delta \text{loss reserves} - \Delta \text{loss receivables}$
 - Loss receivables may consist of reinsurance recoverable, salvage and subrogation recoverable, and reimbursements expected on high-deductible policies
 - Loss reserves are of three types
 - * Case reserves for reported claims
 - * Bulk reserves for adverse development on reported claims
 - * Incurred but not reported (IBNR) claim reserves
 - Incurred losses in a calendar year (CY) do not depend on the type of reserve or the accident date of the claim
 - Loss reserves are not known with certainty, and random fluctuations distort the incurred losses
 - CY accounting assigns incurred losses to the period in which the money is paid, not the period when the claims occur

§1f CY, policy year (PY) and AY accounting

- Premiums and losses are estimates, can be revised as follows
 - Premium: by audit and retrospective premiums after the policy expires
 - Losses: may be revised as claims are investigated and settled
- CY accounting requires final figures at each valuation date
- PY and AY accounting change the figures at each valuation date
 - AY 20X5 losses at Dec. 31, 20X6 differ from AY 20X5 losses at Dec. 31, 20X5
 - CY 20X5 losses are final at Dec. 31, 20X5
 - Any changes in the loss estimates from that CY are allocated to subsequent CY based upon the calendar year in which the estimate changes
- Usage of CY, PY and AY
 - PY for performance measurement

- AY for reserve estimates
- CY for financial statements: CY figures only change if they reflect errors in accounting methods or material data errors
- Aggregation of PY data
 - Aggregated by the effective date of the policy
 - Premium and loss transactions related to a policy effective in 20X6 are coded to PY 20X6, even if the transaction occurs in a subsequent year
 - * PY 20X6 exposures are the exposures (e.g., sales, payroll) for policies issued in 20X6, not the exposures of PH in 20X6
 - * PY 20X6 EP stems from policies effective in 20X6, regardless of the periods covered by the policies or the dates the premium is collected
 - * PY 20X6 losses are losses stemming from policies effective in 20X6, even if the accident occurs or the claim is reported or the loss is paid in subsequent years
 - * PY premium is not earned evenly over the year, even if policies are written evenly through the year
- Aggregation of AY losses
 - Aggregated by the date of the accident
 - Claims occurring in 20X3 are AY 20X3 losses, regardless of when the policy is written, the claim is reported or the loss is paid
 - The analogue of accident year losses is exposure year premium, which allocates premium by the exposures covered
 - CY premium is like exposure year premium in that both allocate EP to the years when the exposures are covered
 - Difference occurs only when premium audits or retrospective premium adjustments are mis-estimated during the policy term

Example 1

If the policy from the previous illustration, written on Apr. 1, 20X4, has no premium audits, both CY and exposure year EP are 9,000 for 20X4 and 3,000 for 20X5. If the policy has an audit that is correctly estimated at 2,000 on Dec. 31, 20X4, both CY and exposure year EP are 10,500 for 20X4 and 3,500 for 20X5. If the 2,000 audit is incorrectly estimated as 6,000 on Dec. 31, 20X4, the final exposure year EP does not change, but the CY EP is 13,500 for 20X4 and 500 for 20X5.

- In general, CY 20X5 EP = estimated exposure year 20X5 EP at year-end 20X5 + changes to exposure year EP estimates for prior years made between year-end 20X4 and year-end 20X5
- CY 20X5 losses are estimated AY 20X5 losses at year-end 20X5 plus changes to AY loss estimates for prior years made between year-end 20X4 and year-end 20X5
- Reasons that using figures that do not develop (CY data) can't improve the accuracy rate indications:
 - CY premiums and losses do not develop, because they are fixed at the year-end valuation
 - * The premiums and losses do develop, but CY figures ignore the development
 - * Ignoring relevant information degrades the estimates
 - CY premiums and losses include current year re-estimates from older years that are not related to the experience of the years in question
 - * Including unrelated data degrades the estimates

- If premium is not subject to exposure audits or retrospective premium adjustments (e.g. personal lines insurance), CY EP = exposure year EP
 - For other lines (with audits or retrospective adjustments, e.g. workers compensation), those two premiums differ
 - However, insurers rarely compile exposure year data by state, territory or class, so they are of limited value
 - For these lines, insurers project future audits and retrospective premium adjustments at the end of each accounting period
 - If the projections are correct, or if the bias in the projections is the same each year, CY EP = exposure year EP
 - Ratemaking actuaries generally use either CY premium with AY losses or PY premium with PY losses
- AY results are important to actuaries and insurance regulators, so that statutory financial statements usually include some exhibits that display data on an AY basis

§1f(i) Effect of business growth/reserve adequacy on CY data

- Paid loss ratio = paid losses / WP
- Incurred loss ratio = incurred losses / EP
- When business volume grows, the incurred loss ratio is often greater than the paid loss ratio, since premium is collected before losses are paid
- AY and PY data are updated as more information is learned about premiums and losses
- CY data are not affected by events subsequent to the valuation date
- Consider a stable environment in which there is no change to business volume
 - If case reserve adequacy does not change, CY incurred losses equal CY incurred losses
 - if there is a one-time strengthening (weakening) of case reserves in the current CY, it will increase (decrease) the CY incurred losses
 - If the strengthening (or weakening) of case reserves is done consistently every year in a stable environment, calendar year incurred losses should remain stable
- However, if business volume grows or declines, even consistent reserve deficiencies or redundancies affect CY result
 - This is because of the influence of the more recent AY
 - Those AY comprise the greatest proportion of the reserves, changes its relative level to the total
- The following table summarizes the effect of consistent reserve deficiencies or redundancies on CY incurred losses in periods of changing business volume

Loss Reserves	Business Volume	CY Incurred Losses
Consistently Deficient	Growing	Understated
	Stable	Unbiased
	Declining	Overstated
Consistently Adequate	Growing	Unbiased
	Stable	Unbiased
	Declining	Unbiased
Consistently Redundant	Growing	Overstated
	Stable	Unbiased
	Declining	Understated

Example 1

Consider a simple scenario in which AY claims are paid fully in three CY as follows:

50% in the CY of the AY;

30% in the first following CY; and

20% in the second following CY.

At the end of any CY, total loss reserves consist of reserves from the current AY and the two prior AYs. Expected incurred losses are 1,000 for each AY. For CY 20X3, we have paid losses of 1,000 consisting of 500 paid from AY 20X3, 300 from AY 20X2 and 200 from AY 20X1. With consistently adequate reserves, both beginning and ending reserves are 700. As such, CY 20X3 incurred losses are 1,000 (CY paid plus change in reserves).

If reserves are consistently 20% redundant, paid losses do not change but the loss reserves change from 700 to 840. This is for both beginning and ending reserves. As such, even with reserves consistently 20% redundant, incurred losses are unbiased at 1,000.

Now consider 10% business volume growth with consistently adequate reserves. Expected losses for AYs 20X1 to 20X3 are 1,000 cu, 1, 100 and 1,210 respectively. We have the following for CY loss payments and year-end (YE) loss reserves by AY:

AY	Loss Payments					Loss Reserves	
	CY 20X1	CY 20X2	CY 20X3	CY 20X4	CY 20X5	YE 20X2	YE 20X3
20X1	500	300	200	0	0	200	0
20X2		550	330	220	0	550	220
20X3			605	363	242		605
Total			1,135			750	825

Therefore, under 10% growth and consistently adequate reserves, CY 20X3 incurred losses are 1,210 (CY paid plus change in reserves = 1, 135 + 825 - 750). This is unbiased because it is equal to the AY 20X3 incurred losses.

Finally, consider 10% business volume growth with reserves consistently 20% redundant. We have the following for CY loss payments and year-end (YE) loss reserves by AY:

AY	Loss Payments					Loss Reserves	
	CY 20X1	CY 20X2	CY 20X3	CY 20X4	CY 20X5	YE 20X2	YE 20X3
20X1	500	300	200	0	0	240	0
20X2		550	330	220	0	660	264
20X3			605	363	242		726
Total			1,135			900	990

Therefore, under 10% growth and consistently 20% redundant reserves, CY 20X3 incurred losses are 1,225, overstated by 1.2%.

§1g Computations of equity

- The recognition and measurement of financial statement entries (assets, liabilities, revenue and expense) differ by accounting system, so the computed equity differs by accounting system
 - If accounting systems differ in the measurement of an asset (e.g., fair value versus amortized cost of bonds), they also differ in the measurement of investment income
 - If they differ in the recognition of an asset (e.g., whether office furniture is admitted on BS) but don't differ in the recognition of depreciation expense, they have charges or credits to equity
- SAP places primary emphasis on BS and focuses on financial strength in adverse scenarios when the insurer is liquidated
 - It admits only those assets likely to be realized even if the insurer is liquidated
 - BS surplus is computed using a liquidation perspective
 - IS equity (PH's surplus, or PHS) is adjusted to match BS equity
- GAAP places primary emphasis on the IS focusing on investors' predictions of operating performance
 - It matches revenue and expenses to portray insurers' performance
 - it capitalizes and amortizes deferred policy acquisition costs so that BS equity equals IS equity
- IFRS places primary emphasis on the BS, using market values whenever possible
 - GAAP distinctions designed to provide a smoother pattern of income, such as amortization of bonds and recognizing only realized capital gains for stocks, are discarded in most instances (with exceptions)
 - BS computation of equity is primary, and IS follows by articulation
- On BS, equity (or surplus) is a residual after subtracting liabilities from assets
 - Statutory surplus = admitted statutory assets - liabilities
 - GAAP equity = net (after reduction of depreciation and bad debts) GAAP assets - liabilities
 - IFRS equity = fair value assets - fair value liabilities
- BS equation: $\text{assets} = \text{liabilities} + \text{equity}$, implies that $\Delta\text{assets} - \Delta\text{liabilities} = \Delta\text{equity}$, which solves for equity
- IS equation solves for change in equity: $\text{Ending equity} = \text{beginning equity} + \text{revenue} - \text{expenses}$
- Assuming all financial statement entries reflect operating income, double-entry bookkeeping forces the articulation of financial statements
 - Cr are revenue (IS), an increase in liabilities (BS) or a decrease in assets (BS)
 - Dr are expenses (IS), an increase in assets (BS) or a decrease in liabilities (BS)
 - For any operating activity, $\text{Cr} = \text{Dr}$, so the same is true for all activities combined: $\text{Cr} = \text{revenue} + \text{the increase in liabilities}$, which is equal to $\text{Dr} = \text{expenses} + \text{the increase in assets}$
 - Thus, $\Delta\text{assets} + \text{expenses} = \Delta\text{liabilities} + \text{revenue}$
 - This leads to that $\Delta\text{equity} = \Delta\text{assets} - \Delta\text{liabilities} = \text{revenue} - \text{expenses}$
- Articulation does not distinguish net operating income from other comprehensive income
- Other comprehensive income (gains/losses from investments classified as available for sale) creates direct charges and credits to equity (or surplus)
- IS shows operating performance and the statement of other comprehensive income shows non-operating transactions, both are the firm's performance

- However, transactions with owners are not performance (e.g. capital contribution by owners, or stockholder dividends)
 - Capital contributions and distributions do affect equity because they change the assets on BS, but they are not part of articulation expressions
 - Transactions with owners are direct charges and credits to surplus or equity

Practice questions

1. For a US general insurer, briefly describe the accounting systems that it may need to use.
2. Explain different valuation methodology for general insurers' unpaid losses.
3. Insurer A is expanding recently. According to its reserve department, the calendar year loss reserves are consistently redundant. Identify the adequacy of its calendar year incurred losses.
4. (SOA GIFREU 2014 spring Q1(a)) Describe the difference between cash accounting and accrual accounting.
5. (SOA GIFREU 2015 spring Q18) (a) Describe two U.S. statutory accounting rules, other than full value reporting of unpaid losses, that use the concept of conservatism to achieve the statutory accounting objective.
(b) Compare the two statutory accounting rules that you described in part (a) with the comparable rules under GAAP.
6. (SOA GIFREU 2016 spring Q18) (c) Identify the organization that establishes and oversees:
 - (i) U.S. generally accepted accounting principles (GAAP)
 - (ii) U.S. statutory accounting principles (SAP)
 - (d) Compare the emphases of U.S. GAAP and U.S. SAP in terms of balance sheet amounts versus income statement amounts.
7. (SOA GIFREU 2019 spring Q8, may require understanding of Ch 1–4) You are given the following information for a U.S. general insurance company:

A Assumed reserves from pools & associations

B Ceded reserves from retroactive reinsurance

C Ceded reserves from reinsurance that does not meet the risk transfer test

D Other ceded reserves (not retroactive or financial reinsurance)

E Statutorily permitted tabular discount on permanent disability workers compensation cases

F The insurer's best estimate of uncollectible reinsurance

Each of the items A to F in the table above may, or may not, belong in the statutory balance sheet. Possible balance sheet locations for these items may include, but are not limited to:

- contra asset on the assets section of the balance sheet,
- reinsurance recoverable on the assets section of the balance sheet,
- loss reserves on the liabilities section of the balance sheet,
- write-in liability on the liabilities section of the balance sheet,

Identify where each item belongs or does not belong in the statutory balance sheet.

Solutions to practice questions

1.
 - US GAAP: for reporting to the SEC
 - SAP: for reporting to state insurance supervisors
 - US tax accounting: for reporting to the IRS
 - As many US insurers are part of holding companies with global operations, they may need to use IFRS standards for operation in other countries
2.
 - SAP and GAAP: nominal value (full value loss reserve)
 - CGAAP: discount at investment yield on assets (adjusted for risk margins)
 - US tax accounting: discount at mid-term risk-free rates with no margins
 - IFRS 17 (both IASB and FASB): discounts unpaid claims at a company-specific rate
 - The rate is principle-based to reflect the risk characteristics of the insurance liabilities and not be based upon the financial instruments held by the insurer
 - The unpaid claims estimate is to include an explicit risk adjustment for insurance risk. overstated.
3. Since CY loss reserve is consistently redundant, whereas the insurer's business volume is growing, its CY incurred losses are
4.
 - Cash accounting: income is recognized when cash is received, expenses are recognized when they are paid
 - Accrual accounting
 - Income is shifted to better match earning patterns
 - Expenses can be shifted to reflect the income
 - Premium revenue is accrued, unearned premiums are deducted from written premium to form earned premium
 - Losses are recognized when they are incurred, not when they are paid
5. (a)
 - Non-admitted status for assets not available to fulfill policyholder obligations
 - Immediate expensing of acquisition costs (explained in Ch2)
 (b)
 - GAAP recognizes assets even if they cannot be used to fulfill policyholder obligations.
 - GAAP amortizes acquisition costs over contract periods. (explained in Ch2)
6. (c)(i) FASB oversees U.S. GAAP accounting.
 (ii) State insurance departments oversee U.S. SAP.
 (d)
 - U.S. GAAP emphasis is income statement for transparency of earnings (profitability) and comparisons between companies.
 - U.S. SAP emphasis is on balance sheet for solvency.
7. A. Loss Reserves liability
 B. Write in liability as a contra-liability
 C. Write-in deposit asset
 D. Loss Reserves liability as a contra liability

E. Loss Reserves liability as a contra liability

F. If it is greater than the calculated Schedule F provision, it is the Provision for Reinsurance liability otherwise it is not on the balance sheet.

Chapter 2

Accounting for Insurance Contracts

Learning Outcomes

(1a) Understand and apply the concepts of insurance accounting

(1b) Understand and compare different financial reporting standards for general insurers including: U.S. Statutory Accounting Principles (SAP), U.S. Generally Accepted Accounting Principles (GAAP), and International Financial Reporting Standards (IFRS)

§2a Introduction

- Insurance contracts may be measured in diverse ways:
 - Cash accounting vs. accrual accounting
 - Policy lifetimes vs. contract terms
 - Matching of revenue with expenses vs. actual incurral dates
 - Present values of cash flows vs. amortization of profit margins
- Contract boundaries distinguish long-duration vs. short-duration contracts in GAAP, and are critical for general measurement approach (GMA) vs. the simplified premium allocation approach (PAA) in IFRS 17
- Accounting systems for GI contracts must address issues:
 - When to recognize underwriting cash flows (e.g., premiums, expenses, insurance losses, and reinsurance)
 - How to value insurance liabilities and assets (e.g., loss reserves, reinsurance recoverables)
- For the recognition of premium cash flow:
 - GAAP, CGAAP and IFRS PAA recognize EP by the loss-incurral pattern and incur expenses by the premium earning pattern
 - SAP does not link premiums with acquisition expenses
 - The matching of expenses with premiums differs for GAAP, the two IFRS 17 measurement models, tax accounting and CGAAP

§2b Premiums

- Premiums are the primary source of revenue for GI, normally are prepaid

- Accrual accounting involves the earning of WP, so that revenue is recognized as protection is being provided over the policy term
- For policies with no audits or retrospective adjustments, $EP = WP - \text{the change in UEPR}$
- UEPR is a liability on the BS, if a policy is canceled during the policy term, the insurer returns the unearned portion of the policy premium to PH (less any contractual fees)
- EP are either a pro rata portion of WP or a portion based on the loss- incurral pattern
- For GI, the majority of business consists of one-year and six-month term policies

§2b(i) Earning patterns

- Accrued revenue (Cr in IS) = collected revenue (Dr in BS) + increase in accounts receivable (Dr in BS) - increase in accounts payable (negative increase in liability is Dr in BS)
- For insurance premiums, $EP = WP + \text{the increase in premium receivable (EBUB and ARP) - the increase in UEPR}$
- Under accrual accounting, revenue is recognized by the economic pattern of the activity, and economic pattern is defined in various ways
- The primary distinction is the amortization perspective of GAAP/SAP/IFRS 17 PAA vs. the fair value perspective of the IFRS 17 GMA
 - GAAP uses the insurance protection provided for GI (short duration) contracts
 - * Contracts with a constant amount of insurance have constant insurance protection (e.g. motor contracts have constant flows of EP)
 - * Contracts with varying exposure have varying EP over their term

Example 1

A consumer takes a 12-month auto loan of 120 on Jan. 1 with payments of 10 at the end of each month, and a credit insurance policy that pays the remaining balance if the payments are not made. The exposure is 120 in January, 110 in February, ... , and 10 in December. The total monthly exposure is $120 + 110 + \dots + 10 = 780$, so the premium is earned $120/780$ for the month of January, $110/780$ for the month of February, and so forth.

- IFRS 17 PAA retains the amortization perspective of GAAP with 2 modifications:
 - * Premiums are net of directly attributable acquisition costs
 - * Amortization follows the value of coverage or the value of the insurance services
 - † For insurance coverage exposed to natural catastrophes, the insurance protection is constant over the year, but the value of the insurance varies with expected losses due to seasonality
- IFRS 17 also changes the definition to the value of the coverage
 - * If the claim incidence varies during the year, so does the accrual pattern for the premium
 - * The claim incidence is seasonal in many lines of business, so IFRS 17 explicitly uses a pro rata pattern of accrual unless the claim incidence has a material difference

§2b(ii) Premiums and policy term

- EP depends on the coverage provided, not on the policy term
 - A change in the policy term does not affect the EP
- WP declines when policy term is shortened and increases when policy term is lengthened

- The decline or increase is temporary and it reverses in the next year
- UEPR depends on the policy term
 - If the effective dates are spread uniformly through the year, the premium in force at year-end equals the annual EP \times (the policy term/12 months)
 - A decline or increase from a change in the policy term is permanent, not temporary

Illustration: Premiums and policy term

Background An insurer that has been writing annual motor insurance policies with no exposure changes or rate changes. Policies are effective evenly through the year.

- In 20X5, the written premium is 100 million
- In 20X6, policies are converted to six-month terms at renewal
- No policies lapse, and no new business is written
- The insurer continues using six-month policies in 20X7

Compute the WP and EP for each of the CY 20X5 to 20X7 and the UEPR for each corresponding year-end.

CY 20X5 This period is a steady state with one-year policy terms.

- EP = WP = 100 million
- UEPR depends on the lag since the average effective date. If this lag is L and the policy term is T, the UEPR is $(L/T) \times$ premium in force = (6 months/ 12 months) \times 100 million = 50 million .

CY 20X6 This period introduces shorter policy terms. Premiums will be earned from one-year 20X5 written policies and six-month 20X6 written policies. We consider a division of the 20X5 written policies between those with effective dates in the first six months of the year versus those with effective dates in the latter six months of the year.

- If the 20X5 annual policy is effective in the first half of the year, it is renewed as a six-month policy in the first half 20X6 and again for a second six-month term in the second half of 20X6.
 - The 20X6 WP for the two six-month policies = the 20X5 WP for the single annual policy
 - The policy effective dates are spread evenly through the year, so the WP for these policies is 50 million
- If the annual policy is effective in the latter half of the year, it is renewed only once in 20X6 as a six-month policy in the latter half of the year
 - 20X6 WP for the six-month policy is half the 20X5 written premium for the annual policy
 - Since the policy effective dates are spread evenly through the year, the 20X6 WP for these policies is 25 million
 - Therefore, the total WP for 20X6 is 50 million + 25 million = 75 million
- EP depends on the coverage provided, not on the policy terms
 - The same insureds are covered in 20X6 as in 20X5, so the EP is 100 million
- The policies are distributed uniformly through the year, so the UEPR at Dec. 31, 20X6, is half the premium in force
 - All policies on Dec. 31, 20X6 are six-month policies
 - The premium in force is half the EP, or 50 million
 - The lag is three months, so the UEP at year-end are $1/2 \times$ 50 million = 25 million
- It is verifiable that
- EP = WP - Δ UEPR, as 100 million = 75 million - (25 million - 50 million)

CY 20X7 This period is also a steady state, but all policies are of six-month term with two renewals in 20X7: one in the first half of the year and one in the second half of the year.

- The total WP is 100 million
- EP stays at 100 million since the insurance coverage is the same in 20X7 as in 20X6
- UEPR is half the premium in force at year-end, i.e. $1/2 \times 50 \text{ million} = 25 \text{ million}$

§2b(iii) EBUB and ARP

- Premium collected at inception of the policy is prepaid, whereas protection is not yet provided
- Premium billed after the policy term pays for insurance protection already provided
 - Such premiums are earned during the policy term, even though the cash is not yet collected
 - The earned parts of the premiums (EBUB and ARP) are assets on BS
 - BS entries are CY figures, but they rely on PY estimates of ultimate premiums
- PY data are most important when audits and retrospective adjustments change the policy premium after the policy expires
 - CY premium uses the previous years' audits and adjustments and initial estimates for the current year
 - If the estimates differ from the actual audits and adjustments, loss ratios and rate indications are in error
- Commercial lines premiums charged at inception of the policies are generally based upon estimates of future exposures
 - Actual premium depends on audits of exposure over the policy term and may have retrospective adjustments based upon experience
 - PY premiums and losses are commonly used for pricing commercial lines subject to these adjustments
- For commercial lines, PY premiums and losses are not known with certainty until premium audits are booked and claims are settled
 - Financial reporting must balance older mature data, whose values are known with more certainty, against more recent, immature data, whose values may change significantly
 - For lines of business with slow claim emergence (e.g. casualty excess-of-loss reinsurance), up-to-date CY estimates are less useful, and some reinsurers prefer lagged financial statements

§2b(iv) Premium receivables

- Receivables like agents' balances have recognition criteria restricting when they are recognized
 - Both GAAP and SAP write off premium receivables that will not be collected
 - GAAP estimates bad-debt offsets for other premium receivables
 - SAP has formulas for nonadmitted assets
- A receivable is written off when the insurer concludes it will not be collected
 - Premium is an IS revenue when earned
 - Premium is an IS negative revenue (similar to an expense) when written off

§2c Underwriting and acquisition expenses

- These expenses include commission to agents/brokers, direct marketing costs, and various other expenses (applicable employee salaries and general expenses) required to underwrite and acquire the business
- Insurer expenses that are not for underwriting and acquisition include investment expenses and LAE
- Many underwriting and acquisition expenses are paid in advance of the insurance protection provided and are not refundable
- SAP has a liquidation perspective, and underwriting and acquisition expenses flow through the IS when they are incurred
- In contrast, most other accounting systems match the recognition of some underwriting and acquisition expenses with premium revenue

§2c(i) Matching underwriting and acquisition expenses with premium

- Accrual accounting shifts the recognition of premium and losses to match the insurance protection (GAAP) or services provided (IFRS 17) by the insurer
 - Loss incurral pattern is expected to be approximately even over the policy term
 - IBNR loss reserves are posted evenly over the year
 - Premiums are earned evenly over the year
- GAAP and IFRS accounting have going-concern perspective
 - GAAP capitalizes and amortizes expenses to acquire new and renewal policies
 - * Capitalizing a cost means creating an asset (Dr on BS), named deferred acquisition cost (DAC)
 - * Amortizing a cost means converting the balance sheet asset into an IS expense according to a schedule as premium is earned
 - * For most policies, the insurance protection is provided evenly over the policy term, so premium is earned pro rata
 - * IS is primary, and BS values are determined by articulation

Example 1

An annual policy issued on April 1, 20X4, has premium of 100 collected on April 1 and acquisition expenses of 20 paid on April 1. If expected loss incurral pattern is even over the policy term, three-quarters of the premium is earned by year-end and three-quarters of the acquisition expenses are written off by year-end. IS shows the pattern of revenue and expenses: 0% at policy inception and 75% by year-end. We determine the BS values by articulation:

At April 1, 20X4, 100 of premium has been collected but none has yet been earned. The policy has no premium receivables. Under GAAP, the articulation expression gives:

Earned premium (0) = premium collected (100) + receivables (0) - Δ UEPR, thus Δ UEPR = 100.

Incurred expenses (0) = expenses paid (20) + expenses payable (0) - Δ DAC, thus Δ DAC = 20.

At Dec. 31, 20X4, 100 of premium has been collected three-quarters has been earned. Articulation gives:

Earned premium (75) = premium collected (100) + receivables (0) - Δ UEPR, thus Δ UEPR = 25.

Incurring expenses (15) = expenses paid (20) + expenses payable (0) - Δ DAC, thus Δ DAC = 5.

- * GAAP presentation of DAC has a drawback: it capitalizes an imaginary asset to match expenses with premiums
 - † DAC is an accounting construct, rather than a tangible item, created solely to match expense and revenue patterns
- o IFRS 17 has a margin presentation to amortize acquisition costs
 - * The excess of the premium over the benefit and expense costs (the margin) is amortized over the policy period
 - * Under IFRS, premiums are earned pro rata unless the value of the coverage differs materially
 - * In such a case, they are earned in proportion to the value of the coverage (the expected loss-incurred pattern)

§2c(ii) Directly attributable expenses

- Amortizing underwriting and acquisition expenses is more difficult than premium, since many of these expenses are not easily related to specific policies
- Accounting systems have guidelines (e.g., GAAP [ASC 944/FAS 60] and IFRS 17) that explain which expenses are amortized over the policy term and which are written off when they are incurred
- Accounting systems have rules for insurance contracts providing definitions of which costs are directly attributable and, as such, deferrable
- Not-Taken Costs
 - o FASB says that the expenses incurred preparing bids for policies that are not written are written off immediately, since they did not result in policies
 - o IASB says that the total underwriting activity of preparing bids is necessary for writing these policies, so the total cost of preparing bids is matched to the revenue from writing the policies
- Expenses to Third Parties
 - o Expenses paid to persons writing or selling policies, such as underwriting salaries and sales commissions, are clearly deferrable
 - o Expenses paid to others as a percentage of WP are less clear (e.g. state premium taxes, state guaranty fund assessments, and rating bureau fees)
 - o FASB says these expenses are like salaries and commissions and can be deferred
 - o IASB says that these expenses are not paid to acquire the policies, so they cannot be deferred

§2c(iii) Illustration: Accounting for premiums, commissions and losses

Background On July 1, 20X1, annual premium of 1,000 is collected and 200 is paid to the agent. A loss in the amount of 600 occurs on Aug. 1, 20X1, and is paid on Oct. 1, 20X1. The treatment of GAAP and SAP are described.

July 1, 20X1:

- Premium is collected before insurance protection is provided, so the cash increase (Dr on BS) is offset by a UEPR (Cr on BS). No revenue is reported on IS
- Commission paid is a cash decrease (Cr on BS)
- SAP has an offsetting expense (commission expense) on the IS
- GAAP sets up a DAC as an asset on the BS as the offsetting Dr to the decrease in cash

- GAAP IS has no entries and BS entries offset each other, so GAAP equity does not change
- For SA, surplus decreases by 200, since:
 - On BS: 200 less assets than liabilities
 - On IS: 200 more expenses than revenue

Aug. 1, 20X1:

- Both GAAP and SAP allocate loss expense to the date the loss occurs, not the date it is paid
- The incurred loss is a Dr on IS offset by a Cr on the BS of a case reserve

Oct. 1, 20X1:

- The loss reserve is taken down (Dr), and cash is paid (Cr)
- If the cash paid equals the loss reserve, IS is not affected
- If the cash paid does not equal the loss reserve, the excess of the cash paid over the loss reserve is an incurred loss on IS
- In practice, only the case reserve is affected when the loss is paid, and the bulk reserve is determined by the reserving actuary at year-end

Dec. 31, 20X1:

- Half the policy has expired by year-end, so $1/2 \times 1,000 = 500$ is EP on the IS (Cr), offset by a $1/2 \times 1,000 = 500$ reduction in the UEPR (Dr)

Dec. 31, 20X1:

- Half the policy has expired by year-end, so $1/2 \times 1,000 = 500$ is EP on the IS (Cr), offset by a $1/2 \times 1,000 = 500$ reduction in the UEPR (Dr)
- SAP expenses the commission through the income statement when it is paid (no change here)
- GAAP expenses the commission as premium is earned: 50% of premium is earned in 20X1 so 50% of commission is incurred
- Thus, half the DAC is taken down (Cr) and is offset by commission expense (Dr on IS)

Jan. 1, 20X2:

- Premium is written for 1,000
- Expenses of 200 are incurred and paid.
- Cash flows are the same for GAAP and SAP: cash inflow of 1,000 (WP) and cash outflow of 200 (commission)

§2c(iv) Illustration: Accrual accounting and receivables

Background: On May 1, 20X2, an insurer writes a policy with a premium of 3,000 and a 25% commission; it collects 2,000 from the agent. The agent's commission is $25\% \times 3,000 = 750$, and the agent should have paid $3,000 - 750 = 2,250$ to the insurer.

- This results in a receivable from the agent in the amount of 250
- It is a good asset under GAAP if it is expected to be received
- It is a good asset under SAP until it is more than 90 days past due

		Dr	Cr
Dr: Balance sheet (asset)	Cash	2,750	
Dr: Balance sheet (asset)	Agents' balances	250	
Cr: Balance sheet (liability)	UEP		3,000
Cr: Balance sheet (asset)	Cash		750
Dr: Balance sheet (asset)	DAC (GAAP)	750	

- Under SAP, there is no DAC asset, and Dr of 750 is on IS for commission expense

§2c(v) Revenue and expense articulation expressions

- Articulation works in 2 directions
 - May amortize premiums and expenses over contract periods, deriving UEP and DAC at valuation dates, and amortize real estate and bond income over holding periods to derive book values
 - Alternatively, may use fair values of claims or taxes to derive incurred losses or accrued taxes, or may use market values of common stocks or bonds to derive investment income from these securities
- Articulation expression has several equivalent forms, using slightly different terms
 - Expenses are negative revenues, cash outflows are negative cash inflows, and liabilities are negative assets
 - Accrued revenue in the articulation expression need not flow through IS
 - For SAP, realized capital gains flow through the IS and unrealized capital gains are a direct credit to surplus, but they are treated equally in the articulation expression
 - GAAP shows unrealized capital gains in other comprehensive income
 - IFRS for Financial Instruments (IFRS 9) shows unrealized capital gains as part of profit and loss
 - The articulation expression does not distinguish other comprehensive income from profit and loss (income)
- Income from bonds is coupons and principal received plus the change in the book value of the bonds
 - If bonds are carried at fair value, the change in the book value is the change in market value
 - If bonds are carried at amortized cost, the change in book value is the amortization of premium or discount
 - Identical bonds with different BS valuations have different IS revenue
- For expenses, the articulation expression is: $\text{Accrued expenses} = \text{cash outflows} - \Delta \text{noncash assets} + \Delta \text{noncash liabilities}$
- For most simple transactions, this is: $\text{Incurred expenses} = \text{paid expenses} + \Delta \text{accounts payable} - \Delta \text{accounts receivable}$

§2c(vi) Insurance losses

- Insurance losses on IS articulate with paid losses on the cash flow statement and with loss reserves and loss receivables on BS
 - The accounting relation is: $\text{Incurred losses} = \text{paid losses} + \Delta \text{loss reserves} - \Delta \text{loss receivables}$

- Loss reserves are of three types: case reserves for reported claims, bulk reserves for adverse development on reported claims, and IBNR reserves
- Incurred losses in a CY do not depend on the type of reserve or the accident date of the claim
- Loss receivables are reinsurance recoverables, salvage and subrogation recoverables, and employer reimbursements expected on high-deductible policies
 - * They are coded as assets in GAAP and IFRS
 - * SAP these receivables as offsets to the direct loss reserves if the claims have not yet been paid and as separate assets if the direct losses have already been paid to claimants
 - * Receivables estimated by aggregate actuarial methods are often coded as offset to direct loss reserves (e.g. anticipated salvage and subrogation)
- Loss reserves are not known with certainty
 - Random fluctuations distort the incurred losses
 - CY accounting assigns incurred losses to the period in which the money is paid and the reserves increase or decrease, not the period when the claims occur
- SAP shows most loss reserves and loss receivables at nominal values
 - For claims reported at discounted values, such as permanent disability claims with tabular discounts, the accrual (unwinding) of interest is reported as incurred losses

§2c(vii) Fair value unpaid losses: Accrual of discount

- US tax accounting, CGAAP, and IFRS use present values of unpaid losses (i.e., discounted unpaid losses)
- SAP and GAAP generally use full unpaid losses (i.e., undiscounted unpaid losses) but permit present values for certain types of unpaid losses (e.g., workers compensation tabular indemnity reserves)
- Each system has its own rules as to how the present value of unpaid losses should be computed
 - US tax accounting freezes the discount rate for each AY at the beginning of the AY, regardless of market interest rates in subsequent years (discussed in detailed in Ch15)
 - Therefore, if the interest rate was 5% at the beginning of AY 20X1, the discount rate for all AY 20X1 claims is 5% in all subsequent CY
- The presentation of the accrual of interest versus the effect of a change in the discount rate reflects operating income versus other income
 - Accrual of interest is operating income (for GAAP, this is offset to investment, not underwriting income) and flows through IS just as the investment income from the bonds backing the loss reserves
 - Change in the present value of the fulfillment cash flows from a change in the discount rate is not an expected event and is treated as other comprehensive income, not as part of operating income
 - This distinction is consistent with GAAP ASC 320 (FAS 115)
 - * Bonds available for sale are valued at market rate on BS, but whose unrealized capital gains/losses are included in other comprehensive income, not in IS
 - * Under IFRS 9, the category of “available for sale” no longer exists, and bonds are measured either at amortized cost or at fair value, with all gains and losses flowing through the IS

§2d Reinsurance recoverables

- Reinsurance creates accounting entries that are the reverse of those created by direct insurance
 - The direct insurance policy is a Dr to cash and a Cr to UEPR
 - The reinsurance policy is a Cr to cash and a Dr to the UEPR
- Several items complicate the accounting
 - Reinsurance is costly
 - Accounts differ for direct versus ceded business
 - The direct insurance contract must be fulfilled even if the reinsurer does not pay its portion
 - Reinsurance recoverables must be reduced for bad debts (GAAP), a formula for uncollectible reinsurance recoverables (SAP), or for credit risk (IFRS)
- Strong arguments exist for and against offsetting of reinsurance with direct insurance on the same exposures
- SAP follows the economics of insurance business
 - SAP shows the receivables as assets if the direct loss has already been paid and as contra-liabilities if the direct loss is still unpaid
 - An insurer writes a block of business for 10 million of premium and buys 40% pro rata reinsurance for 4 million of premium
 - It shows net written premium of 6 million: a 6 million Dr to cash, and a 6 million Cr to UEPRs
- GAAP follows legal offsetting rules
 - Primary insurer has no legal right of offset: It cannot reduce its liability because the reinsurer does not pay its portion
 - GAAP therefore shows all reinsurance recoverables, both unearned premiums and unpaid losses, as separate assets
 - In the example above, the primary insurer shows a 10 million UEPR and a 4 million asset for unearned premiums recoverable from reinsurers

§2d(i) Illustration: Accounting for reinsurance recoverables

Background: On May 1, 20X2, a primary insurer buys a 400,000 excess of 100,000 reinsurance contract for its 3,000 premium policy with a reinsurance rate of 15%.

- SAP credits cash $15\% \times 3,000 = 450$ and Dr the UEPR 450
- The net written premium is $3,000 - 450 = 2,550$ and the net UEPR is 2,550

BS Assets	Dr	Cr	BS Liabilities and Equity	Dr	Cr
Primary: Cash	3,000		Primary: UEPR		3,000
Ceded: Cash		450	Ceded: UEPR	450	
Net: Cash	2,550		Net: UEPR		2,550

- GAAP maintains separate accounts for direct and ceded reinsurance, since no legal right of offset exists

BS Assets	Dr	Cr	BS Liabilities and Equity	Dr	Cr
Primary: Cash	3,000		UEPR		3,000
Reinsurance: Cash		450			
Reinsurance: Recoverable	450				

§2d(ii) Ceding commissions

- Excess-of-loss reinsurance provides risk transfer
 - The cost of reinsurance pays for the lower risk, allowing the primary insurer to write more business, hold less supporting capital, and cover larger exposures
- Pro rata reinsurance helps manage capital, providing an accounting benefit (surplus relief) to the primary insurer
 - Capital management relies on reversing the accounting entries that cause the initial charge to surplus
 - Pro rata reinsurance has a premium equal to the pro rata portion of the direct insurance premium minus a ceding commission that is offset to the direct insurance commission expense

Illustration: Accounting for ceding commissions

Background On May 1, 20X2, the primary insurer buys a 50% quota share reinsurance contract with a 20% ceding commission.

- The reinsurance premium of $50\% \times 3,000 = 1,500$ is a Cr to cash (for the primary insurer) and a Dr to UEPRs
- The ceding commission of $20\% \times 1,500 = 300$ is a Dr to cash and a Cr to commission expense
- Under SAP, the reinsurance UEPR is an offset to the direct UEPR and the reinsurance ceding commission is an offset to commission expense

BS Assets	Dr	Cr	BS Liabilities and Equity	Dr	Cr
Cash (for reinsurance)		1,500	UEPR	1,500	
Cash (from reinsurance)	300				
IS			Dr Cr		
			Commission expense		300

- For GAAP, the reinsurance ceding commission is an offset to the DAC, not commission expense
- The reinsurance recoverables are separate assets, not offsets to the direct business liabilities

BS Assets	Dr	Cr	BS Liabilities and Equity	Dr	Cr
Cash		1,200			
DAC		300			
Reinsurance recoverable	1,500				

§2e PH dividends

- PH dividends differ from other operating expenses in that they are discretionary and dependent on insurer earnings
 - GAAP uses going-concern: accrues expected PH dividends as BS liability and flows the change in estimates through IS
 - SAP uses liquidation perspective: financially distressed won't pay PH dividends
- Incurred dividends = paid dividends + Δ dividends reserves
- GAAP and SAP differ in the recognition of policyholder dividends
 - SAP assumes no PH dividend liability until they are actually declared and accrues only paid dividend

- GAAP estimates and accrues expected dividends at year-end, assuming the insurer continues as a going concern as expected in its business plan

§2f Accounting for income taxes

- Income taxes are hard to analyze
 - Tax accounting differs
 - Taxes are computed for consolidated entity
 - Differences between taxable income and book income cause deferred tax assets (DTA) and liabilities (DTL), which differ across accounting systems
- Tax accounting terminologies differ from general accounting, and “deferred taxes” for the tax effects of differences between tax accounting and SAP
- Estimated taxes are often paid in advance, and taxes paid during the year include taxes relating to past years
- Current taxes (are taxes owed for current year) = paid taxes – tax refunds + Δ taxes owed but unpaid – Δ tax recoverable
- On BS, tax owed but unpaid is liability and tax recoverable is asset
- Tax payment/refunds are on cash flow statement, and current taxes are on IS
 - Current taxes are CY figures
 - They are best estimate of tax liability for the most recent year + change in estimates for previous years
 - “Current” means that the tax is already due (not deferred, not tax stems from operations in the most recent year)

§2f(i) Deferred taxes

- DTA/L is timing differences between book and tax accounting
 - DTL is additional tax that would be paid if book accounting is used
 - Timing differences for IFRS 17 is almost 0
- Tax accounting for insurers is based on SAP with specific differences, creating clear deferred taxes
 - 3 activities that can cause DTA/L
 - * Unrealized capital gains and losses
 - * Writing new business giving rise to UEPRs
 - * Reporting loss reserves
 - SAP underwriting income has two implicit accounting margins
 - * The prepaid expenses in the UEPRs
 - * The implicit interest discount in the undiscounted loss reserves
 - Tax accounting has neither margin, so the tax basis reserves are lower, the taxable income is higher and the tax liability is greater
 - Thus, the insurer has a DTA that will reverse in subsequent years

§2f(ii) Tax basis reserve discounting in the US

- SAP uses nominal value (no discount)
- Tax accounting use discount rates based on high-quality bonds and no margin
- Tax accounting computes incurred loss as paid loss + the change in discounted loss reserves
- Incurred losses are offsets to taxable income, i.e. the tax rate multiplied by the tax basis incurred loss is a refund of other taxable income
- If taxable income is greater (lower) than statutory income initially and reverses in subsequent years, the insurer has a DTA (DTL)
- For loss reserves, the tax basis underwriting income is greater in the first year, so it is less in subsequent years

§2f(iii) Revenue offset in US

- SA has no DAC but immediately deducts expenses
- Hence, for current CY, SA income < GAAP income or economic income
- Tax accounting creates DAC = 20% of WP
- DAC offsets the expense evenly along policy term
- Hence, EP under tax accounting > (<) EP under SAP in first (second) CY for all annual policies
- Assuming policies are written evenly through the year and business growth is not material, UEPRs are about half of earned
 - With 21% tax rate, DTA from revenue offset is about $21\%/2 \times 20\% = 2.1\%$ of EP

§2f(iv) Changes in DTA/L

- DTA/L are shown on BS, and their changes are shown as direct charges/credits to surplus under SAP, and on IS or other comprehensive income under GAAP
- Accrued tax = current tax + Δ DTL – Δ DTA
- GAAP use nominal loss reserve, so it shows the same DTA for loss reserve discounting as SAP
- IFRS 17 discounts loss reserves, differs in 3 way from tax accounting
 - Tax accounting uses high-quality bond yields, whereas IFRS 17 uses current market yields for a replicating portfolio of the same liquidity
 - Tax accounting uses high-quality bonds of specified durations, whereas IFRS 17 uses the same currency and duration as the loss reserves
 - Tax accounting freezes the discount rates as the long as the claims are on the books, whereas IFRS 17 changes the discount rate to the current yield at each valuation date

§2g Premium liabilities and premium deficiency reserves (PDR)

- Premium liabilities are associated with the unexpired policies and are supported by UEPR, and are not shown on BS
- They are determined on a prospective basis both net and gross of expected reinsurance recoveries
- PDR is required by both GAAP and SAP when the net UEPRs are less than the net estimated premium liabilities
 - Insurers are permitted, but not required, to consider investment income in the PDR calculation
 - PDR is a write-in liability on BS

- PDR is referred to as onerous contract liability in IFRS 17, with the following differences
 - Cost must be directly attributable to insurance contracts
 - It is more common than premium deficiency reserve in GAAP, since Insurance portfolios are more narrowly defined in IFRS 17
 - Expected investment income is replaced by the implicit interest discount in unpaid loss
 - Under GAAP, insurer chooses whether to include investment income, whereas under IFRS 17, valuation of unpaid loss follows the method used for the portfolio
- Basis of PDR
 - SAP: SSAP 53 paragraph 17 states this is on a grouping-of-policies basis in which the grouping is “in a manner consistent with how policies are marketed, serviced and measured”
 - IFRS: this is on each portfolio of insurance contracts
- Treatment of PDR: GAAP vs. SAP
 - Costs
 - * SAP: include expected L/LAE, unpaid acquisition costs and maintenance costs
 - * GAAP: include the above plus DAC and expected PH dividends
 - Liability or Asset:
 - * SAP: established directly as a liability
 - * GAAP: PDR first reduces the DAC asset, and a liability is established only if the PDR computed is greater than the DAC asset, as the amount in excess of the DAC asset
 - Disclosures
 - * SAP: specific disclosure required in the Notes to Financial Statements (Note 30)
 - * GAAP: no requirement

§2g(i) Illustration of premium deficiency reserves

Background

Items	Amount
UEPR	100,000
Maintenance cost ratio	0.05
DAG ratio	0.25
(L/LAE) ratio-three scenarios	75%, 100%, 125%
Discount factor	0.93
Expected PH dividends	0

Under GAAP

	Scenario 1	Scenario 2	Scenario 3
1 UEPR	100000	100000	100000
2 $L/LAE=(1) \times L/LAE$ ratio	75000	100000	125000
3 Maintenance cost= $(1) \times$ cost ratio	5000	5000	5000
4 PH dividends	0	0	0
5 Present value of expected costs= $[(2)+(3)] \times$ discount factor	74400	97650	120900
6 DAC	25000	25000	25000
7 Expected profit= $(1) - (5) - (6)$	600	-22650	-45900
8 PDR	0	22650	45900

- PDR calculated in the table above is not what is booked as the liability under GAAP, but a calculation for a block of business
- DAC asset and the PDR liability are booked on an overall company basis
- Assume that only the block of business is written
 - Scenario 1: no change on DAC
 - Scenario 2: DAC reduces from 25,000 to 2,350 = 25,000 - 22,650
 - Scenario 3: DAC reduces to 0 and a liability for PDR would be set up for 20,900

Under SAP

	Scenario 1	Scenario 2	Scenario 3
1 UEPR	100,000	100,000	100,000
2 L&LAE	75,000	100,000	125,000
3 Maintenance cost	5,000	5,000	5,000
4 Present value of expected costs	74,400	97,650	120,900
5 Expected profit $[(1) - (4)]$	25,600	2,350	-20,900
6 PDR	0	0	20,900

- For both SAP/GAAP, PDR is to be calculated for blocks of business
- A profitable block of business (which could be viewed as having a negative PDR) is not permitted to be used to reduce the PDR from an unprofitable block

Premium liabilities calculation

- PDR is determined net of reinsurance and adjustable features (e.g. audit premiums, reinstatement premiums, variable commissions and retrospective rating)
- Calculation of L/LAE can be done in various ways (as discussed in GIIRR readings), shown above is the expected ratio approach

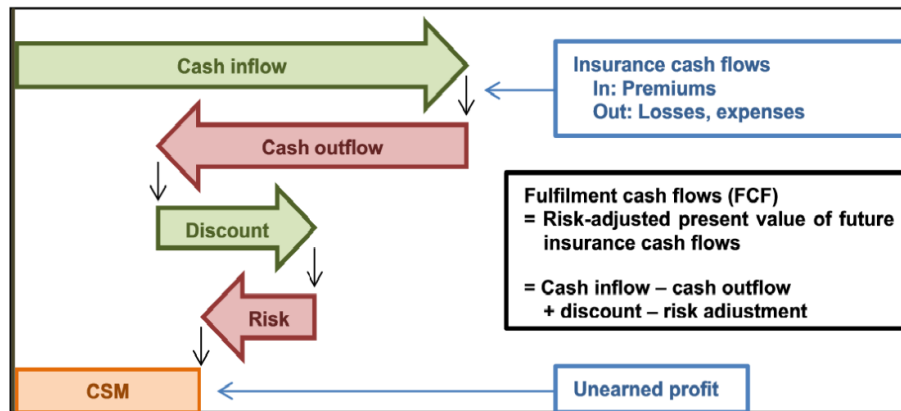
§2h IFRS 17–Accounting for insurance contracts

- IFRS 17 is not an entity-specific but contract-specific standard
 - It applies to all insurance contracts not insurers
 - Definition of insurance contract

- * A contract under which one party (the issuer) accepts significant insurance risk from another party (PH) by agreeing to compensate PH if a specified uncertain future event (the insured event) adversely affects PH
- Contracts that do not significantly expose to insurance risk would not fit the definition of an insurance contract under IFRS 17
 - * For example, a contract that only exposes to financial risk (e.g., risk of change in interest rate, currency exchange rates, credit ratings, etc.) would be accounted for as a financial instrument using IFRS 9
- A contract that contains both an insurance component and an investment component must separate the components so each can be accounted for under the proper IFRS standard
- IFRS 17 requires the valuation of the insurance cash flows to be on a current risk-adjusted present value (PV) basis
 - PV of future insurance cash flows: adjusted for risk and discounted at market-consistent discount rates
 - The measurement model for insurance contracts is described as a current measurement model
 - This differs from fair value measurement in that the company issuing the financial statement uses its own estimates for cash flows and risk adjustment, not a value based on what the market would estimate

§2h(i) Accounting model of IFRS 17

- For IFRS 17 GMA, accounting on BS is the sum of 2 components
 - The fulfillment cash flows: the current estimate of amounts that the insurer expects to collect from premiums and pay out for claims, benefits and expenses, including an adjustment for the timing and risk of those cash flows
 - The contractual service margin (CSM): the expected profit for providing future insurance coverage (i.e. unearned profit)
- Liability = the liability for incurred claims (LIC) + the liability for remaining coverage (LRC)
 - LIC is comparable to unpaid loss reserves
 - LRC is the liability from the unearned portion of insurance contracts
 - Only the LRC has a CSM, since CSM is for future coverage
- Fulfillment cash flows (FCF) = PV(future insurance cash flows) + a risk adjustment
 - PV(future insurance cash flows) = the total value of future insurance cash flows - the amount of discount for the time value of money
- In addition to the default option of GMA, there are 2 alternatives
 - Variable Fee Approach (VFA): a modification of the GMA and is required to be used for “direct par” contracts (not related to GI)
 - PAA: a simplification of the GMA and may be applied to short-term contracts (i.e., those with policy terms of one year or less), such as most GI policies
 - * Under the PAA, an approach similar to UEP is used instead of the GMA for the LRC
- On BS, IFRS 17 insurance contract liability is: $LRC + LIC = [FCF_{RC} + CSM_{RC}] + FCF_{IC}$
 - FCFs are reported at current value, and the discount rate and the risk adjustment must be updated at each reporting period
 - Changes in the discount rate and risk adjustment for business from the reporting period, and prior periods, is recognized as profit/loss



Source: *General Insurance Financial Reporting Topics, 4th edition*

- Changes in the discount rate and risk adjustment for future business is an adjustment to the CSM
- IS for a CY:
 - Insurance Revenue (Cr)
 - * Revenue for coverage provided in the year
 - * Revenue for release of risk adjustment in the year
 - * Revenue for release of CSM in the year
 - Insurance Expenses (Dr)
 - * Expected claims and insurance expenses for coverage provided in the year
 - * Changes in insurance cash flows and risk adjustment for coverage provided in the year and in prior years
 - Insurance Finance Expenses (Cr)
 - * Unwind of discount rate
 - * Changes in discount rates
 - Insurance finance expenses are kept separate from the insurance service result
 - They could be shown along with other financial results (e.g investment income and capital gains/losses)
 - May also be reported as other comprehensive income

§2h(ii) Components of IFRS 17 GMA

- 4 components:
 1. Insurance cash flows: total values of unbiased estimate and probability weighted cash flows including premiums collected, claims paid and expenses paid
 2. Discount: market consistent risk-free rate + liquidity premium to discount component 1
 3. Risk adjustment: for nonfinancial risk only, in the estimate of future cash flows (i.e., timing and amount), to be re-estimated at each reporting period, and reflect diversification benefit and risk aversion
 4. CSM: reflect unearned profit (PV), adjusted for risk

Component 1: Insurance cash flows

- Consist of the premiums, claims and insurance service expenses directly attributable to the insurance contracts
- Estimate of the future insurance cash flows is to be unbiased: a probability-weighted mean across the full range of possible outcomes
- Estimate is to be current, reflecting conditions at the measurement date with explicit amount and no risk adjustment
- Estimated future insurance cash flows are to be within the contract boundary
 - Include the insurer's obligations for insurance contracts at the measurement date
 - For incurred claims and remaining (not for unwritten) coverage
- Expenses that can be amortized are those that are directly attributable to the contract or that can be associated with writing the contract
 - Exclude expenses of direct-mail distribution systems
 - Include premium taxes and assessments can be allocated to particular policies (they are not direct costs of writing the policies)
 - Include not-taken costs
 - Exclude income tax
- General expenses (e.g. overhead and executive salaries) are allocated by formula, not directly attributable to the insurance contracts and are written off when incurred
- Many other expenses are paid from capital and surplus funds (e.g. costs of building distribution systems) are not directly attributable to the insurance contracts and are written off when incurred

Component 2: Discount

- IFRS 17 sets the discount rate for unpaid losses by the attributes of the liability, not entity-specific attributes
- IFRS 17 does not prescribe how to derive the loss reserve discount rates, other than the general principles
 - Unrelated to contract premium or the assets backing unpaid losses or the risk aversion of the insurer
- 2 approaches to select rates
 - Bottom-up: adds illiquidity premium to highly liquid risk-free rates
 - * Should be based on a risk-free yield curve for risk-free rates
 - * Considerations for illiquidity premiums
 - † Robust and that should be able to be applied reliably over time and under a variety of market conditions
 - † Use available market data (e.g., credit default swap spreads) when deducting a credit or default allowance from observed asset yield rates
 - Top-down: subtract market risk premiums and credit risk premiums from risky asset portfolios
 - * Should use a portfolio of bonds and other fixed-income securities that reflect the characteristic of the insurance cash flows to be discounted, not to include equities
 - No requirement in IFRS 17 to reconcile the 2 approaches

Component 3: Risk adjustment

- The purpose is for bearing uncertainty about the amount and timing of the cash flows that arises from non-financial risk
- It is entity-specific and accounts for entity's benefits of diversification
- Although no specific technique is required, IFRS 17 guidelines the following
 - Adjustment is higher for low frequency/high severity insured events as compared to high-frequency/low-severity insured events
 - Adjustment is higher for contracts with a longer duration (all other factors being similar)
 - Adjustment is higher for insured events that have a wider probability distribution as compared with those having a narrower probability distribution
 - Adjustment is higher when there is more uncertainty in the current estimate and trends
 - Adjustment should reduce as experience emerges that reduces uncertainty
- The measured uncertainty may include frequency uncertainty, severity uncertainty and legal environment uncertainty
- Possible approaches to determine risk adjustments
 - Quantile methods: VaR, CTE, TVaR
 - Cost of capital: amount of capital that is to be held for bearing the risk

$$Risk\ Adjustment = \sum_{t=1}^n \frac{r_t \times C_t}{1 + d_t}$$

- * C_t is the assigned capital for end of period t
- * d_t is the discount rate for period t from the yield curve for discount
- * r_t is the cost of capital rate for end of period t
- ISAP 4 asks the actuary to consider the following if the risk adjustment is not based on a confidence-level approach
 - The ability to diversify non-financial risk over the entity's consolidated business
 - The inherent uncertainty in the translation to a confidence level and the need to describe such uncertainty in the report

Component 4: CSM

- CSM not a measure of profit that one would use in ratemaking, but an accounting construct for IFRS
- CSM considers only those expenses that are directly attributable to the contract and is pretax
- CSM is an accounting offset for any gain on initial recognition of a group of contracts
 - At initial recognition, CSM = - FCF
 - if $PV(\text{premiums}) - PV(\text{expenses and benefits}) = Z$, then $FCF = -Z$, and $CSM = Z$ the FCFs are $-Z$, and the CSM is Z
 - * The CSM may be small if the risk adjustment is large
 - * If the residual is negative, the loss is recognized immediately and not amortized
 - * Contracts with a negative residual are referred to as onerous contracts under IFRS 17
- CSM is amortized over the contract period and is created only when it is positive
 - If negative, the loss is recognized immediately and not amortized

- Contracts with a negative residual are referred to as onerous contracts
- Accreted interest of CSM is an offset to investment income, not to underwriting income

§2h(iii) Aggregation of contracts for IFRS 17 calculations

- The different levels of aggregation one may consider under IFRS, from the highest level to the lowest level, are
 - Entity (i.e., all the insurance contracts considered together)
 - Portfolio (i.e., a product line)
 - Annual cohort: ensure that contracts are aggregated so that contract issuance is no more than one year apart within the cohort
 - * Under GMA, there should be the following 3 groups within each annual cohort
 - † Contracts that are onerous at initial recognition
 - † Contracts that have no significant possibility of being onerous at initial recognition
 - † All remaining contracts
 - * Selection of the appropriate measurement approach (GMA, PAA or VFA) is done at an annual cohort level
 - Group: a further segregation into groups of individual contracts with similar profitability
 - * PV of insurance cash flows needs to be produced on a group level of aggregation
 - * CSM is calculated at the group level
 - Individual contract
- When PAA applies, all contracts in the annual cohort may be considered as from a single group

§2h(iv) Reinsurance under IFRS 17

- Any reinsurance contracts that meet the definition of an insurance contracts would be subject to IFRS 17, including assumed and ceded reinsurance
- Rules for using GMA/PAA also apply for reinsurance
- Reinsurance is not grouped with the underlying contracts, but aggregated separately
- Differences of reinsurance vs insurance mostly are for CSM
 - For reinsurance contracts held under the GMA, any residual (whether a gain or loss) is amortized as a CSM
- Aggregation rules also differ, and there is no grouping of onerous contracts

§2h(v) Contract boundaries

- Recall that, cash flows are within the contract boundaries if the insurer
 - Can compel the insured to pay the insurance contract premiums, or
 - Has an obligation to provide the insured with services
- Differences between motor insurance, health insurance and life insurance illustrate contract boundaries
 - Motor: when moves, a higher or lower premium at the next renewal (contract boundary is limited to the current policy term, normally 1 year)
 - Health: can't reprice at renewal, but insurer can reprice when the portfolio is losing money

- Whole life: can't reprice even the portfolio is losing money (the boundary extends for many years)

§2h(vi) IFRS 17 PAA

- May be used for short-duration contracts (contract boundary ≤ 1 year, including most GI lines)
- May also be used for a group of contracts where the PAA is a reasonable approximation of the GMA
- Under PAA, insurer may elect to write off expenses when they occur
- PAA is only for remaining coverage, not incurred claims, for which GMA applies
- PAA does not compute a CSM or risk adjustment
- PAA is similar to GAAP for short-duration insurance contracts with several differences
 - GAAP shows separate UEPR and DAC costs, where as PAA uses a single insurance contract liability
 - GAAP uses nominal payment, whereas PAA may use present values
 - GAAP prorates premiums and expenses over the contract period or spreads them as insurance protection is provided, whereas the PAA amortizes insurance contract liability (accreting interest) either pro rata over the contract period or as losses are expected to be incurred
 - * Under PAA, insurers can elect to defer acquisition costs directly attributable to the contracts (as a reduction to the LRC) or expense them immediately (in the current income statement)
- Insurance contract liability under the PAA is $LRC + LIC = FCF_{RC} + FCF_{IC}$, as no CSM or risk adjustment is considered for LRC
 - At initial recognition, $LRC = UEPR - \text{associated acquisition costs}$ (assuming that the insurer elects not to expense acquisition costs immediately)
 - If the payment of claims is within one year, there is no requirement to discount LIC
 - Risk adjustment to LIC is still required
 - LRC can be determined pro-rata as to time or based upon the expected pattern of risk emergence
 - At the end of each subsequent period, $LRC =$
 - * (+) LRC at the beginning
 - * (-) Premiums received in the period less acquisition costs
 - * (+) Amount relating to amortization of associated acquisition costs
 - * (+) Adjustment to any financing component
 - * (-) Amount relating to insurance revenue recognized for providing coverage in the period
 - * (-) Amount of investment component paid or transferred to LIC
- In summary, similarities between IFRS 17 PAA and GAAP
 - LIC under both is the same except that PAA requires a risk adjustment and discounting
 - LRC under PAA can be viewed as having 2 components
 - * UEPR
 - * the amortized acquisition costs directly attributable to the contracts
 - * This is like UEPR and DAC under GAAP
 - * Difference: DAC is normally limited to commissions, while PAA may include more expenses

- For onerous contracts, PAA includes the additional liability in the LRC, just like PDR under GAAP, except that PAA requires a risk adjustment and discount

Use of the PAA for GI

- For most lines, GI may elect to use the PAA, although it is not required
- GI contracts with boundary > 1 year include engineering, construction, energy, surety, mortgage, warranty and accident insurance contracts, normally can't use PAA unless it is reasonable approximation of GAAP
- Most nonproportional reinsurance may use PAA (since boundaries are ≤ 1 year)
- Many annual proportional reinsurance contracts cover a 2-year period, since they are risks-attaching basis
 - PAA is permitted if each risk attachment has a ≤ 1 -year coverage period

Practice questions

1. Explain the how change of policy term may affect earned premium.
2. Compare the difference between US statutory accounting and GAAP to account for the acquisition expenses.
3. Compare how IASB and FASB treat not-taken costs and expenses to third parties as expenses attributable to contracts.
4. Describe the how IFRS 17 treats premium deficiency reserves (PDR) as defined in GAAP.
5. Insurer A is a mono-line underwriter for motor insurance. Identify which accounting approach(es) the insurer can use under IFRS 17.
6. (SOA GIFREU 2014 spring Q1) (c) Describe the Deferred Policy Acquisition Cost (DPAC) asset under GAAP.

An insurer issues a one-year catastrophe policy on July 1, 2013 covering hurricane claims. The hurricane season is assumed to be September and October. Acquisition expenses are 1,200 and the discount rate is zero.

(d) Calculate the DPAC as of the following dates under both statutory accounting and IFRS 4:

- (i) August 1, 2013
- (ii) October 1, 2013
- (iii) December 1, 2013

7. (SOA GIFREU 2016 spring Q18)

You are given the following information for a book of business:

	June 30,2014	Dec. 31,2014	June 30,2015	Dec. 31,2015
Paid Losses, inception to date	0	10,000	25,000	40,000
Case Reserves, as of date	30,000	60,000	50,000	25,000

- Premium of 110,000 was earned evenly during 2014.
 - Estimated audit premium as of March 31, 2015 was 10,000.
 - The expense ratio for this business is 30%, all variable.
 - The actuary estimated IBNR to be 30,000 as of December 31, 2014.
 - The actuary changed his estimate of ultimate losses to be 90,000 as of June 30, 2015. There were no further changes to the estimate of ultimate losses in 2015.
- (a) Determine the incurred losses recorded in the 2015 income statement for this book of business.
 - (b) Calculate the inception-to-date underwriting result as of December 31, 2015 for this book of business.
 - (c) Compare the treatment of acquisition expenses under U.S. GAAP and U.S. SAP.
 - (d) Describe how U.S. GAAP treats expenses of preparing bids for policies that are not written.
8. (SOA GIFREU 2017 spring Q11) Cheese Head Insurance Company of Wisconsin (Cheese Head) has a managing general agent, Sunny Insurance Agency (Sunny). Sunny “has the pen” in that it collects premiums and pays small claims for Cheese Head, remitting collected premiums net of a 20% commission, quarterly on January 1, April 1, July 1, and October 1 of each year. All policies are annual and policyholders are billed in quarterly installments.
 - Effective June 30, 2016, Sunny writes Policy A, an annual Cheese Head homeowners policy, for 1,200 and receives the first installment immediately.
 - In September 5, 2016, a fire completely destroys Sunny’s office and computer records.

- It will not be possible for Sunny to collect outstanding receivables for Policy A within six months from the date of the fire.
 - There are no claims or other expenses for Policy A.
- (a) (discussed in chapter 5)
- (b) Determine the accounting income in 2016 from Policy A for Cheese Head under SAP.
- (c) Determine the accounting income in 2016 from Policy A for Cheese Head under GAAP.
9. (SOA GIFREU 2018 spring Q13) (a) Describe the four building blocks of total insurance liability under International Financial Reporting Standards (IFRS) 4.
- (b) Compare the accounting treatments under IFRS 4 and GAAP for the following:
- (i) Reporting of premiums
 - (ii) Use of risk margins
 - (iii) Recognition of profit
10. **SOA GIFREU 2021 spring Q1**
11. **SOA GIFREU 2021 spring Q15**

Solutions to practice questions

1. Earned premium depends on the coverage provided, not on the policy term. Hence, a change in policy term will not affect EP.
2.
 - SAP has a liquidation perspective, and underwriting and acquisition expenses flow through the IS when they are incurred
 - GAAP has a going-concern and capitalizes and amortizes expenses to acquire new and renewal policies
 - Capitalizing a cost means creating an asset, named deferred acquisition cost (DAC)
 - Amortizing a cost means converting the balance sheet asset into an income statement expense according to a schedule as premium is earned
 - For most policies, the insurance protection is provided evenly over the policy term, so premium is earned pro rata
3.
 - Not-Taken Costs
 - FASB says that the expenses incurred preparing bids for policies that are not written are written off immediately, since they did not result in policies
 - IASB says that the total underwriting activity of preparing bids is necessary for writing these policies, so the total cost of preparing bids is matched to the revenue from writing the policies
 - Expenses to Third Parties
 - Expenses paid to persons writing or selling policies, such as underwriting salaries and sales commissions, are clearly deferrable
 - Expenses paid to others as a percentage of WP are less clear (e.g. state premium taxes, state guaranty fund assessments, and rating bureau fees)
 - FASB says these expenses are like salaries and commissions and can be deferred
 - IASB says that these expenses are not paid to acquire the policies, so they cannot be deferred
4. PDR is referred to as onerous contract liability in IFRS 17, with the following differences from GAAP
 - Cost must be directly attributable to insurance contracts
 - It is more common than PDR in GAAP, since Insurance portfolios are more narrowly defined in IFRS 17
 - Expected investment income is replaced by the implicit interest discount in unpaid loss
 - Under GAAP, insurer chooses whether to include investment income, whereas under IFRS 17, valuation of unpaid loss follows the method used for the portfolio
5. Since motor line's contract boundary is normally less or equal to 1 year, insurer A can choose to use either the general measurement approach or the simplified premium allocation approach under IFRS 17.
6. (c) GAAP capitalizes a DPAC asset at policy inception to represent the underwriting and acquisition expenses paid at policy inception and amortizes it over the policy term as the premiums are earned.

(d) Deferred expenses are 0 under Statutory Accounting at all times. While not specifically referred to as DPAC in IFRS 4, expenses in IFRS 4 are linked to the loss incurral pattern creating deferred expenses (i.e., DPAC).

 - (i) Aug. 1, 2013: 0% of the expenses are written off, deferred expenses = 1,200
 - (ii) Oct. 1, 2013: 50% of the expenses are written off, deferred expenses = 600
 - (iii) Dec. 1, 2013: 100% of the expenses are written off, deferred expenses = 0

7. (a) Incurred losses 2015 = Ultimate at 12/31/15 – Ultimate at 12/31/14
 = 90,000 – (10,000+60,000+30,000)
 = –10,000

(b) Inception-to-date underwriting result as of December 31, 2015
 = total premium – total losses – total expenses
 = (110,000 + 10,000) – 90,000 – (0.30 × (110,000 + 10,000))
 = – 6,000

(c)

- U.S. SAP recognizes acquisition expenses immediately as they are incurred.
- U.S. GAAP capitalizes the expenses by establishing an asset for prepaid expenses and amortizes the expenses over time as premiums are earned.

(f) U.S. GAAP does not consider these to be acquisition expenses and writes them off immediately as they are incurred.

8. (b) Statutory income is the earned premium minus the acquisition expenses: $50\% \times 1,200 - 20\% \times 1,200 = 360$

(c) GAAP income is SAP accounting income plus the change in the deferred acquisition cost (DAC) asset.

SAP accounting income is 360 from part (b).

The DAC asset is:

- 0 at the beginning of the calendar year, January 1, 2016,
- $20\% \times 1200 = 240$ at the beginning of the policy term on June 30, 2016, and
- $50\% \times 240 = 120$ midway through the policy term at December 31, 2016.

The DAC increases from 0 to 120 during 2016. Therefore, the 2016 GAAP accounting income is $360 + 120 = 480$.

9. (a)

- Insurance cash flows: Estimate of the total value of insurance cash flows: premiums collected, claims paid and expenses paid. Amount is to be an unbiased estimate based on up-to-date information and probability weighted cash flows
- Discount: Adjustment of using a market consistent risk-free rate yield curve plus a liquidity premium to take component 1 to a present value estimate
- Risk Adjustment: An explicit adjustment to reflect the uncertainty in the estimate of future cash flows. This adjustment reflects the diversification benefit for the insurer and the insurer's risk aversion.
- Contractual Service Margin: This margin represents the profit of the contract, where profit is measured as the amount that the present value of future cash inflows exceeds the sum of the present value of future cash outflows and the risk adjustment.

(b) (i) Reporting of premiums

- IFRS: Reported net of directly attributable expenses at inception.
- GAAP: Full amount reported. Income amortized over the contract period.

(ii) Use of risk margins

- IFRS: Explicit risk margins used.
- GAAP: Use of implicit risk margins (e.g. undiscounted loss reserves).

(iii) Recognition of profit

- IFRS: Shows expected profit, risk adjustment and contract margins at inception of the contract.
- GAAP: Recognition of profit is based on premium earnings and loss/expense incurred patterns.

